use and value of the ophthalmoscope in diseases and injuries of the eye, principally on account of its simplicity. It will be admitted that it affords a striking example of the exact diagnosis that we are enabled to make by the aid of this important instrument; and so to clear away much of the doubt and uncertainty that necessarily attach to the investigation of these important affections. It also enables me to make a few comments on the appearances observed, that may be of interest to those who have not hitherto given much attention to this subject, and to whom the mere narration may not convey a very definite and intelligible outline of the case. Though the ophthalmoscope affords most exact information to the expert, it is unquestionable that the tyro will experience both difficulty in observing, and uncertainty in recognising morbid appearances. Hence, the necessity of commencing this mode of investigation on the simplest and most palpable cases. Many who attend the practice at the Ophthalmic Hospital, attempt to use the instrument, for the first time, on eyes that are difficult to examine, even by those accustomed to its application. No wonder, then, that they often are so discouraged as to abandon the effort altogether; while a little preparation would have enabled them to proceed with confidence to the attainment of their object. For the physiological examination, the eyes of the dog or cat afford great facilities to the beginner. He may then observe the eyes of children, as they may be explored with less difficulty than those of adults, and are, of course, excellent illustrations of the typical forms of normal eyes. On some points in the case above detailed, I shall now offer a few comments. In the first place, it was observed that the illumination of the eye was partially obstructed by a change in the crystalline that produced some shade in the image reflected from the fundus of the eye while using the speculum alone. The ophthalmoscope enables us, with the greatest precision, to ascertain the presence of any opacity in the structures situate in front of the retina, and, generally, so far as the anterior segment of the eye is concerned, we can diagnose with great exactness the position and other relations of the opacity, and so to say whether it depends on alterations of the crystalline or vitreous. The amount of opacity may also be estimated by projecting light obliquely into the eye. This can be done very conveniently with the speculum and a convex lens. The two modes materially assist each other.

BIRDS DOING GOOD TO FARMERS. This interesting question, so important to the farmer and to society at large, has had much light thrown on it by the recent French report, which proves that the destructive war carried on against little birds in France is becoming so injurious, and has spread so widely, that the serious attention of Government has been called to the subject, and remedial measures are about to be adopted to meet the evil. The popular little work of M. Michelet (not the German philosopher, but the French historian and amateur naturalist), *L'Oiseau*—composed in so beautiful a style, and in a spirit of such love and attachment to birds—has carried into every region the benevolent spirit of the author, and made him a most effective agent in creating a more tender regard for them, and a wiser conception of their important uses in the great system of the Author of Nature. It is M. Michelet who says,—"L'homme n'eût pas vécu sans l'oiseau, qui seul a pu le sauver de l'insecte et du reptile; mais l'oiseau eût vécu sans l'homme." With reference to the disappearance of little birds from France, he says:—"De nombreuses espèces d'oiseaux ne font plus de halte en France. On les voit à peine voler à d'inaccessibles hauteurs, déployant leurs ailes en hâte, accélérant le passage, disant, 'Passons! passons vite! Evitons la terre de mort, la terre de destruction!'" (*Notes and Queries.*)

Original Communications.

MEDICAL PSYCHOLOGY.

By ROBERT DUNN, F.R.C.S.E.

[Continued from p. 302 of last volume.]

II. *On the Nervous Instrumentality or Apparatus through which the Phenomena of the Mental States are manifested.* We have next to inquire into the nervous apparatus of the sensational, perceptive, and intellectual phases of consciousness.

