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THE PHRENOLOGY OF GALL AND FLECHSIG'S DOCTRINE OF ASSOCIATION CENTRES IN THE CEREBRUM.*

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IN the history of medicine the eighteenth century stands out prominently as a period in which flourished a whole host of so-called medical systems and theories. The *animismus* of Stahl and the nerve-ether theory of Hoffmann had been displaced by the system of Boerhaave ; the last, in turn, being gradually supplanted by the doctrine of irritability advanced by Albrecht von Haller, who had formulated a new theory based upon his experiments in physiology. William Cullen, again, combining Hoffmann's system with the doctrine of irritability of Haller, sought the cause for all pathological

*Remarks made before the Clinical Society of Maryland, November 20, 1896.

processes in the nervous system. Each individual attempted to subordinate the most varied phenomena met with in disease to his own particular principle, and as yet the newer studies in anatomy and physiology were not wide-reaching enough in their influence to prevent the development of the most diverse and contradictory medical theories. The "excitation theory" introduced by John Brown met with an enthusiastic reception, not only in England, but also on the Continent, although it was gradually undermined by the vigorous opposition of Stieglitz and of Hufeland. It was only toward the end of the eighteenth century and the beginning of the nineteenth that the investigations in the field of natural science began to affect medical ideas to any very considerable degree. The natural philosophy of Schelling, which was accepted widely by physicians, especially in Germany, benefited medicine very little, if at all. Indeed, the statement has been made that the general tendency of the time to favor Schelling's philosophy did more than anything else, except the curiosity of the public, to spread the three false doctrines: animal magnetism, phrenology, and homœopathy. Animal magnetism, fathered by the shrewd Anton Mesmer, had a brilliant career until the French commission, with Franklin at its head, successfully demolished it. Homœopathy, founded by Christian Friedr. Samuel Hahnemann, which attempted to subordinate the whole of the healing art to an arbitrary dictum, *Similia similibus curantur*, still has many adherents, especially in America. Phrenology, or cranioscopy, connected closely with the name of Franz Josef Gall, has now but few disciples, and an avowal of belief in phrenological doctrines is usually received, even by the layman, with a suppressed smile.

Gall was born at Tiefenbrunn, in Germany, in 1758. The history of his life affords entertaining reading. He studied medicine in Strassburg and Vienna, and practised his profession in the latter city, where he became very well known. He tells us in his books how, at a very early age, he noticed among his playmates the existence of definite relations between the external appearance of the head and face and certain mental characteristics. His lectures delivered in Vienna, in which his phrenological doctrines were chiefly set forth, were very popular and largely attended until 1802, when, at the instance of the ecclesiastical authorities, he was commanded by the Austrian government to discontinue his public teaching. On leaving Vienna he went to Paris, where he gathered around him many supporters and continued to lecture, investigate, and publish. He died at Montrouge, near Paris, in 1828.

Fig. 1.

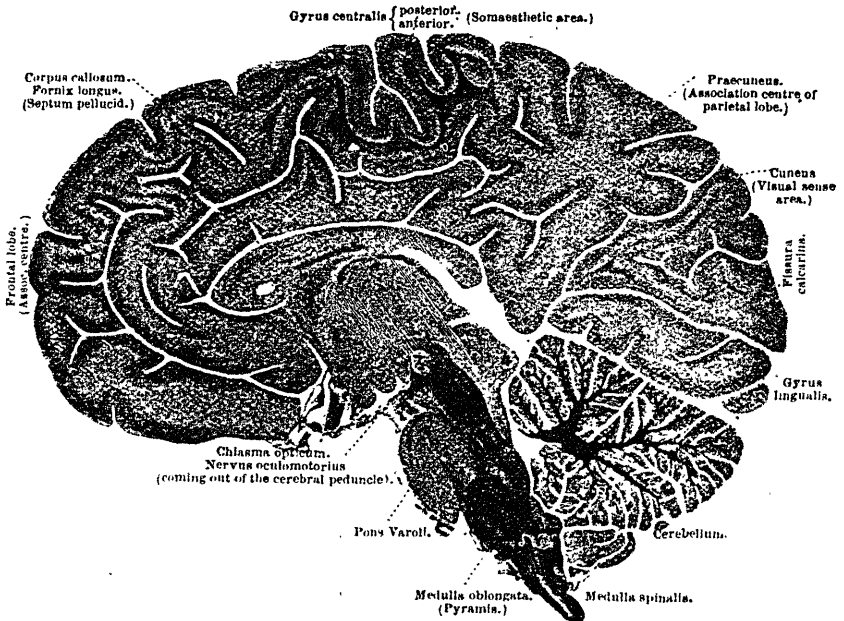


FIG. 1. Sagittal section through brain of a child one month old stained by the Weigert-Pal method. (After Flechsig.)

- a. Træna thalami optici (reflex path for the transference of olfactory impressions to the centres governing the movements of the head).
- b. White matter of septum pellucidum (in part running between the olfactory area and the gyrus hippocampi).
- c. Corpus callosum corresponding to the somæsthetic area.
- g. Superior } colliculus of corpore quadrigemina, cut near the middle line; here very
- h. Inferior } few medullated fibres are present; sections lateral to this show many.
- r. Red nucleus of the tegmentum: below this is seen the decussatio brachii conjunctivi.

[In this and succeeding plates I have translated Flechsig's terms as far as possible into the nomenclature of the Anatomical Society. For his sense centres and association-centres English terms which seemed most suitable have been employed. For the suggestion of the name "somæsthetic area" as a translation of the German *Körperfuhsphäre* I am indebted to Prof. B. L. G Idersleeve.—L.F.B.]

It has been thought by many that Gall's statement concerning his early observations of his schoolfellows was made late in his life with the object of bolstering up his claims to originality. Macallister, in his excellent and comprehensive article on phrenology in the "Encyclopædia Britannica," points out that Prochaska, of Vienna, who had published a work on the nervous system in 1784, is really to be looked upon as the father of phrenology, inasmuch as in his volume are to be found the germs of the views propounded by Gall in the same city a few years later. Prochaska, in turn, was preceded, at any rate as far as the idea of connecting the anatomical diversities of the brain with intellectual peculiarities is concerned, by Metzger, who, twenty years before, had proposed the inauguration of a series of observations bearing upon this point. Moreover, the doctrines of localization of function in the brain are of still older date, though it must be admitted that very little positive knowledge upon this point existed before the beginning of the nineteenth century.

After leaving Vienna Gall attached to himself Spurzheim, who seems to have been for some time an enthusiastic pupil, and along with his preceptor to have made many investigations upon the structure of the brain and the shape of the skull. Spurzheim rendered great service to the phrenological doctrines in England and America, where he lectured to large audiences and attracted many pupils, the most important one in America being, perhaps, George Combe. Gall and Spurzheim did not, however, remain throughout life in harmony. They separated in 1813, in the subsequent years each preaching his own doctrine and disparaging to a certain extent, at least, the philosophical views of the other.

The doctrines of the phrenologists may be briefly summed up as follows: They believed that the brain, as a whole, is the organ of the mind, and that it is made up of multiple organs, each mental capacity displayed by an individual depending upon the development of its corresponding organ in the brain. The form of the skull was thought to depend upon its relations to the brain within it, though Gall, in one of his publications, vigorously opposes the appellation "cranioscopy" as descriptive of his doctrines, stating that he had always maintained that his work was directed toward the anatomy and physiology of the brain, the contributions concerning the relations of the form of the skull to the morphology of the brain being merely an appendage of the bulk of his studies.

It is not my purpose, in this brief communication, to describe the whole list of faculties and the portion of the brain assigned to

each by Gall, Spurzheim, and others ; phrenological diagrams are familiar to all of us, and, moreover, an account of the views of the various adherents and modifiers of the system is to be found in almost any encyclopædia. A glance at the loose manner in which some of the so-called organs of the mind were localized in the brain by bumps upon the skull will suffice to show the unscientific nature of the whole system. Whereas Gall believed that there were only some twenty-six or twenty-seven organs of the brain, with some of his followers the number was increased considerably, Fowler, for example, describing as many as forty-three different faculties. Spurzheim divided the different capacities of the human mind into (1) the *feelings*, including the propensities and sentiments, and (2) the *intellectual faculties*, including the perceptive and reflective activities. As examples of the propensities may be mentioned concentrativeness, amativeness, philoprogenitiveness, combativeness, and acquisitiveness ; of the lower sentiments self-esteem, vanity, and cautiousness may be mentioned ; and of the *higher sentiments* benevolence, veneration, and firmness. Among the *perceptive faculties* he included the appreciation of form, size, weight, color, locality, number, order, time, and language ; while the power to study causality and the ability to compare one thing with another were described as *reflective faculties*. Having gained an idea as to the localization of a certain faculty, Gall and his friends would examine the heads of their acquaintances, and the casts of the skulls of persons who had possessed the particular mental characteristic under examination, and would seek for a distinctive feature corresponding to this particular trait. The following examples are excerpted from Macallister's article. *Amativeness* was located by Gall in the lower part of the posterior surface of the head because he found this area to be hot in a hysterical widow. He referred the faculty to the underlying cerebellum. It is amusing to learn that the adherents of phrenology explained the presence of a rudimentary cerebellum in the girl Labrosse, who had during life exhibited very marked amative tendencies, by assuming its obliteration from over-use. *Destructiveness* was located above the external auditory meatus, inasmuch as this is the widest part of the skulls in carnivorous animals. A marked prominence has been found in this situation on the head of a student, "so fond of torturing animals that he afterwards became a surgeon," and it was also well developed in the head of an apothecary who subsequently became an executioner. *Acquisitiveness*, located upon the upper edge of the anterior half of the squamous suture, was attributed to this region because

Fig. 2.

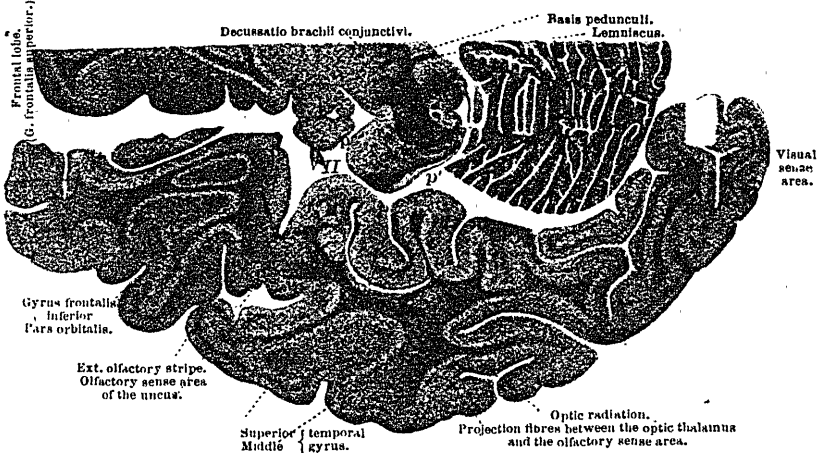


FIG. 2. Horizontal section through the brain of a child aged 3 months. (After Flechsig.)

II. Tractus opticus.

III. Association system (cross-section) in the g. hippocampi, connecting the olfactory cortex of the uncus with Ammon's horn, going over into the alveus.

IV. Nucleus amygdalæ.

V. Pyramidal tract in cross-section.

F'. Temporal cerebro-pontal path.

F". Frontal cerebro-pontal path.

The decussation of the nervous trochlearis is shown. The projection fibres of the olfactory sense area and of the g. hippocampi are completely medullated. At the tip of the frontal lobe and at the junction of the superior and middle temporal gyri myelin is as yet entirely absent. In many other parts (darker in tint), corresponding to the advanced age, association fibres are already medullated.

Gall had noticed it to be prominent among the pickpockets of his acquaintance. The bump of *constructiveness* was easily found, since it was large on the head of a milliner of very good taste, and upon a skull said to have been that of Raphael. *Self-esteem* was located over the obelion, because Gall found this region prominent in a beggar who had excused his poverty on account of his pride. The *love of approbation* was supposed to be situated outside the obelion, inasmuch as this part of the head was especially protuberant in a lunatic who thought herself the queen of France. *Cautiousness* was assigned its proper situation from the observation of the large size of the parietal eminences in an ecclesiastic of hesitating disposition. *Veneration*, located in the middle line at the bregma, was determined by Gall after visiting churches, where he found that those who prayed with the greatest fervor had distinct prominences in this region. The bump of *ideality* was found especially developed in the busts of poets, and was said to be the part touched by the hand when composing poetry. Since the frontal eminence was prominent in Rabelais and Swift, it was believed to be the organ of the sense of the ludicrous. The capacity for recognizing faces was supposed to depend upon the width of the interval between the eyes, inasmuch as Gall found in a squinting girl a good memory for faces. The murderer Thurtell, who had a large organ of benevolence, is said by devotees to phrenology to have been in reality generous, since it was discovered that he once gave half a guinea to a friend. Many other laughable instances might be given of these crude methods of localization, and of the futile attempts of the adherents of the doctrine to bolster up their tumbling edifices.

It is easy to understand how a shrewd man like Gall—and anyone who reads his books will be very ready to grant his shrewdness and intelligence—developing with great rapidity a system full of interest for the public, and stimulating their curiosity by providing them with an infallible clue to the determination of character and fitness for occupation in life, should have attained widespread and lucrative popularity. He soon made large amounts of money, lived in state, and numbered among his personal friends some of the first names in France. Nor was he a charlatan pure and simple; he undoubtedly had a brilliant mind, and made elaborate and careful studies of the brain and skull, which resulted in discoveries of permanent value concerning the anatomy and physiology of the brain. No better proof of this statement can be obtained than by perusing the volumes which I place before you, kindly loaned by the provost of the Peabody Library. This atlas, with its well-executed copper

plates, in particular shows the care with which much of his work must have been done. The edition, including the atlas, sold in Paris at 1,000 francs.

It is curious how nearly a man starting with these premises may often approach to actual conditions. The newer investigations bearing upon the architecture of the brain have thrown much unexpected light upon the origin of the phenomena of the mind; the significance of the brain for the psychic phenomena has been established upon the basis of exact scientific investigations, and we are now justified, perhaps, in speaking in a certain sense of a "new phrenology." It may be interesting to refer briefly to the series of investigations which have led up to our present knowledge upon this subject.

In so far as his doctrine maintained that the convolutions represented the most important substratum of the mental activity, and that the single convolutions of the cerebral cortex are not of equal significance for intellectual life, Gall most certainly approached the modern theory of cerebral localization. The investigations of Flourens led him to very different conclusions, and in 1842 he published his well-known "Examen de la Phrenologie," which was thought to have demolished the phrenological doctrines. It was Flourens' idea that every portion of the substance of the cerebral cortex had precisely the same significance. He believed that the removal of any given mass of the gray matter affected all the mental functions in exactly the same way, so that visual or olfactory perceptions would not be diminished in different proportions, no matter what area was extirpated. The facts which have been discovered by pathologists and clinicians concerning aphasia were, however, in entire opposition to these ideas of Flourens. Gall and Bouillaud had recognized that circumscribed lesions in the cerebrum, especially in the frontal region, could give rise to definite disturbances in speech. Later, Marc Dax pointed out that aphasia occurred practically only when the left half of the cerebrum was diseased, and in 1863 Broca established the fact that, in right-handed people, the third left frontal convolution is the portion of the gray matter of the cerebral cortex which is important for articular speech. Subsequent studies upon aphasia have shown that there are several different kinds of the affection, only one variety of which depends upon disease of Broca's convolution, *i.e.*, the one in which the capacity to speak out the word which the individual has in his consciousness is lost; the inability to understand spoken words, and the incapacity to call into consciousness the names of objects which are visible to the

Fig 3

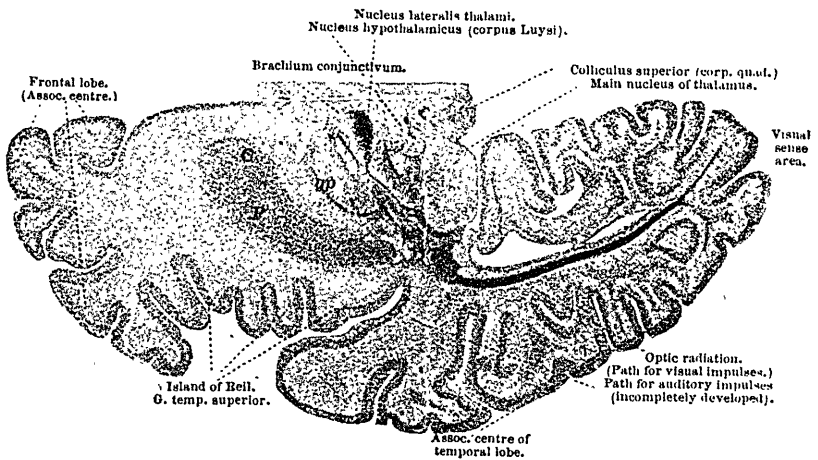


FIG. 3. Horizontal section from the brain of a child a little over a week old. (After *Flechsig*.)

