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A DISCUSSION ON THE TREATMENT OF INSOMNIA.

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The term insomnia includes such a variety of disorders of sleep that it is difficult to cover the general question of treatment in a brief paper. Possibly the only fair way to approach the subject is by first considering the physiology of sleep, as without this, all treatment is apt to become empirical, and indeed much of the routine treatment by drugs in the past has been open to this objection, and even to-day we cannot say that we understand the complex physiology of sleep as we hope to understand it later on. At the same time something has been done, and we can fairly claim that in some of the disorders of sleep we have rational treatment, quite in harmony with the most recent physiological discoveries.

The majority of physiological writers seem to agree that during normal sleep there is vascular dilatation of the skin, as a result of which there is a fall of blood pressure in the arteries at the base of the brain, and a lessened blood supply in the cortex. Elaborate theories have been propounded to account for this condition in which the vasomotor centre controlling the vessels of the skin plays such an important part.

Howell, of Johns Hopkins, has been one of the most recent to advance a new theory, and in the *Journal of Experimental Medicine*, Vol. II., No. 3, 1897, says : " This condition of anæmia, in connection with the withdrawal of external stimuli, causes a depression of the psychical processes in the brain cells, below the threshold of consciousness. The fall of blood pressure is due, in the first place, to a relaxation of tone in that portion of the vasomotor centre controlling

the skin vessels. The immediate cause of normal awaking, on the contrary, is found in the augmented flow of blood to the brain that follows upon the gradual constriction of the skin vessels as the vasomotor centre recovers its tone. The periodicity of sleep is therefore directly connected with a rhythmic loss and resumption of tone in the vasomotor centre, etc.

“ Throughout the waking period the vasomotor centre is under continual stimulation, and is therefore in continual activity. Sensory impulses, especially from the skin and the cutaneous sense organs, are at all times falling into the central nervous system in greater or less quantities, and through a reflex pressor action on the vasomotor centre these sensory impulses keep up a constant activity of the centre, particularly of that part controlling the skin vessels, as is indicated by the striking effect of such stimuli upon the volume of a limb when measured plethysmographically. Mental activity in all its forms is accompanied by a similar pressor effect upon the vasomotor centre, which is likewise known to affect the skin circulation. During the waking hours, therefore, the vasomotor centre is in uninterrupted activity, and the result must be the production of a condition of fatigue in this centre proportionate to the amount of stimulation. If this fatigue is sufficiently pronounced, the centre will relax and sleep ensue in spite of even strong sensory or mental stimuli.” If the fatigue is less marked, as is normally the case at the end of a waking period, adequate relaxation takes place only after the withdrawal of sensory and mental stimuli, and our voluntary preparations for sleep consist essentially in devices to minimise these stimuli. That the vasomotor centre is susceptible to fatigue the author has shown to his own satisfaction by experiments consisting in the continuous stimulation of sensory nerves (sciatic) in curarised and narcotised animals. The great rise of blood pressure that results from such stimulation soon passes off more or less completely, and that this result is owing to fatigue of the centre rather than to fatigue of the muscles in the walls of the blood vessels is indicated by the fact that the blood vessels in the ear of a rabbit may be kept in a condition of strong contraction for a long period (over an hour at least) by constant tetanic stimulation of the peripheral end of the cervical sympathetic nerve.”

Whatever the exact cause of sleep is, at all events it seems to be proved beyond doubt by Mosso and others, that during normal sleep there is cerebral anæmia with corresponding vascular dilatation of the skin, and in directing our treatment in many of the forms of insomnia we should take cognizance of the fact, and whether we agree with Bayliss and Hill, that the brain vessels themselves possess no

vasomotor fibres and that the volume of circulation through them is regulated by the variations of arterial pressure in other parts of the body, or believe with others, that vasomotor fibres exist in these brain vessels, it makes no difference in the way of treatment. Germain Sée's classification of insomnia seems to be very generally adopted, and for those who are not familiar with this I might say that it is as follows :

1, Dolorous ; 2, digestive ; 3, cardiac and dyspnoeal ; 4, cerebro-spinal and neurotic (general paralysis, acute and chronic anæmia-hysterio-hypochondriasis) ; 5, psychic insomnia ; 6, insomnia of physical fatigue ; 7, genito-urinary ; 8 febrile and antitoxic ; 9, toxic.

It is beyond the scope of this paper to discuss the diagnosis of insomnia in general, but it is with the cases coming under the heading cerebro-spinal and neurotic we are chiefly concerned : and in regard to these there is the greatest difference of opinion as to treatment. Long ago, when a student under the revered Dr. Joseph Workman, it was pointed out to me in the so-called cases of cerebro-spinal and neurotic insomnia there was little to hope from the protracted administration of hypnotics, sedatives, and narcotics, but, on the contrary, we might look for results the opposite of satisfactory. In those days chloral and bromides were the fashionable remedies, and chloral claimed its victims by the hundreds, and nearly every case of acute mania admitted to the wards of the hospital had been given chloral to excess, with most harmful results. In a general way the conclusions reached by Dr. Workman were quite correct, although capable of certain modification, and possibly, as pointed out by Brush, of Shepherd Asylum, the great danger in all these cases is the routine practice of giving hypnotics in insomnia. Those of us who have been in the habit of receiving large numbers of acute cases of insanity for treatment have had ample opportunity to form well-defined opinions on this subject, as the general practitioner seems forced, when there is delay in obtaining admission for a patient to an institution for the care and treatment of such cases, to adopt the routine administration of hypnotics, not only with the hope of cure, but also as a means of keeping a restless patient quiet. We are all alive to the fact that in a sense loss of sleep is more quickly fatal than loss of food. This point has been well illustrated by De Manassein, who has shown that while dogs could be saved after twenty or twenty-five days' starvation, absolute loss of sleep for 96 to 120 hours was certainly fatal. While in the former case the brain was almost normal, in death from loss of sleep it was the predilection spot of severe and irreparable lesions. Sée noted also rapid fall of temperature (6° to 8° C.) below

normal, slowing and weakening of reflexes, disease of red blood corpuscles, stagnation of white corpuscles in lymph channels, capillary hæmorrhage in brain, and an abnormally dry and anæmic state of the spinal cord. Whatever may be the cause, the disorders of sleep play an important part in the genesis of nearly all cases of acute mania, and every alienist is sufficiently alive to the fact that a few hours of normal sleep are of more importance to his patient than anything else. These few hours of normal sleep generally mark the first step towards recovery, and it is during these hours that the over-wrought nerve cells made their first effort at repair. Cytothetic changes commence, and very frequently go on, under judicious management, until complete cytothesis is established. Now, how shall we secure normal sleep, or even an approach to normal sleep, in such patients? In private practice, without the aid of skilled and capable nurses, the question is oftentimes unanswerable, and we are perforce driven to the adoption of methods we should be quite willing to avoid under more favourable circumstances. We have our choice of a long list of drugs, ancient and modern, and in this day of chemical marvels very few months pass without a new claim for the discovery of a perfect hypnotic. It is interesting to turn up the back numbers of medical journals and read of the discovery of the numberless hypnotics, each just a little better than the one previously added to the list, and each with its band of enthusiastic admirers, willing to add testimony to the virtues of the drug. I am afraid that I cannot claim to have gone thus far in life without little enthusiasms of my own for promising drugs, enthusiasms developed by some favourable results; but in the end there has been disappointment in the search for the hypnotic panacea—chiefly, I fancy, because it is difficult to find any particular drug likely to meet all the physiological requirements. If, as is claimed by Maurice de Fleury, attacks of insomnia are generally caused by either increase or decrease of arterial pressure, the failure of one particular drug to meet all cases can easily be understood.

In the sleeplessness associated with acute mania, drug treatment is at times extremely valuable in the early stages, but my experience has been that, if marked beneficial results do not occur almost at once, they will not appear at all, and harm will result from the drug treatment. It is doubtless true that some of the modern hypnotics are better than others, and the value of these in particular cases will no doubt be brought out clearly by those who follow me in this discussion; but I am strongly impressed with the advisability of substituting other treatment when possible, such as effusions easy of application, massage, etc. Without drugs and by simple physical

means it is easy in many cases to restore normal arterial tension and cause sleep. In the insomnia of acute mania the warm bath is oftentimes of the greatest value. Our custom is to use water at a temperature not exceeding 104° F., and this is continued for twenty minutes or more while cold applications are made to the head. The bath at 104° F. is certainly much safer than one at 110° F., as advised by some authors, and there is less danger of inducing collapse, a danger never absent in a case of mania. Of course the warm bath is contra-indicated where heart failure is threatened or where organic heart trouble is present. Those who have seen excited patients actually fall asleep in the warm bath can easily believe in its advantages. Its good effects can be understood when we study the physiology of sleep, and the whole procedure is devoid of the objection which so frequently applies to drugs, namely, that the bodily functions, particularly the assimilative powers, are impaired. That this frequently occurs with the continued administration of hypnotics has been proved time and again.

The danger of collapse during or after the administration of hot baths has been referred to ; but certainly it is not greater than to be feared from even such apparently innocent drugs as trional and sulphonal. Van Schaik states that trional has an inhibitory action upon the secretions, seems to possess a stimulating effect, is well borne by the stomach, is easily absorbed by the rectum, and fails to produce unpleasant after-effects. It certainly possesses many virtues, but at times is borne very badly, and a case of poisoning recently reported would go to show that even trional is not always safe. In this case 20 grains had been given daily, and as a result there were hebetude, ataxia, tremour, transposition of words, psychic depression, and weakness and incontinence of urine. In my own experience I have seen unpleasant results follow the administration of even small doses of trional. Perhaps, I have laid too much stress on sleeplessness in acute mania, but to my mind it is a very important subject, and so frequently defies routine treatment. Sometimes, too, it is surprising how quickly the sleeplessness yields. Within the last few weeks I have seen persistent insomnia in a maniacal case in which there was extreme restlessness give way before nothing more complicated than rest in a hammock slung under shady trees all day long.

Sometimes the time-honoured cup of hot milk at bedtime induces the sleep habit, and where a stimulant is indicated a hot toddy is oftentimes worth a dozen doses of choral or its equivalent.

Insomnia occurring in neurasthenia is possibly one of the most difficult and unsatisfactory forms to deal with, but a study of the arterial

pressure at the radial pulse will almost invariably show that in this condition the pressure is lowered. In many cases, as suggested by Dé Fleury, where the patient with asystole cannot sleep, it is because the arterial tension is low. If his feeble heart is strengthened with digitalis sleep is possible. In many cases one can substitute the dynamic agents, massage, frictions, douches, and transfusions, and at the same time caffeine and digitalis can be employed as heart tonics. It is with the neurasthenic cases the amateur doctors who exist in every community have their most satisfactory experiences in the way of suggestive lines of treatment as unique as they are absurd. In the *British Medical Journal*, September 29th, 1894, we find a clipping from the *Glasgow Herald* in which one of these cures for sleeplessness is recommended. It is as follows:—"Soap your head with ordinary yellow soap; rub it into the roots of the brain until it is lather all over; tie it up in a napkin, go to bed, and wash it out in the morning. Do this for a fortnight. Take no tea after 6 p.m." The *Journal* advises following the directions about the tea and leaving the instructions regarding the soap as a last resource. Insomnia is one of the diseases of civilized life and exceedingly common among the highly intellectual and brain workers. It is a condition which may be cultivated and sometimes may certainly be called a bad habit, for after all, as pointed out by A. W. McFarlane, of Glasgow, habit plays an important part in the development of some forms of insomnia. Sleeplessness, he suggests, may arise in persons in health from bad habit alone. Nurses often suffer in this way. They sometimes curtail their sleep unduly to find, when their services are no longer needed, they cannot sleep. Their brain cells have acquired the bad habit of maintaining the activity when they ought to be reposing.

It is a simple matter to give advice to those who have acquired the sleepless habit; it is difficult for them to follow it, for sometimes the very attention that is directed to the bad habit makes it worse. We are told that a good habit of sleep should be sedulously cultivated by falling asleep without delay immediately after retiring. We cannot sleep if we continue to think, we are told. The tossing, restless one says, "Tell me how to avoid thinking when in bed, and I will follow your advice." Some men are so harassed during the day that they are driven to do their thinking in bed, but it undoubtedly means burning the candle at both ends. For these over-wrought and oftentimes nervous people I have found a glass of hot milk on retiring useful in some cases, in others half a pint of bitter ale answers every purpose. Oftentimes, too, it is necessary to arrange the patient's diet on a physiological basis. I agree with Dr. McFarlane that regularity

in the habit of retiring is of more importance than going early to bed, and certainly when one who has suffered from insomnia has succeeded in overcoming the bad sleep habit he should be slow to endanger his health and happiness by doing anything likely to induce insomnia again.

Change of air is extremely valuable, and for most people of nervous type an outing under canvas in the northern woods of Canada is a sleep producer of the most remarkable kind. I have seen men haunted for years by the demon insomnia go to these woods, and while there develop a sound sleep habit which added years to their life. After the first night at camp sleeplessness is almost unknown. Personally I prefer advising almost anything rather than drug treatment in the common forms of insomnia, and feel satisfied that we are playing with fire when we resort to the use of hypnotics, except as a temporary expedient. Of course, we should not forget in these different forms of insomnia that sleeplessness is frequently something more than a bad habit: it is a symptom of other trouble, and it is necessary to discover and treat the underlying cause.

If neurasthenia is to be regarded as one of the autotoxic diseases—and there is abundant evidence to support this view—in all probability the effect will disappear with the removal of the cause. The same remarks apply to all of the cases of insomnia resulting from toxæmia; and when we get clearer light on autotoxis than we have at present no doubt it will be a simple matter to improve our methods of treatment. In neurasthenia, autotoxis will admirably explain the etiology of the disease, as has been pointed out by Van Giessen and others. With insomnia accompanying surgical operations I have had little experience, but the subject has been deemed worthy of a good deal of attention by those who have had ample opportunity to observe.

G. G. Van Schaick concludes that insomnia, from whatever cause, is an important complication of surgical disorders. Its relief is necessary for the comfort of the patients, improves the prognosis, and naturally assists recovery after operation. Where pain is the chief factor morphine is the only drug that will relieve with certainty, although there is a strong feeling in favour of the use of trional.

In a general way, then, I may say that many writers are impressed with the belief that in the majority of cases of insomnia drug treatment is to be avoided, if other more simple methods of inducing normal sleep are found successful. Certainly the simple methods should be tried before any drug treatment, and in any case the condition of the arterial pressure should be carefully studied and noted before any line of treatment is decided on.

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The treatment of insomnia is the treatment of a symptom; an important symptom, it is true, but still it is a symptom. I am in thorough accord with Patrick¹ when he says: "Insomnia is the result, not the cause, of cerebral affections, and it does not give rise to organic disease. It may be the earliest manifestation of otherwise latent brain disease, and the conscientious physician will search this out and treat it; not attempt to avert some indefinite and vaguely threatened disaster by attacking the insomnia." As for its relationship to other pathological conditions we know that it is a symptom of various habits, for example, alcohol, coffee, tobacco. Here prevention is essential, and hypnotics are only temporarily necessary. If study or business are taken into the hours of sleep, this insomnia, truly a simple insomnia, is to be treated antipathically—the habit of sleeping must replace the habit of sleeplessness. Measures other than drugs are required. If sleeplessness is the result of pain, another symptom, the cause of the latter must be sought out and relieved, either by the cause being removed, or if this is impossible, a narcotic, not a hypnotic, is indicated. If there are circulatory disturbances the condition of the heart and blood vessels needs investigation and hypnotics have but a temporary use. Should the patient be afflicted with goutiness, and Ewart deserves our thanks for coining a useful term, quite likely sodium phosphate, sodium salicylate, piperazine, or uricedine in this instance will prove to be a valuable hypnotic. Again, if we are dealing with kidneys in which arterial degeneration has taken place, systemic blood vessels are contracted and the wall of the left ventricle is thickened, the nitrites may relieve the insomnia. In the anæmia, or rather hydræmia, of the young woman, iron in organic preparation will be a true soporific. Instances might be multiplied.

It is essential that we have at our disposal safe, reliable, and pleasantly acting hypnotics. Sleep is as essential as food; the organism cannot dispense with either. They are of nearly equal importance. There is scarcely a morbid condition of which the prognosis does not become markedly worse if insomnia supervenes. Just so far as impaired nutrition militates against cure so far sleeplessness becomes an important factor.

Drugs alone are not sufficient; the cause of the symptoms having been ascertained and, if possible, removed, physical therapeutics should be employed. That portion of the subject has been entrusted to one

thoroughly competent, both by education and experience, to present it. When all has been accomplished that is possible from hygienic and physical measures there yet remains an important place which drugs, and drugs alone, can occupy. The drug treatment of insomnia is well worth our careful study. Routine prescribing is utterly indefensible; equally so is the reckless administration of drugs. Insensibility is not sleep. The question is not "how large a dose can the patient survive?" but "how little of the drug will produce a sleep closely approximating the normal, and what remedy will give rise to the fewest and most insignificant after-effects?" We desire sleep-persuading not sleep-compelling drugs.

The Mode of Action of Hypnotics.—To possess an accurate knowledge of the action of hypnotics it is evident that we should have at our disposal a complete theory of the sleep phenomenon. A very cursory reading of the existing works upon physiology demonstrates that this is not the case. If they treat of this subject at all, and some do not in any satisfactory way, it is dismissed after a brief reference to the theory of cerebral anæmia as a causative factor. That anæmia alone is entirely inadequate to explain the phenomena of sleep is evident after even a superficial consideration. With few and unimportant exceptions, the fact that during sleep the brain is anæmic is admitted; the relation of anæmia to sleep is a problem which has occupied the minds of many investigators. As we come nearer to this relation we are likely to reach a clearer understanding of the sleep phenomena. That cerebral anæmia is not caused by constricted blood vessels is evident, else we should have somatic evidence of such constriction as would be shown by pallor². Besides, the probability that cerebral blood vessels are deficient in motor nerves is also evidence against this theory. That cerebral anæmia alone cannot cause sleep is evident when we consider what happens after a severe hæmorrhage, producing a true cerebral anæmia, when wakefulness, not sleep, is a marked symptom.³ That there is a definite relationship between the circulation in the brain and general arterial pressure is evident from the work which had been done since 1887 by Gaertner and Wagner⁴, Roy and Sherrington⁵, Bayliss and Hill⁶, and finally by Renier and Schnitzler⁷, and that there is an enlargement of the limbs during sleep was shown by Mosso⁸, as early as 1881, by his plethysmographic experiments. When we consider, as was mentioned above, that it is probable that the blood vessels in the brain possess no motor fibres, the importance of these observations becomes evident. The recent conclusive experiments of Howell⁹ making use of the plethysmograph must be interpreted as indicating dilatation of the

blood vessels of the arm, and this probably due to relaxation of the tone of the cutaneous vessels. This appears to be convincing, despite the objection of Meltzer that this dilatation might be due in part to relaxation in the tonicity of the skeletal muscles during sleep. The observations of Howell have been conducted with such care that his theory of the immediate cause of sleep merits quoting at some length. It lies in a vascular dilatation (of the skin) that causes a fall of blood pressure in the arteries at the base of the brain, and thereby produces an anæmic condition of the cortex cerebri. This condition of anæmia in connection with the withdrawal of external stimuli, causes a depression of the psychical processes of the brain cells below the threshold of consciousness. In addition to the effect of the cerebral anæmia, an accessory favouring condition may be found in a certain degree of fatigue of the parts of the brain mediating psychical processes. Portions of the sensory and association areas of the cortex must be active during the greater part of the waking period, and probably therefore lose their irritability to a greater or less extent. Upon the withdrawal of the normal blood supply their irritability will tend to fall more quickly below the threshold of consciousness in consequence of this fatigue. According to Howell, then, the three factors which combine to produce normal sleep are: (1) A diminution of irritability, caused by fatigue, of large portions of the cortical area (2) voluntary withdrawal of sensory and mental stimuli involved in the preparations for sleep; (3) the above described diminished blood supply to the brain. Substantially the same theory is advanced by Hill¹⁰, save that, for him, the cerebral anæmia is brought about by relaxation of the tone of the splanchnic area which reduces general arterial pressure and correspondingly reduces the venous; the latter factor tends to retard the flow of blood through the brain. As Howell very properly remarks, it is possible that there is a lessened volume of blood in the vessels of the viscera, but this requires experimental evidence before we accept it as a fact. So much for the circulatory theories. It will be admitted, I think, that various general measures based upon these theories, notably the use of baths, may tend toward the relief of insomnia; that they do not materially aid us in assigning the mode of action of drugs is true.

The chemical theory of sleep, whether we take into consideration that of oxygen as advanced by Sommer¹¹, or of the lactic acid of Preyer¹², or of the catabolism which results in combined oxygen and carbon (CO₂) of Pflüger¹³, and in advance but a step to Cappie¹⁴, who believed that there was (1) diminished molecular activity of the cerebral cells coincidentally with capillary anæmia of the brain, and conse-

quently (2) that the brain occupied less space. These statements, taken in connection with the studies of Hodge¹⁵, twenty years later, which demonstrated that cell volume and contents diminish after fatigue, bring us nearer a working hypothesis for the action of hypnotics.

The theory of the neuron, as advanced by Rabl-Rückhard¹⁶ in 1890, in a far too brief paper, opened up great possibilities in neurological theory and practice. These, Lépine¹⁷ and Duval¹⁸ embraced apparently independent of each other, and Azoulay¹⁹ added a short contribution. Due honour should be accorded to Ramon y Cajal²⁰, who demonstrated motility in nervous structures, and although Dercum³ traverses some of his conclusions, yet he leaves the matter in a very satisfactory condition. Whatever may be the ultimate fate of this theory, it explains far better than any previous one many physiological phenomena. For him sleep is explained in a very simple manner: "The cortical cells in the motor area have processes extending toward the surface—dendrites—and a protoplasmic process extending downward through the white matter of the brain, the internal capsule, the crus, the pons, the medulla, and into the spinal cord, where it terminates in a brush-like extremity—the end tuft. Here it has a certain relation with the motor cells in the anterior horn of the cord—probably one of contact, though that is not definitely known. If the nerve cells retract this contact is broken; if the abnormal contraction of the nerve-process is relieved for the time being, contact once more takes place." Evidently, if the neurons are functionally active, their dendritic processes must be in contact; without this, consciousness is impossible. When the nerve cells are exhausted by fatigue, there is every reason to believe that their volume shrinks, and it is, therefore, more and more difficult for them to remain in contact. When relaxation comes, the processes retract and unconsciousness, that is sleep, supervenes.

From this hasty sketch of the various theories of the sleep phenomena it seems fair to conclude that from the direct action of substances introduced into the circulation, the neurons retract their processes, and, for a shorter or longer time, sever their relations one with another, and that during this severance consciousness is abolished and sleep supervenes. In starting from this point we should not underestimate the value of the labours of those quoted in this paper, but give them due credit, because it is only through them that we have come to a working theory. The question now arises as to what drugs influence the protoplasm of nerve cells so that this retraction may take place.

As was pointed out by Leech,²¹ the alcoholic radicles (alkyls C_nH_{2n+1}),

of which methyl ($C H_3$) and ethyl ($C_2 H_5$) are familiar examples, depress the functions of the higher cerebral centres, and that chlorine, among other elements, tends more than the alcoholic radicles to depress the functions of the lower centres. It is very probable that the true explanation of their action is that it is upon the protoplasm in the way of causing the dendrites of the neuron to contract, and as a result sleep is induced. That anæsthetics are protoplasmic poisons chloroform ($C H Cl_3$), a chlorine compound, furnishes evidence. Binz² many years ago demonstrated that morphine produced alterations in nerve cells which reminded him of those caused by the action of quinine on the white blood corpuscles. Besides, according to Ehrlich, such changes produced in nerve cells would tend to lessen functional activity, and a diminution or alkalinity by the products of tissue waste would also lessen oxidation in the brain cells by contracting the protoplasm at the same time that the changed reaction lessened their affinity for oxygen. According to Binz, chlorine, amongst other elements, is a hypnotic because it tends to increase the formation of acid (diminishes alkalinity) in the nerve cells. Since it is admitted that a combination of the alcohol radicles with chlorine increases the hypnotic action of the former, it seems fair to conclude that not to one factor but to both should be attributed the fatal effect of a drug; that each has a share in producing the end result. Experience has shown that the particular combination of alcohol radicle and chlorine gives increased hypnotic power, but as well presents the disadvantage of seriously depressing the circulatory and respiratory centres in the medulla. Inasmuch as King has demonstrated that the amide radicle ($N H_2$) stimulates just when this combination depresses, we have a leading suggestion as to what should be the composition of a chemical hypnotic.

Since the possibilities of carbon combinations are practically limitless, we may justly expect that a synthetic compound shall be produced which shall be a protoplasmic irritant without being a poison, which shall act upon the most highly developed tissue—the nervous—and upon the higher centres to a greater extent than upon the lower centres at the base of the brain, and that it shall be of sufficient molecular weight that its effects shall be fairly durable.

THE VALUE OF INDIVIDUAL DRUGS, ESPECIALLY THE NEWER HYPNOTICS.

It is not, I think, profitable to go over the familiar ground of the somnifacient powers of opium and its alkaloids—morphine, narceine and codeine. Undoubtedly it is of all drugs the most certainly

hypnotic, but we should hesitate before we employ a remedy possessing such varied powers for good or evil in order to obtain a single physiological effect. The dangers of habituation are too great, the untoward effects too numerous to permit of this save as a last resort. Even if these facts were not sufficient, the use of morphine in the last decade of the nineteenth century as a hypnotic seems to be a confession of paucity of resource not to be expected in these days of drug-plenty. Of the salanaceæ the alkaloids hyoscyamine, hyoscyne and scopolamine seem to possess a peculiar usefulness in the treatment of the insomnia of the insane, especially of those conditions characterised by excitement. All present various disadvantages, require rapid increase of dose, and are by no means ideal hypnotics. Of the urticaceæ the constituents of Indian hemp, cannabinin and cannabinon, are rather narcotic than hypnotic, and this is also true of piscidin, from Jamaica dogwood or the leguminosæ.

There is, however, one drug of vegetable origin which should occupy our attention for a moment. This is an alkaloid by name pellatin, which is obtained from the *Anhalonium Williamsi*, commonly known as pellote, a cactus found in Mexico. The alkaloid, which is isolated from the crude drug to the amount of 0.74 per cent.,²³ occurs as a colourless, amorphous, intensely bitter powder, of slight solubility in water, but readily in alcohol, ether and chloroform. Its chemical formula is $(C_{13} H_{11} NO_3)$. The chloride crystallises readily, is extremely soluble in water, and, since it does not produce local irritation can be administered hypodermically. Heffher,²⁴ in his experiments upon frogs, found that slight narcosis followed its injection in from ten to fifteen minutes. The reflexes were somewhat diminished, and strong irritation was necessary to obtain response. After twenty or thirty minutes there came a distinct increase of irritability, followed by spasms, recalling those of strychnine tetanus. This period of increased irritability of the reflexes may continue with undiminished intensity for several days. If large doses are now administered this condition sooner or later passes into one of complete paralysis. The irritability of motor nerves is destroyed only after long periods of spasm, and it is likely there is induced an increased excitability of the spinal cord. A personal experiment demonstrated that the pulse-rate is diminished for about an hour, drowsiness is marked, and sleep supervenes about two hours after its administration, preceded by a feeling of weariness, weight of the limbs and eyelids, and disinclination to bodily and mental exertion. The drug is probably excreted by the kidneys: at least, a small quantity of it can be detected in the urine. Pilez²⁵ has employed this remedy in fifty-eight cases, generally in the

dose of one-third of a grain, although it is best to use one-half of this quantity on first trial. He deemed the result to be satisfactory if the patient fell asleep in from one-half to one and one-half hours after injection, which was made at nine in the evening, and remained asleep during the entire night. In one-half of these cases the result was satisfactory, in over 29 per cent. the result was moderate, and in nearly 21 per cent. failure ensued. Jolly,²⁶ in an experience covering forty cases, found in one-half of these that when given during the day one-third of a grain caused languour and sleepiness in quiet patients, but this was obtained only after three-fifths to grain doses, which caused several hours' sleep within one-half to one hour after their administration. In excitable and delirious patients these doses were insufficient, and even two grains would not produce sleep, but merely calmed the patient for several hours. In the second half of his cases, when administered in somewhat larger doses in the evening he obtained very satisfactory results. Save some slowing of the pulse, giddiness, and restlessness before sleep in a few instances, and rarely similar results upon awakening, there were no untoward symptoms produced by the drug. Pilez, however, reported that heaviness of the head and nausea had been sometimes observed. Jolly found that patients suffering from painful troubles (*tabes dorsalis*) slept, but that their pains returned on awakening. Quite recently Hutchings²⁷ reports four cases in detail among the eleven who received over 100 administrations with rather favourable results, although in several instances it seemed to have no effect in moderate doses. The sleep produced was singularly calm and natural, and the patients could be readily aroused. No unpleasant after-effects—as headache, nausea, or coated tongue—were observed, and the patient awakened calm and refreshed. If the drug is given in the morning two or three hours' sleep may be obtained, but when administered at bedtime it is much longer, and may last during the entire night. It does not affect the appetite nor influence the secretions. When the drug was given in full doses it had a tendency to cause vertigo, but this was only noticed when the patient was not in a recumbent position. In no instance, however, was this symptom severe enough to call for treatment. Jolly seems to believe that one grain is the proper dose, and one not likely to be followed by any ill effects. Should further observation confirm the results of these observations I am of the opinion that we have in pellatine an addition to our therapeutic resources which is of real value.