Now it is universally conceded that the brain or encephalon, in its totality, is the material organ of the mind, where the ultimate molecular changes precede mental states, and where the mandates of the will originate the changes which lead to and terminate in acts of volition. But, as I have elsewhere observed, "be it remembered, in affirming that sensation, perception, emotion, thought, and volition are functions of the nervous system, it is only maintained that the vesicular matter of the encephalic ganglia furnishes the material conditions—the substratum through which these mental phenomena are manifested in this life; and, at the same time, it is fully admitted that the essential phenomena of matter and of mind are so completely antagonistic, it is in vain that we attempt to establish any relationship of analogy or identity between them." (*Vide Essay on Physiological Psychology*, p. 7. Churchill: 1858.) In truth, to us the abstract nature both of matter and of mind is alike inscrutable. We can no more comprehend the essence of the one than we can that of the other; for the forces of external nature which underlie all vital phenomena, and the changing states of consciousness, which constitute our mental life, are as inscrutable to us as is that internal something of which consciousness itself is the exponent. But, whatever may be our belief as to the abstract nature or essence of mind, this at least is indisputable, that *sensibility* and *mobility* are its primordial points of contact with the external world or nature, and it is clearly demonstrable that these essential attributes have their seat in the sensory and motor ganglia of the nervous system. In the life of relation, indeed, and throughout the whole animal kingdom, the nervous system is the medium of communication with the external world. This system, in its simplest but essential type, consists of *nervous centres or ganglia, commissures, and nerves*. The vesicular matter of the nervous centres or ganglia is the source of the nervous force, where impressions are received and impulses are generated; between these centres, the commissures are the media of communication; and to and from them, the nerves are internuncial conductors or cords. In the invertebrate sub-kingdom is best seen the simplest form of the nervous system; namely, distinct ganglia, with commissural cords and nerves, administering to the functions of automatic life, and to the operations of instinct. Now nervous actions are of a threefold character—physical, or *excito-motory*; sensory, or *sensori-motor*; and volitional, or *intelligent*. But it is only in the highest class—the vertebrata, and where there exists a cerebro-spinal system—that we recognise the existence and co-ordination of all these different kinds of nervous actions. In the very lowest animal organisms, the physical or excito-motory alone are present. These are essentially automatic, and occur without sensation; to them, in the invertebrate kingdom, and as typical of animal life, the sensory or sensori-motor are superadded; whilst it is solely in the vertebrate series that the intelligent and purely voluntary come into play. Throughout the whole of the vertebrate subkingdom, the type of the nervous system, including man himself,

is the same. It admits of a threefold division, in accordance with its functional endowments and co-ordinations—into,

1. The physical or excito-motory and reflex—the true spinal system of the late Dr. Marshall Hall.
2. The nutritive and secretory, or ganglionic system, administering to the functions of animal life.
3. The sentient, percipient, and intellectual, or the cerebro-spinal system.

But it is only with the last of these that we are now more immediately concerned, in relation to the sensational, perceptive, and intellectual phases of consciousness; for, in its totality, it comprises the organic instrumentalities through which the phenomena of sensation, perception, and intellection are manifested in this life. The physical or excito-motory phenomena are, indeed, without the domain and beyond the control of intelligence; and the reciprocal relations between the ganglionic and the cerebro-spinal systems have but an indirect, though a most important bearing on our present inquiry. In the nervous system of the invertebrata, we have the homologues of the nervous apparatus of the sensational consciousness of the vertebrate series, and even of man himself; for the sensory ganglia are the instruments through which the phenomena of the sensational consciousness, of whatever kind, are manifested—not only of sensorial feeling, but of emotional also; and the cranio-spinal axis, with the corpora striata at its summit, is the centre and source of all the movements of the body, reflex, consensual, emotional, and volitional; the two great centres of sensation and motion being co-ordinated and brought into harmonious and associated action through the medium of the cerebro-spinal axis. And thus we see that the nervous instrumentality of the sensational consciousness of man—the sentient and sensori-motor apparatus—the system of automatic life and instinctive action, subservient to sensations, and to those consensual and instinctive actions which are indissolubly linked on with sensations,—consists of the spinal axis and nerves, the medulla oblongata, and the chain of sensory ganglia, including those of the spinal senses at its summit. For, if we follow up the cranial prolongation of the spinal cord—the medulla oblongata—into the fibrous strands of which we see imbedded the *respiratory*, the *auditory*, and the *gustatory ganglia*, and carefully trace out its ramifying branches, we find it sending off distinct fasciculi of fibres to the ganglionic centres at its summit—to the cerebellum, the corpora quadrigemina, the thalami optici, the corpora striata, and to the peduncles of the olfactory ganglia. Moreover, a continuous nervous thread ramifies throughout the entire centre of special sensation; the thalami optici, as the great centres of sensorial feeling, being the common foci or points of union for all the nerves of special sense. The whole series, indeed, of the sensory ganglia of the cerebro-spinal system, including those of the special senses, are in direct fibrous connexion with the cranio-spinal axis, forming with it, as an aggregate or whole, the *sensorium commune*, or great circle of sensational consciousness, of consensual and instinctive action.