C. Nucleus caudatus.

P. Putamen of the nucleus lenticularis.

G.P. Globus pallidus of the nucleus lenticularis.

The optic radiation is well medullated; the auditory path is not yet medullated as far as the cortex.

individual, being associated with disease of other parts. These facts alone prove that different regions of the brain are of different significance for the intellectual functions.

In addition to the studies on aphasia, there have been recorded a whole series of pathological lesions which clinically were associated with definite disturbances of sensation; thus, lesions of the occipital cortex have a tendency to affect visual sensations; lesions of certain portions of the temporal cortex interfere with hearing; the sense of smell has been shown to be connected with the under surface of the cerebrum, and the sense of touch with the upper frontal and anterior parietal regions. Physiologists, by means of experiments upon animals, have added most satisfactory support to these clinical and pathological observations.

In 1870 Fritsch and Hitzig reported the results of their investigations concerning galvanic excitation of the surface of the brain of animals, in which it was shown that stimulation of definite regions calls forth movements of certain only of the parts of the body. Three years later Ferrier used faradic stimulation of the cortex, and was able to elicit quite complicated movements of different parts of the body, movements which seemed to be purposeful, inasmuch as they correspond to those employed by the animal when utilizing its sense organs, that is to say, movements such as are employed in listening, touching, looking at, or smelling external objects. Munk proved, further, that by the removal of certain convolutions it was possible to produce in animals disturbances of sensory activity quite analogous to those which had been observed in the clinical and pathological study of diseased human beings.

The studies of Goltz upon dogs supply an exceedingly interesting link in the chain of experimentation. This investigator demonstrated the possibility of keeping a dog alive for a considerable length of time in the entire absence of a cerebral cortex, and in this way was able to ascertain what faculties the animal possesses when only the lower parts of the brain are functioning uncontrolled by the cerebrum. He found that an animal without a cerebrum still possesses a very complex nerve life, a fact which is not so very surprising when one recollects the observations of comparative anatomy. While the dog of Goltz' experiment appeared to be devoid of memory and judgment, and incapable of finding out for himself, among the objects outside of the body, those necessary for the satisfaction of his needs, he showed himself to be by no means an involuntary machine. Goltz states that he could stand upright, could run, could be set in motion by external stimuli of various kinds;

that he could show evidences of emotion, becoming angry, and biting and howling under provocation. When hungry the whole body entered into lively motion, and after food had been taken the animal again became restful, and showed evident signs of satisfaction. As Flechsig points out, these experiments do not permit any conclusion regarding the condition of consciousness after the loss of the cerebrum, but they do show distinctly the power and the independence of the bodily instincts, and teach us that no small part of the acts concerned in these can be set free simply through bodily influences, entirely independent of the higher mental faculties.

The studies of His and Flechsig, which have done so much in recent years to give us an insight into the finer organization of the nervous system, have been especially devoted to the development of the nervous system. It is the work of Flechsig to which I wish on this occasion to especially direct your attention.* His method of outlining tracts by the observation of successive periods of myelination is not new. His larger work, published many years ago, and entitled "Die Leitungsbahnen im Gehirn und Rückenmark." is based almost entirely upon studies made after this fashion. The tracts which function first receive their myelin sheaths before the others, and a tolerably definite idea of the physiological capacities of a developing animal at a given moment, up to a certain period at least, can be gained by ascertaining the number of tracts which have already been medullated. Thus the spinal cord, medulla, pons, and corpora quadrigemina are almost entirely medullated^d at a time when the parts higher up show very little or no myelin. Even in the newborn child Flechsig has shown that the cerebrum is almost entirely unripe, inasmuch as extremely few of the myriads of nerve fibres which it contains are at this period medullated. Man, therefore, at the beginning of his earthly experience, resembles very closely the dog of Goltz' experiments; he is practically a being without a cerebrum, and yet, as in Goltz' dog, even with the drawing of the first breath, the bodily instincts in the child demand satisfaction. The newborn infant, with satisfied impulses and unaffected by external stimuli of a disagreeable nature, shows no evidence

* I have thought it best at this time to present, in as clear and brief a manner as possible, and without discussion, the main tenets of Flechsig with regard to the structure and function of the brain. While in such a short communication it is impossible to do justice to so broad a subject, it is to be hoped that it may be possible to show at least the trend of his views. The anatomical basis for his studies is given at some length in the voluminous notes appended to his "Gehirn und Seele" (Leipzig, Veit. Co., 1896). An idea of some of the criticisms which may be made of his doctrines can be gained by a perusal of the discussion of the address delivered by Flechsig at the Psychological Congress in Munich, summer, 1896 (cf. *Centratbl. f. Nervenheilkunde und Psychiatrie*, October, 1896).

Fig. 4.

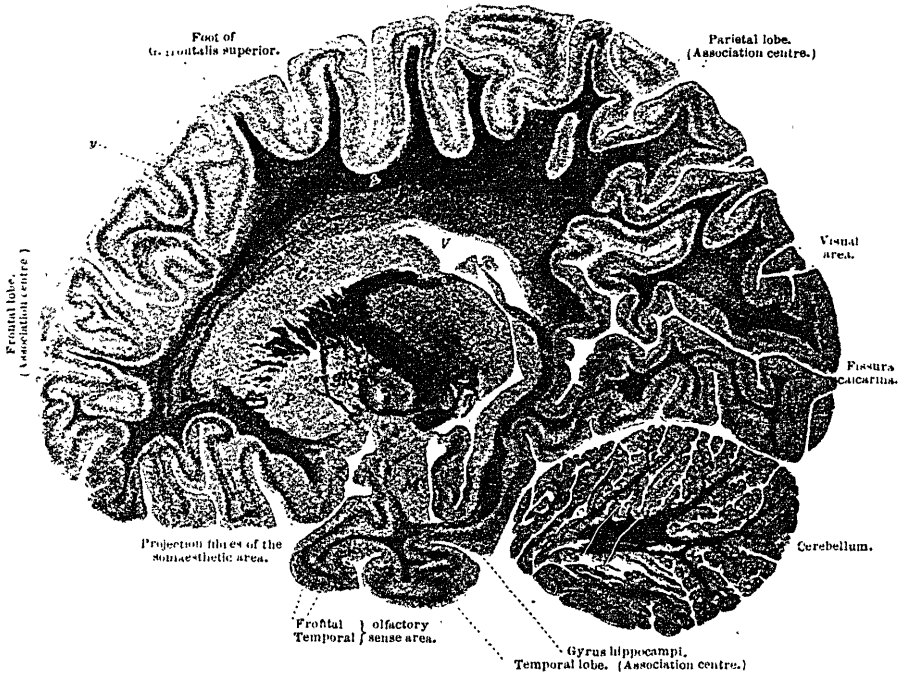


FIG. 4. Sagittal section through the brain of a child said to have died in the fifth month of life. (The child was probably some months older.) (After Flechsig).

All parts of the white substance medullated, only in places still mixed with non-medullated fibres.

C.P. *sp.* as in Fig. 3.

T. Thalamus (lateral nucleus).

II. External geniculate body.

X. Substantia innominata *Keil* (gray substance between the n. lenticularis and the n. amygdalæ.)

M. Nucleus amygdalæ.

x-y. Projection fibres of the anterior upper and inner part of the somæsthetic area (*Körperfühlsphäre*): these run from the internal capsule (between *P* and *C*) forwards and bend around at an acute angle at *x* to pass downwards and inwards.

V. Lateral ventricle.

of consciousness. If it become hungry or be exposed to cold, or if painful stimuli be applied to it, active movements of the body result.

Flechsigs has shown in his study of the embryonal cerebrum, that it is the sensory paths which first become medullated. Gradually the individual fibres of one sensory path after another, beginning with that concerned in the sense of smell and ending with that by which are carried auditory impulses, passing from the sense organs of the body toward the cerebral cortex, gain their myelin sheaths. Each sensory path includes a very large number of nerve fibres, containing the axones of neurones whose cell bodies are situated lower down. Following the different sensory paths to their cortical termination, it is easy to show in these early stages, in which very little of the brain is medullated, that the individual sensory paths terminate in tolerably sharply circumscribed cortical regions, for the most part widely removed from one another, being separated by masses of cortical substance which remain for a considerable period entirely unripe. Indeed, the cortical terminations of the individual sense paths correspond entirely to those regions of the surface of the brain which pathological observation has shown to stand in relation to the different qualities of sensation. It is the destruction of these internal sense organs which results in cortical blindness, cortical deafness, etc.

After these sensory paths in the child's brain have become medullated, new paths begin to develop from the points where the sense fibres terminate—paths which go in the opposite direction. These fibres, as they become medullated, can be traced passing downwards to the medulla and the spinal cord to the nuclei of origin of the motor nerves, and connecting in this way the sensory regions on the surface of the cerebrum with the motor apparatus. The area of the cortex concerned in the sense of touch has an especially well-developed bundle of these motor fibres, the fasciculus cerebro-spinalis or so-called pyramidal tract, which consists of more than 100,000 fibres on each side, an arrangement which permits the carrying out of very delicate movements, especially of the parts of the body concerned in the sense of touch. Connections between the cortical sensory areas and the lower centres which appear to be concerned more directly with the bodily instincts have already been made out. It is clear, therefore, that bodily instincts and external sense impressions may reciprocally influence one another. According to Flechsigs, the sense of smell is most intimately connected, the sense of hearing least associated with the centres

concerned in the exercise of the lower instincts, a fact which, if confirmed, might account for the more ideal character of auditory impressions.

In the diagram before you the localization of these various sense areas in the brain, according to the newest investigations of Flechsig, has been pictured. It will be seen that they are very sharply circumscribed, although at the peripheries of the areas the fibres do not terminate so close together as in the central parts. The large region, the somæsthetic area, occupying the whole domain between the fossa sylvii up to the corpus callosum, including the gyri centrales and the feet of the frontal convolutions, together with the lobulus paracentralis and the middle third of the gyrus fornicatus, represents the cortical field, in which terminate on either side those of the 200,000 fibres of the medial lemniscus, which do not stop at the basal ganglia. These fibres, together with those relaid in the thalamus, it is believed, carry to the cortex the impulses which are concerned in the projection into consciousness of sensations of touch, pain, temperature, muscle and tendon sense, thirst, hunger, and equilibrium, as well as sexual sensations, that is to say, the sensations which tell us of the condition of our bodies rather than that of external objects. It is obvious that this area must represent a complex mass of sense centres rather than a single sensory area; indeed, we already have evidence from the pathological side indicating very different functions to the several parts of the somæsthetic area, although the localization here, as might be expected, concerns that of groups of elementary rather than that of single sensations. This is the area in which the body in its whole extent can be reflected in consciousness. It is possible that a similar mirroring of somatic sensations occurs in the cerebellar cortex.

Besides being a sensory field, the somæsthetic area is also the great motor region whence nearly all the movements serving for the voluntary satisfaction of the bodily instincts appear to start. When a man voluntarily swallows, chews, breathes, or seizes an external object, it is this area which is active.

The nerve fibres conducting the impulses concerned in olfactory sensations terminate, according to Flechsig, mainly in the gyrus uncinatus, where it touches the island of Reil, although many of them end in the frontal lobe.

The fibres concerned in visual sensation, passing from the lateral geniculate body, the thalamus and the superior colliculus of the corpora quadrigemina, follow a direct course to terminate in the immediate neighborhood of the calcarine fissure, although sub-

Fig. 5.

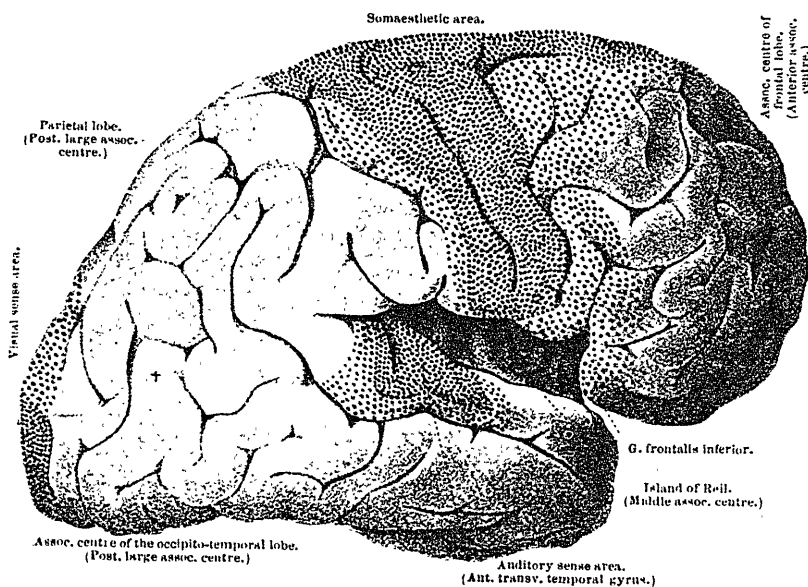


FIG. 5. External view of right cerebral hemisphere, showing sense centres and association centres. (After *Flechsig*.) The more closely dotted areas show the regions in which the majority of the sensory projection fibres terminate. The large areas between the dotted areas represent the association centres.

sequently fibres run out from this tract into adjacent areas, ending, however, only in that part of the cortex of the occipital lobe which shows the well-known macroscopic stripe of Vicq d'Azyr. It is interesting to note that fibres from the fovea centralis are believed to go to the cortex of both cerebral hemispheres. Such a distribution would help to account for the incomplete blindness from unilateral cortical lesions.

The fibres communicating auditory impulses to the cerebral cortex form the lateral lemniscus in the pons, and are connected particularly with the median geniculate body; they run out into the temporal lobe to terminate mainly in the transverse temporal gyri, especially in the anterior one. It is obvious, therefore, that the main portion of the auditory area of the cortex is hidden in the wall of the fossa sylvii, appearing on the external surface of the hemisphere only in the middle third of the superior temporal gyrus, *i.e.*, in that part of it which is in contact with the transverse gyri.

When all these sense centres have become ripe, that is, when the fibres going to them and the motor fibres passing from them to become connected with the lower motor centres are medullated, only about one-third of the whole area of the cortical surface has been concerned. This means that approximately only one-third of the human cerebral cortex is directly connected with the paths which bring sensory impressions from the periphery into consciousness or carry motor impressions to the periphery, causing muscular contractions. Two-thirds of the whole cortex appears to have nothing directly to do with the periphery, but to be reserved for another and apparently a higher work. These other areas, which are left uncolored in the diagram, are the so-called association centres of Flechsig. They make up the main portion of the frontal lobe, a large part of the temporal and occipital lobes, the island of Reil, and occupy a large area in the posterior parietal region of the brain. For a whole month after birth these portions of the cortex remain unripe and are entirely devoid of myelin. But after the development of the sense areas of the cortex, Flechsig has been able to follow band after band of nerve fibres passing from the different sense areas into these other immature portions of the cerebral cortex, and ending there close beside one another, thus forming true centres of association between the different sense centres. And it is his belief that these association centres represent arrangements which unite the activities of the central internal sense organs and build them up to higher units. Sensory impressions of different qualities, visual, auditory, tactile, olfactory, and gustatory, are united, or, at any rate,

the anatomical mechanism is afforded for their union. The association centres have an entirely different microscopic structure from that to be made out in the sense centres, a topic into which, however, I cannot now enter.