We need not delay to consider those substances of inorganic chemistry of reputed hypnotic properties, as for instance the bromides.

At times they are useful, it is true, but as it has always seemed to me by their soothing action upon the general nervous system, by shutting out external sources of irritation, as does a door, which closed, keeps out disturbing sounds. We come now to the carbon compounds which will be separated into series the members of which closely resemble each other.

I. OXYGEN DERIVATIVES OF THE HYDROCARBONS.

(1) *Alcohol*.—The only alcohol which interest us as a hypnotic is amylene hydrate (di-methyl-ethyl-carbinol) which was introduced by Von Mering in 1887. From this drug of low specific gravity (.815 to .820) we should expect speedy and not very lasting effects and this is the result of experience. In drachm doses dissolved in an ounce of water (it will float upon water if there is an insufficient quantity of the vehicle) or, better, given in a glass of Burgundy, its administration is not difficult. Sleep is likely to follow in from one-half to one hour, and last from six to eight hours. It is rather more efficient than paraldehyde, acts more quickly, and in ordinary doses produces none or trifling ill-effects, but patients readily become habituated to it, and no results can be obtained. In several instances of failing heart muscle I have succeeded in giving the patients needed rest, but in all it became necessary to seek for another remedy.

(2) *Ethers*.—Methylal (methylene-di-methyl-ether) has been in use since 1868 for various purposes. It was chiefly through Persovali that it became known as an hypnotic. This is also of low specific gravity (.855) and like amylene hydrate it acts quickly but does not yield so many hours of sleep and even more rapidly establishes an habituation. From one-half to one drachm doses in water or syrup I have seen some brilliant results follow its use in delirium tremens, but quite as frequently failure follows.

(3) *Aldehydes*.—(a) Probably paraldehyde, introduced by Cervello in 1882, is the most reliable of this group which includes some derivatives. This is of higher specific gravity (.998) and its effects are more durable. It is best given in from one-half to one drachm doses dissolved in glycerine, or nine parts of water. Its first taste is not unpleasant, but it produces a most disagreeable and lasting odour in the breath. It does not cause much circulatory depression, but like all aldehydes it irritates the intestinal and respiratory mucous membranes. In fact it is "wonderfully innocuous" as Aitkin²³ puts it, but if it fails to produce sleep, it acts as an excitant. And further dangerous symptoms have followed its use as Whitaker²³ and others have shown. On account of its disagreeable after-effects we should

not expect a habit to be formed, yet quite recently several instances have been reported of delirium tremens resulting from the habitual use of this drug. While this remedy may be useful in simple insomnia or as a temporary help toward forming a sleep habit my own experience leads me to make use of it with comparative infrequency.

(b) Undoubtedly the most popular hypnotic is chloral (chloral hydrate), and it is one of the oldest, having been introduced by Liebreich in 1869. It is the one from which a habit is most frequently formed and from my observation this is prevalent among the clergy. From its high specific gravity (1502) we have a comparatively durable action, and from its ready solubility in water (less than its own weight) early effects (ten to fifteen minutes). On the other hand while in from ten to twenty-grain doses it is an efficient and ordinarily safe hypnotic, the large number of instances of poisoning, accidental or not, warn us that this drug should have a limited use. The great danger arises from its depressant action upon the circulatory apparatus, which frequently cannot be properly estimated and what is greater, the danger of the formation of the habit, which should always be borne in mind. Personally I feel that with the exception of an insomnia occurring in an individual whose heart is hypertrophied and upon whose arteries its vaso-dilator effects are important, and whose kidneys present the condition commonly known as chronic interstitial nephritis, none other demands the use of chloral.

Of substitutes for chloral, butyl-chloral and chloral-ammonium have been so infrequently employed that they need not detain us. The depressing effect of this drug upon the heart has led to the insertion of various radicles which would obviate this difficulty.

(c) The most successful result is seen in chloral formide (chloral-amide), when the amide radicle (NH_2) evidently lessens the dangerous effect of chloral upon the heart. Introduced by von Merin in 1889, this remedy has received attention from Sympson³⁰, Egbert³¹, Marcus³², Reichmann³³ and others. It is rather slowly soluble in cold water, but quite readily in alcohol; heat and alkalies, however, decompose it. Its slightly bitterish taste is best disguised by the use of brandy and elixir of orange or tincture of cardamom as a vehicle. A safe dose is 30 grs. given as above, and single doses of double this quantity are not excessive. Sleep does not appear so quickly as with chloral, but it is quite as certain and lasting; the awakening is calm and without headache. Its dangers are insignificant. After it has been used for a month the dose must be increased; the nutrition does not suffer. I believe that a habit is acquired with difficulty; but one instance has come under my observation, and the cure was readily secured within

a month. We can assuredly state that this remedy has long passed the experimental stage, and to-day it should be classified among our safest and most satisfactory hypnotics. It is particularly useful in the insomnia resulting from excessive mental activity (Collins³⁴), and, I believe, the safest of the hypnotics for the insomnia of patients suffering from cardiac disease.

Of chloralozo (anhydro-glucos-chloral), introduced by Hauriot and Richet³⁵ in 1893, I can record little but disappointment. It was thought that in a small dose, 3 to 8 grs., given in capsules on account of its insolubility and bitter taste, we would find in it a valuable substitute for chloral. Schnirer³⁶ and Fleming³⁷ added to our knowledge of the drug, but the adverse reports of Williams³⁸, Bardet³⁹, and Touvenaint⁴⁰, left no doubt but that it was too dangerous for ordinary use. In a few instances collapse followed the exhibition of a large dose.

(d) Another drug of very doubtful utility is hypnol (mono-chloral antipyrin), in all probability a mixture which was introduced by Bordet. This was proposed by Filehne as an hypnotic in from 15 to 30 gr. doses dissolved in water, which gives a tasteless solution. It seems to possess very feeble hypnotic power, and in the few instances in which I have employed it failures were the rule.

(e) The last aldehyde to be mentioned is hypnone (aceto-phenone), introduced by Dujardin-Beaumetz in 1885. When liquid it is colourless or slightly yellow, of a specific gravity of 1032, and has a decidedly unpleasant taste. It should be given in from 2 to 4-drop doses in capsules. It is likely to disorder digestion and impart an offensive odour to the breath. I have administered this drug but rarely, and never successfully.

II.—SULPHUR DERIVATIVES OF THE HYDROCARBONS.

Sulphones.—Sulphur alcohols and others differ from the corresponding oxygen derivatives in their being able to combine.

(a) Sulphonal (di-ethyl-sulphon-di-methyl-methane) was introduced by Kast in 1888. This occurs as colourless, odourless, nearly tasteless prismatic crystals, which are soluble in about 500 parts of cold water. After a dose of from 7 to 30 grs. sleep, lasting several hours, follows in two or three hours. After large (drachm) doses mental hebetude and symptoms resembling paralysis supervene. Its marked insolubility would lead us to anticipate a slow action, and in practice the time above stated is generally prolonged so that frequently sleep does not take place until the following day. To obviate this the drug should be finely powdered and administered in hot bouillon or milk three or

more hours before sleep is desired. The reports of Johnston⁴¹ and Fürst⁴² are generally favourable, while the fact that exanthemata appear after its use has been noted by Walters⁴³ and Taylor⁴⁴, among others. Of much more importance is the occurrence of hæmatoporphyrin in the urine after its use. This has been noted by Garrod and Hopkins⁴⁵ as a normal constituent, in traces, but found in much larger quantities after continued use of the drug. Abdominal pain and vomiting are the usual symptoms ending in fatal collapse. Harris, Anderson, and Nolan have furnished histories of three fatal cases in women who had taken this drug for long periods. Hot fluids are said to diminish the tendency to hæmatoporphyrinuria. Or the drug may be given only every second day. Even its careful administration may result in heavy and dull feelings, unsteady gait, headaches, nausea, and vomiting. In view of the uncertainty as to the dose or length of time required to produce serious symptoms, and the prevalence of the sulphonal habit among the laity, it is the duty of the careful physician to discourage as much as is possible the use of this drug.

(b) Trional (di-methyl-sulpho-methyl-ethyl-methane) was introduced by Barth and Rumpel⁴⁶ in 1890. This occurs as colourless and odourless crystals which dissolve in about 320 parts of cold water, forming an almost tasteless solution. The remedy is effective in doses of from 7 to 30 grs. given one to two hours before sleep is desired. It gives rise to but few after-effects, and these of less importance than those of sulphonal. Vertigo and nausea, as well as *malaise* and formication of the limbs, have been noted by Spiegilitz⁴⁷. The reports of Collatz⁴⁸, Vogt⁴⁹, Goldmann⁵⁰, Hewitt⁵¹, Mattison⁵², Randa⁵³, Mabon⁵⁴, Brie⁵⁵, and Boettiger⁵⁶, are representative. This remedy is more prompt in its action than sulphonal; although its solution is slightly bitter it is more readily taken; the resulting sleep is of shorter duration, although with this we may obtain better sleep upon the second night, the same dose being given. Habit is formed with considerable difficulty, although it is not unknown. Increase of dose is not so necessary as with many other hypnotics. On account of its readier solubility there is less likelihood of cumulative effects, and the danger of hæmatoporphyrinuria is not great. Yet experience has shown that in addition to the nausea and vertigo, mentioned above, headaches, slight inco-ordination, tinnitus aurium, unpleasant diaphoresis, and disturbed nutrition have been observed. Some of these may be lessened or obviated if the remedy is frequently (every five to seven days) omitted, a daily movement of the bowels insisted upon, and an alkaline water or seltzer be freely administered during the day. Instances of exanthemata and chronic poisoning are by no means rare according

to my own observation and that of Hecker⁵⁷ and Young⁵⁸, so that prolonged administration is to be avoided.

(c) Tetronal (di-ethyl-sulphon-di-ethyl-methane) occurs as colourless, odourless shining plates, and is somewhat less soluble than trional. In solution it is tasteless, and is administered in the same dose. Theoretically, this should be of more powerful hypnotic action because of the increased number of ethyl radicles and of slower effects. A limited experience demonstrated that it presents no particular advantages over its congener, trional.

III.—URETHANES AND THEIR DERIVATIVES.

But two examples of this series are introduced, and but one of these, the first, is important.

(a) Ethyl urethane, commonly known as urethane, was introduced by Von Jaksch in 1885. This occurs as colourless, odourless crystals, which are soluble in an equal part of water, but are decomposed on warming with either acids or alkalis. In dose of from 15 to 45 grs. it is a mild hypnotic and devoid of danger. Its ready solubility would lead us to expect rapid action, transient effects and easily acquired habituation, and these in practice have been found to exist. The remedy is useful when a change of hypnotics is desirable, and even then it should be considered as unreliable.

(b) Chloral urethane, also known as ural and uraline, is probably not a chemical combination. It is a solid which is insoluble in cold, but decomposed by hot water. Dissolved in alcohol, it can be administered in the same dose as urethane. Poppi⁵⁹ found that it but slightly affected the blood pressure, although it quickened the pulse rate. As somnal is known an alcoholic solution of chloral urethane, which is given in dose of thirty drops. A representative report is that of Meyers⁶⁰. Both ural and its solution are intestinal irritants, are feebly hypnotic, and so far as I can learn present all of the disadvantages and none of the advantages of the substances of which it is composed.

IV.—THE AMIDO DERIVATIVES.

But two examples of these are known to be hypnotics, and our information concerning them is meagre.

(a) Methyl phenacetine occurs as colourless crystals, but slightly soluble in water.

(b) Ethyl phenacetine, a yellow oil, soluble with difficulty in water, but easily in alcohol, is said to be a weaker hypnotic than the preceding. The dose of neither is given by Sayre⁶¹ and Coblentz⁶². These are merely noticed for the sake of completeness.

In this paper those drugs which have been used in recent years as hypnotics have been taken up not because all are available, but in order that we should learn what are our resources. In spite of the considerable number of drugs at our command, I cannot but feel that in all cases it is better for a patient to lose sleep for several nights, if need be, than be forced into unconsciousness. On the other hand, in properly selected instances, we can certainly be of very material assistance to our patients by discreetly making use of hypnotics. For all practical purposes, always keeping in mind that insomnia is a symptom, after omitting the dangerous, unreliable, and objectionable drugs, we have remaining four which are amply sufficient for ordinary conditions.

Following the plan which Leech²¹ employed in his most admirable paper, read before the Leeds meeting of this Association, I would classify them as follows:—

1. Potency : Paraldehyde, chloralamide, pelletin, trional.
2. Rapidity : Pelletin, paraldehyde, chloralamide, trional.
3. Duration : Trional (longest), chloralamide, pelletin, paraldehyde.
4. Habituation : Pelletin (slight) trional, chloralamide, paraldehyde (considerable).
5. Safety : Chloralamide, pelletin, paraldehyde, trional.

Using these drugs judiciously, I believe that in no department of therapeutics as in this can we add so much to the comfort and well-being of the patient. On the other hand, in scarcely another can we so readily lay the foundations for temporary inconvenience and lasting detriment. Through our skill the patient can secure "tired Nature's sweet restorer," and peaceful sleep will lend assistance towards the permanent recovery of health.

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HYPNOTICS: THEIR CONTRA-INDICATIONS AND
ILL-EFFECTS.

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We have so little exact knowledge of the essential nature of sleep and of the precise effects of the various medicines that induce it or a somnolent state resembling it, that little more can be made than a general statement of the contra-indications to, and the ill-effects of hypnotics.

As to the nature of sleep, some believe that it is an arrest of all the functions of the central nervous system except these essential to life; others that sleep itself is a function. In either case its occurrence is probably largely due to the accumulation of fatigue products—neurotoxin—in the central nervous system. How these fatigue products act is uncertain, but probably by interfering with metabolism. The accumulation of waste products may have a paralysing effect on the protoplasm of the neuron, lessening its affinity for the oxygen of the blood, possibly by diminishing its alkalinity. As a consequence contraction of the neuron or its processes takes place. There is loss of contact of the neurons as a result of such contraction and consequently loss of function in the higher nerve centres causing loss of consciousness. In the lower centres resistance is greater, and there is only a diminution of the vital function, as shown by the slower breathing and pulse-rate, and loss of the reflexes.

Of the physiological disturbances causing sleeplessness, our knowledge is no less imperfect than that of the cause of sleep. If sleep be due to the fatigue products, sleeplessness can scarcely be due to their absence, because they must be present in increased quantities in conditions of wakefulness. In insomnia there is always disturbance of metabolism with inadequate excretion of waste products, and, therefore also, of inadequacy of nutrition. It is possible that on this account there is a loss of stability in the neurons leading to irregularity in the action of many of them in response to the stimulus of the fatigue products. That there is derangement of the functions of the neurons in sleeplessness the loss of mental power and of general physical well-being amply proves.

The loss of power of compensation in any part can be restored only by lessening the labour and improving the nutrition of the part. The treatment of failure of compensation in the nervous system is no exception to the rule. In insomnia the neurons fail to compen-

sate for the overstrain to which they have been subjected and in their restoration all agencies which may interfere with the removal of waste products and increase of nutrition, or lessen their stability, should as far as possible be eschewed.

On theoretical grounds, then, it follows that hypnotic drugs are always contra-indicated, but in practice it is often best "to do a little wrong to do a great right."

In a general way it may be said that hypnotics should not be used in those in which the cause of insomnia is palpable and removable. These causes may be briefly summarized as follows :

1. Digestive derangements, whether from improper food and drink, insanitary surroundings, or from whatever cause.

In this class are to be included nearly all cases of disturbance of sleep in children in whom faults of digestion form the bulk of all their ailments.

In the adult, however, these same causes play a very, if not the most, important part in the production of insomnia, much greater than they are usually credited with. In the adult the insomnia is, however, less often due directly to the disturbance of the stomach and bowels, that is, due to a reflex cause, than it is in children whose nerve centres lack the stability of the adult, but is more often the result of the absorption of toxic agents produced by the ill-digested food in the digestive track.

2. Local irritations, such as dentition, irritable diseases of the skin, disturbance of the urinary tract. These are also most common in children. To these may be added reflex disturbances from diseases of the uterus and its appendages. Eyestrain is credited with being a frequent cause of insomnia as well as other reflex disturbances.

3. Overwork and the neurasthenic condition resulting therefrom. In the majority of these cases, nutrition and excretion play the most effective part, as, with a good state of nutrition and the observance of the laws of sleep, overwork is almost impossible.

4. Anxiety and worry. These should be really included with overwork, as they disturb the stability of the cerebral cells in the same manner.

5. Toxic cases are common. Many of them result from derangements of digestion, and are included under that head. Others result from chronic disease—as gout, lithæmia, chronic constipation, and Bright's disease. With these may also be included toxæmia produced by excessive indulgence in tea, coffee, tobacco, alcohol, and the habitual use or abuse of such drugs as morphine, chloral hydrate, cocaine, etc.

6. A very important group of cases of insomnia is formed by those

suffering from disturbed cerebral circulation, whether due to cardiac, renal, or pulmonary disease, or to disease of the cerebral vessels themselves. The blood supply may be excessive and vascular tension high, as in arterio-sclerosis before cardiac compensation fails: or defective and irregular, as in dilatation of the heart. While in some of these conditions the stronger hypnotics are the potent means at our disposal of giving relief, not only to the insomnia, but also to the causes of it, yet in many of them their use would be unwise, and might be disastrous.

7. In not a few, sleeplessness is the result of long indulgence in pernicious habits, mental and physical, in regard to sleep, such as, irregular hours, various dissipations, the conning over after retiring of the difficulties and reverses, and perhaps the successes of the day. Such people are loth to believe how much can be done to recover the power of going to sleep at will. It is vain to retail to them the facts of Napoleon, Wellington and Grant being able to lie down on the field of battle at any time and take a short sleep if needed. They should be encouraged in the effort, and every cause of disturbance removed and such conditions sought as will bring most composure of mind.

In the treatment of insomnia, then, our first duty is to seek out diligently and treat intelligently such obvious causes as may exist, as to remedy digestive derangements whether of stomach or intestines; to stop the ingestion of unsuitable food and drink; to relieve constipation; to stimulate the free elimination of fatigue products; to relieve local irritations and reflex disturbances; to stop overwork and bring the daily duty within the capacity of the worker; to relieve anxiety; to correct as far as possible all disturbance of circulation; to relieve anæmic and debilitated conditions; to secure due regard to sanitary requirements; to cultivate good habits of sleep.

In all this our aim is to remove all sources of irritation, direct or reflex, from the cerebral cells, to supply them with ample nutrition, and to cultivate healthy habits in them.

Not until these indications are met is the resort to hypnotics legitimate, unless it be to overcome a temporary difficulty; the further use of them is injudicious if not injurious.

Unfortunately there is a large class in whom the cause is not easily discovered nor easily removed; or it may be quite apparent and yet impossible of removal. Of such are many cases of neurasthenia, hysteria and hypochondria. Many of these have a neuropathic temperament, inherited or acquired. In them, slight causes, mental or physical, may induce insomnia. Astigmatism may give rise to eye-

strain that, though not noticed in health, causes headache or wakefulness in the debilitated condition. Or it may be some slight derangement of the digestive system that is sufficient to prevent sleep in the abnormal state of health. Whatever the cause, though it may be very trivial, judged by the standard of health, in the debilitated condition of the nerve centres it is often sufficient to produce disastrous effects. In the mental habit that has developed, its importance may be greatly magnified. There is a weakness of will power and a ready acquiescence in whatever brings temporary relief, so that the drug or other habit is easily formed and may be difficult to avoid, and, once formed, always difficult to overcome.

When, then, should hypnotics be used? In acute diseases sleep is often a necessity in order to secure such a restoration of the vital powers as to render recovery of health, or even continuance of life, possible. In sleep, general excitability of the nervous system is quieted, the action of the heart is reduced, and tissue waste is diminished, while more waste products are excreted. All this contributes to improved metabolism and renewed activity. So that in the conditions occurring in acute disease hypnotics may be essential; the sleep obtained, although not characterised by benefit to an equal degree to that of natural sleep, yet is often invaluable. In chronic diseases the same temporary need may arise, but the use of hypnotics in the ordinary conditions of chronic disease is rarely attended by anything but evil. Of the injurious effects of hypnotics on the cells of the central nervous system practically nothing is known. Changes in the nuclei of the cells have been described; they become smaller and more homogenous, and colour more deeply; but we know not what interpretation to put on this. While we know nothing of the histo-pathologic changes, of the physiological effects there is much known in a general way. I need not stop to detail the injurious effects of morphine, chloral, cocaine and alcohol.

Of the continued use of the bromides, it might be pointed out that in addition to the general cachexia with loss of appetite, disturbed digestion, anæmia, loss of memory, mental apathy, and commencing paralysis and trembling of the extremities that may be developed by their immoderate use, there may occur also marked mental aberration and alarming homicidal tendencies.

Chloralose in three-grain doses has produced alarming collapse in a woman within an hour. Recovery was slow.

Sulphonal.—The administration of this drug is, even in moderate doses, occasionally followed by fatal results. The symptoms set in with abdominal pain and vomiting, scant and usually dark urine.

owing to hæmatophorhyrinuria. Collapse results, soon followed by death. These symptoms may appear suddenly after the patient has been under treatment for some time, and has been benefited by the drug.

These effects have been most frequently met with in women with marked constipation. Owing to the constipation there is probably retention of the sulphonal in the system. But serious results have occurred without the existence of constipation to cause retention of the drug. Eighteen grains daily for three days has caused collapse with pallor, weak rapid pulse, anæmia, diplopia, meiosis, hyperæsthesia, and paresis, the patient being only able to walk with difficulty two weeks later.

In a woman 28 years old, the subject of melancholia and hysteria, 30 grs. given in two doses, one and a quarter hours apart, caused sleep for twelve hours; then she was aroused. But the somnolence increased, pupils contracted, and in forty hours death occurred suddenly.

Hæmatoporphyrinuria is supposed to be due to gastro-intestinal hæmorrhage. In dogs killed with sulphonal active and passive congestion of the meninges have been found, with, in some cases, hæmorrhages at the floor of the first ventricle.²

Marked congestion of the spinal cord and degeneration of the nerve cells of the anterior horns of its lower portion have also been found.³

It is evident that greater care is necessary in the administration of the drug than has generally been observed. The laity are coming to look upon it as a safe hypnotic, and many use it without restriction.

Trional.—Its continued use tends to give rise to various disturbances of consciousness, of speech, of hearing, and of vision, to loss of memory and to ataxis of movements in general. There may be involuntary excretions of urine and fæces. To prevent these untoward symptoms its use should be intermitted from time to time.⁴

Paraldehyd.—This is a comparatively safe hypnotic, yet large doses of it have been followed by serious effects. Great dyspnœa and collapse have resulted in a case of chronic bronchitis from one drachm.⁵ Somewhat larger doses have caused marked delirium with paresis of the functions generally resembling delirium tremens of alcohol.⁶

The proneness to the formation of a confirmed habit is a strong reason why any hypnotic should be used carefully and with the appreciation of the needs of each individual case. And this propensity to form the drug habit is especially marked in neurasthenics, the very classes from which the cases of insomnia are most largely drawn.

In neurasthenia and in conditions of unstable nervous or psychical equilibrium, whatever develops or creates self-discipline and self-control in the patient is of great value. Such self-discipline is interfered with by hypnotics.

In some conditions the amount of narcotics necessary to induce sleep is so great that it is better to let the patient like awake for two or three nights even than to give such large quantities.

If power of compensation be lost, it cannot be restored by any means other than by lessening the labour and improving the nutrition of the parts that have failed. It would seem eminently unfitting in such a condition to resort to medication that interferes with digestion and assimilation and retards the processes of elimination, when the hope of cure must rest on restoration to a healthy metabolism.

It is wise practice to give hypnotics rarely, and only when other means have failed; then only in the smallest dose necessary to give sleep, being satisfied with the least amount of sleep that is safe.

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IV.—R. FERGUSON, M.D.,

Lecturer on Therapeutics in the Western University.

When I received the polite invitation of your secretary to present a paper to a section of this Society, I felt that, although I should not be able to prepare an elaborate essay upon the subject, I could not do less than acknowledge the courtesy by an attempt at least to contribute something upon a subject which in our present conditions of civilisation and of work is constantly forcing itself upon the attention of practitioners, and which unless this is a very exceptionally fortunate body among brain-workers, must have not only a professional but a personal interest among a certain proportion of this gathering. Although I have been obliged for nearly six years to take into serious consideration many times almost every day the treatment of insomnia, I may as well confess at the outset that I have not formed any peculiar theory or settled down upon any one pet plan for its treatment.

I do not think that there is any one theory of sleep or the want of it which stands the test of therapeutics, and in fact it would be as absurd to expect such as it would be to look for exactly the same

pathological condition in all cases of paralysis or neuralgia. I can do but little more than give you, in perhaps a somewhat disjointed way, the results of my experience.

Of course the various theories based upon the blood supply of the brain are those which seem to offer the most secure basis for a rational system of therapeutics in this affection, especially the more chronic forms, but I do not know of any one of them all which is thoroughly satisfactory and adequate to explain all the phenomena. That the surface of the cerebral hemispheres is usually in a condition of relative anæmia in normal sleep, and also, as a natural consequence, that other parts of the body and in particular the skin, are apt to contain more than the usual amount of blood, are tolerably well-established facts. But congestion of the brain, although certainly not a condition of normal sleep, produces symptoms not very different from it, and on the other hand, cerebral anæmia, whether as a part of a general anæmia or simply local, gives rise to symptoms just as far from normal sleep as those dependent upon the opposite condition of the blood supply. It is probably just as true in insomnia as in many other visceral states, that the demands of the nervous centres regulate the supply rather than the reverse. In the treatment of insomnia, in the first place a normal and sufficient general nutrition is to be looked out for, as the basis for normal cerebral action, and, secondly, the distribution of the blood should be equalised, with the balance, however, tending rather to anæmia than the reverse, although by no means to the extreme.

The derivation of blood may be accomplished by hot baths to the feet, or the lower half, or even the whole body, emphasized if need be by the addition of a little mustard. The well known expedient of a small amount of easily-digestible food just on going to bed or on waking up in the course of the night, probably acts, to a considerable extent at least, by withdrawing superfluous blood from the brain to the stomach. Massage in the evening is a valuable agency in the same direction.

Another illustration of the same influence is to be found in the intense drowsiness that comes over one who has been exposed to the cold for a considerable time and sits down in a warm room in front of a cheerful fire. Cold feet are often an accompaniment of insomnia, and it is better to promote the circulation in them by alternations of hot and cold water and friction than to simply attempt to warm them by hot external applications.