It is further demonstrable that the spinal cord, with its cranial prolongation, is a *distinct and independent centre of action*, consisting of a series of segmental ganglia and nerves, structurally homologous, and functionally analogous to the jointed ganglionic cord of the articulates. The excito-motory and reflex actions of which it is the seat are evidently subservient to the conservation of the organism, by the excitation of the respiratory movements, by the governance of the various orifices of ingress and egress, and by the maintenance of the integrity of other vital processes in which the reflex movements are concerned. Of the medulla oblongata—the *nodus vitæ* of Flourens—Schroeder Van der Kolk truly remarks that, “of all the parts of the human

body, there is not one which is of such great moment to existence and to the continuance of life, and to the maintenance of the most different and important functions of the system; uniting in a small space, and directing, as from a central point, so much that is various in aspect, and really diverse.”

It is a centre of *sensation* and of *co-ordination*, of automatic respiratory movements, and of deglutition—a middle point, in which are imbedded the roots both of sensory and motor nerves; not only the seat of the ganglia of the nerves of *hearing*, *taste*, and *feeling*, but also of the vagus, hypoglossus, and glosso-pharyngeus etc., where many different bundles of fibres end, and from whence others, originating in various ganglionic groups, radiate and transmit their influence to other centres and organs of the body. Some fibres, ascending, as Foville has shown, to the “*espace quadrilatère perforé*,” and from thence passing out through the anterior posterior arch of fibres, under the internal convolutions, radiate into the grey matter of the hemispheres. It is emphatically “the knot of life”; for, “in a limited portion of the organ, a simple puncture or injury suffices immediately and irrevocably to extinguish life, and, as with a stroke, to annihilate its principal phenomena, respiration, voluntary motion—nay, all that constitutes existence.”* It has been experimentally proved that, if the brain be cut off above the medulla, respiration still continues.

Now it is practically of great importance to bear in mind that we have in the nervous apparatus of the sensational consciousness a *distinct centre of action*, independent of, and not to be confounded with, that of the perceptive or intellectual consciousness; for it may be intact when these are in abeyance, benumbed, or paralysed; no longer capable of receiving impressions, and of responding to or acting upon them; and we may be called upon to witness the sad and melancholy spectacle of a man in prime of life reduced to his primitive condition of a mere sensational and instinctive being. An interesting and instructive illustrative instance of this kind came under my notice some years ago, in the case of a young woman whose intellectual faculties were quite suspended, and whose only open avenues to the sensational consciousness were those of sight and touch; for she could neither hear nor speak, taste nor smell. The narrative of the case, and a commentary on the more important of its psychological bearings, will be found in the ASSOCIATION MEDICAL JOURNAL for 1855. It has been characterised by Dr. Carpenter as the most remarkable case upon record in illustration of the nature of a purely *sensorial and instinctive*, as distinguished from an *intelligent existence*, and the gradual nature of the transition from the one to the other. (Vide Dr. Carpenter's *Human Physiology*, 5th edition, p. 667.)