Flechsigt believes, therefore, that these association centres are the portions of the cerebral cortex which, above all others, are concerned in the higher intellectual manifestations, in memory, judgment, and reflection. If his theory be right, the study of the association centres should be the especial object of research for the neurologist and psychologist. That they really are of definite importance for the intellectual activities has been shown by these anatomical studies, which might of themselves be deemed conclusive. But it must be conceded that clinical experience has also afforded a large mass of evidence in favor of the view. In certain of the diseases of the mind marked disorganization of the association centres has been noted, the microscope permitting the recognition in them of the destruction of many cells and fibres. In such cases, during life, instead of a connected train of thought, the mental processes may be confused and tangled. New mental pictures entirely foreign to the normal intelligence may appear, the capacity for using past experiences may be lost, and the knowledge of the results of certain acts be gone. It is in the study of general paresis that the most convincing clinical proof of Flechsigt's doctrine of association centres is to be found, and from a consideration of the varying symptomatology of this disease, taken together with the pathological lesions which have been proven to exist in such cases, some clues have already been gained toward the explanation of differences in function in the different parts of the association areas in the cortex. Flechsigt, in the first edition of his "Gehirn und Seele," stated that the anatomically demonstrable alterations of the brain substance in general paresis were often limited to the intellectual domains. He refers in the second edition particularly to the monograph of Tuzek upon dementia paralytica published in 1884, and recommends strongly the study of this paper in connection with his own classification of the different regions of the cortex.

It seems likely from Flechsigt's studies of the brain lesions in general paresis that this disease more than any other will afford the key for the deduction of psychic disturbances from alterations in the cerebral substance. In cases of the disease in which the lesions are widely diffused over very many different areas of the cortex no reliable conclusions can be drawn regarding the significance of the association centres; but occasionally the disappearance of nerve

Fig. 6.

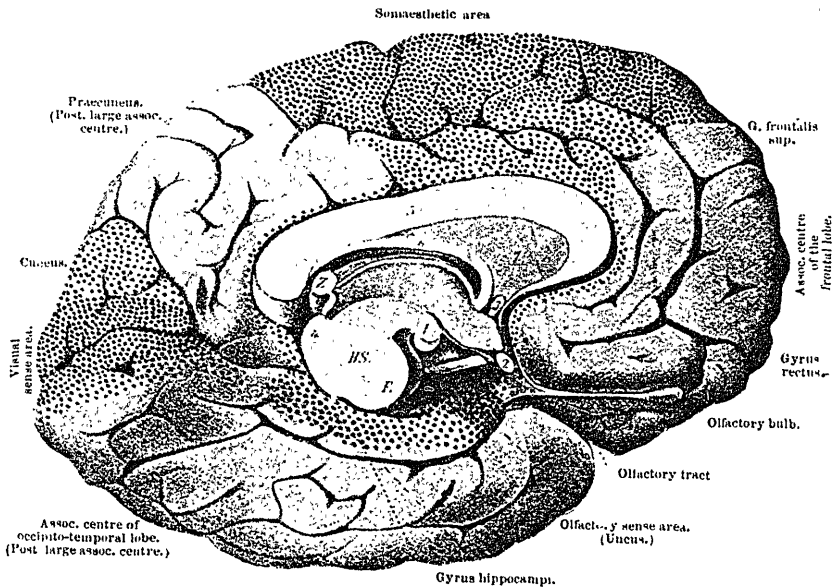


FIG. 6. Internal view of left cerebral hemisphere. (After Flechsig.)

1. Corpus mammillare.
 2. Median section of optic chiasm.
 3. Cross-section of anterior commissure.
 4. Superior colliculus of corpora quadrigemina.
 5. Corpus callosum (cross-section).
 6. Fornix.
 7. Septum pellucidum.
- H.S. Tegmentum.
F. Basis pedunculi.

fibres is limited almost entirely to the association centres, and in some instances especially favorable for the study of function the frontal association centre alone, or the large posterior parietal association centre alone, is chiefly diseased.

The study of such lesions and of the symptoms manifested by the patients during life has not yet gone far enough to justify many positive assertions regarding the specific function of the different association centres; but enough has been done to warrant the consideration of certain statements which possess some degree of probability. Thus, where there has been bilateral disease of the frontal lobes, that is, of the anterior association centre, there has been observed in the individual during life an alteration or loss of ideas regarding his own personality and his relations to what is taking place inside and outside his body—symptoms which are quite in accord with those observed in higher apes by Bianchi after extirpation of the frontal lobes. The phenomena vary of course according to the irritative or destructive nature of the lesion. The individual may in his mind connect his personality with mental pictures which have in reality nothing to do with himself; thus, he may think himself of enormous dignity, or that he is possessed of great wealth, or that he is a genius. In other cases, he fails to connect his own person in any way by means of association with external perceptions, so that he may forget himself or may fail altogether to observe his surroundings. Still, in possession of numerous ideas, he may speak in an orderly fashion, although he appears unable to distinguish the true from the false and the imagined from the experienced. Besides these logical defects he may show a diminution of his capacity for ethical and æsthetic judgment, so that he will perform acts entirely irreconcilable with his character as manifested earlier in his life. Even in the absence of emotion he may appear to be devoid of his normal self-command, but when subjected to unaccustomed stimuli, especially to sexual excitement, anger, or vexation, he may lose all control of his movements and acts, so that some simple influence may lead him to try to satisfy his desires without any regard to custom or good taste. In late stages of the disease imbecility may appear, with entire loss of the mental pictures regarding his personality.

The mental phenomena displayed in connection with diseases of the posterior parietal association centres appear to stand in marked contrast to those just outlined. They have been studied in cases of general paresis, but better opportunities for the observation of such phenomena are often afforded where there has been focal softening

of the cortex, due to vascular disease. Here the individual may be incapable of naming correctly objects outside his body which he can touch and see ; and if this centre on both sides be widely diseased he may not recognize at all the nature of these objects, so that he loses the power of forming intelligent conceptions of the external world. On the contrary, he may be entirely clear as regards his own personality ; he may appear to possess his self-control, and may show deep perversity of feeling or of the will, the specific character of the disease-picture consisting in his inability to recognize external objects, that is, to associate external sensory impressions with the memories of those of his previous experiences. On this account he may use external objects falsely ; he may confuse persons ; he has no certain ideas as regards space and time. His mental conceptions of the external world, the knowledge of these which he can put into words, and the power of interpretation of external impressions as the result of experience, are lost to him. He is, in severe cases, almost bankrupt in ideas, although his regard for himself and for those who are dear to him may be unaffected.

If one of the sense areas of the cortex alone be diseased, the clinical picture is entirely different from that presented by these purely intellectual disturbances. Here, again, we may have to do either with phenomena of absence or phenomena of irritation. A tumor pressing upon the auditory area may give rise to noises and other subjective perceptions of sound. Pressure upon the posterior central gyrus may lead the individual to believe that he experiences movements of his thumb, although his eyes convince him that it remains stationary. Again, a tumor pressing upon the uncinate gyrus has been known to give rise to subjective odors ; while a cysticercus cyst pressing upon the visual area of the occipital lobe has caused the arrival into consciousness of mental pictures of colored figures and the like. Destructive lesions of the sense centres may prevent the external sense impressions from entering into consciousness at all. There may be entire absence of mental confusion in such instances ; the patient recognizes the subjective character of the hallucinations, and so is not actually mentally diseased in the ordinary sense ; but if focal disease affect along with one sense centre several of the others, or the posterior large association centre, the picture of hallucinatory confusion is prominent.

Time will not permit me to discuss the so-called functional disturbances ascribable to conditions of exhaustion of different cortical areas dependent upon prolonged and violent emotion, various intoxications, impoverishment of the blood, and other causes. Suffice it

to say that, on theoretical grounds at least, more or less sharp criteria can be mentioned for the participation in the process of the different centres, especially the somæsthetic area, the frontal lobes, and the posterior large association centres. In many instances, however, the phenomena presented show, what we *a priori* might expect, that several of the sense areas and association centres are diseased at once. The various permutations and combinations possible will doubtless account for the manifold symptomatology of the great group of nervous and mental diseases, a symptomatology which as yet is in almost hopeless confusion, and which calls urgently for an ordering hand. It will be the task of psychology and neurology in the future to analyze the specific activities of the various regions of the cortex, and to correlate these with the mental phenomena of human beings in health and disease.

Flechsigt's researches have established the fact that the human cerebral cortex is made up of at least seven anatomically more or less well separated areas. As the phrenologist thought, the brain is the organ of the mind, and the whole is in reality made up of multiple organs. But, instead of calling these, as did the old phrenology, after certain qualities, friendship, good-nature, wit, firmness, and the like, thanks to Flechsigt's studies we can now adopt a more rational nomenclature. We can now speak of sense centres and of association centres in the cerebral cortex. The sense centres may be roughly grouped as the somæsthetic area, the visual sense area, the olfactory sense area, and the auditory sense area; the association centres for the present have to be designated according to their position as frontal or anterior, insular or middle, and parieto-occipital or posterior. Thus a distinct advance has already been made, and it is hardly too much to expect that further study will permit of much more complete differentiation and more definite localization of both kinds of areas.

It is not stating too much to affirm that advances in true psychology are to be mainly hoped for from strictly scientific investigations into the structure and function of the nervous system. Pure philosophical psychology has advanced but little beyond the concepts of Aristotle and the other ancients, and as Flechsigt says: "Medicine at all periods has been nearer the ideas believed in today mainly on account of the fact that the physician has had ever before him as the special object of his observations the human individual, presenting healthy or diseased conditions, in life and in death."

It would take too long to give even a brief résumé at this time of

the insight into psychological processes which are afforded by Flechsig's work. His recent publications speak for themselves, and his treatment of the subject cannot fail to prove interesting to the reader. Doubtless many of the theories which he has advanced as a result of his anatomical studies will not stand the test of time. But we owe to him a deep debt of gratitude for supplying us with a large mass of entirely new knowledge from which further investigations may start.*

The relative positions of the individual sense centres to the association centres are, as can be seen from the diagram, very peculiar. The posterior association centre is situated among the visual, auditory, and somæsthetic areas of the cortex; while the anterior association centre is related, in gross at least, only to the somæsthetic area and to the olfactory sense area. The middle association centre has adjacent to it the auditory, olfactory, and somæsthetic areas. When one remembers that the association centres receive bands of fibres which run into them from the adjacent sense areas the remarks made before concerning the specific functions of the different association centres will perhaps be more easily appreciated.

Flechsig, in his "Rectoratsrede," as well as in his later address upon the "Borderlands of mental health and disease," has laid especial emphasis upon the significance of the somæsthetic area. Assuming it to be the portion of the cerebral cortex where impressions regarding the body enter into consciousness, the centre which appears to have to do with the bodily emotions and bodily needs, and upon the excitability of which the crudity or delicacy of the instincts which enter into consciousness depend, as well as the centre whence start nearly all motor impulses which are concerned in conduct, be they those leading to the closure of the fist, the pressure of the hand, or the most delicate embrace. Flechsig believes that this somæsthetic area is to be looked upon as the main organ of character. This cortical area, connected as it is on the one side directly with the peripheral sensory and motor apparatus of the body, and on the other with the higher association centres in the cortex, stands, as it were, like a buffer intercalated between the organs of the body and the organs of the intellect. The character

*We should be particularly grateful for the definitiveness of the concepts of brain structure which Flechsig has afforded us. In this embryological self-analysis of the cerebral tracts, the bands of medullated fibres, stained by the method of Weigert, stand out as clear-cut on the yellow background of non-medullated nervous tissue as the lines of a diagram. The illustrations of sections in Flechsig's book are by no means fanciful. In his regular lectures during the spring semester of 1895, Flechsig showed us a large number of his preparations which bear out fully his anatomical statements and illustrations.

of the activities manifested by these complex cortical centres of which the somæsthetic area is made up may thus be influenced from either of the two sides. As Flechsig says, it represents a sort of arena in which, at least in the more nobly-endowed natures, the lower impulses struggle for the mastery with the higher feelings and ideas. To follow this struggle between the reciprocal influences of the body and the intellect will form one of the most stimulating problems of brain investigation, especially when it is remembered that the subject is of eminently practical significance. In the investigation of the brain it will be necessary to study the conditions which lead to an ennobling of the sensual instincts, whether it come immediately through bodily influences or from the other side through the intellect. Since, further, in these studies the presumptive existence of an ennobling of the intellect through refinement of the sensual instincts must be kept in view, the new brain anatomy and physiology is brought into contact with the fundamental problems of all scientific pedagogy and the aims of all true culture. The old *a priori* ideas concerning the antitheses of sensuality and reason, and of the "heart" and the "brain," would seem to find some actual confirmation in recent anatomical discoveries.

Furthermore, Flechsig sees in these newer studies the essential preparation for a physiological basis of ethics, so much desired by some of the writers of the last century. Inasmuch as the health of the cerebrum is essential for the control of the lower centres concerned with the instincts and emotions, as is proven by the cessation of the struggle between the instincts and the ethical feelings where the intellectual centres are paralyzed; and inasmuch as we now know some of the causes of the diseases of the sense-centres and of the association centres, and are convinced that many of these causes are removable or avoidable, the ethical significance of these studies becomes manifest.

It must be the aim of educators to enlighten the people concerning the hygiene of the body, and especially of the brain. We must not fear to teach the intimate interdependence of bodily conditions and mental phenomena, or hesitate to let the masses know that the abuse of alcohol, the over-indulgence of the passions, and mental and physical excesses of all descriptions, can lead to results of a most serious nature. Only by increasing knowledge, general and special, can we hope in coming generations to strengthen and make solid the foundations of the higher ethical feelings. All will agree that for the advancement of the race we must presuppose a social arrangement which will subordinate the blind instincts of the moral-

ly and intellectually deficient to the control of the deeper insight and the better will of an intellectual ethical aristocracy. If it is, in the main, the remarkable development of his association centres which has raised man so far above the level of all other living creatures, it is also by virtue of the function of these same association centres that man is to be elevated in the future beyond his present status. Flechsig, at the close of his "Rectoratsrede," makes brief reference to the aims other than practical of these newer studies. "Just as by means of one of the noblest faculties of our natures, namely, the thirst for knowledge, an instinct conferred upon human beings with the development of their association centres, we are forced to study the natural laws involved even in the domain of the mind, so the actual advances of our knowledge even in this field of investigation lead with the forcible necessity of a natural law to an ideal philosophy. The more the enormous potencies embodied in an intelligent individual become unveiled to our questioning reason, the more clearly must we feel that behind the world of phenomena there are controlling forces with which human knowledge scarcely dare lay claim to be compared."

LACERATED PERINEAL WOUND—DEATH FROM SEPSIS—USE OF ANTISTREPTOCOCCIC SERUM.

BY A. PRIMROSE, M.B., C.M. EDIN.,

Surgeon to the Ho-pital for Sick Children.

THE following case, the clinical history of which I reported at a meeting of the Clinical Society, is of considerable interest. The injury described is not a very common one, and therefore the case is worth recording. But there are other proofs connected with the case which led me to report it. The history is that of a patient who presented no very marked symptoms of septic poisoning until eleven days after the infliction of the injury: the symptoms of infection, in fact, developed after the opening of an abscess, the operation having been performed on the eighth day after the injury. Antistreptococcic serum was used in the treatment.

A little girl, 12 years of age, was admitted under my care in the Hospital for Sick Children on October 23, 1896, suffering from a lacerated wound in the perinæum. Six days previous to admission she had fallen astride of a picket fence, and thus received the injury. The external sphincter of the anus had been torn through, and a wound extended forwards from the anus towards the right labium vaginæ. The right labium was firm and solid to the feel, and considerably swollen, so that its left margin completely overlapped the vulva. Great pain was complained of on pressure over the injured parts. The temperature on admission was 102°. I did not see the patient until the following afternoon. She did not appear very ill, the temperature had dropped to 101°; pulse, 100. She suffered little or no pain unless an attempt was made to examine the wounded parts. I left instructions to have her prepared for operation for the following day, thinking that in all probability pus would form in the right labium. Accordingly, at 3 p.m. on October 25, *eight days after the infliction of the injury*, she was brought down to the operating room. The temperature had fallen to 99.4°, and there was no increase in pulse frequency, which was 100. Chloro-

form was given, a catheter was passed into the bladder, and sixteen ounces of urine drawn off. The extent of the injury was now thoroughly investigated. The wound did not penetrate deeply; it passed through the external sphincter, opening up the rectum, the mucous membrane of which was split for an inch and a half on the anterior wall. The wound extended the same depth in the perinæum, opening up the posterior wall of the vagina, lacerating the hymen, and passing into the right labium majus. On manipulating here an abscess gave way and opened into the vestibule at the anterior extremity of the wound. An incision was made into the labium externally, an opening being thus established into the abscess from in front. Mr. J. J. McKenzie, who was present, obtained some of the pus for bacteriological examination. The vagina was douched with carbolic lotion, the abscess cavity irrigated, and a piece of iodoform gauze passed through it and retained for drainage; a warm boracic poultice was applied, and the patient sent back to bed, with instructions to the nurse to have the poultice frequently changed.