There seems to be a certain medium degree of activity in the cerebral circulation necessary for normal sleep, and indeed it might

be expected that this would be so. On the one hand, the activity and discharge of nerve force could hardly be prevented, while the neurons are being bathed by a rushing current of highly arterialised blood. On the other, sleep is not simply and solely a condition of exhaustion. It should be a preparation for waking activity and the occasion on which the storage of potential energy for future use must for the most part take place, and of course this cannot be accomplished without a supply of nutriment to the cells.

The promotion of the general nutrition is of great value in the treatment of insomnia, especially of the more chronic forms. Sometimes it is sufficient without the introduction of any more specific measures in restoring the normal function. But people lie awake when the extremities, the skin, the viscera, so far as anyone can judge, are properly supplied with blood, and when everything seems conducive to its proper distribution; everything, that is, except the condition of the brain itself. Either an excitement which cannot be banished or an excitability which makes slight disturbances into great ones, drives away repose, and an active congestion is the result of the too long continued demand upon the brain.

Cases where sleeplessness results from adequate causes—pain or extreme sensory irritations, bright lights, loud noises—are hardly to be reckoned as insomnia at all, but the line which separates the adequate from the trivial varies greatly, according to the individual and in the same person at different times. The psychical element is very distinctly shown in the great diversity of effect produced by disturbances according to the mental attitude of the would-be sleeper. A noise which he considers perfectly legitimate or for which he feels no responsibility, is much less likely to keep him awake than those of another origin, though perhaps the same in quality, like the dog, who, to no purpose, bays the moon or the cough for which the doctor has ineffectually prescribed, and which is constantly reproaching him for his failure. Some cases have been observed where, several of the senses being wanting, stopping up temporarily the channels of the remainder, has resulted in sleep within a few minutes, but it is well known that noises to which one has become accustomed and for which one no longer waits, cease to have any effect in awakening a sound sleeper. In fact, it is their cessation, and not their continuance, which acts as an irritant. It is necessary to bring the the attention to rest.

It is probable that the sensible fatigue of mental labour consists not so much in the actual cerebration, the bringing together of ideas,

as in forcing the work to continue in certain definite directions, without regard to outside distractions.

After a time this becomes more and more difficult, and stronger and stronger irritants are necessary to retain the attention. Thus we have under normal conditions the soothing effect of monotonous repetitions, as of music or a prosy speaker. In normally going to sleep the attention either because too much fatigued to act longer, or failing to receive stimuli from without, ceases to exercise its control in co-ordinating the intelligence received from the special senses and the various departments of the brain. Cerebration disassociates itself from the recent memory and from the data of sight and hearing and feeling as they are rapidly becoming blunted. Definite thinking becomes dreaming. True insomnia, as distinguished from an interruption of sleep determined by special causes, seems to consist largely in the attention refusing more or less obstinately to surrender its directing and controlling power over the action of the brain. Perhaps the associational centres of Flechsig may, by too long continued and intense activity without rest, get into a condition analogous to that of the motor centres in chores or writer's cramp.

The products of a partially exhausted cerebral activity, which should be allowed to float vague and purposeless, calling for an expenditure of energy much less than the nervous tissue is capable of reacquiring during the same time, are still more or less held together and intensified so that the potential energy of the nerve centres is drained away as rapidly as it can accumulate; the output exceeds the income, the patient gets little rest, and arises unrefreshed.

It may be remarked, however, that the effect of two or three nights of this form of insomnia is less absolutely and thoroughly exhausting than the same period of enforced wakefulness under great pressure, as, for instance, that of a sentry, a nurse, or an engine driver working overtime, although the latter may occasionally pass into the former, as an acute disease may pass into a chronic.

A purely experimental want of sleep produced by constantly waking the persons experimented on, although to be sure assisted as far as possible by themselves, seems to have produced singularly little disturbance in nervous or cerebral function, and to have been recovered from with an amount of sleep much less than that lost, varying from 16 to 35 per cent. In these cases, however, the mental strain in the form of anxiety or responsibility was almost *nil*, and it is not difficult to understand how the effect upon the reserve supply of nervous force might be correspondingly less. Dogs usually die after four days of wakefulness.

A plan sometimes resorted to in desperation by victims of insomnia of producing great bodily fatigue, as for instance by a walk much beyond the usual habit or ability is an extremely bad one, and usually fails entirely of its object. As with the circulation, a certain medium degree of fatigue is required for the best kind of sleep, and if increasing the burden is to be of any value, it must be shifted so as to fatigue new portions of the brain and not deepen the old ruts from which it is already difficult to dislodge the current of the thoughts.

Reading one's self to sleep, with the very important proviso that the book shall be a suitable one, not too interesting and not in the same direction with the day's anxiety, is a common and commendable device. Probably nothing could be more valuable and efficient, were it generally available than music, which would, however, require a delicacy of adaptation to the individual case that would considerably interfere with its practical applicability. Many might yield to this influence, but many different tunes (and I use the word advisedly) would be required, from the monotonous, crooning acceptable by the restless and uncritical infant to the *Träumerei* of the accomplished artist, or those mysterious airs played by Volker with his sword fiddle-bow as he kept watch before the resting-place of the doomed Nibelungen :

Then sounded his strings till all the house rang ; softer and sweeter he began to fiddle till flitted forth from him into sleep full many a careworn soul.

The prescription most frequently made for chronic insomnia and undoubtedly in most cases the best, is that of rest or a vacation. Unfortunately both of these recommendations are usually more easily given than taken. Absolute vacancy of mind is talked about but never attained, and relief from mental activity means in reality relief from the habitual current of anxious thought, from care and responsibility, matters which in such cases are apt to be beyond the control of the physician. It is especially difficult to obtain them at home or in the midst of familiar surroundings. A vacation in the country, real country, if it can be realised, is by far the best method of getting the necessary diversion, but here also there is a choice. It is to be remembered that the disturbances of sleep which are the most difficult to manage come from within, and the occupation of the vacation must be such as will displace morbid activities by healthy ones, not intense but sufficient to predominate. If the patient has nothing else to think about he will be sure to think of his troubles. Of course there will be cases where this train of thought is so firmly established that nothing can displace it, but a life in the woods with adventure enough to command the attention of the invalid in an entirely different direction

from the habitual one, is as likely to do so as anything. A well founded doubt as to whether he is going to find any place to sleep at all is a very useful corrigent to the harrowing anxiety as to whether he shall be able to sleep if he gets there too easily.

In cases not insane, the haunting idea which is likely to stand in the way of satisfactory sleep, is the dread that it will not come or the feeling of doubt and expectation when it is awaited. Insomnia and the dread of it re-act upon each other to heighten their intensity. Under ordinary circumstances it is better that all ideas in regard to sleep, even the expectation of it, should be banished from the mind, unless, of course, it be so firmly believed in that the element of doubt no longer exists. "Sleep, like the other gods, comes when we least expect him." When this idea can be banished a great step has been taken. Suggestion, as it is mildly called, not dependent upon hypnotism and varying from the gentlest limits to the most vigorous asseverations, is by no means certain of ridding the patient of this dread, and it must very often be backed up with a dose of something.

Patients, when they are strongly suspicious, or even when it is acknowledged that the medicine ordered will not be a very powerful one, are reluctant to be abandoned to their own resources. They catch at straws like drowning men.

A placebo or half placebo, as some of the mild hypnotics and even some of the others when given in very small doses, may be called, ought always to have a reputation, whether deserved or not, if there is any chance of the name becoming known, lest a highly intelligent patient, as such patients are apt to be, or an officious nurse should look it up in a medical dictionary, which for practical purposes, whatever it may do from a scientific point of view, should give out no uncertain sound.

Hence a part at least of the value of lactucarium, lupulin and hop-pillow, and the knowledge that a powder is lying on the chimney piece or that a note has been made in the order book has a tranquillising effect often highly desirable.

A graduated series of powders, with sugar of milk to maintain the bulk and quinine to maintain the taste, beginning with a full dose of sulphonal and ending with none of it, is a convenient method of ridding the patient of the drug habit without the disturbing thought involved in the information that he must get on as best he can without it.

Hypnotics may be roughly divided into two classes: those which permit and those which produce sleep, those which diminish nervous excitability which keeps the patient awake, and those which distinctly though perhaps not profoundly, narcotise the nervous centres.

The most typical of the first class are the bromides, of which I have personally never abandoned my preference for bromide of potassium as decidedly the most powerful, believing that the fear of any depressing effect of the potassium element therein is purely imaginary in any doses likely to be used in the treatment of insomnia.

The bromides are better given in two or three doses during the evening, and, in many chronic cases, through the day, than in a single large one, although in my own person the latter plan works well also.

The bromide of potassium, under circumstances demanding mental activity, even in considerable doses, is not a distinct hypnotic, although when given in the way I have suggested it will frequently allow a patient to sleep if it does not make him do so; and I think the same is true of its corrigent action when given with narcotics that are liable by themselves to exercise an excitant effect, as opium or *cannabis indica*, which it converts from excitants to sedatives. I have taken a single dose of more than 100 grs. of bromide of potassium for the purpose of having the condition of the retinal circulation examined by one of my ophthalmic colleagues, and then made my hospital visit without any perception of anything unusual in my mental condition or any remarkable degree of somnolence perceptible, so far as I was aware, to others. Yet such a dose in the evening would have given me a very quiet night if undisturbed, and I have no doubt, if I had yielded to it, would have done the same in the daytime.

Opium, the first of narcotics, notwithstanding its undoubted power and the fact that sleep, or something resembling it, usually follows a sufficient dose, is not a trustworthy hypnotic, although Molière attributes to it the mysterious "virtus dormitiva."

It is in small doses uncertain, in many persons having the reverse of the desired effect, and in large ones its disadvantages far outweigh its benefits. I can hardly think of circumstances which would justify its use in a case of pure insomnia.

Cannabis indica is hardly a hypnotic at all when alone, but often acts very well in combination with the bromide. I have used it also with good effects in cases where the dreams were troublesome, with the result, or coincidence, of their changing their character for the better. Chloral, I think, has to a considerable extent gone out of use. I have ceased to use it myself except very rarely in cases where patients believe that a very small dose is sufficient, or where it is necessary to produce a decided effect promptly and surely. I judge from the catalogues of drugs given me by patients that the fear of it is not peculiar to myself.

Of the immense number of other hypnotics, mostly of coal tar-

origin, each of which has in turn been brought forward as agreeable, sure and free from danger or disagreeable after-effects, I will only mention two. I do not believe that the hypnotic is yet discovered, or ever will be, which is at once trustworthy as to producing the result desired, and incapable of producing any unpleasant after-effects. Sulphonal, it seems to me, comes as near to this standard as any drug of which I know anything, and, used with care, is little likely to do harm except that which attaches to any habit of the kind and dependence upon artificial aid to sleep. The tardiness and permanency of its action is undoubtedly a consequence of its difficult solubility and slow absorption, and cannot be looked upon as a disadvantage if properly allowed for, since a second good night without a repetition of the dose is by no means an unusual occurrence.

I have found it to fail but rarely when given in the dose of 1 gramme.

I have rarely, if ever, repeated this dose on the same night. In doses of less than 30 centigrammes it may properly be considered a semi-placebo. It should not be given continuously, that is on successive nights, for any length of time, and, if its use has to be continued, the intervals should be even longer than two days.

Trional is more soluble and rapid in its action, but seems to enjoy most of the advantages of sulphonal, except that of acting for two nights.

The peculiarities of each may be best utilised by reserving sulphonal for a patient who has not slept for several nights, and who, it is pretty clear, is not going to get a good night unassisted, so that the medicine may be given early, namely, 6 or 7 P.M., in order that its effect may be developed at about the regular time for going to sleep.

Trional, on the other hand, may be kept for a case where sleep is likely to be well begun, but where it is likely to be broken off very early in the night, and not renewed without a hypnotic. The dose may be given at any time in the night necessary.

All hypnotics are of course to be looked upon as makeshifts, and only for temporary reliance; but they, and more especially the recent introductions, make possible the relief of sleeplessness, and as I believe, if judiciously used, without harmful after-effects, or materially postponing the day of the restoration of the normal action.

They enable us to abolish that feeling of dread with which the patient watches for the coming of night, and to promise, with as near an approach to certainty as is ever possible in therapeutics, that he shall sleep.

V.—PROFESSOR CHARLES RICHEL,

University of Paris.

Professor Charles Richet, speaking in French, said that chloralose ($C^6 H^{10} CHCl^3 O$) studied physiologically had the effect of benumbing the brain and stimulating the spinal cord. In a dose of 10 or at most 59 centigrammes it induced and made the cardiac circulation regular and strong. It was therefore distinctly indicated in diseases of the heart, and, as it did not in any way disorder the digestion, in diseases of the stomach. It raised arterial pressure, so that it could not be said that insomnia was due to a cerebral anæmia.

VI.—DONALD MACALISTER, M.D., F.R.C.P.,

Physician to Addenbrooke Hospital, Lecturer in Medicine, University of Cambridge.

Dr. D. MacAlister, after an appreciative reference to the general surveys contributed by the openers, thought it might be well if each subsequent speaker would give something of his own practical experience for the instruction of his colleagues. He himself had to deal at Cambridge with large numbers of students, many of whom were hard-working, while some worked too hard; and in their case, when examinations were approaching, the addition of anxiety to mental overstrain led to insomnia. The treatment was conditioned by the necessity that nothing should be done which would interfere with mental acuity or memory. He had been driven by this condition to abandon all hypnotic drugs in the regular management of these cases. All tend to confuse the mind; all are liable to be taken habitually. Simple means, such as Benjamin Franklin's air bath—mere walking about the room naked for a few minutes and then slipping between the warm blankets—or lying in a hammock with none but an over-covering, or wearing a nightshirt wrung out of cold water closely wrapped round with a flannel "blazer" or pyjamas, were in the majority of cases adequate. But there were cases where these failed; the patient was literally over-fatigued, too tired to sleep, as Dr. Brunton had said. It was needful not to depress but to stimulate, until what we might call the level of normal fatigue was attained. Dr. Richet's remarks on the peculiar strychnine-like action of chloralose on the cord were of special interest to Dr. MacAlister in this connection, for it bore suggestively on the fact that in these over-tired patients strychnine itself was often of striking value. One-fortieth to one-twentieth of a grain of the hydrochloride at night was followed first by a sense of cheerfulness, and then by normal sleep. A small cup of strong coffee now and then serves the same end. In

women students, who were very prone to ante-examination insomnia the same general means were generally efficient. The only other drug he regularly used in their case was magnesium sulphate, and an excellent one it was. Of course instances occurred in which the evil lay deeper, cases in which even the examination must be sacrificed that the insomnia may be relieved. He used then one or other of the hypnotics that had already been discussed, preferring the bromides and chloralamide to the rest; but he made it a rule never to *prescribe* them; he gave them to the patient out of his own stock, and the name of the medicine was never mentioned

VII.—ROBERT SAUNDBY, M.D., F.R.C.P.,

Physician to the General Hospital, Birmingham.

Dr. Saundby wished to express his agreement with the views expressed by so many speakers in favour of abstinence as far as possible from the use of hypnotic drugs. The treatment of disease should be based upon its etiology, and yet it was when this knowledge failed that the use of hypnotic drugs seemed to begin. Yet, assuming that there are occasions upon which the use of such drugs is necessary, it is better to give drugs of which we know something, and it is difficult, if not impossible, to keep pace with all the novelties introduced into our *Pharmacopœia*. The most certain hypnotic drugs are chloral and sulphonal, and their danger has been exaggerated. Could it be that some preparations of chloral were impure? Chloral should be combined with tincture of digitalis in equal quantities. It is valuable in the insomnia of enteric fever and in delirium tremens. In the insomnia of dyspepsia, which supervenes two or three hours after retiring to rest, a little bicarbonate of soda and peppermint water to take on waking gives sleep. In his own case the insomnia of overwork had been readily amenable to small doses of bromide at bedtime.

VIII.—PROFESSOR A. R. CUSHING, M.D.

Professor Cushing mentioned that the chlorine compounds of the fatty series—chloroform, chloral and chloralamide—have been shown to produce fatty degeneration in various organs when given habitually to animals, and asked for information regarding any such effects following the administration of chloralamide and chloralose in man. He thought it not unlikely that the small dose of the latter which was necessary to produce sleep might be given with impunity. The pharmacological effects of pellatine and chloralose resemble those of morphine closely. Animals are thrown into a state of excitement,

and even into convulsions by all three, while in man narcosis follows their administration. It would therefore be of interest to find whether these newer hypnotics resemble morphine in its specific effects on pain.

IX.—HENRY BARNES, M.D., Carlisle.

In considering the treatment of insomnia the first question which we should decide to ourselves is this ; " Is the patient really suffering from want of sleep ? " I am accustomed to tell patients when importuned for sleeping draughts that an hour of natural sleep is worth four or five that amount of drug sleep. The absence of sleep is sometimes very distressing and very trying to the patient and to his friends ; and patients are very apt to have delusions as to the amount of sleep which they obtain. They are also very apt to fall into the habit of taking sleeping draughts without due necessity. It has happened to me on several occasions to have my attention called to the frequency with which patients were indulging themselves in sleeping draughts or powders. The morphine habit, the chloral habit, the sulphonal habit is easily set up. In England, where patent medicines containing opium are easily obtained, I have found patients indulging themselves in chlorodyne in extraordinary quantities. I had one patient who informed me that her usual dose of chlorodyne when she could afford it was a 4s. 6d. bottle. This contains 2 ounces and 2 drachms of chlorodyne. I think, therefore, we should be chary in prescribing hypnotics. Some people require more sleep than others. No general rules can be laid down. Nature must decide. Time spent in real sleep cannot be said to be wasted, as sleep is a wonderful restorer of nervous energy. The division of the day by a celebrated English jurist, Sir E. Coke, may be quoted :

Six hours in sleep, in laws grave study six.

Four spend in prayer, the rest on nature fix.

In procuring natural sleep the first thing is to remove all sources of anxiety. The want of sleep is certainly most depressing. Little difficulties, which at other times it would be a pleasure to surmount, appear insuperable, but patients should not despair. Sleep may be induced in two ways. We may lessen the flow of blood to the brain, or we may lessen the functional activity of the brain cells. The former object may be accomplished by removing anything which tends to force the blood to flow forcibly through the brain ; by ensuring a sufficient degree of warmth and bodily comfort, by a warm bath at bedtime, and by strict attention to the general health. Insomnia is very common in gouty subjects. We all know how sleep

is sometimes suddenly interrupted in the earlier morning hours of the acute gouty paroxysm. A similar form of sleeplessness is often dependent on acid or fermentative dyspepsia. According to Duckworth, Cullen was the first to call attention to this. Cullen said, "Persons who labour under a weakness of the stomach, as I have done for a number of years past, know that certain foods, without their being conscious of it, prevent their sleeping. So, I have been awaked a hundred times at two o'clock in the morning when I did not feel any particular impression, but I knew that I had been awakened by an irregular operation of that organ, and I have then recollected what I took at dinner, which was the cause of it." Murchison has described this form of sleeplessness, and attributed it to hepatic derangement, which induced lithæmia and other forms of gout. The insomnia in these cases comes on suddenly. The patient goes to bed apparently quite well, and goes to sleep as usual. Suddenly sleep is interrupted, and there is sometimes nausea and stomach discomfort lasting for two or three hours. I am inclined to think that insomnia has a gouty origin in a larger number of cases than is generally supposed. In these cases simple draughts of hot water, or potash water with sal volatile, give some relief, but attention to diet is very necessary to prevent recurrence, and rhubarb and soda or Gregory's powder at bedtime. Insomnia also sometimes depends, especially in elderly people, on atheroma of the arteries, whereby they lose their contractile power, and they are unable to regulate the flow of blood to the brain. In these cases iodide of potass is useful and the addition of bromide helps to quiet the brain cells. Of the newer hypnotics I rely mainly on paraldehyde, sulphonal and trional. Paraldehyde I consider mainly useful in cardiac cases, and in acute inflammatory conditions of the lungs, also in delirium tremens, in doses of $\mathfrak{z}\text{i}$ to $\mathfrak{z}\text{ss}$: sulphonal up to 30-gr. doses and trional 20-gr. doses. Sometimes I use hyoscin, but the best advice I can give patients is to use drugs as little as possible, to be as little in the house and as much out of doors, to take things as easily as possible, and the blessing of sleep will soon return.

X.—A. A. McCALLUM, M.D.

Dr. McCallum referred to the action of Behring's serum in the non-diphtheric in producing sleep. He mentioned the fact that patients treated by antistreptococcic serum fell into sound sleep. He does not know whether patients sleep from excretory inadequacy or an internal secretion or an arrest of internal secretion.

XI.—DR. LEARNED, Northampton, Mass.

Dr. Learned told of a method he had found of inducing sleep in the following words. He said a violent collision with frozen earth, the result of my first ride after a newly purchased horse in 1883, took me out of the busy life of the every day and night practitioners. For many years, instead of experimenting upon a willing and paying class of the laity, I was experimenting upon an unwilling and non-paying member of the profession. I did not sample all the remedies of the profession. I did not sample all the remedies of the dispensatory, if I remember correctly, but I sampled many remedies outside the dispensatory. Hot water, cold water, inside and out : lack of food and surplus of food : gymnastics in my room, and gymnastics with the wood saw in the basement, in the night time ; brisk walking in the halls and around the square before retiring ; friction direct and indirect ; long deep respirations with and without the numberless mental occupations, as varied as the physical—all these I tried faithfully.

I read about insomnia, its causes and remedies. From my hammock under the tree I looked out upon the doctor's swiftly passing phaeton, and read reports of his marvellous achievements, medical and surgical, in the evening papers. It was during this blank interval, while I waited power to return to me, that I raised the enquiry : Can we devise any means to turn off the belts from this little fragment of brain that insists upon its automatic excursions day and night ? This perpetual motion of a few cells of grey matter, that obstructs rest, and prevents repair of the great whole ? Can we by counteraction set up a motion elsewhere after retiring that will bring an equilibrium of arterial and vital current so that sleep pure and undefiled will come to our relief ?

During this frame of mind I experimented and practised with muscle and will in many and divers ways after retiring. I had the whole bed, length and breadth. I directed various contractions and relaxations, and finally reached the conclusion that a systematised and well-ordered method of muscular and mental activity would soon bring the conditions required—a sense of fatigue that precedes and invites sleep. The recumbent position furnished the best opportunity. Once asleep the point is gained. Who has not been dull and almost asleep before retiring, but wide awake immediately after disrobing and experiencing the gentle shock of the fresh sheets and changed posture ?

Is it necessary to recite here the advantages of proper conditions of atmosphere and temperature of the sleeping room ? I will assume

not; but say that open windows, at all seasons, heat never turned on in my sleeping room, and moderate bed covering has come to be a necessity with me. This is my method.

Lying upon the back, with or without pillow, I reach for the footboard and headboard at the same time. This brings into use many muscles that have not been on active duty during the day. I now raise the head half an inch, enough to realise it has more weight than I had before supposed. At the same time, by will power, I direct the respiratory process to a slower and deeper movement. I order about six or eight inspirations, deep and full, in place of sixteen per minute. Every inspiration is recorded, counted. Thus the process begins of inviting two forces into new channels, and relieving the old. At the expiration of ten to twenty inspirations the head has become so heavy you want to drop it. This you do. Immediately the right foot is raised a half inch from its resting-place. The reach for the footboard and headboard continues; the count of slow, deep inspirations continues; the sense of fatigue of muscles engaged in lifting the foot and holding up the coverings continues. Here as before, the foot, like the head, has become a dead weight, and must go down. Now, immediately the left foot is elevated with all the previous conditions remaining. The reach downward and upward of foot and head is kept up, so far as power will permit without exhaustion. This foot remains up for the same length of time, the respirations being the clock work. It goes down. You may now relieve the reach for foot and headboard and use the muscles to elevate the trunk, holding it by resting upon heels and head and shoulders. This elevation of the central part of the body and rest upon the two extremes will call for change, as all the former positions have done. By the same clock you have the time marked off, and the body is again flat upon the back, waiting new orders.

Turn now to the right side, reaching for head and footboard as before, and elevate the head half an inch by use of lateral muscles of neck and chest. At the expiration of time the head goes down and foot goes up, by use of lateral muscles. Change now to left side, and repeat what has just been accomplished by the muscles of the opposite side.

You have now assumed eight positions, and used a large majority of the whole number of muscles in carrying out your dictations. If you have not fallen asleep before this cycle is completed, you may begin again and go over the same round. If you have already gone to sleep you will not be required to.

Other methods of procedure would answer the same purpose un-

doubtedly, with the respirations guarded and uniformity observed, mind and muscle constantly occupied. There should be no periods of rest, no vacations. Thus fatigue comes inevitably, and sleep follows. I know of no means so ready, so much at command, any time and anywhere, so inexpensive and so absolutely certain as this routine of mental and muscular exercise to induce sleep. It involves a principle. Following it sleep appears to be inevitable. There is but one drawback: it requires some exertion—continuous mental and muscular exertion. The indolent will find it unattractive.

Some conditions of heart or nerve centre may contra-indicate altogether this method. The length of time employed in the several positions will vary according to the make-up of the individual. No one rule can apply to the robust and the exhausted as to the time spent in a given exercise, only that which measures the power of endurance. It is the sense of general weariness following persistent effort that brings the desired result.

Lying supinely upon your back on a bed of comfort it is not surprising that some part of the brain should take a little spin over its accustomed playground. Gentle means of coaxing will not suffice to call it away. Turn off the belt, however, here, and put it on at another point, you inevitably control the situation.

XII.—J. A. CAMPBELL, M.D.,

Medical Superintendent, Garlands Asylum, Carlisle.

I shall condense my remarks as far as possible, and shall speak first of insomnia in the insane, second in the nominally sane. I have naturally been interested in this subject, as insomnia is a distressing feature in several forms of insanity. In the *Journal of Mental Science*, 1873, I contributed an article giving the results of observations I made with the tincture of hyoseyamus, potassium bromide, and chloral in maniacal excitement and insomnia. I found, as all now know, that chloral was the most certain sleep producer, and that potassium bromide was not a powerful enough hypnotic to compel sleep when great insomnia exists. In the *Lancet*, August 2nd, 1879, I published a summary of the results of my practice for the five years ending 1878. I found that during that period I gave a sleep producer to 101 cases, and had a note made of when the patient became quiet and slept. I almost entirely used chloral, and at that time thought highly of its certainty of action and harmlessness when given for short periods. When first introduced chloral was given in too large doses and for too long periods. In summing up my results

I said "that in acutely excited cases where exercise does not cause sleep at night, it is well to induce it artificially so as to prevent injury to health from exhaustion, but this form of treatment should only be used for short periods, even in the distressing insomnia so often persistent in melancholia." In the *Lancet* of March, 1883, I gave a summary of four years' treatment at Garlands. In 1879 I only treated 210 patients for insomnia, in 1880, 11, in 1881, 8, and in 1890, only 3. In this period, for a limited number of nights, sleep was artificially produced, and in all but two cases chloral was the drug used. Of late years I have not found it so necessary to use drugs as sleep producers, and for a considerable time paraldehyde has mainly been the sleep producer used at Garlands. This diminution in the calls for medicinal sleep production I attribute to increased outdoor exercise and greater attention to the suitable dieting of patients.

If architects would devote more attention to deafening asylums, fewer sleep producers would be used. One noisy patient often keeps many awake, and in asylums hypnotics have at times to be given to one patient for the good of others, but a few days' exercise in the open air soon does away with much necessity for drug-produced sleep.

Now just a line or two about insomnia in the sane. I believe that with those sufficiently well off to bear the cost of change of location, occupation and usual habits, and who are not in feeble health, in search of a lost power of sleeping, insomnia can be speedily and surely treated without the exhibition of drugs. Rising early, diminishing consumption of animal food, spending the day in the open air in suitable sports, trying the effect of mountain air or sea air, taking one's principal meals in the early part of the day, never having a loaded intestine, and carefully avoiding having snatches of sleep during the day will in a very short time make most people sleep, and sleep soundly. Though not of a sleepy nature, sea air or mountain air combined with exercise makes me sleep nearly the round of the clock.

XIII.—DR. W. S. MUIR.