Nervous Apparatus of the Perceptive Consciousness. “If,” says Mr. Solly in his valuable work,† “there is one point in the physiology of the brain more unequivocally demonstrated than another, it is, that the great hemispherical ganglia are the instruments of the mind—the portion of the brain in which sensations are converted into perceptions, and give rise to ideas. Comparative anatomy; developmental anatomy; experiments on living animals; observations on its size and form, as indicated by the size and form of the skull; and last, but not least, pathology,—all afford a mass of overwhelming evidence that this portion of the brain, and this only, is

* Vide Sch. Van der Kolk, “On the Minute Structure and Functions of the Medulla Oblongata.” Published by the New Sydenham Society, 1850. This able work, and the experiments and the equally valuable researches of Dr. Brown-Sequard, into the relative functions of the several columns of the spinal cord, are alike interesting and important, from their practical bearing, to every pathologist and medical practitioner.

† Solly, “On the Human Brain, its Structure, Physiology, and Diseases.” Second edition, page 335, 1858. A work which every physiological psychologist ought carefully to study.

the organ of intellectual power." He further quotes the authority of Müller in support of the position that the intellectual faculties reside in the hemispherical ganglia, and who says: "It has been proved by direct experiment that such is their seat. The experiments of Flourens are especially instructive, and Hertwig has on the essential points done no more than confirm them. The hemispheres are insensible both to puncture and incisions. That part of the brain in which sensations are converted into ideas, and the ideas are hoarded up, to appear again, as it were, shadows of sensations, is itself devoid of sensibility." Hence, as the exclusive centre of intellectual power, the seat of the understanding and the will, the cerebrum, in its totality, is the nervous apparatus both of the perceptive and intellectual consciousness.

The phenomena, indeed, of the perceptive consciousness require for their manifestation, beyond the mere sensory apparatus, an augmentation and elaboration of the nervous system; for whilst, in sensation, the ganglionic action is single and direct, the conscious mind feeling instinctively the physical impulse of the external object, and each sensory ganglion, as the seat of a special endowment or sensation, responding directly to its own appropriate stimulus,—in perception a double ganglionic action is involved; the nervous impulse is carried a stage farther; for the sensory impressions, and the intuitions of the special senses, whether sights, sounds, smells, tastes, or feelings, internal or external, in order that they may be *idealised, perceived, and registered*, require to be transmitted to a second ganglionic centre—the *hemispherical*; for it is there that ideation is effected and memory resides. "The cerebrum", to use the language of Cuvier, "is the sole receptacle where the various sensations are consummated and become perceived by the animal, and where all sensations take a distinct form, and leave behind them lasting traces of their impressions, serving as a seat to the memory, and furnishing the animal with materials for its judgments." The cerebral hemispheres are thus the crowning ganglia of the whole series, and the distinguishing feature of the cerebro-spinal system, manifestly superimposed on the sensory ganglia within the encephalon, and in close and direct commissural connexion with them, for the purpose of combining and associating instinctive actions and emotional sensibilities with perceptive activities, and for offices or purposes the noblest and most exalted in the economy of man. In the lowest, indeed, of the vertebrate series of animals, the representatives of these hemispheres are reduced to mere laminae or crusts; but they gradually increase in size, complexity of structure, and in the number of their lobes and convolutions, as the animal rises in the scale of intelligence, until they reach their culminating predominancy in man; and then it is that they completely overlap and crown all the other encephalic ganglia. But wherever they do exist, and in however rudimentary a state of development, there we invariably find unmistakable evidence of the manifestation of the essential phenomena of the perceptive consciousness. In proof and illustration of this, we need only advert to the case of the fish, the lowest of the vertebrate series, and where these ganglia, as in the *carp*, are reduced to mere vesicular laminae, incrusting the corpora striata, as affording clear and indubitable evidence of the exercise of *perception, memory, and volitional movements*, as opposed to mere consensual and instinctive actions; for, says Sir Benjamin Brodie, "we, at any rate, recognise in the stupid *carp*, which comes to a certain spot at a certain hour, or on a certain signal, to be fed, the *existence of memory and the association of ideas*." (*Physiological Inquiries*.) But, as in the brain of the fish, so in that of the human embryo at two months, the rudimental cerebral lobes are the mere incrustations of a layer of vesicular tissue upon

the corpora striata. Nature, indeed, begins the development of the encephalon with the sensory ganglia of the sensational apparatus; that is, with the formation of the parts which place us in immediate relation with the external world; viz., with the centres of smell, the quadrigemina for sight, and the medulla oblongata for hearing, taste, and feeling; for the hemispherical ganglia are not developed until after them, and then in direct commissural connexion with these centres, by special bundles of fibres, as has been so beautifully shown by Foville in his *Anat. et Phys. du Système Neureux*, Plate xviii, Fig. 1, NN, S, and CL, BBB.