Mr. McKenzie found in the pus a pure culture of a streptococcus.

The following day the temperature rose slightly, reaching 100.2° ; the pulse, 96. The child did not seem as well as she should have been, but there were no alarming symptoms; the wound was draining well, and the swelling subsiding.

The next day (October 28) she complained of pain in the abdomen. The temperature in the morning was normal and pulse 80, and the evening temperature 102.2° . There was no symptom to cause much anxiety, but she was somewhat listless, and one could not help feeling somewhat uneasy about her.

October 29. Morning temperature 102° , and pulse 138; in the evening, temperature normal and pulse 120. It was quite evident now that she was suffering from the effects of septic absorption, and the rapid pulse with a falling temperature I looked upon as very unfavorable. At midnight, however, the temperature had again risen to 102° . Two grains of calomel were administered, and the wound dressed as before. She vomited, during the night, yellow-colored fluid several times. Urine was passed involuntarily.

October 30. The child was listless and indifferent. She complained of great pain on palpating abdomen. During the night the pain in abdomen had been so severe that the house surgeon administered one-half grain of morphia. She complained, occasionally, of great thirst, and asked for something cold. The temperature at 6 in the morning was recorded as 95.3° . Vomiting continued at inter-

vals. At 8 a.m., temperature 97.2°. The abdomen was not much distended, but was very tender on palpation, resonant on percussion. As there was some doubt as to the absence of urine in the bladder, chloroform was given and a catheter passed, but the bladder was empty. A mixture of morphia, strychnia, and atropia had been administered from time to time.

At 11.45 a.m., 10 c.c. antistreptococcic serum was administered hypodermically. Vomiting during the day became more persistent, and she now retained nothing on her stomach.

10 p.m., 10 c.c. antistreptococcic serum was administered.

October 31. At 2 a.m. temperature recorded was 99.2°; pulse, 120; respiration, 28. Nutrient enemata were administered, but were expelled at once; the injury to the sphincter evidently prevented their retention.

At midday the note was made that "the pulse is of fair strength, and the wonder is that the child has rallied from the profound state of collapse in which she was yesterday morning."

2 45 p.m., 10 c.c. antistreptococcic serum was administered. Various means were adopted to allay the vomiting, but without avail. The patient became restless, and as this became a more marked symptom the administration of morphia with strychnia and atropia was repeated more frequently.

12 midnight, 10 c.c. antistreptococcic serum was administered.

November 1, 1896. Condition unchanged. The temperature was 101° at 2 a.m., and at 4 a.m. had dropped to 95°, with a pulse of 106. The vomiting became most distressing, and was repeated at short intervals. The abdomen was distended, but not at all markedly so. Saline solutions were administered by the rectum, but were not retained; a subcutaneous injection was thrown in over the chest.

November 2. She became delirious in the early morning and very restless, and died at 7 a.m.

A post-mortem examination was made seven and a half hours after death. Lividity was well marked. A gaping wound existed in the right labium majus two inches long. The perinæum was practically absent, the soft tissues having been completely destroyed; the rectum communicated through the sphincter with the vagina. The vestibule and ostium vaginæ presented a dark gangrenous appearance. The chest and peritoneal cavities were opened. Greenish-yellow pus was found free in the peritoneal cavity. Pus was also found on the dorsal aspect of the sternum extending along the internal mammary arteries. The pericardium contained one ounce of fluid somewhat opaque. A clot was found in the right ventricle, else-

where the heart contained fluid blood. Heart muscle was pale, muddy, and mottled in appearance; valves normal. The left pleural sac showed some old pleural adhesions, the left lung exhibited some small congested areas. The right side also showed some old pleuritic adhesions. There was a small tubercular mass in the right apex posteriorly. The glands at the root of the lung were enlarged. The peritoneal cavity was full of pus. The appendix normal. The stomach was adherent to the liver. Spleen pale, covered with fibrinous material, and on section very pale and granular-looking. Kidneys markedly pale, but normal. Right lobe of liver extended down to iliac crest; on section, pale and fatty-looking. On examining the bladder the outer end of urethra was found to be dark and gangrenous-looking, but the upper part was normal in appearance, as also was the bladder.

The rectum was dark and gangrenous-looking for one inch from anus.

The intestines were somewhat distended with gas.

A careful search was made for any direct communication between the perineal wound and the peritoneal cavity, but apparently healthy tissue everywhere intervened, and no such connection could be made out anywhere.

REMARKS.

The value of antistreptococcic serum in the treatment of septicaemia has not yet been proven. It is extremely difficult to determine the effects produced, in a given case, by the employment of this therapeutic measure. We would be justified in using it constantly if we had scientific proof that it introduced a something into the system which was the direct antagonist of the toxins produced by the streptococcus, and which was capable of destroying entirely, or at least diminishing, the toxins present in the tissues. At present, however, bacteriologists tell us that the effect produced by the introduction of antistreptococcic serum *may* have the reverse effect. It is now known to be germicidal in its action, and, further, we know that there are bacteria which, when killed off, are capable of producing more virulent toxins in their death than during their life. It is easy to imagine, therefore, that at a certain stage in the process antistreptococcic serum may be beneficial, *i.e.*, when the bacteria are not present in large quantities, and the individual is capable of withstanding the effects of the dosage of toxins produced on the death of the organisms. It is further possible to imagine that, when the streptococci are present in great quantity, the individual may succumb to the effects produced by the enormously increased dosage of toxins

produced by the death of the germs. We cannot judge, by any known methods, the number of streptococci in any given case ; consequently our treatment, whilst it *may* do good, is capable undoubtedly in some cases of directly causing fatal results. We therefore feel that the value of antistreptococcic serum is very questionable ; we cannot tell when it may be of service or when it may do positive harm. One is apt to use such measures in "otherwise hopeless cases," but, apparently, these cases (because of the large number of streptococci which are likely present) possess the very condition in which its use is contraindicated. These facts regarding the action of antistreptococcic serum became known to the writer after its use in the case now placed on record. Its action in this particular instance was not very apparent ; in fact, the progress of the case was not markedly affected by its use. One cannot find in medical literature any record of definite value obtained by the use of the serum, and we are forced to conclude that in the meantime its value is not scientifically demonstrated. The action of this serum is quite different from that of the diphtheria antitoxin ; the latter is not germicidal, and we have direct scientific proof of the value of its use as a therapeutic measure in the treatment of diphtheria.

Selected Articles.

SOME POINTS ON THE TREATMENT OF INFANTILE DIARRHŒAS.*

BY M. LE D'LESAGÉ.

DURING the last few years our knowledge of the etiology of infections of the digestive tract in children has much increased. It is well known now that milk fermentation by various micro-organisms is the most frequently observed cause. The practical demonstration of this opinion is furnished by the employment of sterilized milk. It is a well-established fact that the digestive infections have become more and more rare since the general employment of sterilized milk. Treatment has benefited by these new studies.

We do not wish to study in detail all the therapeutical questions involved. We will pass over the question of the various medicaments employed with lavage of the bowel (calomel, lactic acid, antipyrine, tannagin, benzonaphthol, and salicylate of bismuth). We will confine ourselves in this article to a description of blood-serum injections.

When a child is brought with digestive troubles it is best to use the following treatment :

(1) Milk diet, even sterilized, must be stopped. Milk not only keeps up, but increases the disease.

(2) Give the child water to drink—albumen water ; and if we wish to use drugs, one of the substances mentioned above.

(3) If the sickness is severe, either from the intensity of the general symptoms or the digestive phenomena, we must use subcutaneous injections either of artificial serum or of blood serum.

I. *Injections of artificial serum.* There are two varieties : in large doses and in small doses. There are particular indications for the use of each of these.

* Translated from *Revue Therapeutique*, 15th Dec., 1896, for THE CANADIAN PRACTITIONER by W. J. Greig, M.B.

(a) *Injections in large doses.* In this first method of treatment we attempt to put into the circulation by subcutaneous means a volume of liquid sufficient to replace the serum lost in the purging, as Cantani was the first to do in 1865 in cholera (we know that Professor Hayem obtained excellent results in the same cases by injecting liquid directly into the veins). In the hypodermoclysis of Cantani the quantity of artificial serum injected into the connective tissue is from four to six litres for an adult. This method has also been applied to other maladies (severe hæmorrhages, convulsions). Since the results obtained in cholera we can understand that these subcutaneous injections would be applied to the diarrhœas of infants characterized by very free watery evacuations (an infection of the algid type or cholera infantum). Luthon, of Rheims, was the first to apply, in 1884, these injections to the treatment of infantile cholera. He writes thus: "We have injected in these unhappy little creatures, doomed to death, this saline solution in doses of 5 grammes, and we have had the satisfaction of saving them in spite of the most unfavorable prognosis." In 1888 Weisse resumed this treatment, and injected a larger dose of 30 to 60 grammes; he obtained a rapid recovery in every case of infantile cholera in which he used it. In 1890, Sahli, of Berne, recommended these injections. In 1892, Wilde, of Heilbronn, in his own child, seven months old, on the point of succumbing to an attack of infantile cholera, used six injections of 25 grammes each; the child recovered. Demieville observed an infant of four and a half months attacked with cholera infantum resuscitated by hypodermic injections of artificial serum; he injected 120 to 150 grammes. The child soon appeared better, and in two days digestive troubles ceased. During the years 1890-93 Monsieur Hutinel studied these serum injections. These cases are recorded in the works of his pupils, Thiercelin and Marois. Recently Monsieur Picot has reported a case with collapse cured by these injections of serum. Since these writings these injections have become common practice. I have used them frequently for several years, and have very often obtained marvellous and unhoped-for results. To-day it appears to me to be the best treatment of severe diarrhœa, leaving far behind it in effectiveness intestinal medication. For several years I have been contented with the following practice: When an infant is attacked with an abundant watery diarrhœa with a tendency to chill I have not waited for the algid collapse; I make use of a serum injection, at the same time stopping all food. Intestinal treatment comes after. I believe that it is of the greatest impor-

tance not to await the appearance of the algid stage. If the algid stage becomes established the results will be still good, but it will be necessary to repeat these injections, when in the first instance a single injection would often suffice. In a word, we must not temporize.

We can employ one of these solutions :

(a) Sodæ chlor gram vii.

Aquæ distil steril litre i.

(b) The artificial serum of Prof. Hayem :

Sodæ sulph gram x.

“ chlorid “ v.

Aquæ distil steril litre i.

The injections are made subcutaneously with antiseptic precautions. We can also inject into the muscular tissue. Shampoo the part for several minutes after to assist absorption, and give three to six injections a day of 30 cubic centimetres each. The purpose of this treatment is to put into the circulation a large quantity of liquid to make up for that lost by the purging. Furthermore, it is well to notice that as circulation becomes more active the stimulating effect is evident. Such are the subcutaneous injections in large doses. The indication for them is an infection of the algid type with profuse watery evacuations.

(b) *Injections in small doses.* In some cases injections must be made in small doses of five cubic centimetres. The object is altogether different. These small but repeated doses, which have been insisted on by Cheron, cause an increase of arterial tension. (We know that injections of this kind have been successfully employed in adults, in neurasthenia, in long convalescences, and in post-operative shock.) M. Cheron and Debove, besides this stimulating action, have observed a passing elevation of temperature (beyond that of the disease). M. Hutinel has also observed an increased vascular tension and an increase of the secretions ; an increased excretion of urea and of the number of hæmatoblasts without change of that of the leucocytes. The indications for these injections in small doses are *emaciation, cachexia, dwindling of the child with a lingering chronic diarrhœa*. In these cases, where we hope to increase the energy of the organism, the density of the liquid is of more importance than its quantity. Thiercelin has obtained good results from them ; he uses once or twice a day five grammes of the salt solution or of the serum of M. Hayem, or else the solution of Cheron, which is intended for these small injections :

Phenic acid.

Sod. chlor.

Sod. phos.

Sod. sulphate, aa, gram i.

Aqua distil, gram 100.

The physiological effects of these injections must be closely watched, for, while their first effects are good, if continued too long they will produce a weakness in the child which will pass off when the injections are stopped. Thiercelin has carefully noticed this : " We have often seen debilitated children rapidly increase in weight under the stimulation of these injections, but these, if continued too long, have produced a state of unrest, with cries and sleeplessness ; they produce also a true lymphatic engorgement.

I have observed during the year very evident symptoms of lymphatic engorgement by this treatment carried to excess. The child will become pale and drooping, will present a slight œdema of the extremities and the eyelids ; he becomes cachectic, suggesting Bright's disease, but the urinary examination does not show any change in that fluid. This cachexia may be accompanied by enlargement of different glands of the body, which may become large and soft. This functional hypertrophy does not appear to be tubercular, as we will relate cases further on in which these glands diminished in size when the injections were stopped. Our conclusion is as follows : We ought to use these injections only in small numbers. When sufficient effect has been obtained we ought to stop them, so as not to reach the period of excitement, and of the lymphatic engorgement. Further, these injections may, in children predisposed to tuberculosis, be followed by an awakening of the latent disease. This is what we are now going to study.

The drawbacks to these small but repeated injections. M. Hutinel has observed that a febrile action is set up in children with the tubercular diathesis by these injections. In a healthy child the temperature curve is either not changed or not more than an elevation of two-fifths of a degree. On the contrary, with a tubercular child, there will be an increase of from 1 to 2.5 degrees. The increase commences about the sixth hour, and the highest point is reached in about twelve hours. The temperature is maintained at this point three or four hours, and then returns to the normal. This febrile reaction is exactly identical with that of tuberculosis. In addition, these injections in certain cases will provoke peri-tubercular inflammation, easily seen in the case of external lesions (bony, glandular or cutaneous), but probably also in visceral tubercloses. M. Hutinel, from a study of 176 infants, arrives at the following con-

clusions : " That if these subcutaneous injections in certain proportions give rise to fever in healthy subjects they will provoke in smaller doses much greater febrile reaction in the tubercular ; that these febrile reactions are sometimes accompanied by peri-tubercular inflammations which are not without danger ; that the intensity of these reactions would make us suspect the existence of latent tuberculosis, without, however, constituting a pathognomonic sign of the disease." I have used these injections in fourteen cachectic children with pulmonary bacillary lesions. In all of them I produced a permanent aggravation of the local condition. Therefore I have given up completely injections of serum in the treatment of infantile disease if pulmonary lesions exist.

Should the same rule be followed in latent tuberculosis when the child presents no sign of visceral change? The question is difficult to answer. In the first place, a cachectic child with a little diarrhœa with healthy viscera has enlarged glands in the axilla and groin. What should we do? We know that these simple adenites are often tubercular. I have treated five children answering to this clinical type with small but repeated injections of serum. In four of them after the third and fourth injection I have observed pulmonary lesions which forced me to stop the treatment. I believe that in these cases there existed latent centres of tuberculosis which have been in some way roused by the injections. In a word, we see that all injections of artificial serum or of salt water are capable of aggravating an existing tuberculosis (by provoking a peri-tubercular congestion) and of betraying a tuberculosis otherwise latent. Therefore the better line of action is, I believe, the following : injections in small doses are indicated in feeble children, providing the viscera are healthy, and the lymphatic glands normal. Every lesion, however small, pulmonary or lymphatic, is a contrary indication to these injections.

II. *Injections of blood serum.* Reinach has employed the serum of a horse not prepared—in a word, normal blood serum. He injected each day under the skin of the sick child ten to twenty cubic centimetres. This serum is followed by the same improvement as the artificial. It is equally a stimulant of the lymphatic system, as my master, M. Metchnikoff, says. Reinach says that this serum is superior, as it possesses more nutritive properties. The albumen of the blood nourishes the child. We know from the researches of Landois that injections of blood serum increase the transformation of albuminoid material and the rate of the formation of urea. After Hoppe-Seyler, twenty cubic centimetres of serum

contain $1\frac{1}{2}$ grams of albumen which correspond to 50 grams of cow's milk and 150 of mother's milk. Thus the object of these injections, whether artificial or normal serum, is to stimulate the organism, to gain time and permit it to react against the digestive infection. But can we obtain a blood serum possessed of the same stimulating properties united to a specific quality? In a word, can we obtain a serum specific for infantile diarrhoea analogous to that of diphtheria? We have hopes of this, and we have obtained the most encouraging results. In the first place, we must seek the means of obtaining this specific serum.