Dr. Muir deplored the multiplicity of literature and drugs that are thrust upon the younger practitioners, as the older practitioners soon learn that the medicines and drugs simmer down to a few. He thought every medical man who practises conscientiously will before prescribing for his patient make a thorough investigation of his case, particularly examining into the condition of his stomach and kidneys; many cases of insomnia do not find their first resting-place in the asylum, but are in a manner due to a want of careful study of the case and an honourable treatment thereof; every case requires its own

special treatment, and for a doctor to say that he uses this or that drug in insomnia is absurd. He stated that hydrate of chloral is by far in his hands the surest, but not by any means the safest, hypnotic. Many accidents occur from its use, but in many instances are traceable to negligence. He did not think that we should prescribe it in larger quantities than in two doses of 20 grs. each, that is, when the doctor leaves his medicines and trusts to an uneducated nurse. In the treatment of delirium tremens especially it should be combined with digitalis. Bromide of potassium still is by far the surest and safest hypnotic. Paraldehyde in the insomnia of typhoid has in his hands been the safest and surest hypnotic, as it has a double action; its only objection, so far as he has personally observed, is its abominable odour. Urethane, hypnone, and chloralamin still have their places among the fashionable drugs. Sulphonal and trional are by far the most commonly used drugs in the treatment of insomnia at the present hour. Still, it should be remembered that they are both not devoid of danger. Cases where the untoward effects of both have shown themselves are not infrequent. The speakers preceding him, he said, must remember that the toleration of drugs in the insane is much greater, and that one cannot in private practice use hypnotics, especially with such a free hand. Bromide of hyoseyine is one of the best and surest hypnotics used hypodermically; still, it must be remembered that it has its idiosyncrasies. He has lately had much benefit from the sulphate of duboisin. Its action is very similar to that of hyoscin, dilating the pupils and producing dryness of the throat. Still he thinks it the safer of the two, and he has yet to learn of any accidents following its use. In conclusion he said that every conscientious practitioner should, before resorting to the use of hypnotics for the cure of insomnia, tax his own resources to the utmost and abstain from the use of drugs until he is actually compelled to do so.

XIV.—J. O. BROOKHOUSE, M.D.

Physician to the General Hospital, Nottingham.

Dr. Brookhouse, of Nottingham, was glad to find from the discussion that the treatment of insomnia was not to be dissociated from its etiology. Treatment of disease is not an abstract thing, it is closely relative. Take a patient with chronic Bright's disease, his blood is drained of its most important constituent; his vessels, the larger ones, atheromatous; his capillaries undergoing a fibroid change become anæmic; his brain is anæmic, and as the outcome of these conditions he is sleepless. Another patient comes before you having so far as you can discern no organic disease, but he has suffered anxiety, business cares

and worries, grief, or other depressing emotions, and as the outcome he is sleepless. The contrast here is sharply defined, and treatment suitable and proper in the latter case would be positively harmful in the former. Before referring to the use of drugs, he would say that in many cases they are not indicated and much better not employed. We may advance any theory we please as to the causes of sleep on the one hand or insomnia on the other, but inasmuch as we have no definite basis we are in the safe position of running little risk of contradiction, which has its advantages. I am glad to find the tendency of medical thought is not to treat insomnia by drugs, but rather by change of scene, fresh air (mountain air if possible), moral help, regulated exercise, and a suitable diet, not forgetting in this latter relationship that those who cannot sleep cannot properly digest. I call this natural treatment of disease, and believe it to be the best. If, however, recourse be had to drugs I think a combination of morphia, chloral, and sodium bromide the best. Of the newer remedies I will not speak in detail, but of their use in general I am not favourably impressed.

XV.—W. WHITLA, M.D.,

Professor of Materia Medica, Queen's College, Belfast.

Professor Whitla expressed the very great pleasure which he had experienced in listening to the discussion. A discussion conducted upon such lines would have been an impossibility twenty-five years ago. The total absence of the old empiric spirit was a most marked feature in the debate, and the absolute unanimity of all the speakers upon the main question that hypnotics should only be resorted to when all other measures failed. He went into the relative merits of various hypnotics, and emphasised the dangers of chloral as above the dangers of all the rest put together. He dwelt upon the importance of remembering the habit danger as well as the life danger, and chloral stood at the top of the list in both respects. He reviewed the qualities of alcohol, praising its certainty and freedom from immediate danger to life, but emphasising its habit danger; but for the latter he thought it the best of all hypnotics. The dangers of chloral were greatly exaggerated and it should not be forgotten that it had been used many millions of times, and it was fallacious to compare the published results of the drug with those of rarely employed hypnotics. He detailed a peculiar form of insomnia which occurred in patients who went to bed, fell asleep in a few moments, and awoke again in a few seconds. These patients he had noticed were broad shouldered men, and the symptoms were caused by the pillow difficulty. He recommended the German wedge-shaped pillow as a specific in that form.

XVI.—ANDREW H. SMITH, M.D., New York.

Dr. A. H. Smith stated that 20 grs. of powdered capsicum given in one dose in the form of a bolus will very generally produce sleep very promptly in cases of delirium tremens. This is a practice handed down by the medical officers of the old United States army. It has no disagreeable after-effect until the next defecation, when there is apt to be a momentary check in the patient's enthusiasm over the otherwise admirable action of the drug. He has introduced this method into his hospital practice, and the results are very satisfactory.

XVII.—G. A. ATKINSON, M.D., Newcastle-on-Tyne, England.

Dr. Atkinson pointed out how errors of refraction, especially in neurasthenic patients, cause mental irritation and headache when reading at night, and so lead to insomnia. Further, in aged persons to whom opium or its preparations have been given, and in whom there is a defective arterial supply to the brain, preparations of beef-tea, or tea or coffee, will act well and largely if not entirely replace the drug.

XVIII.—D. J. LEECH, M.D., F.R.C.P.,

Professor of Materia Medica and Therapeutics, Victoria University, Manchester.

Dr. Leech said that a marked feature in the discussion which had taken place was the agreement of all the speakers as to the necessity for avoiding, as far as possible, the use of drugs in the treatment of insomnia, and of trying to produce sleep by removing the causes of wakefulness, and the adoption of what might be called general treatment. Whilst fully agreeing with these views, he nevertheless thought that in a considerable number of cases the use of drugs could not be avoided. In young adults, as Dr. MacAlister had pointed out, drugs were rarely necessary for simple insomnia. But in a class of people coming under the care of the speaker, he looked upon hypnotics as an important aid to treatment. He alluded to middle-aged people with gouty and neurotic tendencies, immersed in business more or less, and over-worked. Here, of course, it was always necessary to attend to the secretions in the first place, and remove, as far as possible, the causes of insomnia. People of this class nearly always had a bad habit of carrying with them to bed the cares of the day, and they usually suffered from a special form of sleeplessness. The mind continued active, but in a useless kind of way—thoughts being often somewhat disconnected and useless, notwithstanding they led to restlessness. Sometimes, instead of this seeming mental activity

there was simple wakefulness, and not actual restlessness. Now in the wakefulness of the first kind, bromides in 20-gr. doses each night, or oftener, were advantageously combined with general treatment. In simple wakefulness, sulphonal in 10-gr. doses, or chloral in 15 to 20-gr. doses might be taken with advantage for a week or two. In restless wakefulness the bromides, in doses of 20 grs. were most beneficial. He did not believe that he had seen any harm from such use of bromides, although from the large doses mentioned by one of the speakers, grave evils might arise. With regard to chloral, it did not seem that harm was done in properly selected cases, and it seemed to him that the dangers of the careful administration of hypnotics had been somewhat exaggerated. In a second class, the highly nervous, evils might more easily arise, and chloral was a drug which should, if possible, be avoided, and which should not be prescribed so that the patient could get the medicine renewed, and thus take it to excess. Even in these cases a soporific was at times required, and paraldehyde was perhaps the best. It is true a paraldehyde habit might be acquired, but then it could not be acquired secretly; a paraldehyde taken could be scented from afar. Sulphonal was only objectionable from the ease with which it might be continuously taken without the fact being known. In a third and most trying class of cases soporifics were rarely of more than temporary benefit, and often a grave evil. Many men—and medical men with especial frequency—suffered from almost continuous insomnia, without any special cause, such as disordered secretion or overwork being present. In not a few the sleeplessness had commenced with overwork, but continued even when this had been given up. Such insomnia often lasted years, and was a source of extreme suffering. All soporifics in turn gave relief temporarily, and in these cases not infrequently a bad habit of taking soporifics to excess is acquired. Chloral, sulphonal, and even trional might thus be used in excess, to the detriment of the patient's health. In such cases a long change of surroundings was the only cure—a life for some time under new conditions, as, for example, in the backwoods, was desirable. Soporifics were dangerous unless in the case of patients gifted with more than usual control. A voyage was sometimes prescribed, but this had one danger—if the sleeplessness was at all associated with melancholic tendency—the temptation to suicide, if the proposed relief from the voyage were not quickly obtained. Dr. Leech concluded by congratulating the Section on the success which had attended the first day's discussion.

REMARKS ON BRAIN TUMOURS AND THEIR REMOVAL, WITH A RECORD OF EIGHTY CASES AND FIFTEEN OPERATIONS.

BY

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There are few subjects in the field of medicine which excite more universal interest than cerebral surgery. It appeals to general practitioners, to neurologists, to ophthalmologists, and otologists, and particularly to the surgeons; for it offers a reasonable hope of successful treatment in a class of diseases hitherto considered uniformly fatal.

It is impossible in a single paper to deal with the many forms of disease of the brain in which surgical treatment is applicable. I have selected the subject of brain tumours because it is in this field that the most brilliant results have been attained; and I believe that if these results are more widely appreciated, many cases will be discovered in which operative interference is clearly indicated.

The first operation for brain tumour was recorded by Bennett and Godlee in London in 1885, though Macewen, of Glasgow, had successfully removed a tumour (subsequently reported) in 1879. The chief impetus to brain surgery was given by the discussion of this subject before the British Medical Association in 1888, and I think we may proudly claim that in this field of work British and American surgeons and physicians have fairly led the world. Germany and France have been behind even the Australian colonies in this respect, though now at last their interest is enlisted. Within the past ten years medical journals everywhere have contained records of cases, and it is from these records as well as from a personal experience of 80 cases of brain tumour that the facts I am now to present to you have been gathered.

1. The frequency of brain tumours can only be ascertained by a study of pathological records. From Table I it will be seen that at hospital necropsies a brain tumour is found in about one out of every hundred subjects. It is only from statistics of large dispensaries that any estimate can be made of the frequency of brain tumours in practice. Byrom Bramwell has found 82 cases among 10,115 patients. I have seen 80 cases among 16,361 patients. It is evidently difficult to determine therefore the frequency of the disease, the hospital statistics being as misleading in one direction as the dispensary statistics are in the other.

TABLE I.

At the New York Hospital 30 brain tumours were found in 2,970 necropsies.

At the Presbyterian Hospital 7 brain tumours were found in 745 necropsies.

Beadles reports 45 tumours in 4,000 necropsies at one of the insane asylums in England.

Beck reports 50 tumours in 6,177 necropsies at Heidelberg.

2. The diagnosis of brain tumour is in the majority of the cases a matter of little difficulty, yet every year cases are observed and reported in which it has been impossible. The simultaneous existence of headache, severe and persistent, of vertigo and tinnitus aurium, of vomiting, of optic neuritis or atrophy, and of general convulsions point directly to a brain tumour. When that tumour is located in the well-known motor or sensory or speech areas of the cortex, or in the course of their tracts, there are clear indications of its position. It is a very encouraging fact that the parts of the brain in which tumours cause marked local symptoms are the very parts which are open to the surgeon for exploration. There is no more brilliant proof of the value of physiological investigation than the present use to which the doctrines of cerebral localisation worked out by Fritsch and Hitzig, by Ferrier, by Munk, and by Horsley by methods of vivisection have been put. These facts are so easily comprehended that the general practitioner can reach a local diagnosis of brain tumour as readily as the neurologist. For, as Keen has said, the various parts of the brain are as distinct in their function as the various organs of the abdomen, and disturbance in function causes usually definite symptoms.

The chief localising signs of brain disease are spasms and paralysis, disturbances of speech and of sight. A localised spasm, associated with numbness beginning in one limb and extending to others in a definite sequence, and usually followed by a temporary paralysis known as Jacksonian epilepsy, and differing from ordinary epilepsy in the fact that consciousness is not lost, is the most important of all local symptoms. It points to the motor area of the cortex, about the fissure of Rolando, as the site of the lesion, an area easily accessible at operation. It is interesting to learn that it has proved the guide to the surgeon in over 100 of the cases already operated upon, and is the most reliable guide which we have.

Disturbances of speech either in the form of sudden temporary suspension or progressive loss of the power of expression, or of the power of understanding words, heard or seen, is the next most frequent local sign of brain disease; and as the speech areas, motor and sensory, in the third frontal and first temporal regions are quite definitely located, such disturbances may also guide the surgeon in his search. The loss of vision in one half of the visual fields, hemianopsia, is

another important symptom showing disease in the occipital lobe. Thus definite signs are to be expected in brain tumours in about two-thirds of the accessible region of the cerebral cortex.

The diagnosis of brain tumour lying in the cerebellum is equally easy on account of the characteristic staggering and the very usual development of cranial nerve symptoms. The cerebellum is an organ so deeply situated and so hard to reach, except in the small fraction, hardly one-tenth of its surface lying under the occipital bone, that operations upon it are attended with less success, and are always exploratory. Thus in 34 attempts to remove tumours from the cerebellum but 19 were successful, and but 10 of the patients lived and recovered from the operation. Cases which do not present very clear localising symptoms are, of course, beyond the range of surgical treatment. Among 80 cases of which I have records it was possible to locate the tumour in 65 cases; 26 were cerebellar, 14 were in the motor region, 10 were in the basal ganglia, 7 were frontal, 4 were parietal, 4 in the pons, 1 in the occipital lobe.

3. The proportion of tumours open to operation: It being evident, therefore, that surgical treatment may be successful in cases of brain tumour in which the diagnosis can be made, the question at once arises what proportion of tumours are open to operation. This question can be decided in several ways. It is possible to review the pathological records and to estimate the percentage of tumours which might have been removed. This method has been pursued by many authors since Hale White first made his estimate from the records of 100 tumours examined in Guy's Hospital.

TABLE II.—*Proportion of Tumours found post mortem which might have been removed.*

Author.	Reference.	No. Tumours.	Operable.
Mills and Lloyd	Pepper's <i>System of Med.</i> , 1886, vol. v.	100	10
Hale White	<i>Guy's Hosp. Rep.</i> 1888	100	10
Starr (children)	<i>Medical News</i> , January 12th 1889	300	16
Knapp	<i>Intracranial Growths</i> , 1891	40	2
Gray	<i>Sajous Annual</i> , 1891 and 1892	102	10
Seydel	<i>Verhandl. Deut. Gesell. f. Chir.</i> , 1892	100	3
Dana	<i>Trans. N. Y. Acad. Med.</i> 1893	29	5
Starr (adults)	<i>Brain Surgery</i> , 1893	300	21
Byrom Bramwell	<i>Edin. Med. Jour.</i> June, 1894	22	5
Oppenheim	<i>Die Geschwultze der Gehirns</i> , 1896	23	1
Bruns	<i>Gehirn tumoren Encyclo. Jrhrk.</i> , 1896	33	3
Starr	Personal cases	12	2
Total		1,161	88

In Table II the results are shown: 88 tumours out of 1,161 might have been successfully diagnosed and removed—7 per cent.

Another method of estimation is to study cases clinically and determine in what per cent. a satisfactory diagnosis can be reached and an operation recommended. If we take the records of clinics, we find here a considerable variation of opinion. Thus, Bramwell states that, out of the 82 tumours which he has studied, 5 could be recommended for operation, and in two of these its success would have been doubtful. Of these cases, 22 were studied *post mortem*, and of these, 5 could have been operated upon had a diagnosis been possible, which was the case in 1 only. My own records are as follows:

Of the 80 cases which I have seen, I could recommend an operation in 18, because it was possible to locate the tumour accurately in these cases in a place supposedly accessible to the surgeon. Of these 18 cases, 15 have been operated upon. In 9 the tumour was found where it had been diagnosticated, and in all but 1 it could be removed; in that 1 case it was too extensive and too vascular to be excised. In 6 the tumour was not found; 5 of these cases were tumour of the cerebellum, and the necropsy showed the tumours to have been inaccessible as they lay on the anterior surface far from the bone. This experience has been duplicated by almost every surgeon who has attempted to remove cerebellar tumours. In the sixth case the symptoms of aphasia and hemiplegia which led to the diagnosis of a tumour in the third frontal and adjacent anterior central convolution were due to pressure from a distance. The tumour was found at the necropsy deep in the apex of the temporal lobe and Island of Reil.

I cannot but believe that the estimate made by pathologists that only 7 per cent. of tumours are removable is too small a one, and that with more careful clinical examinations the proportion will be greatly increased. In 1889 I showed that among 600 tumours taken at random from the records, 164 lay in a position to be accessible to the surgeon, while 46 could have been diagnosticated and 37 successfully removed. It is not impossible that at the present day a larger percentage might be successfully located, symptoms being studied by modern methods. It is safe to say that 1 tumour in 10 is open to surgical treatment.

4. The result of operations—Granting, then, that surgical success is to be anticipated in a certain proportion of brain tumours, let us now consider the results thus far attained. I have succeeded in finding records of 220 operations for brain tumour since Bennett and Godlee's original report. Before approaching the statistical results of these cases, be it remembered, that this is a novel operation, attended by many unforeseen contingencies, and that experience is essential to success. After my own experience in the direction of the removal of

15 tumours, supplemented by that derived from 16 brain abscesses, and about 40 cases of epilepsy, for which trephining has been done, I must confess that every operation offers some new point of instruction, and I can support the dictum of Keen that this is not an operation to be rashly undertaken by the novice in surgery. Statistics show that the greatest success has been reached by the surgeons whose experience in this field is the widest. Hence I believe that, as experience brings knowledge, future statistics will show results even more favourable than these which I present.

TABLE III.—*Operation for Brain Tumour.*

		Cerebral.	Cerebellar.
Total number of operations.....	220	186	34
Tumours found and removed.....	140	121	19
Tumours found but not removed.....	7	5	2
Tumours not found	73	60	13

In a few cases the site of the tumour, its vascular character, or the sudden collapse of the patient from hæmorrhage or shock has prevented the removal of a tumour which was found. In some of the cases in which the tumour was not found there has been a manifest lack of indication for the operation from the symptoms, and greater care in diagnosis would have arrested hasty action. In other cases the symptoms were clearly misleading in character. Thus some cases found at necropsy to be subcortical or basal tumours have given rise to symptoms of Jacksonian epilepsy so typical as to lead to the diagnosis of a cortical disease. The differentiation of subcortical from cortical tumours is the hardest problem presented to the neurologist, and is in many cases as yet impossible to solve. Cerebellar tumours are more frequently missed at the operation than cerebral tumours.

Turning now to the successful cases in which the tumour was found and removed, 140 in number, I find that 6 were frontal, 99 were about the Rolandic fissure in the motor area, 6 were parietal, 3 were occipital, 19 were cerebellar. The preponderance of tumours in the central convolutions is owing to the fact that here the diagnosis is, as a rule, quite easy, and this part of the brain is most accessible. As Bruns has aptly said: "The tumours, which are most easily diagnosed, are the ones which are the most easily reached."

But successful removal is not always followed by recovery. I find that out of the 140 cases, 92 recovered from the effects of the operation, so that its primary result was satisfactory, and 48 died. This is

a mortality of 30 per cent. Death has been due to shock (which is now prevented by dividing the operation into two stages on different days), or to hæmorrhage (the arrest of which is less difficult than formerly because of the many ingenious devices), or to sepsis (which can now be obviated). Hence there is a reasonable hope that this mortality will be diminished in the near future.

5. The question of ultimate recovery and restoration to health is the one of the most interest, and only recently could this be answered with any precision. I cannot offer precise statistics here, for many cases have been reported as cured within two or three months of the operation. But I know that such reliable surgeons as Macewen, Horsley, Durante, Keen, and Weir, have recorded cases as living and in good health from six to eight years subsequent to the operation. One of my own cases is in perfect health, now fifteen months after Keen removed a tumour the size of a large hen's egg from the frontal lobe, and has recovered his vision, which had been lost before the tumour was taken out. These cases, were there no others, are sufficient to warrant the statement that in every case of brain tumour careful consideration of the possibility of surgical interference is imperative.

The character of tumour removable is of some interest, and determines the prognosis in any case. The following table shows the varieties of tumour removed and the results :

TABLE IV.

Variety of Tumour.	Recovered.	Died.
Sarcoma.....	26	12
Glioma.....	10	8
Gliosarcoma.....	7	2
Tubercle.....	11	8
Cystic.....	10	8
Angioma.....	4	0
Gumma.....	4	3
Fibroma.....	3	1
Endothelioma.....	2	1

It is evident that the prognosis is best in hard encapsulated tumours, and that the greatest mortality is in cases of infiltrated glioma, or in cystic tumours, which are frequently the result of degenerated gliomatous tissue. The prognosis is also serious in tuberculous cases, because of the liability to a tuberculous meningitis developing after the operation, or to the existence of multiple tumours.

It is manifestly impossible to determine prior to an operation whether the conditions present are such as to lead to a hope of success, hence every operation for brain tumour must be regarded as

exploratory and as open to many unforeseen difficulties, which may prevent a successful result. This, however, should not be regarded as a contra-indication to operation.

6. Remarks regarding the operation : While the technique of an operation is a matter largely for the surgeon to determine, I venture to state from a study of many cases, and from the careful observation of the methods of many different surgeons, that I prefer the flap operation of Wagner, in which a horseshoe-shaped incision is chiselled through the bone, scalp and bone being reflected together, thus exposing a very large surface of the brain at the outset, and preserving an adequate protection to the brain subsequent to the operation. The hæmorrhage from the scalp is best controlled by pressure applied by the fingers of assistants during the incision, and a rapid clamping of the vessels by the operator as this pressure is removed. Attempts at compression of the blood vessels by a band about the head, or by insertion of long needles through the scalp, or by ligature passed beneath the scalp and tied or tightened about needles, appear to me to involve waste of time and to offer no advantage in point of saving of blood over the other method. In cutting the skull the line of incision is to be first traced with a sharp gouge, and then completed by a chisel ; and it is better to chisel through the skull at an angle of 45 degrees to its surface than to chisel through vertically. In prying up the bony flap, which is to be done by pressure exerted at three points rather than at one or two, it is necessary to proceed gradually, and, in reflecting the skull, to be aware of the danger of a jagged edge of bone at the point of fracture being thrust into the dura or tearing a large dural vessel. The question of suspending the operation at this stage of the proceedings and completing it upon a second day is an open case ; but inasmuch as experience has shown that such an exposure of the brain can be accomplished within fifteen minutes without difficulty, while a correspondingly large opening produced by trephining at two or three different points and removal of the bone by means of rongeurs requires a greater time, it has rarely seemed to be necessary to delay the completion of the operation in my experience. The incision of the dura should be semicircular, following the incision in the skull, but not nearer than $\frac{1}{4}$ inch to that incision, as the dura is apt to retract, after cutting, and thus to disappear beneath the edge of the opening. The treatment of the brain itself depends largely upon the conditions met with at the time of the operation. Some tumours can be easily shelled out from a capsule and the cavity packed with iodoform gauze. Others have to be incised in order to be removed, and it is better to take out a tumour in sections than to delay the

operation by an enlargement of the original opening. In case of gliosarcoma infiltrating the brain, no complete removal is possible, and severe hæmorrhage is liable to be met with which may even prevent a completion of the operation. It is not dangerous to incise the brain substance, and in such a case, if anything is done in the way of removal of the tumour, it is better to cut through the brain at the border line of the tumour in the hope of preventing its further extension. Bramann has excised portions of a glioma on three occasions from the same patient at intervals of a year. The hæmorrhage from a glioma is sometimes very alarming; and, if it is impossible to tie the delicate vessels with catgut and the actual cautery does not arrest the hæmorrhage, the only means possible is the packing of the wound with iodoform gauze.

In case the tumour is not evident at the opening, puncturing in various directions with a large aspirating needle is legitimate, and if cysts are found or resistance is met with, it is right to incise the convolution at its summit, and thus reach and remove the subcortical tumour. This has now been done successfully in a number of cases. In case a cyst is met with it is not sufficient to merely empty it or to excise a small portion of its wall, for the cavity will surely fill again with fluid unless it heals from the bottom; therefore an extensive dissection of the wall of a cyst is necessary, its packing with iodoform gauze, and the slow removal of this gauze as the cavity fills up with granulating tissue. It is my experience that the prognosis of cysts is by no means as favourable as that of other tumours. In uncomplicated cases it is possible to remove the packing of gauze on the second or third day, or if there has been no reason for packing the wound, to remove the rubber tissue which is used as a drain, and thus secure rapid healing. In a number of cases, however, subsequent to the operation, within twenty-four or forty-eight hours, the appearance of symptoms of pressure may indicate the occurrence of secondary hæmorrhage, under which circumstance it is necessary to open the wound again and wash it out thoroughly. This should not be neglected, as in several cases under these conditions very large clots have been found and removed to the subsequent benefit of patients.

RECORD OF PERSONAL CASES OPERATED UPON.

CASE I.—M., 40. General symptoms: Headache, forehead and top, on left side; nausea, hebetude, stupidity, optic neuritis, slowness in use of words, imperfect control of sphincters. Local symptoms; Tenderness over left frontal region near top, one convulsion beginning with head turned to right, followed by right hemiparesis lasting two weeks, and returning after one year; slow speech, spasms after two

years in right leg or arm. Duration of symptoms: Two years of gradual increase since the convulsion up to time of diagnosis: (1) Diagnosis: (1) Tumour in posterior part of second frontal gyrus on left side, possible gumma; no improvement on specific treatment after six months. (2) Tumour for operation. Operation by Dr. McBurney, June 23rd, 1892. Trephined over tender area; tumour found in 1 and 2 F. gyri; $2\frac{1}{2}$ by $1\frac{3}{4}$ by $1\frac{1}{2}$ inches; removed completely; sarcoma. Result: Death from hæmorrhage and shock eight hours after operation. Reported: *American Journal Medical Science*, 1893, April.

CASE II.—M., 42. General symptoms: General convulsions at intervals for seven years; optic nerve pallor. Local symptoms: Numbness and spasms of right hand and arm, extending to face and leg followed by weakness; several daily for five years; partial right hemiplegia with slow hesitating speech; increased knee-jerk on right side; slight anæsthesia of right hand. Duration of symptoms: Seven years of gradual increase up to time of diagnosis. Diagnosis: Tumour or clot, with scar in left anterior central gyrus. Operation: Dr McBurney, November 5th, 1894. Bone flap chiselled over middle motor area. Infiltrating vascular glioma through the anterior and posterior central convolutions; impossible to remove it on account of hæmorrhage. Result: Death from shock and hæmorrhage twenty-four hours after operation. Reported: *New York Medical Record*, February 1st, 1896, in abstract.

CASE III.—M., 40. General Symptoms: Headache, vomiting, vertigo, optic neuritis, double vision, blindness, boulimia. Local symptoms: Spasms beginning in left hand, extending to leg, followed by weakness and hemiplegia; no anæsthesia. Optic neuritis worse in right eye. Duration of symptoms: Duration of general and local symptoms one year; under specific treatment six months. Diagnosis: Tumour in central region, right side. Operation by Dr. McBurney, October, 22nd, 1895. Bone flap chiselled over right middle motor area; nothing found. Result: Death from exhaustion two weeks after operation. Necropsy: Large sarcoma in basal ganglia and centrum ovale on right side, under area exposed at operation.

CASE IV.—M., 21. General symptoms: Headache, left parietal region; mental excitement with maniacal attacks and amnesia; mental weakness. Local symptoms; Tenderness of parietal bone at point of an old fracture; depressed bone. Duration of symptoms: Five years of attacks, increasing in frequency. Diagnosis: Depressed fracture with pressure on brain. Operation by Dr. McCosh, February 10th, 1894: Trephined; no depression; angioma lying on surface of superior parietal lobule removed. Result: Recovery; loss of muscu-

lar sense in right hand for three weeks, gradually subsiding; fits of mania recurred three years later without headache. Reported: *American Journal Medical Sciences*, November, 1894.