Foville has invested the *locus perforatus* through which these fibres pass from the sensory ganglia of the special senses to the grey matter of the convolutions with peculiar interest, as being the central nucleus of the hemisphere, and whence all the longitudinal convolutions of the brain spring and are evolved. Still the vesicular laminae spread upon the corpora striata in the brain of the fish are manifestly the homologues of the hemispherical ganglia of the whole vertebrate series, including man himself; for, as Schroeder Van der Kolk has justly remarked, "in the ascending scale of animals, all the fundamental parts retain their proper function, only others are added, which are more closely connected with the higher faculties." And if from the *general* to the *special* be the great law of progress which it is held to be, then must it be equally applicable to the development of the cerebral hemispheres as it is to every other organ of the body. The case of the fish is both interesting and instructive, not only from the closeness of the union of the perceptive and motor ganglia, but as being the earliest instance to which we can point of clear and distinct evidence of the exercise of perception, memory, and volitional movements, as opposed to mere consensual actions. Now throughout the whole of the vertebrate subkingdom, the type of the brain is the same; and, on a general survey of the series, it cannot escape observation that the longitudinal convolutions, from their first workings out, increase in number, volume, extension backwards, and in complexity of structure, as the animal rises in the scale of intelligence, and as the range of its perceptive activities widens. To unravel all the complexities of the intimate structure of the cerebral hemispheres has hitherto baffled the most eminent anatomists, with all the appliances that science can furnish; but Foville and Leuret have clearly shown that these hemispheres are chiefly made up of three distinct series of convolutions—the *longitudinal*, the *commissural* or *anastomosing*, and the *transverse series*. The longitudinal series are the first to be developed; and, according to Foville, they arise from a common central nucleus, the *locus perforatus*, and are closely banded together. It is indisputable that the internal convolutions are the primitive basement convolutions of the hemispheres, forming the broad lines of demarcation between the sensory and perceptive ganglia, between the sensational and perceptive apparatus; they are the central organs of the perceptive consciousness, and therefore the common portals to intellectual action and volitional power. Now, since these basement convolutions are the first developed, and as the whole series of longitudinal convolutions arising from the same central part are most intimately connected and associated with each other, and are commissurally banded together, my own mind rests in the conviction that *an unifying bond of action pervades them*, and that the entire series of longitudinal convolutions, as an aggregate or whole, constitutes the nervous apparatus of the perceptive consciousness—in other words, the instruments of all our immediate or intuitive cognitions; not only the seat of the perceptive faculties, through the instrumentality of which, by the inlets of the special senses, we acquire a knowledge of external existences, their sensible qualities and physical attributes—of the differences and re-

lations of things, their order or arrangement and numbers, and the phenomena of their action or events; but also of those purely ideational activities which form constituent elements in the composite nature of the personal or individual and social affections, and of the emotional, moral, and religious feelings of man.