In another work we will show the following facts :

(1) In fermented milk the agent of fermentation is nearly always the bacillus coli communis.

(2) In 28 out of 100 samples of fermented milk the bacterium coli was possessed of virulent properties.

(3) These active milks killed little guinea pigs (below 200 grams in weight) in a dose of 1 cubic centimetre.

(4) This virulent bacillus isolated from milk killed without fail, in twelve hours, the guinea pigs with a dose of $\frac{2}{3}$ c.c. of bouillon; with peritoneal septicæmia.

(5) No other microbe found in this active milk possessed any virulence, and all were inoffensive even in large doses.

(6) The fermented milk (72 samples out of the 100) which contained the normal bacterium coli, not virulent, did not kill guinea pigs even in large doses (10 to 15 c.c.), but when the milk underwent the same fermentation containing the virulent bacterium coli it killed in a dose of 1 c.c., and even $\frac{2}{3}$ c.c.

(7) These 28 active samples of milk provoked digestive infections in children. But there was isolated from the diarrhoea a bacterium coli possessing the same virulence as the one found in the milk.

(8) From these diarrhoeas no other microbe was found possessing virulence.

From thinking of the injurious action of this bacterium in milk, it is only a step to hope to produce an anti-colic serum from this bacterium. Without entering into the details of bacteriological research which others have studied (Golgi, etc.), we will say that with this bacterium isolated from virulent milk and from the diarrhoeas of sick children we can obtain, by the preparation of an animal (donkey), a serum which possesses specific qualities which the normal blood serum does not.

To study, on an animal, the action of this serum we must take

guinea pigs of a weight less than 300 grams. Larger animals than this are refractory to this virulent bacterium. If we inoculate the peritoneum with $\frac{2}{3}$ c.c. of a bouillon culture of this bacterium the animal dies in twelve hours from septicæmia. If, as a parallel experiment, we inject another animal of the same weight and in the same manner, and if an hour later we inject under the skin $\frac{1}{3}$ c.c. of anti-colic serum, the animal does not die. In half the cases he recovers; in the other half he lives ten or twelve days. In this last case there is a notable lessening of the infection (from twelve hours to ten or twelve days). If, instead of using anti-colic serum, we employ normal blood serum, or artificial serum, the animal dies as in the first experiment. There appears to be in this anti-colic serum a power of arresting or of lessening the infection of the bacterium coli.

The same result is obtained if, instead of isolating the bacterium, we use the milk; the anti-colic serum seems also to check the action of this milk.

We have studied, with Legrain, the action of this serum on 52 children attacked with severe diarrhœa, without any other treatment; in these cases the same virulent bacterium coli was isolated from the stools. The dose was 5 c.c., repeated or not, as needed. The results obtained were as follows: In 26 cases the morbid phenomena disappeared in forty-eight hours; in 14 cases we obtained immediately an improvement in the symptoms, and in five or six days the child was well; 12 times the result was *nil*. Whenever the diarrhœa was green, acid, or bilious, the injection caused the color to disappear immediately. This is important, as it shows an evident action of the serum on the liver. We know that each fresh intestinal infection is accompanied by an over-active liver and by a superabundance of bile.

Evidently, therefore, the anti-colic serum has a beneficial action. Certainly it is far from being perfect, or from giving constant results, but we hope for improvement. We hope by study to obtain a more active and more specific serum.

Progress of Medicine.

OBSTETRICS

IN CHARGE OF

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ASSISTED BY

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PUERPERAL ECLAMPSIA—ITS ETIOLOGY AND TREATMENT.

Dr. William Warren Potter, of Buffalo, in a paper read at the ninety-first annual meeting of the Medical Society of the State of New York, Albany, January 26, 1897, said, *inter alia*, that we seem to have arrived at the Renaissance of eclamptic literature; that while the subject is being discussed in magazine articles and societies it would not answer for this society to keep silent.

Though the pathogenesis of eclampsia is still unsettled we are certain that it is a condition *sui generis*, pertaining only to the puerperal state, and that to describe, as formerly, three varieties, hysterical, epileptic, and apoplectic, is erroneous as to the pathology and causation, as well as misleading in treatment.

The kidney plays an important office in the economy of the eclamptic. If it fails to eliminate toxins, symptoms are promptly presented in the pregnant woman. Renal insufficiency is a usual accompaniment of the eclamptic state. Overproduction of toxins and under-elimination by the kidney is a short route to an eclamptic seizure. However, many women with albuminuria escape eclampsia and many eclamptics fail to exhibit albuminous urine.

The microbic theory of eclampsia has not yet been demonstrated. The toxæmic theory in the present state of our knowledge furnishes the best working hypothesis for prevention or cure.

Treatment should be classified into (a) preventive and (b) curative. The preventive treatment should be subdivided into *medicina*

and hygienic, and the curative into medicinal and obstetric. A qualitative and quantitative analysis of the urine must be made at the onset. If there is defective elimination something must be done speedily to correct a faulty relationship between nutrition and excretion. One of the surest ways to control progressive toxæmia is to place the woman upon an exclusive milk diet. This will also serve to flush the kidneys and thus favor elimination. Distilled water is one of the best diuretics; it increases activity and supplies material, two important elements. In the pre-eclamptic state, when there is a full pulse with tendency to cyanosis, one good full bleeding may be permissible, but its repetition should be regarded with suspicion. If there is high arterial tension—vasomotor spasm—glonoin in full doses is valuable.

When eclampsia is fully established the first indication is to control the convulsions. Full chloroform anæsthesia may serve a good purpose. If the convulsions are not promptly controlled the uterus must be speedily emptied. This constitutes the most important method of dealing with eclampsia. Two lives are at stake, and by addressing ourselves assiduously to speedy delivery of the fœtus we contribute in the largest manner to the conservation of both.

Rapid dilatation, first with steel dilators, if need be, then with manual stretching of the os and cervix, followed by the forceps, is the nearest approach to idealism. Only rarely can the deep incision of Duhrssen be required. Cæsarean section should be reserved for extreme complications, as deformed pelvis, or to preserve the fœtus when the mother's condition is hopeless. *Veratrum viride* is dangerous, uncertain, and deceptive in action.

In eclampsia of pregnancy, *i.e.*, prior to term, the aseptic bougie, introduced to the fundus and coiled within the vagina, may be employed to induce labor. Finally, to promote the elimination of toxic material, diuresis, catharsis, and diaphoresis should not be forgotten; neither should the hot air bath nor the hot pack be overlooked.

POST PARTUM HÆMORRHAGE—DANGER OF GAUZE.

Schaeffer (*Rev. Obstet. Internat.*, December 1, 1896) agrees with those who distrust gauze as a material for uterine tampons in cases of flooding. If impregnated with iodoform or some other antiseptic, there is no danger of sepsis. If, however, it should happen, as is often the case, that the tampon fails to stimulate uterine contractions, and if when the bleeding is from a lacerated cervix the plug does not cause the torn artery to close by thrombosis,

the gauze increases the danger, for it acts as a capillary drain and takes up much blood. All who have attended many labors know that the tolerance of hæmorrhage is very irregular in different subjects, and an apparently trifling loss will kill certain women. Hence the best rule in flooding is not to allow one drop more to be shed if possible. Gauze, above all, if "absorbent"—which simply means more absorbent than commoner material—takes up many drops of blood at least. Schaeffer now uses non-absorbent gauze, prepared by impregnating it with gutta-percha. It can be mixed with iodoform or aïrol. By rolling it up into a ball it can be passed into the uterus, which it distends without absorbing any more blood. As a tampon the gutta-percha gauze retains its elasticity. Hence Schaeffer finds it suitable for inducing abortion.—*British Medical Journal*.

SURGERY

IN CHARGE OF

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AMPUTATION AT THE HIP-JOINT BY THE WYETH METHOD.

In the *Annals of Surgery*, September, 1895, Erdman reported eighteen hip amputations done in Bellevue, Roosevelt, St. Luke's, Mount Sinai, Chambers street, German, and Presbyterian Hospitals in New York city, with eight deaths and a mortality of 44.4 per cent. Of these eighteen cases seven were operated upon by Wyeth's method, and all recovered, leaving eight fatal cases in eleven amputations by other methods, a death rate of 72.7. Dr. Wyeth's description of his method, which has reduced so materially the danger of this, the most formidable of amputations, we take from the *Annals of Surgery* for February.

The patient should be placed with the sacrum resting upon the corner of the operating table, the sound limb and arms being wrapped with cotton batting and thoroughly protected from unnecessary loss of heat. The limb to be amputated should be emptied of blood by elevation of the foot, and by the application of the Esmarch bandage, commencing at the toes. Under certain conditions the bandage can be only partially applied. When a tumor exists, or when septic infiltration is present, pressure should be exercised only to within five inches of the diseased portion, for fear of driving the septic material into the vessels. After injuries with great destruction, crushing, or pulpesfaction, one must generally trust to elevation, as the Esmarch bandage cannot always be applied. While the member is elevated, and before the Esmarch bandage is removed, the rubber tubing constrictor is applied. The object of this constriction is *the occlusion of every vessel above the*

level of the hip-joint, permitting the disarticulation to be completed and the vessels secured without hæmorrhage and before the tourniquet is removed. To prevent any possibility of the tourniquet slipping, I employ two large steel needles or skewers, three-sixteenths of an inch in diameter and ten inches long, one of which is introduced one-fourth of an inch below the anterior superior spine of the ilium and slightly to the inner side of this prominence, and is made to traverse superficially for about three inches the muscles and fascia on the outer side of the hip, emerging on a level with the point of entrance. The point of the second needle is thrust through the skin and tendon of origin of the abductor longus muscle half an inch below the crotch, the point emerging an inch below the *tuber ischii*. The points should be shielded at once with cork to prevent injury to the hands of the operator. No vessels are endangered by these skewers. A mat or compress of sterile gauze, about two inches thick and four inches square, is laid over the femoral artery and vein as they cross the brim of the pelvis; over this a piece of strong, white rubber tubing, half an inch in diameter when unstretched, and long enough when in position to go five or six times around the thigh, is now wound very tightly around and above the fixation needles and tied. If the Esmarch bandage has been employed, it is now removed. Excepting the small quantity of blood between the limit of the Esmarch bandage and the constricting tube, the extremity is bloodless, and will remain so.

In the formation of the flaps, the surgeon must be guided by the condition of the parts within the field of operation. When permissible, the following method seems ideal:

About six inches below the tourniquet a circular incision is made down to the muscles, and this is joined by a longitudinal incision commencing at the tourniquet and passing over the trochanter major. A cuff that includes everything down to the muscle is dissected off to near the level of the trochanter minor. At about this level the remaining soft parts, together with the vessels, are divided squarely down to the bone by a circular cut. At this stage of the operation the central ends of the divided superficial and deep femoral veins, as well as the arteries, are in plain view, and should be tied with good-sized catgut. This done, the disarticulation is rapidly completed by lifting the muscular insertions from the trochanters and digital fossa, keeping very close to the bone with knife or scissors, and holding the soft parts away with retractors. The capsular ligament is now exposed and divided, and, by forcible elevation, adduction, and rotation of the femur, it is widely opened,

the *ligamentum teres* ruptured, and the *caput femoris* dislocated.

If properly conducted up to this point, not a drop of blood has escaped, except that which was in the limb below the constrictor when this was employed. The remaining vessels which require the ligature should now be sought for and secured. There are, first, the *saphena vein*, which, on account of its proximity to the main trunk, should be tied; the *sciatic artery*, which will be found near the stump of the sciatic nerve; the *obturator*, which is situated between the stump of the adductor brevis and magnus, usually about half-way from the centre of the shaft of the femur to the inner side of the thigh, the vessel being on a level with the anterior surface of the femur; the *descending branches* of the *external circumflex*, two or three in number, usually found about an inch and a half outward and downward from the main femoral vessels beneath the rectus and in the substance of the crureus and vastus externus. The *descending branches* of the *internal circumflex* are insignificant, and are usually found on the level of the femoral vessels in the substance of the adductor longus and between it and the adductor brevis and pectineus.

In tying the larger femoral vessels I make it a rule to dissect both the superficial and deep femoral stumps back from one-half to three-fourths of an inch, so that I can apply the ligature behind any of their branches which may have been divided close to their points of origin, and I do not hesitate to include the large veins in the same ligature in order to save time. With the vessels I have mentioned quickly secured, there is really no necessity for even temporarily loosening the tourniquet. If the operator is not sure that he has found and securely placed the ligatures upon these larger vessels, it is a simple matter to loosen slowly the grasp of the tourniquet until the pulsation of the larger trunks is perceptible. No attention should be paid to the general oozing from the large muscular surfaces which have been divided. If every oozing point were ligatured, from half an hour to an hour would be consumed in securing a dry wound in the majority of cases. In order to hasten the operation and stop the oozing, I introduce a snug packing of sterile iodoform-gauze ribbon into the cavity of the acetabulum and the space between the muscles from which the bone has been removed, leaving one end of the ribbon to pass between the flaps for the purpose of its removal. With a long, half-curved Hagedorn-Fowler needle, armed with good-sized catgut, deep sutures are passed through the stumps of the divided muscles in such a way that large masses of muscle are brought tightly together when these sutures

are tied, taking two to four inches in the grasp of each suture. The needle is not passed in the proximity of the large vessels or the sciatic nerve, but in all other directions the muscles are rapidly quilted together. This effectively and rapidly controls all oozing. Nothing remains but to close the flap with silkworm-gut sutures, and cleanse it off thoroughly dry, seal it with collodion in its entire extent to prevent any infection from the genital or anal region, apply a large, loose dressing of iodoform and then sterile gauze, and a light bandage over the first light dressing. The pins are then removed and the remainder of the dressing completed. Preliminary pressure of the light dressing prevents oozing, and the wound remains dry.

When, from destruction of the parts by accident or disease, or by the proximity of a neoplasm, this ideal method is not practicable, any modification may be employed, preference being given to the incision which keeps farthest from the tumor and gives the healthiest flaps. When there is not sufficient material to cover the stump, it is even safer to err on the side of an unclosed wound and trust to granulation or grafting for ultimate closure.

In the first two operations I did, I divided the femur on a line with the incision through the muscles, tying the vessels, removing the tourniquet, and then dissecting out the upper fragment of the femur. I found it exceedingly difficult to disarticulate the head of the bone, and, at the suggestion of the late Dr. J. B. Murdock, of Pittsburg, Pa., who witnessed the operation, I have since left the femur intact in order to facilitate the disarticulation.

In regard to the steel pins, Professor John B. Deaver, of Philadelphia, has held the rubber tourniquet in place without them, substituting a tight strip of roller bandage underneath the tube in front and behind, an assistant making strong traction upward. Dr. Emory Lanphear, of St. Louis, Mo., succeeded in doing the operation with only one, the outer pin, in position. The fixation pins are not expensive, can easily be obtained in any part of the country, and obviate every risk of hæmorrhage. I see no reason for failing to employ them as directed.

PSYCHIATRY AND NEUROLOGY

IN CHARGE OF

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OPERATIVE GYNÆCOLOGY AND INSANITY.

Dr. A. H. McFarland, in the *Cincinnati Lancet Clinic*, says that : (1) Gynæcological operations are more likely than any other surgical procedure to distract the mind. (2) Hereditary antecedents of the patient's should always be determined. (3) In insane patients operations should be performed only when the physical condition endangers life or renders it insupportable. (4) Patients precedent to the operation should be in a calm frame of mind ; hence moral treatment of the patient previous to operating is the best prophylaxis. (5) Inherited and acquired insane constitution is the fundamental factor in most cases of insanity. This conclusion does not, however, justify us in ignoring physical diseases immediately preceding or associated with insanity. (6) Healthy genital organs do not give rise to reflex symptoms ; consequently caution should be exercised in operating for the relief of insanity. (7) Operations may be satisfactory in properly selected cases.

APHASIA OF THE HAND.