CASE V.—F., 27. General symptoms: Headache, optic neuritis, left eye blind, vomiting, exophthalmos. Local symptoms: Spasms in right foot followed by weakness and numbness every two weeks; ataxia of right hand; paresis of right foot; increased knee-jerk, right > 1; tenderness over left parietal region and pressure caused twitching of right leg and feeling of defect in skull. Duration of symptoms: Two years of local spasms; six months blind; three months parietic in leg. Diagnosis: Tumour in upper left motor area. Operation: Dr. McBurney, June 10th, 1896. Defect in skull found and enlarged about a soft tumour lying on the dura. This was removed. On exposing brain a second large tumour was found and removed, 2½ by 2 by 2 inches, adherent to brain, only partly encapsulated; glio-sarcoma. Result: Death from hæmorrhage due to laceration of longitudinal sinus six hours after operation. Reported: *American Neurological Association*, 1897.

CASE VI.—M., 22. General symptoms: Headache and tenderness of the head following a blow on the right upper frontal regions. Local symptoms: Fracture, with depression at junction of frontoparietal bones, upper part. Spasms beginning with turning of head and eyes to the left, and spasms of left arm. Duration of symptoms: Spasms for six years. Diagnosis: Depressed fracture; possible cystic tumour. Operation by Dr. McBurney, January 31st, 1895. Trephined, and the opening enlarged by rongeur. Cyst under the thickened dura, with fibrous walls indenting the brain 1½ by 1 by 2 inches. Wall excised. Result: On the fourth day return of convulsions, with left hemiplegia and mental dulness. Wound opened; large clot removed. Immediate relief of hemiplegia and mental dulness. Recovered; discharged perfectly well. Fits recurred in five months. Wound reopened; cyst had refilled; was drained. Became infected in June, and died in convulsions in July. Necropsy showed an extensive cyst beneath the one drained.

CASE VII.—M., 19. General symptoms: Severe headaches after general convulsions. Fracture of left frontal bone at age of 1, with large defective region of skull and fluctuation. Local symptoms: Spasms in right hand, going on to general convulsions in a series as many as 300 at a time, once in two or three weeks. No paralysis or aphasia. Duration of symptoms: Since injury, eighteen years. Diagnosis: Cyst of the meninges, with pressure on the brain. Operation by Dr. Hartley, March 8th, 1895. Trephined behind the defect

in the bone, and a large area exposed. Large cyst, 3 by 2 inches, extending into the brain emptied. Fibromatous bands within the cyst forming honeycomb-like tissue. Cyst drained. Result: Death six days later from exhaustion. Necropsy showed that the brain had been compressed by the cyst, and infiltrated with connective tissue from the cyst wall, which was adherent.

CASE VIII.—M., 17. General symptoms: Headache, frontal; exhaustion on exertion of unusual kind; vomiting attacks; optic neuritis; hebetude and irritability; slight convulsive seizures; general feebleness; vertigo; incontinence of urine on several occasions; pulse slow. Local symptoms: Exophthalmos of left eye; paresis of right face with thick speech; athetoid motions of right hand; right knee-jerk increased; dulness to percussion over left frontal region. Duration of symptoms: Nine months of slow increase of symptoms: a blow over the site of the tumour had been received three years before. Diagnosis: Tumour in left second frontal convolution at posterior part; probably sarcoma, from slow progress. Operation (by Dr. W. W. Keen, May 10th 1896): Bone flap chiselled over frontal region, and enlarged by rongeur. Tumour found protruding through cortex, and removed with its capsule. Sarcoma $3\frac{1}{2}$ by $2\frac{1}{8}$ by $2\frac{5}{8}$ inches. The ventricle was opened and drained and then packed with gauze. Result: Progressive recovery. In June, 1897, was well in all respects except for a weakness of vision due to remaining optic neuritis, which was still improving. Reported: *American Journal of Medical Sciences*, November, 1896.

CASE IX.—F., 35. General symptoms: Headache left side frontal and temporal; nervous and mental excitability; loss of memory; optic neuritis; staggers to right and backwards; somnolence. Local symptoms: Progressive motor aphasia with use of wrong words; confusion of thought going on in three months to monosyllabic speech, alexia, agraphia. Slight hemiplegia worse in arm, not severe, but progressing rapidly in two weeks. Duration of symptoms: Four months. Diagnosis: Tumour in left third frontal convolution invading motor region or tract, probably glioma from rapid progress. Operation by Dr. R. F. Weir, December, 23rd, 1896: Trephined and opening enlarged with rongeur over lower frontal region; nothing found. Result: Gradual exhaustion; death on tenth day after operation; symptoms unchanged. Necropsy: Glioma, vascular, 2 by 2 by 1 inches in left temporal lobe inner forward part.

CASE X.—M., 40. General symptoms: Headache, mental irritability, occasional general convulsions. Local symptoms: Hesitation in use of words and mispronunciation; difficulty in reading and

writing ; tactile apraxia in right hand ; slight right hemiparesis. Duration of symptoms : Symptoms developed after compound fracture of left parietal bone with defects ten months before operation. Diagnosis : Depressed bone with probable cystic tumour causing pressure on inferior parietal lobule. Operation by Dr. McBurney, January 28th, 1897 : Old fracture exposed and opening enlarged, bone thickenings chiselled away ; dura thickened ; fibro-cyst with much fibrous tissue found ; cyst emptied ; fibroma removed. Result : Immediate improvement in speech ; four days later aphasia became complete and hemiplegia worse ; wound opened and clots removed ; progressive recovery ; return of fits four months later ; present state about as before operation.

CASE XI.—M., 30. General symptoms : Headache, frontal and occipital ; vertigo, increased on motion ; tinnitus, hebetude, stupidity, drowsiness, optic neuritis, exophthalmos, nystagmus. Local symptoms : Numbness in left face and mouth : paresis of left internal rectus ; deafness of left ear ; staggering gait ; falls forward and to right ; weakness of right hand : knee-jerk $r > 1$; ankle clonus in right foot ; pain behind left ear. Duration of symptoms : Three years of gradual increase up to time of diagnosis 1 ; treatment for two years, then diagnosis 2. Diagnosis : 1. Tumour, specific treatment for eight months ; no results. 2. In cerebellum on left side. Operation by Dr. McBurney, December 3rd, 1891 : Chiselled opening over left occipital bone : nothing found but great bulging of brain. Result : Convalescence for six days, then hæmorrhage due to fall out of bed ; shock ; fever, 105° ; death on December 15th. Necropsy : Tumour ; gliosarcoma, 2 by 1 by 1 inches, on ventrocephalad surface of left cerebellar hemisphere compressing pons 1 V. n. 1 VII. n. and 1 VIII. n. Reported : *American Journal Medical Sciences*, April, 1893.

CASE XII.—E., 7. General symptoms : Headache, frontal, general. Vomiting ; optic neuritis ; vertigo. Local symptoms : Staggering gait, falls back and to left ; earache in right ear. Duration of symptoms : One year of general symptoms, then three months of local symptoms. Diagnosis : Tumour of cerebellum on right side. Operation by Dr. McBurney, December 29th, 1891. Opening chiselled through right occipital bone. Nothing found. Cyst evacuated by needle. Result : Increase of symptoms ; shock. Death six days after operation. Necropsy : Tumour ; gliosarcoma, $2\frac{1}{2}$ by 2 by 1 inches in middle lobe and extending into both hemispheres of cerebellum, chiefly into right side, pressed on fourth ventricle. Reported : *American Journal Medical Sciences*, April, 1893.

CASE XIII.—M., 19. General symptoms : Headache, frontal ; ver-

tigo, vomiting, hébetude and irritability ; optic neuritis ; nystagmus. Local symptoms : Staggering gait, falls to left side : ringing in left ear ; deafness in right ear ; paresis of right external rectus ; loss of smell in left side ; paresis of right side of face ; knee-jerks diminished. Duration of symptoms : Six months of general symptoms and four months of local symptoms to time of diagnosis, March 10th, 1893. Diagnosis : Tumour of cerebellum right side of base. Operation by Dr. McBurney, March 15th, 1893. Opening chiselled in right occipital bone. Tumour found, and partly removed ; two cysts opened, $1\frac{1}{2}$ by 1 by 1 inch. Glioma. Result : Death on eighth day from gradual exhaustion. Necropsy showed that tumour extended forward on the base beyond reach. Reported : *Brain Surgery*, 1894, Case XXIV.

CASE XIV.—M., 28. General symptoms : Headaches ; general spasms, with stiffening of trunk muscles and clonic spasms of extremities and back without loss of consciousness, lasting one minute, many daily ; vomiting extreme ; vertigo on motion ; emaciation : slow pulse ; optic neuritis ; nystagmus. Local symptoms : Staggering gait ; knee-jerk normal. Duration of symptoms : Five months rapid progress to moribund state. Diagnosis : Tumour of cerebellum, secondary hydrocephalus. Operation : Dr. McCosh, January 15th, 1897. Trepined over right cerebellar fossa ; nothing found. Opening enlarged upward exposing occipital lobe ; ventricle-drained ; 30 c.cm fluid evacuated, and permanent drainage by tube about 20 ozs. daily. Result : Relieved of headache, vomiting and vertigo, and of the spasms ; pulse normal. Death suddenly from respiratory failure eight days after operation. Necropsy showed glioma 2 by 1 by 1 inches in right cerebellar hemisphere.

CASE XV.—E., 11, General symptoms : Headaches ; vomiting ; optic neuritis ; blindness ; hydrocephalic head. Local symptoms : Staggering gait ; especially towards right ; slight hemiplegia ; knee-jerks diminished. Duration of symptoms : Fourteen months general symptoms, nine months local symptoms. Diagnosis : Tumour of cerebellum. Operation by Dr. McCosh, February 23rd, 1897. Occipital bone exposed ; found eroded and softened ; enormous hæmorrhage from skull required cessation of operation. Result : Discharged from hospital one month later in same condition.

ON THE DURATION OF THE PERIOD OF INFECTION IN SCARLET FEVER.

BY

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The period when a convalescent from scarlet fever ceases to be infective and becomes safe for discharge must at times be a source of anxiety to every physician who has charge of a fever hospital ; and it appears to me that this uncertainty is likely to continue more or less until the specific microbe of the disease has been definitely isolated, its life-history studied, and the extreme limit of its retention within the human body experimentally proved. Not till then, and until we have at our disposal reliable methods for detecting the microbe shall we be enabled to pronounce with certainty that a given patient is free from infection and incapable of conveying the disease. Until we arrive at exact methods we must be guided in dismissing patients from hospital by the result of close observation, accurate records, and carefully prepared statistics in connection with cases while in hospital and the relation which their discharge therefrom bear to the occurrence of fresh cases in the district to which they belong. By this means it would be possible in time, I think, to acquire fairly accurate information with regard to the probable period during which scarlet fever continues to be infectious.

That the period of infectiousness varies in different cases is true, and the severer the case the longer is it likely to remain infectious. Hitherto the generally recognized period during which isolation should be maintained in mild and ordinary cases is six weeks, provided desquamation is complete. In my opinion that period is too short, even in milder cases, and although I admit that the desquamating cuticle is infectious I am not certain that the completion of desquamation is a safe and reliable guide as to when a given patient ceases to be infective even in cases where no complication arises.

That a purulent discharge from the nose, ear, or a running sore, the usual sequelae and complications which necessitate a prolonged period of isolation, is infectious has been proved beyond a doubt. But what is the source of the specific poison contained in these discharges ? Do these discharging surfaces afford conditions in which the specific microbe can increase and multiply ? The discharge itself comes from

the blood vessels, and if the blood has been rendered immune to the disease are not these discharges in consequence inimical to the growth of the microbe? In my opinion the source of the specific poison is not the mucous membrane of the nose or ear, or the surface of the sore, but the blood-stream, and that the mere existence of such discharging surfaces are not in themselves capable of prolonging the infective period, and that they only serve as exits by means of which a portion of the virus finds its way out of the circulation and the body.

It has not yet been shown that the cessation of the period of infectiousness and the healing of a discharging surface are coincident, and I do not think that such is always the case. Sometimes possibly the healing precedes, while at others I feel sure that the power of infection ceases before healing takes place. A discharge in some cases continues through a very protracted period, but it is obvious that infected material cannot be retained within the body indefinitely. Although the infective period varies in different cases is there not a time limit to the retention of the virus in the body beyond which no complication whatever can prolong the period of infectiousness?

In cases of infectious disease where the fluids of the body are more or less laden with specific poison a certain time must elapse under the most favourable circumstances before that poison can be completely eliminated, and in scarlet fever it appears that conditions exist, at any rate in some cases, which considerably prolong the period of complete elimination. In this respect scarlatina seems to differ from many of the other fevers, consequently the idea has suggested itself that a storing up of infective material takes place somewhere in the body, and this perhaps in the condition of spores.

I have noticed in scarlet fever that not only the glands of the neck but also the lymphatic glands in the axilla, groin, and other parts become enlarged during the earlier stages of the disease, and that the enlargement is more general and marked in the severer forms of the disease. Therefore I incline to the opinion that the specific poison accumulates in these glands causing irritation and enlargement. As the irritation ceases and the enlargement becomes absorbed, the virus passes again into the blood-stream, and is eliminated during convalescence by the different emunctory organs.

In typhoid fever great care is bestowed upon the disinfection of the discharges from the bowels and kidneys, and especially the former but in scarlet fever little attention is usually paid to these excretions. When the fluids of the body contain a specific poison is it not capable of being discharged therefrom by every organ whose function is to separate effete materials from the blood-stream? According to Crook-

shank the microbe of anthrax has been found in the discharges from affected animals. I think the desquamating cuticle in scarlet fever, especially in the later stages, owes its infectiousness very much to the excretion of the glands of the skin.

With a view of obtaining information as to the usual length of hospital isolation in scarlatina I issued a circular to a number of fever hospitals situated in different parts of England asking for the minimum, maximum, and average period of isolation that obtained in each place during the two previous years, and also the number of return cases which occurred within seven days of the discharge from hospital. From the replies received I find the minimum period varied between 4 and 5 weeks, while the maximum in some cases extended to 6 months. The average period the most useful for the purpose of comparison varied between 39 and 65 days. In many hospitals information regarding the number of return cases did not appear to be available, but I have been enabled to secure pretty accurate records of some 15,000 patients, and I find that where the average period of isolation was 49 days and under, the return cases averaged 1.86 per cent—where the average period varied between 50 and 56 days, the average percentage of return cases was 1.12, and where isolation extended to between 57 and 65 days the average percentage was 1.0.

Although I would not like to lay too much stress upon these figures yet they seem to point to the conclusion that the average period of retention in hospital bears a relation to the number of return cases of the disease.

The question of return cases of scarlet fever is an important and very difficult one. Of course a patient might become infected in the ordinary way, or might contract the disease from some source with which we are ill acquainted, and in each case this might be coincident with the return from hospital. The stowing away of infected articles belonging to a patient has been shown to be the cause of return cases, but with improved apparatus, and more perfect and thorough methods of disinfection, this probably does not play so important a part in the matter as formerly.

Allowing that a certain number of return cases contract the disease from other sources yet there is little doubt but that discharged patients in a certain percentage of cases are the direct vehicles of infection,

Several eminent authorities are of opinion that patients through breathing the actively infected air of a hospital during convalescence store up infective material in the cavities of the nose and lungs, and by that means convey the poison outside the institution. This may possibly occur, but were it the chief cause, would not the number of

return cases be even greater than it is? Moreover it appears to me in that case the percentage would not be effected by prolonged hospital isolation in the way the figures just quoted seem to show.

The lymphatic glands, I think, store up infective material. This has been previously referred to, and should any enlargement be found when a patient is examined for discharge it is my practice to prolong the stay in hospital in consequence thereof.

Systematic disinfection of the nasal cavities before discharge has been advocated, which no doubt is a useful and necessary procedure; also a convalescent ward in which patients may be prepared for a week before dismissal. I think there should be two such wards in connection with large hospitals, so that they can be used a week each alternately, and disinfected when not in use. This would ensure for the patient a purer atmosphere which would aid in freeing him from infection.

In view of the points raised and the facts referred to, it is doubtful whether a minimum period of retention in hospital of less than eight weeks is sufficient as I think it safer to increase and maintain the average rather by extending the minimum than by prolonging the maximum period of isolation.

From returns received I find that several authorities consider 13 weeks of isolation sufficient even in cases where complications supervene, and irrespective of the healing of discharging surfaces. I incline to agree with this, and think that a minimum of 8 and a maximum of 13 weeks may be considered safe until the contrary be shown by the result of accurate records based upon careful observation, or they be proved to be incorrect or inadequate by exact bacteriological methods.

Dr. Johnson (Glasgow) said this was a very important subject to those who had charge of fever hospitals. Having charge of such an institution in the city of Glasgow, it was a source of continual anxiety and worry to him that patients discharged might carry home the infection and communicate the disease to other members of the family. Yet the precautions taken were as complete as human knowledge could make them. The patient's clothes were sterilised by steam, and the patient had a final disinfection before being discharged after a minimum detention of 8 weeks. The percentage of return cases infected from dismissal were 2 per cent. Within the last few months he had seen one or two cases which for complications, such as suppurating ears, were kept in hospital for three months, and were apparently absolutely free from infection on their dismissal, but each case after going home infected a younger member of the family, and perpetuated the spread of the disease. He could not quite concur in

the glandular pathology of the paper. Bacteriological methods with respect to scarlet fever were by no means perfect, but everyone agreed that the infection, whatever it was, was very insidious and very tenacious of life. He verily believed that the healthy mucous secretion about the mouth and pharynx might retain sufficient infective matter to spread the disease in the household, especially if the patient, the night after being dismissed, were put to bed to sleep with a younger brother or sister. In such cases he often found it necessary to caution parents that children just discharged from hospital should sleep alone for two or three nights in a room by themselves, quite separate from any other member of the family. He believed there were at present a number of such cases, and it was very difficult, indeed almost hopeless, to entirely prevent them.

APPENDICITIS.

BY

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Mr. Chairman and Gentlemen,—I have thought that a discussion on appendicitis in this section might perhaps prove interesting and instructive for two reasons.

First, of course, because of the great surgical importance of the subject and the fact that more deaths occur annually from appendicitis than from any other acute surgical affection; and secondly, because we have an opportunity here at this meeting of bringing together for comparison the views of English and American surgeons.

Through the courtesy of my colleagues in the Montreal General Hospital and of my *confrères* in the Royal Victoria and Western Hospitals, I am able to place before you the results obtained in the treatment of appendicitis in those three institutions, as shown by an analysis of 517 cases, (It may be of interest to note just here the age and sex of those cases).

AGE.	SEX.		TOTAL.
	Male.	Female.	
1 to 10.....	19	13	32
10 " 20.....	75	62	137
20 " 30.....	138	71	209
30 " 40.....	60	13	82
40 " 50.....	28	10	38
50 " 60.....	7	3	10
60 " 70.....	2	2	4
70 " 80.....	2	0	2
	340	174	514

Three not mentioned. 340 males, 174 females. Nearly two males to one female.

This table certainly shows a rapidly increasing frequency of appen-

dicitis during the first three decades and a gradually lessening frequency after thirty.

The greater frequency of the affection in men than in women in the third decade is noticeable.

Etiology.—This difficult question is, at present, unfortunately only partly worked out. I have for some years felt that the entrance of faeces into this blind pouch of small calibre, and abnormal position was an important etiological factor. It goes without saying that whatever removes the protecting epithelium layer from the mucous membrane lining the appendiceal canal creates a *locus minoris resistentiae* and permits the entrance of ever present bacteria. I think the initial lesion is often of the nature of a stercoral ulcer. Then follow, according to circumstances difficult to define, either a perforating ulcer, or the thinning of the appendiceal wall to a degree which permits the escape of pathogenic organisms into the surrounding tissues or a healing ulcer with subsequent contracture and stricture.

The investigations of Dr. Abbe are interesting in this connection and throw a good deal of light on the question of the pathology and morbid anatomy of appendicitis. He has studied appendices removed during the interval. He directs that within a few hours after their removal they be distended with ninety-five per cent. alcohol and then immersed for twenty-four hours or more in alcohol of the same strength. The appendices are then ready for transverse or longitudinal section and he seldom finds two alike. First a catarrhal inflammation may be followed by a stricture as in the urethra. Second, a natural point of flexure in the appendix (due usually to an abbreviated point in its mesentery) leads to an arrest of its faecal contents which, becoming inspissated, grow into a concretion. Third, an otherwise healthy appendix may be the subject of circular ulceration from no apparent cause other than microbial infection.

Final obliteration evidently sometimes occurs, but even this change does not always rid the patient of pain, as in the process of cicatrization nerve filaments may become included.

In 59 of my series of cases concretions are reported to have been present. In one case a pin was found in the appendix, and there is an appendix in the museum containing 10 or 12 shot, which never gave any trouble to the man from whom they were removed.

Dr. Abbe finds on microscopical examination of unstained and stained bits taken from the centres of many of these concretions, pus cells, exfoliated epithelium cells, minute bits of meat fibre and starch cells, with occasional crystals of decomposition. Dr. Abbe concludes

that the development of the diseased appendix may be said to pass usually through the following stages.

First.—A catarrhal inflammation of the lining mucous membrane.

Second.—Irregular narrowing of the calibre, with hypertrophy of the mucous and muscular coats.

Third.—Stricture.

Fourth.—Imprisoned food, desquamated epithelium, and pus, forming concretions.

Fifth.—Obstruction at the stricture, distention, perforation, abscess.

These observations certainly take us a step forward, although very much remains to be done.

Dr. Wyatt Johnston has prepared a number of appendices after the manner suggested by Abbe, but has used instead of alcohol Jores' solution of formalin, thus preserving the natural colour. This promises to throw considerable light on the subject of the early changes which take place in the appendix.

Mr. Rutherford Morrison finds that many attacks seem to come on during the night after sleep, and he would explain this by attributing it to the increased contraction of the unstriped muscle fibre in the wall of the appendix and cæcum during sleep, due to the increase of carbonic oxide.

The greater frequency of appendicitis in men than in women, especially in the third decade is noticeable. This may possibly be due to the greater physical activity in man, and the more common occurrence of violent strain, which might increase for the time the intra-abdominal pressure. Dr. W. H. Draper has suggested that the frequency of occurrence of appendicitis during recent years may be due to the poison of influenza.

Since 1889 there have been admitted to the Montreal General, Royal Victoria and Western Hospitals 517 cases of appendicitis with a mortality of 12.8 per cent. During this period cases of appendicitis have been submitted to operation with gradually increasing frequency. At first only the hopeless cases were operated upon and then the operation was often done as a *dernier resort*. Greater experience led to greater frequency of operation, and the results have improved and are still improving.

It is instructive to compare this mortality with that before 1889, that is, while these cases were treated in the medical wards without operation. Up to July, 1892, cases of appendicitis were admitted, almost invariably to the medical wards. Occasionally they were afterwards transferred to the surgical side.

Since July, 1892, all cases are admitted to the surgical wards unless

an attending physician brings one into his own ward, under his own care.

In the Annual Reports of the Montreal General Hospital from 1858 to 1873 peritonitis alone is mentioned. In succeeding years the term perityphlitis occurs quite frequently, with an average mortality of 12 per cent. Peritonitis cases at this time lessen in number but the mortality increases to about 40 per cent.

After the year 1890, perityphlitis is not mentioned and the term idiopathic peritonitis occurs but rarely. The term appendicitis becomes more and more common.

The total number of cases of perityphlitis, and peritonitis from 1858 to 1890	152
Two cases of pericæcal abscess	2
One case of perforation of vermiform appendix.	1
	155

Deaths:—Perityphlitis and peritonitis.....	35
Pericæcal abscess	1
Perforation vermiform appendix.....	1
	37

A total mortality of 23.8 per cent. nearly double what it is in the succeeding six years. The mortality has been reduced by the operative treatment to about half what it was before the operative treatment was introduced.

Further examination of the cases admitted into these three hospitals since 1889. shows that of the 517 cases treated, 389 were operated upon and 128 were treated without operation. Of these latter four died, a mortality of 3.12 per cent. These were the mild cases, and except in a few instances operation was not advised. The four deaths were due to septic peritonitis.

Of the 389 cases operated upon, 84 were interval cases, and in this group there was not one death.

Of the 305 cases operated upon in the acute stages 63 died, a mortality of 20.65 per cent. a rate of mortality in the severe cases less than in the whole series in pre-operative days.

Now I take it the important question is the cause of death in the 63 fatal cases, and how it may be avoided. Thirty-six were general septic peritonitis cases. Two tubercular appendicitis and peritonitis. Eighteen were abscess cases. Five were cases of septic inflammation of the mesenteric veins and liver abscess. Thus septic and tubercular peritonitis, abscess, and, mesenteric pylephlebitis leading to abscess of

the liver, account for 61 of the 63 deaths, and septic pneumonia and broncho-pneumonia for the other two.

I would like to mention here that we cannot as yet quite drop altogether the term idiopathic peritonitis.

There have been six deaths in the Montreal General Hospital during the past five or six years from general peritonitis, in which an autopsy was performed by Dr. Wyatt Johnston, and in which no cause could be found. Five of them were apparently a streptococcus infection and one a pneumococcus. One or two of them gave a history of having recently had a sore throat and several seemed to have occurred about the menstrual period. In one case I opened the abdomen and found a considerable quantity of sero-purulent fluid but could not find any apparent cause. I washed out the abdomen with normal saline solution and inserted a large drain to the bottom of the pelvis and the woman recovered. This attack immediately followed an evening's skating during menstruation.

The first three cases that occurred in my practice after graduation made a very strong impression upon me and I think they are worthy of brief mention.

First, in March, 1881, I attended a young man *æt.* 28, who developed well marked right sided local peritonitis, followed by symptoms of abscess formation. I asked my old professor in surgery to see the case with me and while he admitted that there probably might be an abscess inside yet he maintained that it was inoperable and my persuasive powers failed to gain his consent to an operation. The man had recurring chills and sweats until he died of exhaustion. At the autopsy, performed by Dr. Osler a large retrocæcal abscess was found.

Second, in December, 1883, an almost exactly similar course was passed through by a young man *æt.* 17. Only in this case I thought I would seek advice from a younger surgeon, but here again I was disappointed. The younger surgeon, said the case was one of typhoid fever. At the autopsy I found a large pelvic abscess connected with the appendix vermiformis.

Third, a young man *æt.* 19. Started with right sided abdominal pain followed by symptoms of abscess formation. This time I decided to avoid surgeons and called in the late Dr. R. P. Howard, at that time Professor of Medicine in this University, a most progressive man. He readily agreed to my diagnosis and supported my advice to operate. On the 24th February, 1884, the 24th day of the illness, I opened the abdomen on the right side and readily came upon a large retrocæcal abscess. I simply opened and drained, the appendix was not removed. The patient died on the 6th day after the operation and at

the autopsy, performed by Dr. Osler, who was then a professor in McGill, a mesenteric pylephlebitis was found. It was easily followed up along the branches of the portal, through the main trunk into the liver. Several abscesses were found in the liver and the mesenteric glands were enlarged. I must admit that the mortality rate was not improved by my operation, although so far as I know it was the first done in Montreal, but I got one lesson that I have never forgotten, viz., delay is dangerous. The successful treatment of general septic peritonitis is one of the most difficult tasks a surgeon has to undertake, and the secondary results of abscess formation are a frequent cause of death in appendicitis.

The abscess cases and the general septic peritonitis cases are the ones that increase the death rate. This is the group of cases which gives us our failures and the best way to treat them is to prevent them, to anticipate their development. This is accomplished in the vast majority of cases by prompt surgical interference. Even the fulminating cases are often preceded by milder attacks during which, or in the interval immediately following, an operation might have been successful.

The question of "time to operate" naturally arises here, and it is one that might be discussed for days. I believe it to be next to impossible to put in words a clear statement of the time to operate. There are two groups of cases upon which I think nearly all will agree. In one the attack is so mild that the question of operation during the attack scarcely arises. In the other the condition of the patient when first seen is so grave, that but few would dare to delay. But there is a much larger group where there seems to be room for difference of opinion. It is here that the judgment and experience of the surgeon need to be exercised to their fullest extent.