In accordance with this view of the office or functions of the vesicular matter of the longitudinal convolutions, may we not in ascending planes of development, and as the animals rise in the scale of intelligence, trace corresponding extension and elaboration of the nervous apparatus of the perceptive consciousness? It may, at least, be legitimately inferred that the primitive basilar convolutions, as we have seen in the case of the fish, are the seat of the perceptive activities which are subservient to the formation of the inferior region of the true or conscious mind. Thus, as I have elsewhere observed (*Essay on Physiological Psychology*, p. 86), "the lowest plane of cerebral development, and of which we may recognise the analogies in the inferior vertebrata, the perceptive apparatus seems limited to the basement or internal convolutions, with their anterior and basilar connexions; that is, to the common central organs of the perceptive consciousness, the seat of ideation, memory, and volition; to the anterior perceptive organs, through the instrumentality of which, by the inlets of special senses, we acquire a knowledge of the sensible qualities and physical attributes of external existence; and to those basilar organs which administer to the preservation and maintenance of animal life. The love of life is paramount; and around the organs of the alimentative propensity are marshalled and associated those of the propensities subservient to the defence, protection, and conservation of existence. It may, indeed, be fairly inferred that the intuitions of the special senses, and their allied feelings, appetites, and instincts, form the chief and predominant part of the mental life of the inferior vertebrata; while, at the same time, it must not be forgotten that these too constitute the inferior region of the true or conscious mind, and enter largely into the completed web of human existence.

"On a higher plane of development, and of which, too, we may recognise the analogies among the highest mammalian and quadrumanous groups, the longitudinal convolutions are carried upwards above the lower perceptive organs, and prolonged backwards even beyond the median lobes; and the perceptive apparatus is proportionately elaborated and extended. Leuret, in the demonstration of the convolutions of the Indian elephant, aptly remarks, 'Suppose that all the superior convolutions, and the prolongation of the internal convolutions, were obliterated. The fourth anterior convolution might then be united to the fourth posterior convolution, the third to the third; and we shall have one of the groups of convolutions of the brain, of an inferior grade, of the ruminantia and solipedes.' It is through these superior perceptive organs that we rise above the mere perception of external objects, their sensible qualities and physical attributes, to that of the differences and relations of things, their order or arrangement and number, and to the phenomena of their action or events, with the adjuncts of time and place. The higher individual or personal affections too, such as the love of self or self-esteem, the love of approbation, and love for others, or benevolence, are then brought into play.

"But there is still a higher plane of perceptive development, exclusively human, in which the towering longitudinal convolutions reach the fulness of their evolution backwards, and the nervous apparatus of the perceptive consciousness its most elaborate and complete development. The moral and religious intuitions are the sole prerogative of man, and they constitute an immutable distinction between him and the whole animal creation. In man's moral and religious attri-

butes the lower animals do not participate: equally destitute are they of those enduring, tender, and endearing relations which are the charm of his existence here."*

This view of the nervous apparatus of the perceptive consciousness receives, as I think, not a little confirmation from the minute anatomical researches of Gratiolet, and especially in reference to the distribution of the optic nerve, and the ramification of its cerebral roots. Sight, it must be acknowledged, is the highest, most refined and objective of all the special senses; *for sight is knowledge*, and the visual impressions on the retina pass direct to the seat of the perceptive faculties, in the cerebrum. Now Gratiolet has demonstrated that, as an animal rises in the scale of intelligence, as the range of its perceptive activity is enlarged and widened, so are the cerebral connexions of the optic nerves extended and multiplied; and that in man they radiate to every part of the convoluted vesicular surface of the hemispheres. He has shown that in the quadrumana, as in man, a large tract of fibres, quite independently of any connexion with the corpora quadrigemina and thalami optici, passes at once from the optic nerves to every part of the ganglionic tissue of the hemispheres; its fan-like expansion extending not only to the superior and posterior borders of the hemispheres, but also to their frontal extremities, making a special termination in that band of convolutions which extends along its superior border, and of which the high development is so peculiarly characteristic of the human brain.

And thus whilst, on the one hand, in the ascending series of animals, as in man, the proper cerebral termination of the optic nerve gains rapidly upon its sensorial roots, so on the other, in the marsupials, the cerebral ramifications are altogether wanting, and the roots of the nerves pass directly to the large tubercula quadrigemina and thalami optici; and so again in the monkey, where the optic nerves are large, the cerebral distribution is small, when compared to what passes to the corpora quadrigemina. In fact, as the cerebral roots diminish, those of the sensory ganglia augment in absolute amount; and as we descend in the vertebrate scale, it is worthy of note, the portion of the roots connected with the thalami optici diminishes, whilst that which passes to the proper optic ganglia (the tubercula bigemina) increases not merely relatively, but *positively*.