Professor Grasset, of Montpellier, records in *Progres Médical* an interesting observation of a deaf mute, aged fifty, who with the symptoms of a gradual local softening of the brain from thrombosis of branches of the left Sylvian artery became unable to express himself as he had been accustomed to do in the sign language with his right hand. He could still talk with his left hand, but was unable to write, as he had never learned to use his left hand for this purpose. His understanding of what was said to him in the sign language was perfect, and his ability to read was unimpaired. There was a certain degree of paresis of the right arm, co-ordinated movements were not seriously interfered with, and there was no purely physical

difficulty in the way of his using the finger language. Mentality was also only slightly impaired. There was, therefore, in this case a true aphasia of the hand, combined with agraphia, which latter has been called by Charcot "aphasia de la main." It is an interesting question what part of the brain was especially in fault; the paresis of the arm would suggest a possibility of the arm centre, but we have here a defect that altogether exceeded that involving the general use of the hand, which ought to have been more seriously impaired were the finger or arm centre affected. The symptom of agraphia observed in this case is often attendant in motor aphasia from lesion of Broca's convolution. In this patient it would seem that there existed a speech centre distinct from that of the hand.

COLD WET PACK IN PARESIS.

The last medical report of the Government Hospital for Insane, Washington, D.C., refers to the satisfactory and, in some instances, surprising results in the treatment of paresis by the use of the cold wet pack. The cases cited are of striking interest. The conclusions are that the pack seems to act :

(1) By skin stimulations—by reflex action it increases force of heart's action and vascular tonus (a fact based on physiological experiments).

(2) Lower tone of vaso-constrictor nerves in brain, producing passive congestion (with reflexes of various sorts), while impaired metabolism is directly improved in this way.

(3) The derivative effects of hyperæmia of skin upon internal organs.

(4) Vessel depletion by sweating, with stimulation of absorbents, etc.

(5) Relief of congested perivascular lymph spaces in brain, and their intercellular connecting channels, thus directly affecting brain nutrition.

(6) The increased vascular tone, with consequent restoration of equilibrium in vascular pressure, the relief of the lymph channels, and a more normal supply of healthy blood to the starving tissues are supposed to be the causes contributing to the mental calm and frequent refreshing sleep which the pack brings.

The foregoing processes are all enhanced by massage following the pack, especially effleurage. The thermometer is always used to determine details of covering, need for artificial heat or cold.

The benefit of this active treatment is by no means limited to

cases of paresis. Melancholia and acute maniacal attacks are often relieved, but the important question of to-day is: In this hitherto incurable disease does it offer, even in a small proportion of well-established cases, some ground for hope? It can certainly do no harm to try it in other hospitals.

TRANSMISSION OF INSANITY.

Some figures are given in the *Journal of Mental Science* upon the frequency of hereditary insanity, based upon the study of 1,039 cases observed in the Essex County Asylum (Eng.). The daughters appear especially to suffer from the insanity of the parents, but the insanity of the father appears to be more often hereditary. Thus 106 insane fathers have had 117 sons and 138 daughters affected with insanity, while 256 mothers have transmitted the insane taint to 113 sons and 182 daughters. These figures confirm Darwin's law of heredity, according to which the characteristics of the father are more often transmissible to the male line, those of the mother to the female line.

COLONIES FOR EPILEPTIC PATIENTS.

At the meeting of the Ontario Medical Association, June, 1894, Dr. A. McKinnon, of Guelph, introduced a resolution calling attention to the necessity for an institution in Ontario solely for the care of epileptics. Attention had previously been called to the subject in the annual reports of several of the medical superintendents of this province, and a deputation was appointed to place the matter before the Ontario Government. Since then in the State of New York the Craig Colony for Epileptic Patients has been established, and its success has been such as to reflect great credit upon its projectors and to give additional hope for this very afflicted class. The colony now cares for 200 patients, or about one-fourth of those in the state needing care. Remarkable improvement is noticeable in those already admitted. Nearly every patient has gained in weight and in general health, and in all cases seizures have diminished in frequency. A school has been established, and various industries, as carpentry, sewing, painting, blacksmithing, are carried on. Patients of both sexes work in the field and garden, and eighty-three per cent. of males and seventy-six of females have been employed eight hours each day. One-half of the cost of maintenance has been produced by the colony. A similar colony has been established in Massachusetts, and its success is equally satisfactory.

Ohio has made separate provision also for this class. Of the 30,000 or 40,000 epileptics in England 1,100 are now cared for at Passmore-Edwards House, a colony established in 1895. In the Province of Ontario there are, according to our asylum reports, over 300 epileptics in the several provincial institutions, besides the much larger number of similar cases which are taken care of at home.

HEREDITY AND CRIME.

Professor Belman, of the University of Bonn, relates the career of a notorious drunkard who was born in 1740 and died in 1800. Her descendants numbered 834, of whom 709 have been traced from their youth. Of these 7 were convicted of murder, 76 of other crimes, 142 were professional beggars, 64 lived on charity, and 181 women of the family led disreputable lives. The family cost the German Government for maintenance and costs in the courts, almshouses, and prisons, no less a sum than \$1,250,000; or, in other words, just a fraction under \$1,500 each. It would probably, says the *Medical Record*, be difficult to find a more remarkable example of the transmission of hereditary defects.

MORAL PARANOIA.

Dr. Martin W. Barr writes an interesting paper on the above subject in the *Alienist and Neurologist*. He defines two classes of paranoia, the mental and the moral; in the former the intellect is dominated by one or a set of fixed ideas and delusions, and gradually weakens and degenerates, and the ethical sense is not necessarily implicated; in the latter the ethical sense is either weak or wanting, and it may not be associated with intellectual deficiency, but often there is intellectual precocity. This moral form of paranoia is more frequently described as moral imbecility. Moral paranoia is divided into two kinds; in the first the moral sense has not been developed, or through accident or disease has been arrested, but it is capable of development through training; this class is comprised of people not wilfully bad, but of weak wills, easily led astray, and whose weakness of will develops and grows with their physical growth until they astound society with some sudden outbreak. There are many such at present in the care of various institutions in England and America, in which under proper discipline and training they become useful members of society, and as they are *totally irresponsible* they should always be under restraint, so that they may not become vagrants or criminals, or the tools of wicked men.

In the second class, owing to degenerative tendencies and practices through successive generations, or through the taint of some remote ancestor, the moral sense is absolutely wanting. In this type the intellectual faculties may be found defective, but more frequently are unnaturally developed, so that a person of this sort is dangerous to himself and his fellow-citizens. The worst class of criminals, the murderer and the harlot, are examples of this type. Patients of this class are in this condition from birth, and even as children are self-willed, obstinate, and delight in sulking, in annoying children, and in torturing animals. According to Lombroso, physical anomalies, such as cranial and facial asymmetry, premature synostosis, unusual frequency of left-handedness, large orbits, prominent zygoma, nervous contraction of face, and a cold, glassy, immobile look are found in this class. The line that separates these patients from criminals proper is distinct, and has long been recognized by alienists, but unfortunately the lawyers do not appreciate the nature of delusional diseases, nor the frequency of instances in which men not only lose all sense of responsibility, but are regardless of harm to themselves. Children of this class should be placed in special schools adapted to their needs, in order that a firm and well-directed discipline may enable them to attain some degree of self-helpfulness, and the Government might thus be spared the ignominy and cost of criminal trials and punishments. They should be detained for life, and as it has been found they can be trained this treatment should be put into practice, so that their lives may be made happy and useful, and they may become docile and harmless. Education does the greatest harm, the author asserts, as it fosters the ill we would cure; in teaching them to write we give them increased power of mischief, and therefore instruction should be given *only* in physical work. To prevent moral imbecility is a larger question still; the public required to be educated and informed that the intermarriage of persons tainted by insanity *must be prevented by strict legislation regarding the marriage contract*, and that during pregnancy great care should be taken to keep the future mother in a tranquil condition. The author further is of the opinion that castration should be adopted in cases of this kind, and mentions the names of several who strongly advocate such procedure.

LARYNGOLOGY AND RHINOLOGY.

IN CHARGE OF

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RETROSPECT OF THE YEAR 1896.

DIPHTHERIA.

J. MacIntyre (*Journal of Laryngology*, January, 1897) speaks of the abundant literature from all parts of the world by which our knowledge upon this subject has been increased during the year. Kanthack and Stephens deal with the passage of the diphtheritic bacilli to the lymphatics and blood vessels and their distribution by the blood stream. Dr. N. W. Smith startled the medical world of London (Report to School Board) by the statement that school life plays an unimportant part in the spread of diphtheria. On inquiring into the history of 2,168 cases, according to his figures only 124, or 5.7 per cent., were attributable to school influence. Wolfenden (*Journal of Laryngology*), in a long criticism, declares this position not proven; while Murphy combats the view and holds that school life is a very serious factor in spreading the disease.

Statistics have again been brought out by many able writers in support of the efficacy of serum therapy in this disease. Among its advocates are many of the most reliable and painstaking observers, as well as a large proportion of the medical profession, who conscientiously believe that very many lives are saved by its use. Still, there are many unbelievers. Lennox Browne has prepared a valuable review of the records of the treatment of diphtheria since serum therapy was introduced. After using the serum extensively in his own practice, and not being favorably impressed with the result, he records the names of forty-four eminent authorities in Europe and America "who express themselves as either definitely adverse to the treatment, or who deprecate the extravagant enthusiasm of some of its advocates." (*Journal of Laryngology*, December, 1896.) He concludes by expressing the opinion "that the benefits equally with the dangers of antitoxin are due to the albumen in the blood serum, and not to any special antidotal element."

NOSE AND NASO-PHARYNX.

Atrophic rhinitis. In the treatment reported there has not been much definite progress; though enthusiasts in special lines have given very promising results. Belfanti and Vedora (*Gas. Med. de Turin*) maintain that the disease is produced by attenuated diphtheria bacilli; and that they have cured it by injecting antitoxin. Fage (*Rev. de Lar.*) attributes the disease to Lowenburg's coccobacillus; while Sattler considers it a true degeneration of the trophic nerves of the mucosa, and advises simple cleansing treatment. Capart and Cheval have continued the use of electrolysis with a report of 90 per cent. of cures by the bi-polar method. They attribute the result to nutritive changes produced by the current. Bayer, on the other hand, lost a patient from meningitis supposed to be induced by electrolysis applied for the cure of the atrophic disease. Pocher (*Trans. South Carol. Med. Assoc.*), having used many remedies, is still open to conviction of the efficacy of any treatment.

Hypertrophic rhinitis. The only new thing worth recording is advanced by Blondeau (*Journal of Laryngology*). It consists of partial or complete transfixion of the inferior turbinated by a galvanocautery needle. The needle or lance point is passed between the mucosa and the bone. The object aimed at is shrinkage of the turbinal tissues, without destruction of the surface epithelium. The risk of touching the ostium tubæ is not slight. In ten cases taken haphazard it occurred in six, setting up temporary ear trouble, tinnitus and fullness, all of which, however, passed away in a few days.

Purulent rhinitis of children. Fougeray (*Ann. des Mal. de l'Oreille*) gives two classes, congenital, due to gonococcal infection, and that of later date due to staphylococcus. In both cases he advises a 10 per cent. oily solution of menthol for local application.

Milligan draws attention (*Journal of Laryngology*) to the frequency of attic disease as a sequel to adenoid vegetations.

Septum. Septal deviations, ridges, and spurs have received a large share of attention. Ballinger (*Jour. Am. Med. Assoc.*) sums up his experience of electrolysis in reduction of spurs. He says the treatment is not simple, and requires much experience to be successful. It is more suitable to cartilaginous than bony growths, and sometimes perforations occur as a result. Roe describes the vomer as two ossifying plates with a layer of cartilage in the centre. Hence the lateral bulging that so often occurs in the septum.

Rhinorrhœa. Of the four cases reported during the year, those of Mermod (*Ann. des Mal. de l'Oreille*) and Theason (*Trans. Lon*

Lar. Soc.) were discharges of the cerebro-spinal fluid, one of them ending fatally. In the other cases atropine, one per mille, acted very well in checking the discharge.

Hay fever. Strangways (*Ann. Ophth. and Otol.*) advocates the local application of sol. of acetic acid. Lake, in retrospecting the year, speaks of this as distinctly new treatment. In this, however, he must be mistaken, as Sajous, as early as September, 1893 (*Universal Med. Jour.*), advocates the application of acetic acid.

In diseases of the antrum of Highmore, and the ethmoid cells, although many papers have been written, nothing essentially new has developed; except, perhaps, that at the meeting of the Vienna Laryngological Society there was unanimity of opinion (*Journal of Laryngology*) as to the non-existence of necrosing ethmoiditis.

Pharynx. The lingual tonsil has received a good deal of attention, and its pathological importance, direct and indirect, has been forcibly dwelt upon. Escat (*Rev. de Lar.*) treats of the diagnostic points of phlegmonous lingual amygdalites. Lennox Browne (*Liv. Med. Chir. Jour.*) enters minutely into hypertrophy of lingual tonsil in connection with lingual varix. Sir W. Wade (*Brit. Med. Jour.*) calls attention to tonsillitis as a factor of rheumatic fever. A case of alarming hæmorrhage after tonsillotomy is recorded by Piergelli (*Arch. Ital. de Otol. Rhinol. Laryng.*) necessitating ligation of right common carotid. Price records a case of foreign body in the œsophagus located by Roentgen rays and removed (*Med. and Surg. Rep.*).

Larynx. New literature upon the larynx is very extensive. New instruments and new methods of diagnosis are constantly being brought forward by those engaged in special work to ameliorate chronic disease. Chappelle and Hubbard (*New York Acad. Med.*) give good results by creosote internally, and submucous injection of creosote into the larynx for tuberculosis of that organ. Newman (*Lon. Lar. Soc.*) reports two cures by local application of iodoform in ether and alcohol. Heryng (*Dutch Lar. Rhin. and Oto. Soc.*) reports a cure from application of sulpho-ricinate of phenol. Delavan (*New York Acad. Med.*) records papilloma of the larynx cured by applications of absolute alcohol. This recalls to mind the fact that Major, of Montreal, recommended the like treatment years ago. Many cases of successful removal of the larynx for malignant disease have been recorded. Many eminent laryngologists, however, are still undecided whether life on the whole has been lengthened thereby or not.

Of new instruments MacIntyre's cryptolaryngoscope for the

application of the "X" rays to the interior of the mouth for examination of the larynx occupies an important place, as likewise does Kirstein's autoscope for the direct examination of that organ. Van Aurooy (*Dutch Lar. Rhin. and Otol. Soc.*) was able to find and remove a large papilloma from the right vocal cord by the help of the latter instrument. Katzenstein (*Ber. Lar. Soc.*) describes a new laryngeal mirror to give upright images called the orthoscope. Myles (*Journal of Laryngology*) has invented a pair of ethmoid clippers for removing the floor of the ethmoid cells.

This synopsis is necessarily brief, but it contains the more important elements that have come under this department during the recent year.

Editorials.

HOSPITALS AND THE PUBLIC.

WE publish in this issue a letter from a correspondent on the subject of the relations existing between patients and the managers and the medical staffs in general hospitals. There has been in the past, and there is now, much misunderstanding, especially on the part of the public, as to the position of patients who receive hospital treatment. The general tendency of the present system is to pauperize a large portion of the community, who have no desire to become objects of charity as far as their food, clothing, etc., are concerned, but are quite willing or anxious to get medical attendance without paying for it. The evil appears to be growing, especially in Great Britain, the United States, and Canada. While this is generally recognized by the profession, it seems hard to find any practical solution of the many difficulties surrounding the whole question. We shall be glad to publish additional "particulars" from our correspondent in the future, when they are placed at our disposal. A free and open discussion might lead to good results; it certainly could do no harm. We would be glad to print the views of many physicians on the subject.

THE MEETING OF THE BRITISH MEDICAL ASSOCIATION.

THE local executive committee in Montreal is continuing its work in connection with organization for the next meeting of the British Medical Association. Dr. T. G. Roddick, the president-elect, went to England early in January, and remained some weeks. We understand that he is much delighted with his reception and the encouragement he received from the members of the general council and other distinguished members of the profession.

Since our last issue we have received from England the exact wording of the resolution of the council of the association, stating

who are and who are not eligible to be members and to attend the meetings of the association. This resolution was passed two years ago, and inasmuch as we hear on all sides that very large numbers of members of our profession in the United States are proposing to attend the Montreal meeting it may be well again to point out that, however much the local executive desires to welcome American practitioners, its hands are tied. Those visiting Montreal must either be members or invited guests if they are to enjoy the privileges of the meeting, and only British subjects can be members. The resolution runs as follows :

Resolved, that while recognizing it as both a duty and a pleasure to accord a hearty welcome to foreign medical practitioners attending the annual general meeting of the association, the council is of opinion and is advised that it cannot extend to such practitioners the privilege of actual membership, having regard to the origin and constitution of the association, and to the fact that in the opinion of the council the word "qualified," in By-law No. 1, means British subjects who are registered or entitled to be registered in the medical register of Great Britain or Ireland, or British subjects residing in any part of the British dominions who are legally entitled to practise in such dominions, and that such definitions cannot be further extended.