Operations in the interval are so safe that the question often resolves itself into whether there will be an interval or not.

Symptoms in appendicitis are so thoroughly unreliable that no one or two can be taken as safe indications.

Pain, tenderness, muscular rigidity, vomiting, temperature, pulse, facial expression are all valuable signs, but they must be taken together and the opinion be based on the "toute ensemble." I find also that sometimes the further the case progresses the less reliable do the symptoms become. If we were able to foretell positively in a given case whether it would turn out well or ill then could we intelligently make selections, but we cannot by any symptom or group of symptoms be certain, therefore the surgeon should when in doubt give the

patient the benefit and operate. The cautious, conservative surgeon will operate early. Only the bold, will dare say, wait.

Physicians are helpless, they have no means of controlling or limiting the course of this disease. Purgatives may do harm and should be avoided. Opium disguises the condition and misleads the patient, the friends and the medical attendant. It should never be given until the diagnosis is clear and the course of action decided upon, and then only if it is thought that vomiting or active peristalsis will spread the infection, while preparations for operation are being made. The pain is seldom more severe than can be controlled by local applications of ice or hot fomentations.

To illustrate the danger of delay in even mild cases I will report the following experience.

A young professional man in this city was recovering from what his family physician described to me as a very mild form of appendicitis and apparently was making a most satisfactory recovery. On the sixth day he had no pain, scarcely any tenderness and a normal temperature and pulse. He was to have got up on the seventh day, but in the evening of the sixth day, while the nurse was out of the room, he went to the water closet to defecate. While there he was seized with intense abdominal pain and symptoms of collapse. I saw him shortly afterwards and had him removed to the hospital at once and operated with the least possible delay. Yet notwithstanding the most careful cleansing of the peritoneal cavity and drainage, he died of septic peritonitis, the infection coming from a ruptured pericæcal abscess. I have seen a similar sudden rupture of an appendix with peritonitis follow the administration of a dose of castor oil. The patient was the wife of a veterinary surgeon and the oil was given on the third day after confinement. A few hours after its administration the lady complained of agonising abdominal pains, and chiefly on the *left* side of the uterus. A diagnosis was made of probable purulent salpingitis on the left side with rupture. I opened the abdomen and found the left Fallopian tube and ovary apparently normal. I then examined the right tube and ovary and found them normal also. It was a trying moment, because her husband was in the room, and it appeared as if I had unnecessarily undertaken a serious operation. It occurred to me to examine the veriform appendix and to my great relief I found it distended, ruptured at one point and pus escaping through the perforation. Fortunately the patient made a perfect recovery. Why the pain was felt to be so very much more severe on the *left* side I cannot tell. My working rule is to operate on all well marked cases at once. This includes all cases in

which there is pain, tenderness, muscular rigidity, with vomiting elevations of temperature, acceleration of pulse and anxious facial expression.

In the milder cases I advise operation if, at the end of twenty-four hours or thirty-six hours, I am not perfectly satisfied that the condition of the patient is undoubtedly improving and if all the symptoms are not decidedly less on the third day I urge operation strongly. I have no faith in the powers of any surgeon that I have yet met to individualise and select case suitable for operation and not suitable for operation after the third day. If they are not getting well by that time, they should be submitted to operation. I speak thus from experience. I have knowledge of many cases delayed by the advice of consultants, the delay being followed by disastrous results.

There are a few details in the operation upon which I should very much like to hear an expression of opinion.

First, in regard to general septic peritonitis. If undertaken before paresis of the intestinal wall has developed there is a chance of saving them, and they should be given that chance. I am still doubtful of the advisability of turning all the intestines out on the table and washing them and the abdominal cavity before replacement. I am afraid that it lowers the patient's recuperative power and the advantage gained seems to me doubtful. Of the injection of salines into the intestine, as advised by McCosh, I have no experience. The benefit of free movement of the bowels is appreciated by all, but enemata and purgatives, after washing out the stomach, generally succeed, and sometimes at this time opium seems to act as a purgative.

If the infection of the peritoneal cavity in general, thorough irrigation with hot normal saline solution is called for. The so-called antiseptic solutions are here useless and probably injurious from their action on the epithelial layer of the peritoncum. Normal saline solution washes out the pus and sero-pus well, and is non-irritating. The washing out should be thorough, and for this purpose pitchers are useless. An irrigator should be used with a long soft rubber tube attached, which can be carried into the pelvis, and into either loin alternately, and thus a stream be made to flow from within outward. By changing the position of the tube I believe the abdominal cavity and intestines can be washed out as thoroughly as in eventration and with decidedly less shock to the patient.

The next point is drainage, and this part of the technique has not received sufficient attention. A tube in the pelvis does not drain the loins. In these cases three tubes should be inserted, one into the pelvis and one into each loin, and they should be of large calibre. I

have used during the past year large rubber tubes, having a half inch bore. One is carried into the pelvis to the very bottom and one into each loin. Strips of gauze are passed down the tube and all the fluid taken out. This is done sufficiently often to keep them always empty. In this way dependant drainage is secured for the whole abdominal cavity. All the fluid will gravitate into one of these three spaces as the patient lies upon the back, and if it is removed as fast as it accumulates it amounts practically to dependant drainage of the whole abdominal cavity.

Now in regard to abscesses. I should say remove them as far as possible as soon as they are formed. Delay is dangerous. No surgeon can know in what direction an abscess is burrowing or of what its walls are composed, or where the wall is thinnest until he operates upon it. When it is found and opened, should the appendix be searched for and the limiting adhesions broken down? I think the majority of experienced surgeons will say, No.

Before deciding that question let us see what tissues go to form the abscess wall. It will generally be found to be composed of the following: lymph, inflammatory tissue, appendix, intestine, omentum and mesentery; tissues rich in lymphatics and veins. Through these the septic matters may enter and destroy the patient. Their early removal may prevent such an unfortunate ending. In the series of cases which I have reported there are five cases of mesenteric pylephlebitis and abscess of the liver, and I have seen three others in private practice. The channels of infection in these cases may be clearly traced right through the branches of the portal vein into the liver. It does seem but rational to remove at the time of operation all the infectious material that can be removed with a view of arresting or preventing the development of this fatal complication.

Only a few days ago I saw an old lady of 65, who said she had had a mild form of appendicitis, her first and only attack previous to her present illness, in Chicago, in the summer of 1896. It was a very mild form of the disease and operation was not advised. She made an apparently good recovery and remained well until about a fortnight before I saw her. At this time her family physician recognised the case as one of recurrent appendicitis, with abscess formation. The abscess seemed on physical examination to be almost entirely pelvic. In addition her urine, although about normal in quantity, contained albumen and granular and hyaline casts. Operation was mentioned as affording the only chance of relief, but that chance was so small that it was declined. A few days before death the old lady coughed up a considerable quantity of pus, and two days before death she

passed a quantity of pus through the urethra. At the autopsy the pelvic abscess was found connected with a ruptured appendix, mesenteric pyelphlebitis—liver abscess, adhesion of liver to diaphragm, perforation of diaphragm, lung and bronchus. Delay is dangerous. Had this woman been operated upon during her first mild attack in Chicago, or in the interval after recovery, in all probability she would have been alive and well to-day. No man could have foretold the unfortunate ending in this case, or in any similar case, and I hold therefore that the only safe advice to give in any case of appendicitis is to have removed what is a menace to life.

Another reason for advocating the more radical treatment of these abscess walls and the search for the appendix is that otherwise second or third abscesses may be left unopened. Such unfortunate experiences have occurred in Montreal and doubtless in other cities, the secondary abscesses being found in the post-mortem room. As an illustration of this condition I may mention the following :

I was asked during the past winter to see, in the medical ward a case of abscess of the prostate. On examination per rectum I found a normal prostate but distinct fluctuation in front of the rectum, behind the prostate. Enquiry into the history left scarcely a doubt that the case was one of appendicitis. I made a lateral incision in the usual way and emptied the pelvic abscess, but found no trace of the appendix. I broke down the limiting adhesions, taking great care to protect the peritoneal cavity and on raising the cæcum, opened up a second abscess containing the diseased appendix. The man made a good recovery. Had I in this instance been content to drain the first abscess the man would probably have died. The second abscess had no connection at the time of operation with the first, and would not have been found had not the appendix been searched for. I might quote other similar cases but this one serves to illustrate my point.

I am advocating this practice for operating surgeons working in their own operating room, and I hold that under such circumstances it is possible to remove the appendix in nearly all cases, without infecting the general peritoneum. The intestines at once form new adhesions, and thus afford protection when the gauze pads are removed. In fourteen cases of the series there were two abscesses. In nine cases general peritonitis is reported to have developed after operation. In seven of these the appendix had been removed and in two it was not found. But it is difficult to say that the peritonitis resulted from the search for the appendix. It is quite possible that the infection had taken place before the operation was performed.

Since the first of last October I have put these principles which I

have advocated in the treatment of general peritonitis and abscess into practice with satisfactory results. During this period I have had under my care in the Montreal General Hospital twenty-nine cases. Seven of these recovered and declined operation in the interval. Twenty-two were operated on. Eight of these were admitted for operation in the interval. Fourteen were operated on during an acute attack, and in all the appendix was removed. In seven the appendix was gangrenous, and in five, perforated. Four were cases of general peritonitis and all recovered. Ten were abscess cases. They all recovered but one. This case was admitted on the fifth day, the abscess was opened, cleaned out with gauze swabs and the appendix removed. She did well for eleven days. The temperature became normal, bowels moved, food was well borne and she was looked upon as out of danger. On the twelfth day after operation she had a rigour, her temperature rose to 104 F. and she became decidedly septic. Four days later, my colleague, Dr. Kirkpatrick opened the abdomen. This second operation was unsatisfactory, except that it showed the absence of peritonitis. She died four days later, or twenty days after the first operation. Unfortunately we were not able to obtain an autopsy, but from the conditions present, I have little doubt that death was due to mesenteric pylephlebitis and liver abscess. The late date of the first operation was unfortunate.

Fæcal fistula followed operation in fifteen cases. Four of these died. Eight healed spontaneously, one healed after operation and in two the result is not stated. In two of the cases in which the appendix was not removed a second operation was performed for recurring attack. In each instance the appendix was removed at the second operation. Both recovered.

SOME SUGGESTIONS FOR THE TREATMENT OF INFLUENZA, OR THE GRIPPE.

BY

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The grippe, or as it is known in England by its old-fashioned name of influenza, is a very ancient disease, and common to any and every climate all over the world. It has been the direct cause of death in many thousands of cases, chiefly through the complications of the disease, such as pneumonia and capillary bronchitis; or by adding to the labours of an already weakened, or diseased heart.

It has been the indirect cause of death in many more thousands, through the enfeebled conditions left behind by the attack, even when recovery takes place; the convalescence in this disease being very slow even in mild forms, and the tendency to relapse, especially in respect to the catarrhal conditions of the bronchial mucous membrane, being great.

The chief feature of difference between ordinary catarrh of the nasal or bronchial mucous membranes originating from "catching cold," lies in the great prostration preceding, as well as accompanying the attacks of the grippe; demonstrating some profoundly depressing influence to be at work, not found in the usual catarrh arising from cold.

This low condition is supposed to be due to a poison, of what nature it is yet hard to say, although a bacillus was discovered by C anon and Pfeiffer, which was thought by them to be the cause of the disease, as they found the bacillus in the blood, and the bronchial discharges. It appears to the writer, that it is just possible that bacilli may be the expression of a disease, and not a cause; and that in the grippe, pathological conditions may originate the germ in the blood, and that therefore other causes may be found which will more satisfactorily account for the prostrated condition of the patient.

It is with the impression that such causes exist, that they may be identified, and in the hope that we may clearly elucidate them, or pave the way for their ultimate lucid understanding, that we undertake this exposition; and at the same time if correct in the views set forth, advance some suggestions for treatment in accord with them; and which we have found most useful in fevers and inflammations.

Wood and Fitz, in their recent work, "The Practice of Medicine," divide the disease into five different varieties, and considering their

divisions as very clear, and easily distinguished, we will follow their nomenclature, examining particularly, in each division, the nervous conditions, the state of the circulation, the temperature and the catarrhal conditions; endeavouring to explain their origin, and thus demonstrate the advisability of the applications we advocate for their amelioration and removal. While influenza may not begin with a chill, it usually does so, and what are called the nervous symptoms soon follow in bad cases.

What is a chill? It is a contraction of the blood vessels all over the superficial area of the body, yet frequently when there is such low temperature upon the external surface, there is a high temperature within the body, as can be observed in cases of chills and fever, and the high rectal temperature in cholera, during the stage of collapse.

And what may be the cause of this contraction of the superficial arterioles?

It is acknowledged to-day by all leading physiologists and physicians, that the chief function of the sympathetic ganglia, is the contraction of the arteries; in other words they are particularly the vaso-constrictor centres.

This being the case, these centres must be functioning abnormally, to so close the surface blood vessels as to produce a chill, and the question which naturally arises, is: what is the agent acting upon the sympathetic ganglia which thus increases their function? The reply which we have for sixteen years believed to be true, and which during that period we have seen no reason for altering, is, that excess of the arterial circulation when active, in nerve centres, increases the function of the centre, just as a very active circulation in a gland, or a serous membrane, will induce in the latter case, exudation, and in the former, increase of secretion. Clinically we have proved this view to be true many times, by aborting chills from many causes, by applying cold over the spinal region, in rubber bags not more than four and one-quarter inches wide, thus expelling excess of blood from the ganglia, and allowing the arteries throughout the body to re-expand, the blood to be freely re-distributed to all organs and tissues, and active metabolic changes (with their resulting heat) to take place.

Such is always the effect of cold over the spine in cases of chill except in very feeble individuals, or in patients where the vitality is at an exceedingly low ebb.

Oppositely, we have increased the function of the sympathetic ganglia by heat in a double columned spinal hot water bag, many hundreds of times, when the blood vessels acted upon by the ganglia over which the heat was placed, were unduly dilated, either in active or passive

hyperæmia, as congestive headache with great mental excitement, representing the first; or congestion of the lung without rise of temperature, illustrating the second.

Physiologists have proved that when cerebro-spinal nerves are excited after section, by galvanism applied to the cut end of the nerve nearest its nerve terminals, that if ending in a gland the artery supplying blood to the same, dilates, and the secretion of the gland is increased; but if the cut end of a sympathetic nerve is stimulated in the same way, the vessels in the gland will contract, and the secretion lessen.

It is now widely acknowledged by leading physiologists, that every motor nerve, carries with it trophic or vaso-dilator fibres, which terminate in the tissue cells of all forms of tissue, all over the body; and that when this nerve is excited, there will be dilatation of blood vessels within the area of excitement; or in other terms, there will be congestion, active or passive, or inflammation, from subacute, to its most violent form, according to the strength of the nerve currents issued from the excited, or hyperæmic centre, to the parts of the body implicated,

From the foregoing, it may be seen that if we can treat a case of influenza in the stage of chill or very soon afterward, our effort will be to break the chill at once, and this we should do, by applying the spinal ice bag, from the fourth dorsal to the third lumbar vertebra, and over this region alone in the "typhoid form" for the following reasons, viz: because when the reaction does set in from the chill experienced in this form of grippe, there is a strong inclination of blood to the head in greatly increased amount, as shown by the tendency to delirium, stupor, dry tongue, and continued fever; also the catarrhal condition of the nasal and bronchial mucous membranes, denotes hyperæmia of the same; all this in the "typhoid form" of the disease, and as we already have such an undue amount of blood circulating through the upper body, our effort is to expand the arteries widely in the lower body and legs, in order not only to break the chill, but to prevent the reaction of great hyperæmia into the localities named, after the chill is aborted; and this we can accomplish by cold over the region mentioned.

In an attack of grippe experienced by ourselves in the last New York epidemic, we were attacked by chilly sensations alternating with feverishness, severe pain and aching in all the limbs, much prostration, a tendency to sickness at the stomach, a good deal of hoarseness, and congestion of the larger bronchi, and of the nasal passages.

The ice bag as we have recommended was at once applied from the

shoulder blades to the line of the waist, with entire relief to the chills, the pain, the sickness at the stomach, and prostration, within two hours; it was re-applied every fourth hour for one hour and a half at a time, except in the middle of the night, during the following thirty-six hours; when the only trace of the attack remaining was a little hoarseness, which annoyed us for some weeks afterward.

We believe that if caught in the early stage, the spinal ice bag used in the way directed will abolish the disease in many cases, and ameliorate the severity of the symptoms, in many more. Except in the early stage we would not advise this treatment, unless by an expert in its use, but would rather in the second stage depend upon heat over the spine to induce perspiration, and close the unduly expanded blood vessels in the hyperæmic areas.

Let us glance at a severe case of the "typhoid form" of the disease.

Here we have, continued fever, great prostration, muscular pains, dry tongue, catarrh of the nasal and bronchial mucous membranes, and either stupor, or active delirium.

The delirium or stupor, the fever, and the wide spread catarrh all denote hyperæmia of the brain, head, and chest, caused by excessive circulation in cerebro-spinal centres, issuing vaso-dilator nerves to this large surface involved.

In other words, the vaso-dilator centres are so stimulated in function that the sympathetic nerves terminating upon the arterial coats in the affected localities, have lost the power to contract the blood vessels; the balance of action maintained in health between the vaso-constrictors, and the vaso-dilators is destroyed for the time being, and the over-stimulated tissue cells cause the blood to riot and rush through the dilated arteries; giving rise to temporary insanity by the hyper-nutrition of the thought cells, or in the case of stupor, destroying all power of thought, by pressure upon them.

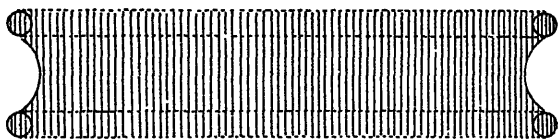
According to the facts, as well as the hypothesis presented in this paper, the indications for treatment are to contract the hyperæmic arteries, and to do it as quickly as possible.

This may be accomplished, and with great rapidity, by the application of the spinal hot water bag, over the cervico-dorsal region, or from the line of the hair, eight inches down the spine. Where the double columned hot water bag is not at hand or cannot be readily obtained, the same effects may be obtained by using a piece of thick flannel, one yard long, and eight inches wide, which may be rolled evenly and not too tightly, but compact from each end toward the centre, leaving an inch of separation between the rolls, so that they shall only cover the sympathetic ganglia; stitch the rolls in order

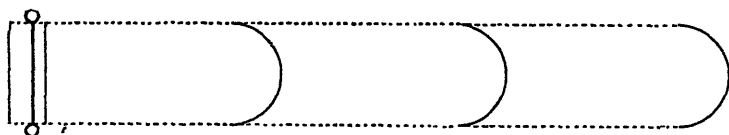
that they cannot come undone, dip them in water at 120 F., wring out quickly, and apply over the cervico-dorsal region, under a folded dry towel, and let the patient lean against them for one half an hour; then re-dip, and re-apply, and so on, until the temperature begins to decline, the skin to sweat, and the nervous symptoms to subside. Now remove, until there are signs of a fresh rise of temperature, and a renewal of the symptoms, when the treatment can be used in the same way, and so on, until convalescence is established. We advise at the same time in these cases a thorough evacuation of the intestinal tract, by a cholagogue cathartic.

This treatment will act in all inflammations of the lungs or pleuræ, or of the bronchial mucous membranes, in the early stages rapidly and effectively, as we can testify after a wide experience. It will also act in congestive headache, in sunstroke or heat stroke, with high temperature, and throbbing temporal arteries; in hæmorrhages, and in various other congestions, when placed over the proper section of the spine.

The following sketch shows the flannel rolled, and stitched together :



We present at the same time a sketch of the spinal ice bag, which is divided into three compartments, and fastened with a clamp at the top; thus one, two, or three of the cells can be used, as the case requires, the unused compartments being turned back over those in use; in using one compartment always fill the top one alone, when two, fill the second compartment first, to the bottom of the top one, and then the top cell, to the line of the cross piece of rubber for the clamp; if three cells are used fill the bottom one first, and so on.



After filling, the clamp should be screwed in place firmly, and the bag should be laid upon a table for five minutes, when it will be found to be bulged out with the latent air in the ice, which the warmth of the room has expelled. The clamp should be now un-

screwed sufficiently on one side to allow of the escape of the air ; and once tightly refastened, and the bag is ready for use.

The usual bag for the adult if of full length is 22 inches long, and four and a quarter inches wide ; and except in very tall or broad individuals, a broader bag will chill instead of warming the body.

In children, shorter and narrower bags are required, according to age and size.

In the "cardiac" form of influenza, where we have the constant menace of heart failure, and in the "respiratory" variety, where there is a tendency to catarrhal pneumonia, and capillary bronchitis, we strongly advise in the first, the inhalation of pure oxygen properly diluted with a gas of lighter specific gravity, in order to insure its absorption by the pulmonary capillaries ; because the first and most assured action of oxygen is upon the heart, second on the arteries dilating them all over the body, and thus distributing the circulation ; and third, upon the tissues, restoring normal molecular action.

In the respiratory form of the disease, we would use the hot water bag, over the dorsal vertebræ, combined with the inhalation of oxygen, and by these measures we feel assured that this form of grippe may be speedily relieved and cured.

Minute doses of antipyrine, aconite and pilocarpine may be used with benefit in the typhoid and respiratory forms of the disease, to lower the pulse and temperature and induce sweating, at the same time as the hot water bag is applied ; but we would not recommend more than half the usual doses, believing that they will be fully as effectual when aided by the heat over the spine.

The use of oxygen properly combined and prepared for therapeutical purposes, in laboratories established for that purpose, is absolutely essential, in order to obtain successful and the best results from its administration.

That prepared by calcium light manufacturers for commercial purposes is filled with chlorine, and other deleterious gases which will injure the patient ; while pure oxygen alone is too dense in its specific gravity to be absorbed by the capillaries. Therefore the purity of the gas, and its dilution with a gas of lighter specific gravity are to be insisted upon.

The gas which we believe to be most efficient for the purpose, is nitrous monoxide, and the formula which is now in use by the London Oxygen Hospital we consider the best. It is composed of two parts of pure oxygen, one of nitrous monoxide, and one per cent. of ozone to keep it fresh.

This preparation is freely absorbed by the capillaries and may be obtained in the "blue cylinder," sold by nearly all the leading druggists in the country, and at the New York Laboratory, of Dr. Walton.

Oxygen by cylinder is very easily administered, as there is a tube connected with a stop cock, and all that is required is to place the tube in the mouth, after strong expiration; compress the nostrils, and inhale as deeply as possible, retaining the inspiration as long as is comfortable, and then exhaling through the nostrils. The gas should always be taken on an empty stomach, and in the erect position whenever it is possible, in order to allow of the fullest expansion of the chest.

In very sick people the tube should be placed in one of the nostrils, the gas turned on, and inhaled by the ordinary process of respiration.

From the whole course of our suggestions and the entire tenor of our paper, it can be readily understood that the writer believes that vaso-dilatation of the arterioles with undue activity of the circulation, is due to hyperæmia in the vaso-motor nerve centres; and that in all forms of active congestion and inflammation, in the early stages of such attacks, the most effective and speediest manner of relief and cure is by the appropriate application of heat and cold over the spine.

Hospital Reports.

FROM THE GYNÆCOLOGICAL CLINIC.

BY

T. JOHNSON-ALLOWAY, M.D.

Gynæcologist-in-Chief to the Montreal General Hospital; Associate Professor of Gynæcology. McGill University.

CASE H. G.—This patient, unmarried, was admitted into hospital complaining of severe reflex pain in both iliac regions, but of exaggerated severity on the left side. This pain radiates round to the lumbar regions and at times up towards the breast and head. Mammary neuralgia and headache are common symptoms indicative of ovarian and uterine disease and are probably the strongest evidence of the material existence of reflex pain, a condition doubted by some, many proofs of which, however, you will see by close observation of patients in these beds. This patient also complained of menorrhagia, very severe dysmenorrhœa and exhausting leucorrhœal discharge. She states that she has been a housemaid and is compelled to earn her living but that lately she has completely broken down from the effects of prolonged suffering

Examination.—I found the cervix bilaterally lacerated, but not extensively eroded. It is hard and small; uterus is enlarged, painful and in a state of chronic metritis. It is retroverted. The ovaries and tubes are prolapsed, enlarged and very painful to pressure.

Operation.—On opening the abdomen I found the ovaries enlarged to about three times their normal size, filled with unruptured Graafian follicles and large hæmatomata. The ovaries were lying down in Douglas' pouch under the retroverted uterus, a position which caused them to be subject to much injury from pressure. The tubes were also much enlarged and congested.

These diseased appendages were removed and the uterus sutured to the anterior abdominal peritoneum by one silkworm gut suture. Hysterorrhaphy. The wound was closed in the usual way. Cases of this kind are exceedingly common. They occur in women who have to do more or less hard work. After bearing one child they do not remain at rest long enough to allow the sexual organs to become involuted, consequently the uterus remains enlarged, heavy and prolapsed. The ovaries and tubes, which also undergo much enlargement during pregnancy, have their process of involution checked and

remain heavy, chronically inflamed and exceedingly painful to pressure. It can therefore be easily understood that so long as the primarily diseased organs remain, there will be no relief from suffering to the patient. This patient was 29 days in the hospital, made a good recovery and was free from pain on being discharged.

CASE A. M.—Age 33, married. Complains of pain and tenderness in the left iliac region. Metrorrhagia. Great general prostration and chronic invalidism. Has had office treatment for years without benefit and has now expressed a desire to submit to operation, which she obstinately refused to undergo in the past.

Examination.—Abdomen slightly distended; marked superficial tenderness in suprapubic, iliac and lumbar regions; uterus bulky, tender and retroposed; cervix bilaterally lacerated.

Operation.—Right ovary densely adherent to, and buried in, the posterior face of the broad ligament. It was found to be dilated into one large blood cyst. The tube was occluded and chronically inflamed, a condition known as pachysalpingitis, containing cheesy matter. The mesosalpinx was filled with numerous blood cysts. The left ovary was also densely adherent to the wall of the pelvis and was one mass of blood cysts. There was also a large cyst in the parovarium containing clear fluid. In this case the adhesions were separated, the diseased parts removed and hysterorrhaphy performed. No drainage. Time of operation forty minutes. Discharged on the twenty-eighth day free from pain.

CASE M. G.—Married; no children. She came into hospital three weeks ago complaining of constant bearing down pain in the pelvis and sacral neuralgia. She suffers severe dysmenorrhœa, completely prostrating her and necessitating absolute rest in bed during the whole time of the menstrual flow. She has constant headache and alarming attacks of vertigo.

Examination.—Cervix elongated and eroded. There were masses of inflammatory exudation felt in Douglas' pouch. The uterus was retroverted and fixed. There was much pain evinced on an endeavour to move the uterus, and general tenderness throughout the whole of the true pelvis. Symptoms of this character are strong evidence of chronic inflammation of the uterus and appendages. This gives rise to fixations from peritoneal adhesions.

Operation.—When the cavity was opened I found the right ovary and tube low down and firmly fixed in the wall of the pelvis by strong membranous adhesions. These had to be carefully divided with scissors and the tube and ovary lifted to the surface. The left tube and ovary were situated in very much the same position in the left

side of Douglas' pouch. They were adherent to the posterior wall of the uterus by firm membranous bands. On separating these adhesions and bringing the parts to the surface, the bleeding cavity left in the bottom of the pelvis was somewhat extensive and gave rise to a very profuse and somewhat alarming hæmorrhage. This was, however, rapidly controlled by three deep sutures of catgut passed through the gaping edges of the torn broad ligament. The cavity was then packed with sterilised gauze, the operation finished, and the cavity closed, leaving the end of the gauze outside. This gauze packing was removed in forty-six hours. The patient made a good recovery; the gauze track closed perfectly.