But the minute anatomical researches of Gratiolet have further demonstrated that, as the longitudinal convolutions become more distinct, numerous, and voluminous, and the convoluted arrangement of the vesicular stratum augmented, so is there found a corresponding complexity in the fibrous tracts connecting the different convolutions with each other, and connecting either hemisphere with its fellow and with other parts of the encephalon. He has attempted to unravel the disposition of these tracts, but confesses that, in the frontoparietal region, the interlacings of the different strata are so complicated that they cannot be traced with absolute certainty. Still Gratiolet has done enough to indicate the closeness of the relationship which must subsist among the intuitive perceptive activities, and has thus shed a ray of light upon the doctrine of the *association of ideas*. From the mode in which the different parts of the vesicular tissue of the convoluted

* In my essay on "Physiological Psychology," I have, on the authority of Professor Owen (*vide* his paper "On the Character, etc., of the Class Mammalia," in the Journal of the Proceedings of the Linnean Society, vol. ii, No. 5, 1857), been led to consider the posterior lobe of the brain as essentially human, and as such to be in consequence the seat of exclusively human affections. But Professor Huxley, in the Natural History Review, has fully exposed the fallacy of the statements of Owen, "that the third lobe is peculiar to the genus *Homo*, and that equally peculiar is the posterior horn of the lateral ventricle and the hippocampus minor, which characterise the hind lobe of each hemisphere," by demonstrating their actual existence in anthropoid apes and in some of the higher quadrumana, and thus proving beyond controversy that these parts are not peculiar to man.

surface of the hemispheres are connected with each other, and with that of the other encephalic ganglia, may we not be led to form something of a better comprehension of how it is that, in the complicated web of conscious existence, our whole life should consist in a succession of ideas, and of feelings associated with them? It has been reasonably inferred by Dr. Laycock that the three alternate layers of grey and white matter of which the convolutions are made up have different functions or offices, for such is the law as to distinct groups or layers of cells; and that they are probably alternate regulative, or ideagonic, and kinetic or motor substrata; for it is in accordance with all the laws of development, he observes, that there are both *kinetic* and *regulative* or *associative*, as well as *ideagonic substrata*, in connexion with every psychical manifestation. (Dr. Laycock, *On Mind and Brain*.)

RARE CASES IN MIDWIFERY.

By EDWARD COPEMAN, M.D., Physician to the Norfolk and Norwich Hospital.

CASE I. *Œdema from Pressure, impeding Delivery.* Mrs. B., aged 35, mother of eight children, five living and three dead, had all good labours except the first, which required the use of the vectis. She was taken in labour with her ninth child on August 10th, 1857; and at 7 A.M. on the following day, her pains had become very severe. Her medical attendant could not detect any presentation; but, finding a large bag of membranes, he ruptured them; but even then, with very strong pains, he could not feel the head without a forcible introduction of two fingers. The promontory of the sacrum projected very much; and the head rested on the brim of the pelvis. Hour after hour passed in strong labour, but without advancing the head; and by 5 P.M. the only effect of the pains was to produce enormous œdema of the os uteri and vagina from the long continued pressure. Mr. — was at a loss to conjecture what might be the cause of obstruction, but thought of twins, or monstrosity. Soon afterwards, the patient became so exhausted, irritable, and apprehensive, that she was almost unmanageable, and my assistance was requested. When I arrived, about two hours afterwards, I found the head still almost out of reach, the os uteri dilatable and much swollen from the pressure of the head above it, its anterior lip excessively tender, and the whole vagina so œdematous as to make a satisfactory examination very difficult. I thought the impediment to delivery might have been attributable to the long diameter of the head being placed in the antero-posterior diameter of the pelvis; and auscultation of the foetal heart led me to the impression that the face was towards the pubes. What was to be done? I felt sure that long forceps could not be safely applied; perforation would have been extremely difficult owing to the loose œdematous tissues which intervened, and if any portion of the cranial bones had projected during extraction, the œdematous vagina would almost unavoidably have been injured; in addition to which, as another argument against perforation, we knew that the child was still alive. The patient was in a most nervous, frightened condition; and, after much anxious consideration, it was determined that I should attempt an application of the vectis, in the hope at least of placing the head in a better position to enter the pelvis. It was difficult to introduce it; and when I had passed it so high as to include a considerable portion of the handle in the vagina, I found I could not alter the position of the head, which was very firmly fixed. I therefore attempted traction; and, finding after a while that I made some slight impression, I continued it. In about an hour and a half, by dint of as hard pulling as I felt to be consistent with safety, and very strong labour pains, I succeeded in bringing the head