LORD LISTER.

IN our last issue we expressed our pleasure respecting the elevation of Sir Joseph Lister to the peerage. At the same time we expressed our regrets that the name of Lister was to be dropped, and that of Kinnear was to be adopted. We are glad to learn from the *British Medical Journal* that Sir Joseph has decided to take the title of Lord Lister instead of Lord Kinnear. The *Journal* says that in taking this course he has followed a precedent set by other distinguished men who have been raised to the peerage in recognition of services rendered to science and to art, as, for instance, in the case of Lord Leighton. It also states that several medical bodies have adopted resolutions of congratulation, such as the Royal College of Surgeons of England, the Royal College of Surgeons in Ireland, the Liverpool Medical Institution, and the Medical Society of London. The medical journals of Great Britain, almost if not quite without exception, express the opinion that the honor which has been conferred upon Lister has given genuine pleasure to the

general rank and file of the profession of that country. It is probably not too much to say that a similar feeling of gratification prevails in the whole medical world

DINNER TO DR. RODDICK IN LONDON.

DR. RODDICK, of Montreal, president-elect of the British Medical Association, was entertained at dinner by some members of the Council of the Association, January 20, at the Grand Hotel, in London. Earlier in the day he had attended the meeting of the Council to discuss the arrangements for the next meeting. From the account of the dinner given by the *British Medical Journal*, we learn that Dr. Robert Saundby, President of the Council, acted as chairman. Among those present as guests were Dr. Wilks, President of the College of Physicians, and Mr. Tegart, Master of the Apothecaries' Society. Dr. Saundby, in proposing the toast of "Our Guest," said the object of those present was to welcome Professor Roddick, their president-elect. He expressed in warm terms the feelings of gratitude they had towards him for crossing the Atlantic to confer with them, and hoped a large number of the members in Great Britain would attend the Montreal meeting.

Dr. Roddick returned thanks, and said he felt it was a great contract to bring the association to Montreal, but he was an Imperialist, and if there was anything by means of which he could bring more closely the premier colony of Canada to the British Isles he would always be willing to do it. He assured them that the visiting members would receive a hearty welcome from the profession in Canada. He told them in eloquent terms what they might see if they took a trip across the continent, speaking especially of the great St. Lawrence river, Niagara Falls, the prairies of the Northwest, the Rockies, etc. He said he had the whole profession of Canada at his back, and in inviting them to come to see us next August he was speaking as the representative of Canada. His admirable speech, from which we have only given brief extracts, together with other interesting addresses, may be found in the *Journal* of January 23.

Dr. Roddick deserves the thanks of the profession of Canada for the great interest he is taking in the organization for the Montreal meeting. A journey across the Atlantic in midwinter is no trifling matter, especially to a busy man. We are glad our friends in England recognize that fact, and fully appreciate what Dr. Roddick has done and is still doing. We hope that the profession in this part of

Canada will do its share towards showing the President-elect next August that he was using no idle words when he stated in London that he "had the whole profession of Canada at his back."

THE FAMINE IN INDIA.

WE are glad to know that Canada is going to give some substantial assistance to those suffering from famine and plague in India. Certain figures given in the *British Medical Journal* will convey some ideas of what this famine means. Without assistance something like 37 millions of the people will be deprived of food for a period of from four to six months. In addition, 44 millions will not receive sufficient food. Such are the bare facts, and the authorities of India and Great Britain are endeavoring to partially supply the wants. The Indian Government will, it is expected, spend from twenty to thirty millions of dollars in trying to prevent death from starvation.

The *Journal* points out that there are humanitarian objects to be served beyond mere subsistence and prevention of death, as, for instance, medical relief and comforts for the sick, the aged, and infirm. The evil effects will continue long after the famine has ceased to exist. The vitality of many millions will be lowered to such an extent that diseases of all kinds will enormously multiply. Already a malignant plague is devastating the Bombay presidency. The death rate, about the middle of January, had become 200 per thousand, and there was then no indication that the crisis had been reached.

In the report published in the *Journal* we find that the record of deaths from plague in Bombay for the previous seven weeks was: 49, 51, 53, 67, 64, 173, 259. In addition, we learn that the mortality from the ordinary diseases is exceedingly high. In one week the number of deaths from remittent fever was 363. It was hoped that the Europeans in Bombay would suffer but little from the ravages of the plague, because such was the case when the plague invaded Hong-Kong. It appears, however, that this immunity in the latter city was due to the excellent sanitary conditions surrounding the Europeans, while in Bombay the same happy condition of things does not exist.

It is feared that the epidemic of plague may rapidly extend westward, and many of the European countries are seriously exercised in consequence. The *Journal* says it is rumored that the British Government will be asked to bring pressure to bear on the Govern-

ment of India to check, if not altogether to prohibit, the pilgrimage to Indian Mohammedans to Mecca this year. Since such an interference with religious beliefs would create very serious difficulties, it is unlikely that this extreme step will be taken. Under such circumstances the opinion that measures should be adopted to diminish the risks is correct. The *Journal* advises the establishment of a camp of observation with the necessary police, sanitary, and commissariat arrangements, to be maintained during the pilgrim season.

JENKINS v. COTTON.

THE recent suit in the Assize Court in Toronto, in which an action was brought against Dr. J. H. Cotton for alleged malpractice, was remarkable in many ways, and created a great deal of interest in the profession. We know of no case where a physician, under similar circumstances, was more thoroughly fortified by the justice of his cause. After the counsel for the plaintiff had concluded his statement of the case, and the presentation of his evidence, there was a general feeling of amazement among the medical onlookers. Is that all—is there nothing else? No! there was nothing in it. Who advised this unfortunate neurotic woman to pass through such a trying ordeal, involving considerable expense to her or her friends for nothing? We don't know.

A neurasthenic patient, with backache and numerous other aches, went into Dr. Cotton's office for treatment—her most prominent symptom being menorrhagia. The diagnosis, as regards the menorrhagia, was fungous endometritis, and curettement was advised. This operation was subsequently performed at the house of the patient, under an anæsthetic administered by Dr. Hay, with strict antiseptic precautions. The result was apparently satisfactory, and proved the correctness of the diagnosis. Dr. Cotton made all the visits he thought necessary, and then left instructions that he was to be sent for if anything went wrong. In the meantime the patient was out of bed, and going about the house, with no sign of anything like septicæmia resulting from the operation.

The plaintiff claimed that a salpingitis that subsequently developed was due to the doctor's negligence; that hæmorrhoids which existed then, and still exist, should have been treated; and that all her ills experienced since that time, which have prevented her from earning a livelihood, arose from Dr. Cotton's carelessness and want of skill; but produced no satisfactory evidence in support of such

contentions. Chief Justice Sir William Meredith, with evident reluctance, allowed the case to go to the jury, and the verdict was very promptly given in favor of the defendant.

Dr. Cotton was particularly fortunate in being able to show that he was both careful and skillful; and, we may add, that his careful habits, especially in keeping records of his cases in a book provided for the purpose, ought to convey a valuable lesson to other practitioners who do not exercise similar care in taking notes, and keeping them for future reference. His notes in this instance were a great aid in many ways, and certainly showed that he was not likely to be negligent in any particular. We think we can offer the congratulations of the whole profession to Dr. Cotton regarding the fact that his reputation as a careful and skillful physician remains unsullied; and, at the same time, we desire to express their regrets that he has been subjected to so much worry and vexation over a wearisome and unjust action at law.

HOUGH v. FORREST.

ANOTHER exceedingly vexatious and groundless suit was brought at the recent Assize Court against Drs. R. W. Forrest and J. Forrest, uncle and nephew, living and practising in Mount Albert. The plaintiff claimed five thousand dollars damages received through alleged malpractice in the treatment of a fractured leg. Dr. Cameron, of Toronto, who had examined the limb by order of the court, stated that he had never seen a fracture more skillfully treated, and that without the aid of the patient he could not have located its seat. He also said that certain disabilities complained of were the result of laceration of the nerves at the time of the accident. The neuritis which had developed was clearly recognized and properly treated. Dr. Dickson and Dr. A. J. Johnson agreed with Dr. Cameron. Mr. Justice Street, in his charge to the jury, referred in detail to the expert evidence, and stated that he had no hesitation in coming to the conclusion that the plaintiff had entirely failed to prove the charges he had preferred, and consequently he felt it his duty to withdraw the case from the jury, and dismiss it with costs.

In this case, as in that of Dr. Cotton, there does not appear to have been any shadow of just reason for entering the action. The Drs. Forrest are capable, honest, and conscientious surgeons, and evidently in this instance did their work with unusual care and skill. These lawsuits are exceedingly unpleasant and expensive; and it

seems strange that even the most intelligent and careful practitioners are not free from serious dangers, which indeed constantly beset them. In a large proportion of such actions the plaintiffs are paupers who have received treatment without charge. We will admit that even under these circumstances the law is correct in not condoning negligence or want of ordinary skill ; but, we contend, a surgeon should in some way be protected from purely speculative suits for damages. As we understand the question, our profession only asks our legislators to amend the law so as to make a plaintiff in such cases give security for costs. We congratulate Drs. Forrest upon their success in this contemptible suit.

Correspondence.

HOSPITALS, WITH THEIR STAFFS, AND THE PUBLIC.

To the Editor of THE CANADIAN PRACTITIONER :

SIR,—In this letter I merely wish to draw the attention of the medical profession and the general public to the exceedingly misleading position hospitals with their staffs occupy in the minds of the people. Through a totally wrong idea of the whole management and working of hospitals, the people have been allowed to grow up with this false idea without any systematic effort being made to enlighten them. Grumbling on the side of the staffs there has undoubtedly been, and also on the part of the public, in which each condemns the other, sometimes most unsparingly. All the outcome of a misapprehension of their respective positions.

Let us take the working of a large general hospital, thereby meaning one where there are all the various departments of general and special medicine and surgery. The hospital is divided into private, semi-private, and public wards. The private wards are used by people who are able to pay extra for a room to themselves and attendance. This payment is perfectly separate from the fee of the physician or surgeon. But the occupant must always pay his physician or surgeon a fee; for being a private patient shows he is not one without means.

The semi-private wards are taken by people who wish and are able to pay a small additional sum to that required by the public wards, so as not to occupy these public wards. This also means that they are able to pay the physician or surgeon a moderate fee.

Now, the public wards are tenanted by people who are unable to pay at all, or only forty cents a day. This forty cents per day must be paid, and, if the patient can't do so, then it must be paid by somebody, or by his municipality, or town, or city. Now, if into the latter wards any patient comes, either through ignorance or dishonesty, who is in a position to pay a fee to his physician or sur-

geon, he should at once be told that his place is in a semi-private or private ward.

At the present time there is such an ignorance on the part of the public with reference to the whole hospital system that people occupy the public wards who have no right to be there. This wrongful position on their part is due to ignorance, but sometimes, I am sorry to say, is because they coolly determine to get medical attendance free. I may mention that all patients in the public wards are attended by the physician or surgeon free of charge. This free attendance is willingly given to the deserving poor; but when the attendance is asked for those able to pay, it then becomes a glaring abuse of charity. The public must also understand that the medical profession give their services to these patients without any payment. That is, the position is honorary, and has no salary attached. The public, I find, as a rule, are fully persuaded that the government or some corporation pays the staff a good round sum for that attendance. This is not the case, and its knowledge by the public should go very far to put matters right, for, as they say, feeling that the doctors are paid a salary, we, of course, think we have a perfect right to their services free.

Mr. Editor, if you insert this letter I shall, with your permission, follow it up and go more into particulars. I am persuaded that it is high time, both for the well-being and good-fellowship of the profession and public, that our situation with respect to each other be most fully stated from all points of view.

Truly yours,

G.H.B.

LABORATORY SPECIMENS.

To the Editor of THE CANADIAN PRACTITIONER :

DEAR SIR,—During the last ten years I have appealed to physicians from time to time to send me the human embryos which fell into their hands, and have in this way procured some very valuable specimens. These specimens have been cut into sections, and are now being modelled and studied very carefully. Yet a number of important stages are still wanting, and I therefore ask through the columns of your journal that physicians send me any material which they may obtain.

The best method to preserve human ova is to place the unopened ovum, without handling, and as soon as possible, in

strong alcohol. By this method the embryo within is well hardened for future microscopic study.

It is very injurious to wrap these delicate specimens in cotton before sending them by mail or express. A perfect method is to place the preserved specimen in a bottle filled completely with alcohol, thus imitating the condition of a *fœtus in utero*. If there be no air or cotton in the bottle, it is almost impossible to injure the embryo by shaking it.

FRANKLIN P. MALL,
Professor of Anatomy.

Johns Hopkins University,
Baltimore, Md.

Meetings of Medical Societies.

TORONTO CLINICAL SOCIETY.

(Concluded from last issue.)

DR. PRIMROSE pointed out that not only was there a difference in the toxins produced during life from those produced by the death of the germs, but that the action of the serum administered in cases of infection from the streptococcus was different in its action from that of the diphtheritic and tetanic serum; the anti-streptococcic serum was germicidal, while the antidiphtheritic was not germicidal.

Dr. Temple asked if there were any indications for section and drainage of the abdomen.

Dr. A. A. Macdonald referred to a series of some fourteen cases of sepsis reported in the *British Medical Journal* recently, in which the antistreptococcic serum was administered. There were two deaths. He thought as good results could be obtained by the old method of treatment, by removing the source of infection.

Dr. Primrose said that the signs of peritoneal invasion did not occur until so late a stage in the case that operation was not advisable. Not only might as good results be obtained from other methods of treatment as by the serum treatment in these cases, as the last speaker had held, but there was proof that the antistreptococcic serum did injury by producing the second toxin spoken of through the death of the germs.

Dr. G. S. Ryerson said that with the assistance of Dr. King he had made some observations of the effect of the "X" rays on the blind, having heard and seen that such cases had been able to see through the use of the rays. Some of the subjects were only partially blind, and others totally. In one case the eye was gone entirely. After a most careful examination they noted that those in whom there was some degree of perception of light, and also in those who could to some degree perceive bodies, the "X" rays were visible. Those who were absolutely blind had no perception of light whatever.

Dr. J. E. Graham presented a heart. The patient had four murmurs before death—a direct and regurgitant aortic, a presystolic mitral, and a systolic mitral. The aortic valves were badly degenerated, the result of syphilis. The mitral presystolic murmur, according to Flint, was due to the fact that the left ventricle never became free, there being always a certain amount of blood in it, the blood preventing the mitral valve from coming in contact with the wall; the segment of the valve being kept a little towards the centre of the chamber, when the left auricle contracted the blood would be driven over this prominent portion of the valve and the murmur produced. It was different in the heart shown. It was pointed out that when the chamber was dilating one of the segments was drawn over by the shortened chordæ tendinæ, the blood passing over which produced the murmur.

Dr. E. E. King gave a demonstration of the Roentgen rays. He described the method of production of the electricity, and the various apparatus needed to produce the ray. Many excellent skiagraphs were shown representing various normal and abnormal conditions. The fellows were able with the fluoroscope to examine their own and their fellows' osseous framework, and numerous articles separated from the tube by intervening objects.

Refreshments were then served, after which the society adjourned.

TORONTO MEDICAL SOCIETY.

THE regular weekly meeting of this society was held in the council building, January 15, Dr. W. J. Wilson, the president, in the chair. Minutes of the last meeting were presented by the secretary and adopted.

OSTEOMYELITIS.

Dr. F. N. G. Starr read a paper on "Osteomyelitis of the Femur," presenting mounted specimen.

The patient, aged three, had come under his care in August last. Five weeks before complained of pain in the left thigh. There was no mark or injury. Physician consulted at the time recommended the application of tincture of iodine. After ten days, in which there was no improvement, a second doctor was consulted, who opened the leg, evacuating pus from an abscess. The femur was found to be largely denuded of periosteum. The lower epiphysis was separated. Drainage was made. As medical attend-

ance could be made only at long intervals and the nursing was bad, the case did not do well. The child was brought to Toronto. Temperature, 102° ; pulse, 140; respirations, 48. The patient was weak, anæmic, and emaciated. Signs of distress and suffering were marked. Under an anæsthetic the shaft was found free, the epiphyses were separated, and a malodorous discharge exuded from the opening. The bone was completely riddled. After removal and irrigation, the cavity was loosely packed. A second abscess on the dorsum of the foot was opened, scraped, and irrigated. Within a few days an abscess formed on the left leg, but was not connected with the bone. The staphylococcus pyogenes aureus and albus were found in this last opening, while in the former the bacillus proteus and an occasional staphylococcus were found. The child finally succumbed.