In regard to this latter procedure, I would say that it is a most difficult thing to place gauze strips in such a way that the hæmorrhage will be controlled. The gauze must be absolutely aseptic and made in the shape of long finger bags, varying in length from twenty inches to three yards. It must be prepared by yourself or a responsible nurse under your direction; otherwise you may lose your patient by the slightest imperfection. The packing must also be arranged in such a manner that the coils of the intestines will not fold over it and be caught and injured during its withdrawal. The method recommended as Mikulicz is not easily applied and does not fill all the necessary requirements. The opening it leaves in the abdominal wall is altogether too large and coils of intestines and portions of omentum are likely to be withdrawn with it. There is also great liability to hernia occurring at the lower angle of the wound following its use. The best method consists in packing the oozing cavity with several thin strips of hemmed gauze, bringing their ends out of the lower angle of the wound. These ends are marked 1, 2, 3, and so on, according to their position in the pelvis so that they can be withdrawn in the reversed order to that in which they were originally inserted. I sometimes use a small sterile rubber tube between the packing and the posterior face of the uterus. This combination is much used in Germany, and in my experience makes the most successful abdominal drainage. It can be left undisturbed for eight or ten days, if necessary. I have left gauze in the cavity for thirty days without infection or any disturbance whatever to the patient. Cultures are made at each dressing, and in clean cases (free from pus) I have not known a growth to have been obtained.

CASE E. D.—Twenty-five years of age. Entered hospital 1st June, 1897. Married, no children, no miscarriages. Leucorrhœal discharge. Menses began at ten years of age, regularly recurring every three weeks; duration eight days; flow very profuse; dysmenorrhœa, pain

in side and back ; bowels constipated. No sugar or albumen ; amorphous urates in large quantities. Uterus enlarged, tender, strongly anteflexed and bound down by adhesions, solidly in the pelvis.

Operation, June 25th.—A quantity of clear fluid escaped from the peritoneal cavity on first incision and a tumour was felt. This was found to be bound down by firm adhesions. The left tube was found to be greatly distended, measuring 2 cm. in diameter ; broad ligament greatly thickened and ovary was enlarged to the size of a Florida orange. All these parts were adherent to the intestines and posterior wall of the pelvis. Adhesions were separated, but ovarian tumour had to be enucleated by splitting the capsule which was found by the broad ligament. During this portion of the operation pus escaped through rupture of the abscess. The ovary and tube were tied off, with catgut and removed. The tear in the broad ligament was repaired by a whipstitch suture, No. 3 gut. The right ovary and tube were found in a similarly diseased condition and removed. During the separation of the adhesions some portions of the peritoneal covering of the intestines were stripped off. These were carefully drawn together and whipstitched with a No. 2 catgut to prevent the weakened portion of the bowel giving rise to internal hernia. On completing the peritoneal toilet a glass drainage tube was introduced, and the peritoneal cavity closed. There was no oozing whatever. June 26th, the glass tube removed and its place taken by one of rubber, which was gradually removed by daily shortening. The patient made a good recovery and left hospital in four weeks.

CASE F. G.—Unmarried. Entered hospital July 11th. Complained of pain in the abdomen ; leucorrhœal discharge for the last fourteen months. June 22nd last, patient was seized with sudden abdominal pain ; about two weeks afterwards pain returned and similar seizure took place, which continued severe from this out until her admission into hospital. Menstruated regularly every four weeks, but lately the flow appeared every three weeks with great pain ; duration four days, quantity profuse ; bowels constipated, urine normal, hæmic cardiac murmur and no hypertrophy.

Operation—Omentum and intestines were found adherent to the anterior abdominal wall. Everything was found adherent. A large mass of adhesion was found in the pelvis, composed of uterus, ovaries and fallopian tubes. On separating these parts considerable hæmorrhage took place ; the left ovary and tube were found to be injured. The adhesions were old and separated with difficulty. These appendages were ligatured and removed ; the same condition was found on the other side and was treated in the same way. This condition was

found to be a large tubo-ovarian abscess on each side. Some pus escaped into the cavity on division of the pedicles. The toilet of the peritoneum being completed, oozing still continued, therefore the pelvis was packed with about three yards of gauze. A rubber drainage tube was inserted alongside the pack, and the cavity closed in the usual way. The patient complained of very little pain during the following days. The gauze and tube were removed on the tenth day, the tube being re-inserted and fresh dressing applied. No growth could be obtained from gauze pack. This patient has done remarkably well; is about to leave the hospital the fourth week following the operation.

[The above cases were reported by the late Dr. Alloway shortly before his death, and it was his intention to have continued the series. He was unable to revise the proof, so any inaccuracies in the report must not be laid to his account. Editor.]

RETROSPECT

OF

CURRENT LITERATURE.

Obstetrics and Diseases of Infants.

UNDER THE CHARGE OF J. C. CAMERON.

Submammary Infusions of Salt Solution.

CLARK, J. G. "Submammary infusions of salt solution in primary anæmia from hæmorrhage, in shock, and in septic infection."—*American Journal of Obstetrics*, June, 1897.

Dr. Clark read a paper in December last before the Gynæcological and Obstetrical Society of Baltimore, in which he described the use of Dr. Edebohl's submammary infusions in the Johns Hopkins Hospital. He quotes from a recent editorial in the *Medical News* reviewing the work of Claisse (*Revue de Chirurgie*, 1895), and Bosc (*La Presse Médicale*, 1895), as follows:—"Take a patient suffering from severe infection, puerperal for instance; all the organs are affected and are working badly, the temperature is about 104° F.; in ten minutes 1,300 to 1,400 grammes of a saline solution are injected subcutaneously. Before half of that amount has been reached, the improvement is manifest. The pulse becomes more regular, fuller and stronger, respiration is deeper and less hurried, and possibly the temperature falls a degree at the end of the injection." "The patient feels better, is brighter and possibly desires to urinate, but not to any great amount. Usually the patient now enters what is known as the critical stage, which comes on generally in four or five minutes, though it may be delayed to half an hour. There is a violent chill with sensations of extreme cold, strong rapid pulse, and a rapidly rising temperature." Following this comes a fevered stage, then the temperature falls and there may be no more bad symptoms. The whole question is reviewed in the *British Medical Journal*, July, 1896. Dr. Clark reports a case of severe puerperal septicæmia in which a litre of saline infusion was injected daily for seven days, a marked improvement in the pulse being noticed after each injection. The patient felt more comfortable after the first injection. She began to improve

at once and finally recovered. The apparatus is simple and the method much easier and safer than radial infusion. In 41 of the last 225 cases of abdominal section in Dr. Kelly's wards, submammary infusion has been used as a stimulant, no patient having been allowed to suffer from symptoms of depression or shock without its employment. In none of these cases did cellulitis occur. Graduated glass jars of 1000 c. cm. capacity are used as reservoirs for the solution (0.6 per cent.) Fitted to the reservoir is a piece of rubber tubing (5 ft.) to which a long slender aspirating needle (2 m.m. in diameter) is attached. The breast is thoroughly disinfected, especially its dependent area. It is then lifted well up from the thorax and the needle with fluid flowing from it, is thrust beneath the gland. Elevation of the reservoir generally suffices to make the fluid flow into the cellular tissue, till the breast swells out or even the fluid spurts from the nipple. When the injection is made, the needle is withdrawn and the puncture closed with adhesive plaster. If the fluid does not flow freely, it may be forced in by stripping the tube. The hands and tube are well vaselined, the upper portion of the tube is pinched between thumb and finger, and the column of fluid in the tube is gently stripped downward with the fingers of the other hand. The lower portion of the tube is then pinched and the upper portion released, allowing the fluid to fill the tube once more. The process is repeated till a sufficient quantity has been injected. As much as 700 c. cm. may be injected beneath each breast. If the operation is done aseptically, no ill results should follow.

The Bacterium Coli Commune in Child-birth.

G. GEBHARD. "Ueber des Bacterium Coli Commune und seine Bedeutung in der Geburtshülfe."—*Zeitschrift f. Geb. und Gynaekologie*. Bd. XXXVII. Heft. 1.

For some years bacteriologists have been working to determine what micro-organisms are capable of causing gas formation in the human body. Krönig, Schnell, Wendeler and Göbel, partly by laboratory experiments and partly by clinical investigations, have sought to prove that the bacillus coli commune does not play a prominent rôle in the production of *tympania uteri*. Gebhard, in his early investigations, was surprised at the constant presence of the bacillus coli commune on the external surface of the newborn in these cases, and from his later observations has been led to the conclusion that this bacillus is the cause of *tympania uteri* in a considerable proportion of cases. Any gas forming bacillus or coccus finding its way into the uterine cavity may produce tympany; but it is so easy for

the bacillus coli commune to pass from the anus into the vagina and thence into the uterus, or to be carried thither by the examining finger, that it is quite reasonable to presume that it may be the causal agent in many cases. Gebhard examined 25 cases of *tympania uteri*, and demonstrated the presence of the bacillus coli commune in 18 cases. He shows the incorrectness of Schnell's statement that the liquor amnii contains no substance from which the bacillus coli commune can form gas. His conclusions are that in *tympania uteri* the bacillus coli commune is an important etiological factor, but that in general putrid infection the anaërobic germs play a more important part.

The Ripening of Graafian Follicles During Pregnancy.

G. COSENTINO. "Zur Frage über die Entwicklung und die Reifung des Graaf'schen Follikels während der Schwangerschaft."—*Monatsschrift für Geburtshülfe und Gynakologie*. Band V. Ergänzungsheft.

It has long been a matter of dispute whether ovulation continues normally during the course of pregnancy, or whether it is then modified or interrupted. Most observers agree that the function of the ovary continues, but hitherto have been unable to affirm that such ovulation is complete, because up to the present time not a single case has been observed where a ripe follicle has burst and discharged a mature ovum during pregnancy. Professor Cosentino, of Catania, has recently had an opportunity to examine the ovaries of a woman six months pregnant who died suddenly of heart failure. The microscopical preparation showed many follicles in different phases of development, and one which had ripened, burst and discharged an ovum. This ruptured follicle was nearly round in form, 15 m.m. in diameter, with indented borders, richly supplied with a network of arteries and veins. In a mass of granular follicular detritus close by, was a ripe ovum with all its elements. This case furnishes the long sought for proof that the ovaries may continue their functional activity during pregnancy, that Graafian follicles may ripen and discharge fully developed ova.

Breech Presentations with Extension of the Limbs.

BLOCC, (Paris). "Étude statistique sur le presentation du siège décomplété, mode des fesses."

DEMELIN. "Observation de dystocie par presentation du siège décomplété, mode des fesses."—*L'Obstétrique*, Juillet, 1897, p. 332.

These two papers were read before the Obstetrical Society of France. According to Blocq, at the Clinic (rue d'Assas), in 11 years,

175 cases of breech presentation were treated; of these 135 were complete breech. Interference was found necessary in 18 cases, 6 multiparæ and 12 primiparæ. The maternal mortality was nil, the foetal mortality $7\frac{1}{2}$ per cent. In the treatment of breech presentation with extended limbs (mode des fesses), when interference is necessary, two means are available, the forceps and the fillet. The fillet is most useful in anterior positions, the forceps in posterior positions. The chief objection to the use of forceps is that the blades are apt to slip. In 1894, Tarnier proposed the use of both forceps and fillet in posterior positions, and Demelin reports a case in which he followed Tarnier's directions and saved both mother and child. The breech was fixed in the pelvis in the position S. I. L. P. (mode des fesses), and could not be brought down. A fillet was introduced, and then the axis traction forceps applied over the lower limbs: first the right blade was passed behind and to the right, then the left blade forward and to the left. The right hand made traction with the fillet, the left with the forceps. A greater amount of tractile force was used with the fillet than with the forceps, the latter being employed chiefly to correct the faulty direction. Delivery was comparatively easy. The method is certainly worthy of trial in cases of dystocia. By dividing the tractile force the fillet will be less likely to injure the thighs or fracture the femur and the forceps will be less likely to slip. Demelin maintains that by this method delivery can be effected more rapidly and with less injury to the mother.

The Treatment of Incomplete Abortion.

CH. MAYGRIER. "Traitement de l'Avortement incomplet."—*L'Obstétrique*, Juillet, 1897, p. 321.

On May 13th, 1897, M. Doléris read an interesting paper before the Obstetrical Society of Paris, on the treatment of incomplete abortion, in which he favoured operative interference as a general rule. He reported 59 cases of incomplete abortion treated in his clinic (La Pitié), of which 26 terminated spontaneously and 33 artificially. The morbidity was insignificant. While in certain cases the use of instruments, such as the curette, brush, and ovum-forceps may be of service, in his opinion the best results are obtained by clearing out the uterus with the finger (Curage). Maygrier reports 275 cases in the *Maternité de Lariboisière* since January 1st, 1895, mostly in the third and fourth month when placental retention is most frequent. Of these 176 terminated spontaneously and 99 required operative interference; 268 were discharged in good condition and 8 died, being in a hopeless condition when they entered hospital. In two cases there was trau-

matic perforation of the uterus. From his statistics he concludes that in a large proportion of cases (176 out of 275), the retention of the placenta after abortion is not accompanied by accidents, provided strict antisepsis is observed, and that the expulsion of the placenta often takes place spontaneously in a few hours. He believes that speedy intervention is apt to increase the dangers of retention and that it is wiser to wait as long as the uterus continues its expulsive efforts and there is no apparent danger. He summarises the indications for operative interference as follows :

1. Whenever retention is accompanied by accidents, such as hæmorrhage, fever, offensive lochia, or signs of infection however slight.

2. In cases of multiple placenta, the increased size of the placental mass affording a greater field for putrefactive changes which may lead rapidly to grave infection.

3. In cases where the cause of abortion is doubtful and attempts at criminal measures are suspected. In such cases infection usually occurs, since the abortionist rarely takes antiseptic precautions. It is therefore more prudent to empty the uterus without delay.

4. Always, in hospital practice at least, when the retention has lasted more than 3 or 4 days even without accident, if uterine contraction has ceased and the os and cervix have closed. A patient should never be allowed to leave hospital until it is quite certain that the uterus has been emptied.

When it is decided to clean out the uterus artificially, digital cureage is the safest method. Above everything, incomplete cureage should be avoided. It is not enough to explore the cervix and extract that portion of the placenta which may be engaged in the os; the finger should enter the uterine cavity, explore every part and empty it completely. The patient should be anæsthetized and the cervix dilated sufficiently to permit the passage of two fingers. Hegar's dilators or a Champetier de Ribes' bag, or even laminaria tents may be required for this purpose, but metal dilators should not be used, especially those with two or three blades. In exceptional cases where it is found impossible to detach fragments which are very firmly adherent, the curette may be used, but the instrument should always be guided and controlled by the finger. When the placental fragments are large, there may be some difficulty in extracting them. Ovum forceps are not necessary or desirable, as they are apt to injure the uterus. Budin's manoeuvre is generally sufficient and is preferable to the use of forceps. The uterus is compressed between two fingers introduced into the posterior vaginal cul-de-sac and the other hand compressing the anterior wall of the uterus through the abdominal parietes; the placenta is thus

pressed out of the uterine cavity quite easily. After the uterus has been emptied, a brush (*écouvillon* of Doléris or Eudin) sterilised and soaked in carbolyzed glycerine is passed into the uterus and made to sweep off any remaining shreds or fragments of placental tissue and membranes; at the same time it cauterises and disinfects the internal surface of the uterine walls. Finally the uterine cavity is irrigated and an intrauterine and vaginal tampon of iodoform gauze is introduced. If a curette is used, great care should be taken to avoid perforating or otherwise injuring the softened and thinned uterine walls. Even in skilful hands, serious accidents have occurred. The curette should be large and should not be introduced until the os has been well dilated, and it should be always guided and controlled by the finger. Ovum forceps are particularly dangerous in the treatment of incomplete abortion. Maygrier's experience leads him to rely upon digital curage when intervention is necessary, and to avoid the use of instruments as much as possible. Quinine (16 grains) has occasionally proved useful as an ecboic, and as it can do no harm, he recommends its administration when there is placental detention after accidental abortion.

The treatment of incomplete abortion may be either expectant or operative; Doléris rather favours prompt operative measures, while Maygrier follows Tarnier and interferes only when expectant treatment fails or there is evidence of impending danger. When the uterus is to be emptied artificially, both agree that digital curage is safer and better than curettage, and both limit the use of instruments as much as possible. Although their views differ somewhat, their statistics show that there is not a very wide divergence after all between their methods of treatment, and their results are excellent.

J. C. Cameron.

Reviews and Notices of Books.

Hygiene and Public Health: LOUIS C. PARKES, M.D., London.
H. K. Lewis, 1897. 5th edition.

The fact that this book has had to pass through another edition in less than two years, shows that its merits are appreciated, and makes any comment on our part unnecessary. Very trifling alterations only have been made. J.

Taylor's Manual of Medical Jurisprudence: Revised and edited by THOMAS STEVENSON, London. Twelfth American, from the twelfth English edition. Edited by Clark Bell, New York. Lea Bros. & Co., 1897. 832 pp.

The great regularity with which new editions of Taylor's Medical Jurisprudence continue to appear would be most gratifying to the departed spirit of its renowned author unless he happened to read them. We doubt if many persons who have taken the trouble to read Taylor in the original before he passed into the hands of editors, know how he has suffered in the process. An incoherent mass of new matter has been indeed added in the attempt to keep the book "well up to date," but it has not been purged of many of its errors, the legal mind being apparently considered as slow to reject error as it is to accept truth.

The book in its present form is undoubtedly very useful to lawyers or others who want to find statements to fit any view of a case which it may be necessary to maintain, but as a practical guide to medico-legal work it is rather too vague and non-committal. The following masterly summary contains all the information vouchsafed on the subject of chlorate of potassium: "Given in large doses it acts as a poison, producing severe vomiting, profuse purging, intense difficulty in breathing, lividity of the countenance, and profound depression of the heart's action. After death the blood is found of a chocolate colour, its pigment *having been destroyed*." Again, though over twenty pages are devoted to the discussion of the toxic results of the various carbonic gases, the following is all that is stated concerning the spectroscopic condition of the blood: "It is a remarkable fact that with the bright red colour of the blood seen in this form of poisoning, two absorption bands similar to those of oxy-hæmoglobin appear, and nearly in the same situation. They are, however, more refrangible than these, and are more in the greenish-yellow rays. A reducing agent does not affect these bands as it does those of oxidised blood. Hence, (!) if the person breathes only for a

short time, the carbonic oxide is expelled. In poisoning by coal gas carbonic oxide appears to be *sometimes* the cause of death." To offset this, three whole pages are taken up in discussing the legal aspects of the Maybrick case.

It is stated that no distinctive chemical test exists for semen. Also that the lungs of still-born children tend spontaneously to undergo gaseous putrefaction, no mention being made of recent proofs to the contrary. Even the X-rays do not appear to have been able to penetrate into this new edition, although they have constantly been used in courts during the past two years.

A good deal of the recent valuable work of J. N. Hall, of Denver, has been incorporated into the sections on gun-shot wounds. The chapter on blood stains has been enriched by some good, but diagrammatic microphotographs. The legal references inserted by Mr. Bell are really valuable, and one only wishes they were collected and classified in a chapter by themselves or as a separate volume instead of being scattered at random through the book.

A chapter on "Medico-legal Surgery" has been added. This consists mainly of lists of the officers of various American Railway Association Surgeons, (none of whom happen to be known as medico-legal authorities on any particular subject) together with a list of the titles of the papers read at last year's meeting of one of these societies, and forms a fitting anti-climax.

"Taylor" still remains a useful work of reference, but it is now too inaccurate to be a sound authority or a good text-book. To be really modernized it would practically have to be re-written. J.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

Stated Meeting, April 23rd, 1897.

GEORGE WILKINS, M.D., PRESIDENT IN THE CHAIR.

Abscess of the Pelvis.

Dr. F. J. SHEPHERD exhibited the pelvis of a male dissecting room subject, half of which was shown as a dry and half as a moist preparation.

There were sinuses in the lumbar, sacro-iliac and gluteal regions, and in the thigh and groin of both sides. The pelvis and sacral regions were filled with pus. On examination, the specimen showed beautifully how the disease was bilateral and what a small amount of original disease there was. The original disease was altogether confined to the intra-vertebral substance between the 4th and 5th lumbar vertebræ, and an abscess cavity was found here which had spread laterally down each psoas muscle and also down the sarcum into the pelvis. There was no spinal deformity whatever. The dry specimen showed new bone throughout about the lower lumbar vertebrae and the sacrum but no sacro-iliac disease. The moist preparation beautifully demonstrated psoas, pre-sacral, and lumbar abscesses, all proceeding from the original disease between the 4th and 5th lumbar vertebrae. Dr. Shepherd said this case explained one of the puzzles met with in surgical wards, where sacro-iliac disease was suspected and abscesses were found on both sides. In the present case the disease could only be searched for in front.

Subacute Lukæmia.

Dr. J. G. ADAMI showed the organs and described the post-mortem appearances in a case of this disease.

Polydactylism.

Dr. SHEPHERD exhibited skiagraphs of a case of supernumerary fingers and toes in a girl æt 17. He found the skiagraphs most useful in operating, and by them he was enabled to have a much more useful hand than he otherwise could. In both hands was a prepollex and in both feet a prehallux. In the feet there was also on each foot

a post-minimus, the post-minimus in the hands had been removed in infancy. There was no history of any such deformity in the family.

An Alleged Case of Uterine Air Embolism.

Dr. WYATT JOHNSTON related a case in which he had acted as expert for the defence in a recent murder trial, where the victim died suddenly, pregnant at the 4th month, and bore marks of attempted instrumental abortion. The cause of death alleged was as above, the air being assumed to have entered the sinus left open at a partial detachment of the placenta, but the autopsy was performed in an unskilful manner, the pelvic organs having first been removed and dissected before the chest was opened. On opening the chest the heart was ligatured and on opening it after removal sufficient air to give a distinct puff, audible to three medical witnesses, was noticed on puncturing the left ventricle. No air was noticed in the right heart, and none was observed in the uterine pelvic veins or vena cava or the veins elsewhere in the body, though the examination in this respect was incomplete, and the whole autopsy was done in so slovenly a manner that the brain, lungs, intestines and liver were not removed and none of the important vessels were slit open. The brain, lung and liver were described as being pale, and the heart free from blood or clot. As air embolism shows a distension of the right heart and veins with air and little or no air in the left, Dr. Johnston maintained that if only in the left heart, the air obviously must have entered the heart post-mortem. The removal of the heart before the air was looked for afforded it the necessary opportunity to enter from the outside while the vessels were being tied off, and the evidence stated that a long narrow bladed knife had been plunged vertically down in opening the thorax, possibly cutting the carotid or innominate artery. Dr. Johnston had found that the heart when empty can be made to behave like a bellows, and that air can be forced in and out at will by holding the organ in a certain manner. If the heart is compressed between the finger and thumb, in the plane of the septum the ventricles are bound to assume a spherical form and air enters in sufficient quantity to give a distinct puff when held in the hand and punctured. When the heart is compressed perpendicularly to the plane of the septum air was always squeezed out. This depends on the physical law that if the circumferences are equal, circles and spheres enclose more space than ovals. This fact was demonstrated to the meeting by means of a calf's heart. In the case under consideration there was no record of any defect of the septum or patency of the transverse ovals.

The jury had returned a verdict of acquittal.

Stated Meeting, May 7th, 1897.

WESLEY MILLS, M.D., IN THE CHAIR.

Cerebro-spinal Meningitis Complicating Pneumonia.

Dr. A. D. BLACKADER reported this case and Dr. WYATT JOHNSTON exhibited the pathological specimens.

Dr. W. F. HAMILTON asked if the enlargement of the spleen was associated with softening.

Dr. WYATT JOHNSTON, in reply, stated that the spleen was very rarely enlarged in pneumonia due to pneumococci, but when due to streptococci enlargement was the rule.

Dr. MILLS pointed out that the failure of the respiration prior to the heart was suggestive. The relation between the cardiac, respiratory and vaso-motor centres was very close, and as the tendency in pneumonia was to watch the heart, one might take an erroneous view of the cause of death.

Bronchiectasis.

Dr. F. G. FINLEY reported this case of which Dr. WYATT JOHNSTON exhibited the pathological specimens.

The Value of Modified Milk in Infant Feeding.

Dr. D. J. EVANS read the paper. (See page 350 of the October number.)

Dr. A. D. BLACKADER congratulated Dr. Evans on the excellent *resumé* of the facts which he had given, but he was disappointed that in the paper Dr. Evans had presented no statistics of his own, although this modified milk had been employed in the Foundling Home for more than a year. Unquestionably this modification of cows' milk was the only scientific method for the artificial feeding of infants, and in his opinion it certainly was the duty of every physician to master the general principles on which its successful employment depended. Once acquired they were afterwards easily carried in the memory. He was glad to hear the use of only a small proportion of the proteids recommended. Unquestionably there was a very distinct difference in digestibility between the proteids of cows' milk and those of human milk, the latter being much the more soluble. This was a factor that could not afford to be disregarded. In his experience, in many cases of disturbed digestion in infants the proteids were the source of trouble, and in young infants it was often necessary to reduce the percentage of them very much, even so low as 50 or 60 per cent. Even with all the advantages supplied by the modified milk, we did occasionally meet with infants in whom even this small proportion of the proteids seemed to make trouble, the infants still passing curds, which

immediately disappeared on a suitable wet nurse being supplied. The one great objection to modified milk at present was the expense. It was the food for the rich and well-to-do, not for the poor. Dr. Blackader had for some time past advocated the establishing in various parts of the city depots for the supply of proper pasteurized milk or cream of known strength suitable for home modification. He was convinced that such could be supplied in jars at reasonable expense, and mothers be taught to do the necessary mixing themselves.

Dr. J. C. CAMERON agreed with Dr. Blackader in his remark that this milk was for the rich and not for the poor. He thought the whole profession should bring this matter before the charitably disposed public in order that the milk might be placed within reach of the poor. He was surprised to hear that there was a sort of under-current of suspicion against modified milk as a possible source of rickets. This was not so, and Dr. Evans paper had certainly shown its value.

Dr. KENNETH CAMERON felt that one reason that modified milk was not more used was the difficulty in understanding how to prescribe it. He had found that it was not an easy matter to write a prescription that one could make up oneself if necessary. The statistics of the Montreal Foundling and Infant Nursery showed that this method of feeding was vastly superior to any other that had been tried in that institution.

Dr. G. G. CAMPBELL agreed with the previous speakers as to the value of this milk. He had found its expense the great drawback and had had considerable success in a method of home modification based upon it. He used a Florence flask fitted with a perforated rubber cork containing a chemical thermometer for Pasteurising, and obtained the necessary proportions of cream and milk by having the patients receive their supply of milk in the ordinary glass bottles and syphon off the quantity directed.

Dr. J. B. McCONNELL considered that physicians did not thoroughly understand the method of prescribing this milk. The great majority of children were overfed and advice and instruction to parents concerning the amount of food, he felt would be of more importance than determining the minute division of the constituents.

Stated Meeting, May 21st, 1897.

F. J. SHEPHERD, M.D., IN THE CHAIR

Two Cases of Myocarditis.

Dr. W. F. HAMILTON reported two cases of the above disease.

Case I. H. G., male, *æt.* 44, was admitted to the Royal Victoria

Hospital on three occasions between November 22nd, 1895, and March 13th, 1896, complaining each time of shortness of breath. The heart, though enlarged, showed no evidence of endocarditis, the limbs were œdematous, and the urine on one occasion contained a trace of albumin. Cheyne-Stokes respiration developed, but rest in bed and a vapour bath benefited him so much that he insisted on leaving hospital. Readmitted three days later with complaints as before, he showed on examination the same condition, and again had a trace of albumin but no casts in the urine which amounted to twenty fluid ounces *per diem*. Digitalis and rest again effected a marked improvement, and after sixteen days' residence he was discharged for the second time. Two and a half months later he was admitted for the third time with Cheyne-Stokes respiration and signs of cardiac failure of much more marked extent than before, cyanosis and pulmonary œdema having developed. The urine contained no albumin. A fatal attack of erysipelas occurred after twelve days in the hospital. Post mortem the heart was found enlarged (hypertrophy with dilatation) and free from endo- or pericarditis. Microscopically the heart muscle showed generalised interstitial myocarditis. The kidneys were passively congested.