through the pelvis, and the child was born alive, with the face towards the pubes. My vectis had reached the left malar bone, where it had produced rather severe contusion but no actual abrasion of the skin. The placenta came away well; the uterus contracted favourably; and I left the patient better than might have been expected. The perineum was not ruptured; no hæmorrhage followed delivery; and, after a full opiate, she fell into a quiet sleep.

Had not the vectis fortunately answered the purpose, I am at a loss to know what could have been done to ensure the safety of either mother or child; and as it was, I much feared sloughing of the enormously œdematous soft parts. She had, however, a rapid recovery, and took no harm.

On March 1st, 1860, I was again summoned to this patient, she having been in labour since the previous morning. She had had one child born without any unusual degree of difficulty, since the labour above reported. I found that she had experienced many hours of severe suffering; and, although her pains were very strong and frequent, she felt she had no power to move the child, and had become excessively worn, irritable, and frightened. I could hardly feel the presentation; the vagina, as before, was filled with loose œdematous structure (the vaginal walls) and the dilatable flabby œdematous os uteri, hanging down below the head, and having had no direct pressure upon it to dilate it. After finding my way through these loose structures, I felt the head above, with the anterior fontanelle forwards, resting on the brim of the pelvis, which was narrowed in its antero-posterior diameter by a very projecting promontory of the sacrum. She was in a state of very great alarm; said she had no courage to make any further effort, and must die. It really seemed almost impossible to hasten delivery by mechanical means; and yet she was in a condition which required speedy relief. Forceps were out of the question; craniotomy would have been exceedingly difficult, and the child was alive; turning was thought of, but that would have been a dangerous operation in her state, and probably would have cost the life of the child. As a little rest was very desirable if it could be procured, we endeavoured to calm her fears, encouraged her to hope we might have the same success as on a former similar occasion, and left her for two hours in order to consider well how we should proceed under such untoward circumstances. The result of our consultation was that, at the earnest solicitation of her surgeon, I attempted delivery with the vectis. It was no easy matter (the head being almost beyond the reach of the finger) to guide the instrument safely through the os uteri and place it in an useful position on a head so little in the pelvis. I managed, however, to get a hold in front of the left ear, by introducing the vectis far enough to include nearly all its handle in the vagina; and most fortunately succeeded in gradually drawing the head into and through the pelvis, by means of as much force as I dared to apply, aided by very strong uterine pains, which she now bore with more fortitude as she felt her labour was progressing. Her sufferings were great for about an hour; but when all was over, she seemed remarkably well, and there was no evidence of any serious injury having been sustained. The perineum was uninjured; the placenta came away naturally; the uterus contracted firmly; and we left her in a satisfactory state, thankful beyond measure at having overcome difficulties which at one time appeared almost insurmountable. The child was alive and vigorous, and exhibited no other injury than a slight mark or two on the side of the face where the blade of the vectis had been fixed. The patient this time had again a rapid and complete recovery.

CASE II. *Occlusion of the Os Uteri.* Mrs. —, aged 35, was in labour with her second child on August 4th, 1858. She had been pregnant only once