The essayist pointed out that an early and correct diagnosis was most important in such cases, and an early operation by free incision desirable. He advocated the method he had used of removing the bone by first dividing the shaft into two segments, because it required only a small opening, and caused less laceration and contusion. A point of interest in the case was the absence of the staphylococci from the medulla. Perhaps, he said, they were present, but owing to their confinement they had been destroyed by their own toxins.

Dr. A. Primrose spoke of the difficulty of early diagnosis in these cases. He found fault with the present classification of inflammatory diseases of bone. He reported several cases of this disease in which the early diagnosis was exceedingly difficult.

Dr. Oakley asked if the same antiseptic precautions were necessary in these septic cases as in ordinary clean cases.

To this last question the reader of the paper answered emphatically in the affirmative.

ANEURISM OF AORTA.

Dr. J. Webster presented an aneurism of the aorta. The patient was a young man, strong and athletic. There was no specific history. In January, 1895, he began to complain of pain in the chest. The speaker saw him about a year later and diagnosed the condition, and ordered that he should be kept quiet, but these orders were disobeyed. He helped to lift a stove, after which the physical signs and symptoms were very much aggravated. On taking rest and under treatment he became considerably better, but again transgressed, and was sent to the hospital. The tumor was

large and perceptible, the sternum bulging out a great deal. The patient died about a month after leaving the hospital.

At the post-mortem the sternum was found to be eroded, and the tissues suffused with blood. The aneurism and the aorta were filled with clot. It had ruptured through the skin in the median line of the neck.

Dr. Webster showed a second specimen. It was diagnosed a carcinoma of the pylorus. There were the usual symptoms found with stenosis of the pylorus. Post-mortem, the cancer was found to involve the pyloric end of the stomach, but not the pylorus itself, there being healthy tissue between the cancer and the pylorus. The neoplasm was circular in shape.

ECTOPIC GESTATION.

Dr. J. F. W. Ross presented a specimen of unruptured ectopic gestation. He had seen the case in consultation with Dr. J. H. Cotton. The patient had a young baby. She had gone a few days over her menstrual period and then began to flow. After the flowing had continued for a time pain commenced in the left side. Dr. Cotton saw her and made a vaginal examination, and concluded that it would be wise to make a thorough examination under chloroform. A small mass could be felt, but it was impossible to state the dilatation was in the tube or just below it. Two weeks passed during which the patient was up and about, at the end of which time the speaker saw her again in consultation. It was decided that the dilatation was in the tube; that it was an unruptured ectopic gestation; and that immediate operation was called for. The next day operation was done and the specimen obtained. The speaker said that he had seen an earlier cause of death by tearing the tube from the uterus.

Dr. Ross gave the history of a second case. In April, 1895, he made an incision in the right iliac fossa into an abscess cavity in a young woman, aged 18, who was apparently in the last stage of sepsis. The illness had lasted some months. The pus was very offensive and streaked with faecal matter. Irrigation and drainage were done and the wound partly closed, the wound being partly packed with iodoform gauze. Faecal matter continued to discharge through the wound, and the temperature and the pulse remained elevated.

About two months after he curetted away old granulations around the abscess cavity. A portion of the intestine was found prolapsed into the abscess cavity through its posterior wall. The bowel was drawn up with forceps, the peritoneum stripped off its

surface, and the opening closed by several sutures. The cavity throughout was touched with carbolic acid and the wound closed by silkworm gut. An iodoform gauze drain was left in situ. Fæcal matter continued to discharge. The patient returned home to recuperate. In January, 1896, she returned. Dr. Ross reopened, and found that several other sinuses had formed. These were thoroughly curetted and touched with carbolic acid and packed with iodoform gauze. There were two other openings into the bowel. The larger one was at the blind end of the cæcum, at the point at which the appendix was originally seated. The openings were closed by means of stitches. A month after this operation fæcal matter again discharged through the wound. Another operation was attempted, but the patient nearly died on the table. The patient went home weighing sixty-eight pounds. She returned in January, 1897, weighing 132. A piece of bowel eight or ten inches long was found lying loose on the abdomen, evidently ilium and cæcum inverted through the opening. Opening up, two large openings were found in the intestines. The intestines were reinverted, and the openings were closed with sutures. The large perforation was an old ulcer of the cæcum. The patient was doing well, and a permanent cure is expected.

A third case was reported by Dr. Ross. The patient had a large fibroid of the uterus. Opening was made in the median line, the incision reaching from the symphysis to four inches above the navel. The ovarian and uterine arteries were ligated, and those of the round ligaments. The uterus was removed, except the supravaginal portion of the cervix. On account of bleeding, the cervix was transixed with a needle and tied in two halves by an interlocked suture. The peritoneum was then tied over the stump and the sutures were drawn out through the lower portion of the abdominal wound, and the stump was fastened close beneath the incision by two of the silkworm-gut sutures passed through it and the abdominal wall. A drainage tube was introduced. The doctor then discussed the merits of this way of disposing of the ligatures, and that of bringing them down through the vagina.

The society then adjourned.

TORONTO PATHOLOGICAL SOCIETY.

THE first regular meeting was held in the Biological building; the president, Dr. J. Caven, in the chair. Members present: J. Caven, Anderson, Reeve, Wilson, W. J., Wilson, R. J., Thistle,

McKenzie, J. J., Peters, Starr, Greig, Fotheringham, Primrose, Ellis, W. H., Oldright, H. H., Oldright, W. By invitation, Drs. Rudolf and C. F. McGillivray.

Proposals for membership—Dr. L. M. Sweetnam, proposed by J. T. Fotheringham and H. B. Anderson.

President's address deferred on motion of H. B. Anderson and W. B. Thistle.

"Sarcoma of the Adrenals" presented by H. B. Anderson.

Specimen of acute corrosive poisoning of the stomach presented by C. F. McGillivray, of Whitby.

Discussion shared in by Drs. Anderson, Peters, J. Caven, Fotheringham, and Wilson, R. J.

Microscopic slides of alveolar sarcoma presented by G. A. Peters. Serial sections of tubercular glands by A. Primrose.

The meeting then adjourned.

The second regular meeting was held on November 28th, the vice-president, H. B. Anderson, in the chair. Members present : Anderson, Primrose, Fotheringham, Carveth, Hamilton, J. J., McKenzie, Starr, Oldright, H. H. Visitors, Drs. Rudolf and Wigle.

Proposal for membership—W. H. Pepler, proposed by H. B. Anderson and H. J. Hamilton.

Mr. J. J. McKenzie read some

NOTES ON THE NEW SERUM DIAGNOSIS OF TYPHOID FEVER.

(See THE CANADIAN PRACTITIONER, December, 1896.) Dr. Rudolf asked if there was any relation between the severity of the case and the reaction. There had not been a chance to observe that.

H. J. Hamilton : Is the reaction as complete at the end of three or four minutes as in twelve to fifteen hours? Yes.

G. Carveth : Is the test present in all stages? Yes.

J. T. Fotheringham : Is the reaction found in cases of typhoid when tuberculosis sets in late in the disease? Do not know, but think that tuberculosis might kill the typhoid bacillus.

H. J. Hamilton : Has any reaction been produced by bacterium coli commune? Some claim to have found it. Not found in my cases.

J. J. McKenzie read a paper on

EXPERIMENTAL TUBERCULOSIS OF THE IRIS IN A RABBIT.

The rabbit was inoculated on September 26, 1896. In twenty days tubercle was found in the iris. Bacilli, epithelial cells, and leucocytes were found. Giant cells absent.

A part of the same suspected urine was injected into the peritoneal cavity of a guinea pig. Killed in four weeks and bacilli tuberculosis were found in the enlarged lymph glands.

The reader of the paper thought the anterior chamber the preferable place for inoculation, showing the growth earlier and more clearly.

Dr. J. T. Fotheringham presented a

CANCER OF THE PYLORUS WITH HISTORY OF A GASTRIC ULCER.

Patient seen four years ago; had been drinking heavily; had a fit, apparently epileptic, followed by profuse hæmatemesis. No recurrence of hæmorrhage. Again saw the patient in August, 1896. Died two weeks later in the General Hospital.

Dr. Primrose showed a series of sections of mammary scirrhus, with secondary infection of glands of the axilla. One section was from an infected gland on the side opposite the affected breast.

Dr. Fotheringham: Was the infection of the gland on the opposite side a result of the original breast infection, or an independent infection? Two infections would explain it better, but this may be too broad. The gland might become affected just as one might get secondary growths in other parts. Secondary growth to be distinguished from a spreading growth, *i.e.*, what is found in the glands of the affected side.

Dr. Primrose asked for an explanation in reference to the infected gland on the opposite side.

Card specimens: Enchondroma of phalanx and metacarpal bone, presented by H. Oldright. Had been growing twelve years. Patient now twenty-four years of age. Was removed from the little finger because it was in the road.

Meeting adjourned.

Book Reviews.

Books received :

AUTOSCOPY OF THE LARYNX AND THE TRACHEA. (Direct examination without mirror.) By Alfred Kirstein, M.D., Berlin. Authorized translation (altered, enlarged, and revised by the author), by Max Thorner, A.M., M.D., Cincinnati, O., Professor of Clinical Laryngology and Otology, Cincinnati College of Medicine and Surgery; Laryngologist and Aurist, Cincinnati Hospital, etc. With twelve illustrations. One volume, crown octavo, pages xi.-68. Extra cloth, 75 cents, net. The F. A. Davis Co., publishers, 1914 and 1916 Cherry street, Philadelphia; 117 West Forty-second street, New York; 9 Lakeside Building, Chicago.

ANOMALIES AND CURIOSITIES OF MEDICINE. Being an encyclopædic collection of rare and extraordinary cases and of the most striking instances of abnormality in all branches of medicine and surgery, derived from an exhaustive research of medical literature from its origin to the present day, abstracted, classified, annotated, and indexed. By George M. Gould, A.M., M.D., and Walter L. Pyle, A.M., M.D. Imperial octavo, 968 pages, with 295 illustrations in the text, and 12 half-tone and colored plates. Philadelphia: W. B. Saunders, 925 Walnut street. 1897. Prices: Cloth, \$6 net; half morocco, \$7 net. *Sold only by subscription.*

A SYSTEM OF PRACTICAL MEDICINE. By American authors. Edited by Alfred Lee Loomis, M.D., late Professor of Pathology and Practical Medicine in the New York University, and William Gilman Thompson, M.D., Professor of Materia Medica, Therapeutics, and Clinical Medicine in the New York University. To be completed in four imperial octavo volumes, containing from 900 to 1,000 pages each, fully illustrated in colors and in black. Vol. I., Infectious Diseases. Just ready. Vol. II., Diseases of the Respiratory and Circulatory Systems, and of the Blood and Kidneys. In press. Vol. III., Diseases of the Digestive System, of the Liver, Spleen, Pancreas, and other Glands. Gout, Rheumatism, Diabetes, and other Constitutional Diseases. In active preparation. Vol. IV., Diseases of the Nervous System and of the Muscles. Diseases of doubtful origin, Insolation, Addison's Disease, etc. In active preparation. Per volume, cloth, \$5; leather, \$6; half morocco, \$7. Lea Brothers & Co., publishers, Philadelphia and New York.

Medical Items.

WE are indebted to DR. HURD, superintendent Johns Hopkins Hospital, for engravings used in Dr. Barker's article.

DR. MONTIZAMBERT, of Toronto, started for British Columbia, February 1, on an inspecting tour.

DR. MCCRAE (Tor., '95), who has been at Johns Hopkins Hospital for some time, is recovering from an attack of typhoid fever.

DR. J. FRANK MCCONNELL is practising in Las Cruces, New Mexico. In a recent letter he speaks of the salubrious climate, 75° at noon, 70° at midnight.

DR. THOMAS VERNER has removed from Toronto to Rossland, B.C. The gold mining boom is drawing large numbers of people to British Columbia. We wish the doctor all possible success.

DR. BRYCE, the secretary of the Provincial Board of Health, and Dr. Sheard, Medical Health Officer of Toronto, are working together with the object of ensuring a supply of pure milk for the city.

DR. WILLIAM OSLER, of Johns Hopkins University, Baltimore, has written Mr. Gage, treasurer of the Home for Consumptives, Muskoka, as follows: "I enclose my cheque for \$25, and you can put me down as an annual subscriber for that amount, as I feel that nothing that has been started in Canada will do more practical good."

LONDON MEDICAL ASSOCIATION. — At the annual meeting of the London Medical Association, held December 14, 1896, Dr. Meek, the retiring president, delivered an address in which he reviewed the work which had been done in the society during the preceding year. The following were elected as officers for the present year: President, Dr. J. Wishart; vice-president, Dr. A. Graham; recording secretary, Dr. W. M. English; corresponding secretary, Dr. W. J. Weeks; treasurer, Dr. R. Ferguson.

MEDICAL SOCIETY OF THE STATE OF NEW YORK. — At the last meeting of the society, held in the latter part of January, the following delegates were elected: To the Ontario Medical Association—Messrs. William R. Howard, Rochester; M. D. Mann, Buffalo; Roswell Park, Buffalo; Henry L. Elsmer, Syracuse; F. W. Limmer, Syracuse; Seneca D. Powell, New York; Daniel H. Cook, Albany. To the Canadian Medical Society—Messrs. C. S. Parkhill, Hornellsville; C. M. Rexford, Watertown; E. F. Brush, Mt. Vernon; W. J. Hermann, Rochester; Eugène Van Slyke, Albany; W. B. Jones, Rochester; Wendell C. Phillips, New York.

DOUBLE ENTENTE.

"I can't conceive," she archly cried,
 "Wherein you men can longer pride
 Yourselves from female rivals free,
 For surely we have grown to be
 Your peers in ev'ry human stride.
 It is a truth that none dare hide ;
 Yet why you men will not agree
 To recognize the new decree
 I can't conceive.

"Now, *entre nous*, won't you confide,
 And tell me true, all jokes aside,
 What difference the world can see
 Between your manly self and me?"

"To tell you truly," he replied,
 "I can't conceive."

—Anon. (*Medical Age*).

COMMENDABLE TESTIMONY IN A MALPRACTICE TRIAL.—The *Winere klinische Rundschau* for August 16 summarizes an account of a malpractice case from a journal that it calls "N. Fr. Pr.," which may or may not mean *Neue freie Presse*. It appears that the physician against whom the action was brought had been called to attend a woman in childbirth, and had undertaken some operation which he considered necessary, but had found himself obliged to leave it unfinished and send the patient into a hospital. There an operation was performed, and the woman died on the following day. At the post-mortem examination a laceration of the internal organs was found, also a foul canal, and it was concluded that the injuries had been inflicted with the forceps. In the complaint the physician was charged with having displayed lack of skill in the operation. Two expressions of opinion, says the account, were of noteworthy weight in the case. On the strength of Professor von Hofmann's necropsy, the judge held it to have been shown that the woman's injuries must have been inflicted before she entered the hospital, and that the physician's operative procedure was not in accordance with the rules of the obstetric art. Professor Schauta gave expert testimony as follows: "The first question is that of whether the operation was indicated, and to that I must answer yes. In this case I should have done the same thing myself; it accords perfectly with the rules of obstetrics. This I must maintain here in direct opposition to Professor von Hofmann's opinion. The woman's physician, to be sure, inflicted the injury with his instrument. But now comes the question, Is that pardonable or not? As to that, I must say that apparently the instrument deviated from its position in consequence of some slight movement on the part of the patient. The circumstances of private practice in such a case are peculiarly embarrassing. In hospital practice we anæsthetize the patient, and she lies perfectly still. In this instance, however, there was no assistance, but that of the midwife. I may remark that all of us, from the first to the least, are often so situated as to have to say with regard to mishaps: Something has happened that might have been avoided. There are disastrous occurrences that are due to the extraordinary difficulties of obstetrics. The present case was one of misadventure, and surely it is not to be attributed to the physician's negligence or ignorance." The *Rundschau* commends Professor Schauta's testimony from every point of view, and so do we.—*Editorial in New York Medical Journal.*