Case II, W. S., male, æt 46, was admitted to the Royal Victoria Hospital on March 26th, 1896, complaining of paroxysmal attacks, pain in the chest, back and right shoulder, and "turns" of dizziness and faintness. The onset of these symptoms dated three months back, and followed "overlifting." On examination little was made out beyond slight enlargement of the heart to the left and an irregular pulse. On the fifth day of his stay in hospital he experienced one of the attacks, became pale and anxious looking, vomited once or twice, and died within a few minutes. A diagnosis of probable angina pectoris from coronary artery disease was made. At the autopsy the heart was found enlarged, and the orifice of the left coronary artery much narrowed, and patches of atheroma on the walls of the vessel. The area supplied by this artery contained patches of myomalacia—irregular, turbid and greyish in colour, and with several small hæmorrhages into the muscle. There was no endo- or pericarditis; general arterio sclerosis, but no changes in the kidneys. Dr. Hamilton emphasized the following points in discussing these cases :

1. The very great danger of making a wrong diagnosis in patients suffering from this disease.
2. The comparatively early age at which such marked changes may be found.

3. The freedom of endocardium and pericardium.
4. The influence of digitalis in one case of advanced fibrous myocarditis.
5. The possible common cause—alcohol.

Some Debatable Points in the Technique of Appendectomy.

DR. G. E. ARMSTRONG read a paper on this subject. (See page 1, the July number.)

DR. A. LAPHORN SMITH agreed with Dr. Armstrong in preferring a glass tube to gauze, for drainage purposes, advocated drainage through the flank in suitable cases. He thought the proper method of removing the appendix was to cut it off and invert the serous surfaces, as he could not believe that two mucous surfaces would unite. He had had two or three cases of faecal fistula following a simple ligature. Judging from his experience in the removal of pus-tubes, one should not only remove the appendix but also the inflammatory exudate, wash out the peritoneum and leave it dry, but in order to do this a large incision would be necessary.

DR. A. E. GARROW asked if there was any difficulty in maintaining the position of the drainage tubes. In one or two cases he had used the method of drainage through the flank with good results.

DR. J. ALEX. HUTCHISON emphasized one or two points made by Dr. Armstrong. The occurrence of secondary abscess in the pelvis should always be kept in mind, and the part carefully explored. He cited a case in which this was the cause of death after an apparent recovery after operation.

DR. F. J. SHEPHERD said it had been the custom of most surgeons lately when the abscess was found behind the cæcum, to drain through the flank, and also in all cases to search the pelvis. The question of drainage was a vexed one. Punjee silk was recommended by Dr. McCosh. The speaker thought the object of gauze was to alter the lymph current rather than to drain. He considered that Dr. Armstrong's record of four recoveries in general peritonitis was most remarkable, and asked whether he had washed out the peritoneum. Dr. McCosh, in a paper read recently at Washington, reported saving six out of eight cases of general peritonitis by turning out all the intestines, and while an assistant washed these, washing out the abdominal cavity and closing with the intestines floated in saline solution. He also injected directly into the ileum two ounces of saturated solution of magnesium sulphate, and closed the puncture with a Lembert's suture. Dr. Shepherd stated that he had never seen a case in which there was diarrhoea which had not recovered.

DR. ARMSTRONG in reply said that he had practised all the devices for removing the appendix, and found that the tying it off with cat-gut was just as satisfactory as the more complicated methods. Silk was likely to become infected, keep up the discharge, and not heal until it came away.

In answer to Dr. Garrow, he said he had had no difficulty in introducing the tube, that a soft rubber tube laid in the abdomen without causing pain or interfering with the peristalsis. He preferred this plan to drainage through the flank, as it obviated the necessity of a second cut, and answered the purpose just as well.

In answer to Dr. Shepherd, he stated that with one exception he had washed out all of these cases. The washing must be done through a tube inserted into the furthest part of the abdominal cavity, so as to secure an outward flow. The cavity could not be washed by pouring water from a pitcher.

Acute Leukæmia.

Dr. G. D. ROBINS reported this case.

Stated Meeting, June 4th, 1897.

GEO. WILKINS, M.D., PRESIDENT, IN THE CHAIR.

The Certification of Insanity.

Dr. T. J. W. BURGESS, in introducing this subject, dwelt largely on the many errors made by the general practitioner in filling up the prescribed form for the commitment of patients to asylums, errors often leading to delay in the reception of patients.

One of the mistakes most commonly made was in the case of married women, whose legal names, in this Province, were not those of their husbands, but their maiden names. In this respect, the law here, based on the Code Napoleon, differed from that in Ontario, where a women's married name was her legal name.

Another respect in which certificates were often lacking was that the *facts* on which the diagnosis of insanity was based were not stated.

Two points were to be clear in the mind of every certifying physician: 1st that the patient was really insane, and 2nd that he was a proper person to be confined in an asylum. Insanity alone did not necessarily constitute a ground for the deprivation of liberty.

The *facts* on which these opinions were based should be stated in full. Merely to say that a patient was insane, or that he had delusions or hallucinations, was not sufficient. The reasons for judging him insane and the nature of the delusions or hallucinations must

be stated, as also any insane conduct on the part of the patient, and the reason for placing him in confinement, viz., that he was or might be dangerous to himself or others, or that he might be benefited by hospital treatment. As an example of a certificate sent him, and one which he had been obliged to refuse, Dr. Burgess instanced a case in which the only information given was, "patient tells lies." Here the patient truly did tell lies, but they were insane lies, in other words delusions, and this fact, with the nature of the false assertions, could just as easily have been stated in the first certificate furnished, had the doctor chosen to exercise a little care, as in the second, which he was obliged to supply ere his patient could be received.

As all forms required for the admission of lunatics to asylums are statutory, any mistakes such as the foregoing, and others instanced made therein, rendered them null and void, and physicians should not feel offended if asylum officials refused to receive papers not properly filled, as by so doing they would render themselves liable to severe penalties.

Dr. VILLENEUVE continuing the subject said that the full bearing of the registration of the insane may be best understood by citing the articles of the revised statutes of the Province of Quebec pertaining thereto. The insane for the purpose of registration are divided into two classes, viz.: 1st *Private patients*; under this heading come the insane, idiots and imbeciles, who can pay for their own maintenance, treatment, etc., either by themselves, their tutors, curators or persons bound in law to support them; 2nd *Public patients*, those who must be supported by the public. The law places no legal restriction on the admission of private patients; article 3188 simply says that the proprietors may receive insane persons, idiots or imbeciles.

With regard to the medical certificate referred to in the case of private patients, article 3189 says: "The persons above mentioned cannot be admitted, unless the proprietors of the asylum are furnished with an application according to form A., and a medical certificate according to forms B. and C., signed by two medical men, who are neither partners, nor brothers, nor in the relation of father and son to each other, to the proprietors of the asylum or to the patient, and who have each separately and personally, examined the patient before the application for his entry into the asylum. The forms A. B. and C., must be attested under oath."

The following article, 3190, enacts that the physicians who sign the medical certificate (forms B and C) must state precisely the facts resulting from their own observations and the information received from any other persons, on which they have based their opinion that such a person is insane.

Proceedings for the admission of *public patients* are a little more complicated; article 3195, covers the case and enacts as follows: "The following persons may be admitted to lunatic asylums at the charges of the government, and of municipalities, of incorporated cities, or towns, or of counties:

1. Insane who have not themselves or through some persons bound in law to provide and care for them, the means of paying, in whole or in part, the expense of their custody, maintenance and treatment, in one of such asylums;

2. Idiots or imbecile persons, when they are dangerous, a source of scandal, subject to epileptic fits or afflicted with any monstrous deformity, and are unable, wholly or in part, to pay their custody, board, maintenance and treatment therein. In the case of a public patient, two points must be made out: 1st That the patient comes within the meaning of the law which unlike for private patients restricts the admission of public patients to stated cases; 2nd That he must be supported by the public. This latter point is borne out by certificates signed, on statutory forms, by the clergyman, and the mayor, and secretary-treasurer of the municipality to which the patient belongs, (forms D E and K respectively, vide article 3195a)."

According to the same article 3195a, the medical certificate is made according to forms B and C., by one physician only, testifying as to the mental condition of the patient, indicating the particulars of his disease, the necessity of his being treated in an insane asylum, and of his being there detained.

In the case of idiocy or imbecility, the physician shall further declare whether the patient comes under the category of idiots or imbecile persons, who may be admitted to or detained in an asylum, and shall specially indicate the reasons upon which he bases his opinion. Such certificate cannot be received, if the physician who signs the same is related or allied to the third degree inclusively, to the proprietors of the asylum, or to the person applying for the admission, or to the insane person. The physician must be one who habitually practices his profession.

If the applicant is unable to write, form A must be sworn to before the mayor or a justice of the peace of the domicile of the patient. The medical certificate (forms B and C), clergyman's (form D) and secretary-treasurer's (form K), must be sworn to before a justice of the peace, a commissioner of the superior court, who may act as such for all the certificates in the same brief, but who must not have signed any of the certificates either as physician, mayor, secretary-treasurer,

or as applicant, as these persons are debarred by the law from acting as justice of the peace or commissioner of the superior court.

Also the same person must not sign two of the forms herein above mentioned, forms B and C, which constitute the medical, excepted.

All the certificates are null if they have been prepared more than twenty days before being sent to the medical superintendent.

All the certificates must be filled up on statutory forms which are supplied by the medical superintendents on demand. After they have been all prepared they must be returned to the medical superintendent for approval and permit to transfer the patient to the asylum.

Dr. J. B. McCONNELL felt that the diagnosis of insanity was of greater importance than the subject under discussion. He felt that in all cases one should have the advice of an expert. People who were only feeble and weak were often declared insane on the evidence of a friend.

Dr. T. GLOVER LYON, of London, England, could not understand the difficulties in filling out the certificates complained of by the first speaker. He agreed with Dr. McConnell that the real difficulty lay in the diagnosis.

Dr. H. A. LAFLEUR drew attention to the fact that in this province imbeciles could not be admitted to an asylum unless they showed dangerous symptoms.

Dr. F. BULLER thought the information received was exceedingly practical and valuable, and pointed out several difficulties he had met with in complying with the legal forms.

Dr. WESLEY MILLS hoped that before long sufficient would be known of the nature and cause of insanity to render the diagnosis more easy.

Drs. D. J. Evans, A. L. Smith, W. F. Hamilton and C. F. Martin asked some questions regarding specific cases, which were replied to by Dr. Burgess.

Dr. J. C. CAMERON could not see why the physician should be required to give a definite opinion in doubtful cases, and by so doing expose himself to an action for damages. He advocated having a place of detention, where, before being committed to the asylum, patients could be observed, and the question of their sanity or insanity settled.

Stated Meeting, June 18th, 1897.

GEO. WILKINS, M.D., PRESIDENT, IN THE CHAIR.

Sporadic Cretinism.

Dr. E. J. SEMPLE showed a case of this disease. (Will be published later.)

Aneurysm of the Subclavian Artery.

DR. C. F. MARTIN exhibited an enormous aneurysm of the left subclavian artery, and gave some notes of the history and autopsy which were briefly as follows :

The patient, who had entered Dr. James Stewart's ward in the Royal Victoria Hospital, June, 1896, was a man of 54 years, a laborer by occupation, and born in England. He had always been accustomed to heavy manual labor, was fairly moderate in the use of alcohol, and had never acquired any venereal disease. His health had been good up to two years before death, when for the first time there appeared some pain in the left shoulder, running occasionally down the arm and up to the back of the neck. It was at first regarded as rheumatism, but soon the pain became more severe, the lower part of the neck became swollen, and so also the left arm, which grew distinctly weaker and colder than the right. These symptoms all gradually increased, and the pain was so severe and persistent as to cause insomnia.

Physical examination on admission showed a rounded prominence in region of clavicle, from the insertion of sterno-mastoid to the junction of the middle and the outer third of clavicle, pulsating and giving a systolic bruit on auscultation. Dulness on percussion was manifest over the tumour, and naturally over the apex of the left lung to the first interspace. P. 72. The right pulse was full, regular and collapsing in character, with capillary pulsation visible in the finger nails. The left radial pulse could just be felt indistinctly. No pulse could be obtained in the left temporal or facial arteries. There was marked general arterio-sclerosis. The heart was enlarged to the left and right, and the sounds were best heard in the fifth interspace within the nipple line. There was a faint, soft systolic murmur at the apex, and a soft, short, diastolic murmur. At the base, double murmurs were detected at both orifices and traced down the right border of the sternum. The left pupil was smaller and less sensitive to light than the right, while the left vocal cord was paralysed. During the patient's prolonged sojourn in the hospital the condition progressively increased, except during a few weeks when it was thought the administration of potassium iodide in doses of 15 grains three times daily was having a beneficial effect. Soon, however, the pulsative tumour grew larger, the clavicle became distinctly eroded, and the swelling of the arm very much more marked. The skin latterly became discoloured, and the extension of the aneurysm seemed to threaten external rupture, so thin was its outer and upper covering. On August 24th the swelling measured $9\frac{1}{2} \times 9$ in. Dyspnoea, pain, swelling and weakness rapidly

increased during the last month, and the patient died on December 12th suddenly, the aneurysm not having yet ruptured.

The autopsy showed that there was much emaciation. The pupils were equally contracted. The left shoulder measured in girth 53 c.m. as opposed to 41 c.m. on the right side. The skin over it was bluish-red and parchmented. On examination the swelling was seen to be due to a large aneurysm commencing from the left subclavian artery, which showed already a dilatation at its origin 4 c.m. in diameter. Immediately after, the aneurysm spread out abruptly into a large sac, in which could be felt the eroded first rib, still attached to the sternum, but with its vertebral end splintered. The clavicle was bared of periosteum for two-thirds its length, and the articulation eroded and ragged, while the acromial end was splintered and fragmented. The acromion process itself was likewise bared of periosteum. The glenoid cavity was normal, as also the head of the humerus. In addition to these bony changes there was erosion of the second rib and the bodies of the first and second dorsal vertebræ. These contained, besides loose pieces of bone, some firm and loose clots. The wall was of varying thickness, the thinnest immediately over the shoulder. The aneurysm had markedly atheromatous walls in front, but behind it seemed to have dissected into the surrounding prevertebral tissues for some distance, as no definite wall could be detected. The aorta itself was dilated in the ascending portion, though not so much as the descending thoracic division, which measured 12 c.m. in circumference, though by the time the celiac axis was reached its calibre was of normal proportions. Calcified plates existed throughout its whole length. The branches had features of some interest. The opening of the innominate artery was distinctly dilated, that of the left common carotid quite obliterated. On tracing up the brachial artery to the sub-clavian, it was possible to meet near their junction a dissection of the inner and median walls, where a commencing progression of the aneurysm was evident in this way. The brachial artery itself was small and thin, the radial still smaller and thinner, indeed more like a vein. In their corresponding veins there were numerous varices and thromboses, some as large as cherries. The heart was dilated and hypertrophied, and showed chronic aortic and mitral endocarditis. There were elsewhere no features of the autopsy of special interest in connection with the aneurysm.

The Pelvic Viscera in Relation to Micro-organisms in Health and in Disease.

Dr. J. C. WEBSTER read a paper with this title. (See page 91, August number.)

It was discussed by Drs. Lockhart, Smith, Martin, Evans and G. A. Brown.



Exhibit of the Apollinaris Company, Limited, London.

BRITISH MEDICAL ASSOCIATION.

30TH ANNUAL MUSEUM.

This was held in the Victoria Skating Rink and was the largest and most complete exhibition of its kind that has ever been held in connection with the British Medical Association. So large and varied was the display that to give a detailed description of it is no easy task, and yet we feel that we must make the attempt, so interesting was the result of the efforts of the exhibitors. To Dr. James Perrigo, the Chairman of the Museum Committee, and Dr. James M. Jack, the Secretary, is especial credit due for the success of the undertaking;



Exhibit of Evans & Sons Limited, Montreal, Liverpool, London, &c.

At British Medical Association Museum, Montreal Aug. 30th to Sept. 5th, 1897.

these two with their Committee brought to a successful termination a task which at first sight would seem an impossibility. Their labours consisted first of all in procuring a suitable building and arranging it for the exhibitors, then, the exhibitors had to be corresponded with, prices for space fixed and rules formulated regarding what classes of exhibits should be admitted, lastly, they issued a full and complete catalogue, a work in itself of no small difficulty. The exhibitors speak in the highest manner of the treatment which they received from the Committee, and the Committee are much pleased at the way the exhibitors fell in with the plans and assisted in the arrangements.

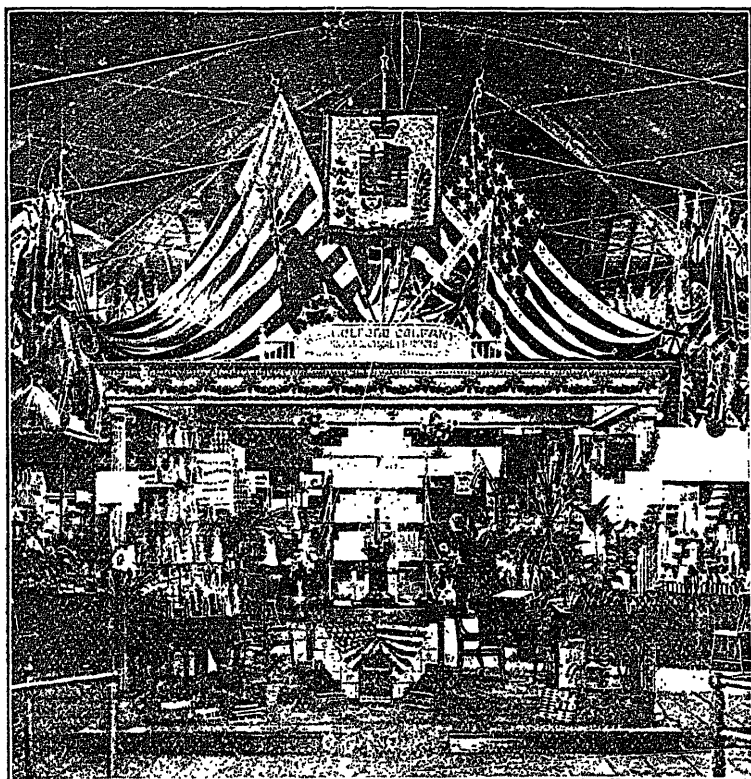


Exhibit of H. K. Mulford & Co., Philadelphia.

At British Medical Association Museum, Montreal, Aug. 30th to Sept. 5th, 1897.

The Skating Rink was transformed for the occasion and, filled with exhibits as it was, it gave a good idea as to what a medical fairyland would be. The exhibits were most tastefully arranged, no expense or trouble having been spared to make them attractive.

On entering the Rink by the Drummond Street Entrance one naturally strolled down the centre aisle, when straight in front, under a canopy supported by Corinthian pillars, was the exhibit of The H. K. Mulford Co. Their specialty is the preparation of the various serums so much in use now, especially the diphtheria antitoxin. They also show a full line of compressed tablets. Their antitoxin syringes are designed for the administration of the serum preparations and are so constructed as to permit of thorough sterilisation of both the case and syringe.

But on either side of the centre aisle are exhibits which cannot be overlooked. Just inside the door on the one side the firm of Kerry,

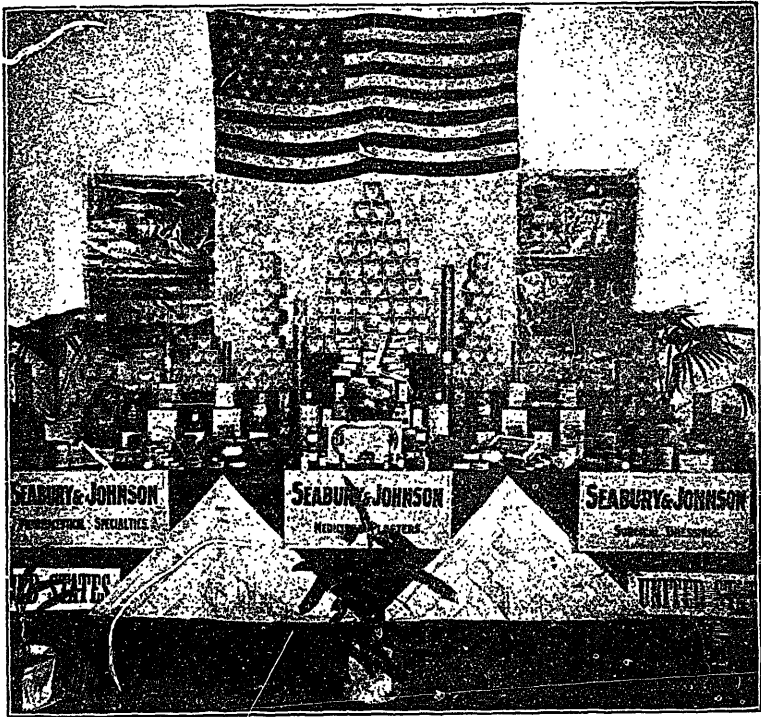


Exhibit of Seabury & Johnson, New York, Surgical Dressings and Plasters.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

Watson & Co., show a full line of their manufactures ; Their tinctures which are made in accordance with the requirements of the pharmacopœia, the well-known Cardinal Food for infants and invalids, and their fluid extracts and elixirs. While on the other side the Pabst Brewing Co., of Milwaukee exhibited their well-known Liquid Malt Extract. Close by we see the aerated waters of Chas. Gurd & Co., a long list, including all the well-known aerated beverages and medicated waters. They are also the agents for the Caledonia Springs, the waters of which are so justly famed in the treatment of rheumatism and kindred affections. A large and attractive exhibit is that of Down Bros. of London, Eng., the brightly polished instruments of all sorts catching the eye and retaining the interest. Their aseptic surgical instruments are from new and original models and they show cases of instruments suitable for all departments of surgery ; their aseptic furniture for the ward and the operating room is well worthy of inspection as it is made from designs furnished by the best men in



Exhibit of Andreas Saxlehner, Budapest, Hungary. Hunyadi Janos, Natural Aperient Mineral Water.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

England. On the other side of the aisle, Fairchild Bros. & Foster, by means of practical demonstrations, illustrated the action and utility of the various digestive ferments and pre-digested foods. Their pancreatic extract was the first product offered to the Profession containing all the active principles of the pancreas in the form of a powder. Their exhibit comprises the whole range of digestive ferments. Beside them is the well-known and popular table water from the Radnor Mineral Springs in the Laurentian Mountain district. The water springs from a bed of Gneiss Rock and, filtering through a Potsdam formation, flows forth cold and clear. Duncan Flockhart & Co. of Edinburgh, whose agents in Canada, are R. L. Gibson, Toronto, are perhaps best known through their chloroform which is largely used throughout the world. Their Blaud Pill Capsules are made up on a novel principle so that the physician is able to prescribe in one capsule the equivalent of one, two, or three ordinary pills. Mellin's Food is the preparation shown by the Doliber-Goodale Co. of Boston: it is made of wheat, and barley malt, after the formula devised by

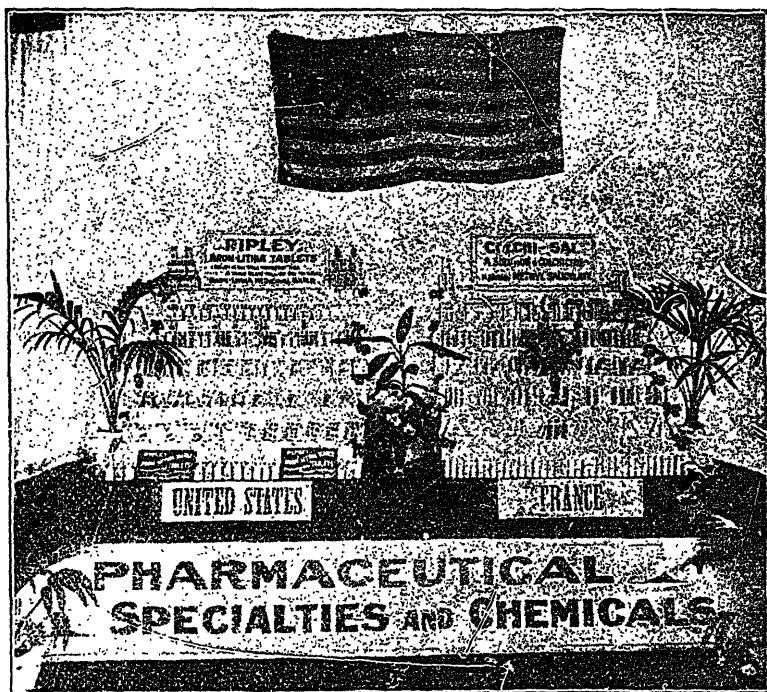


Exhibit of The Ripley Co., New York. Brom-Lithia Tablets (natural Ripley Brom-Lithia Water by evaporation) and of E. Fougere & Co., New York. Colchi-Sal, for Rheumatism and Rheumatoid affections.

Exhibited by Teeming, Miles & Co., Agents for Canada, Montreal.

Baron Liebig and is valuable for infants and invalids. It is prepared for use by dissolving it in fresh water and adding cow's milk in proper proportion.

Continuing on our way we come to the attractive exhibit of Sharpe and Dohme, of Baltimore and New York. This house of manufacturing chemists was established in 1860, or, as they would tell you in Baltimore, "before the wah, sub," and to-day their name on a preparation places its excellence and reliability beyond all question. They are represented in Canada by Hy. J. Dart & Co., of Montreal, and Mr. Dart's many friends in the medical profession had an additional pleasure in being welcomed by him with a hearty hand-shake and a genial smile. Amongst the other preparations exhibited was their Ergotole, which, used hypodermically, causes neither irritation nor abscess, and when administered by the mouth, does not produce the slightest nausea. Their Lactic Pills were very much in evidence, being contained in a huge glass jar which held enough

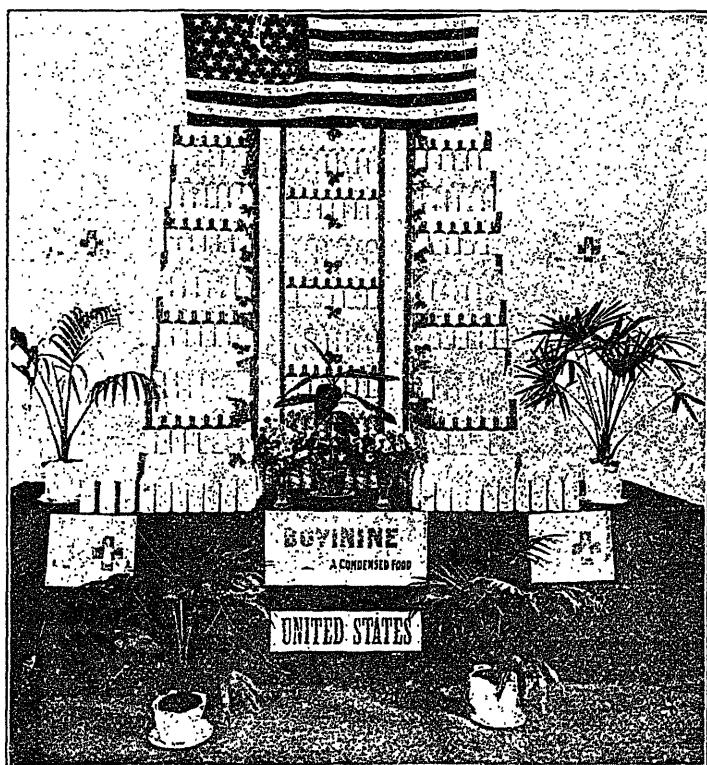


Exhibit of the Bovinine Co., New York, Bovinine a Condensed Invalids Food.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

Lapactic Pills to provide one for each man, woman and child in Montreal.

At the same table, the exhibit of Alex. Riddle and Co. attracted a good deal of attention. Their agents, Arthur P. Tippet & Co., took a very practical way of demonstrating the beauties of Stower's Lime Juice Cordial, by giving free drinks to all that applied, and they appeared to have great success in convincing people of its merits. But many longing eyes were cast towards the pyramid of bottles which occupied the next table. Here, alas, free drinks were not the order of the day. The bottles were filled with Canadian Club Whiskey distilled and bottled in bond by Hiram Walker & Sons. The Paul Paquin Laboratories of St. Louis, Mo., attracted a good deal of attention by the exhibition of cultures of a number of the more common bacteria. They showed the bacteria which caused the disease, and then exhibited their antitoxins and serums for curing the

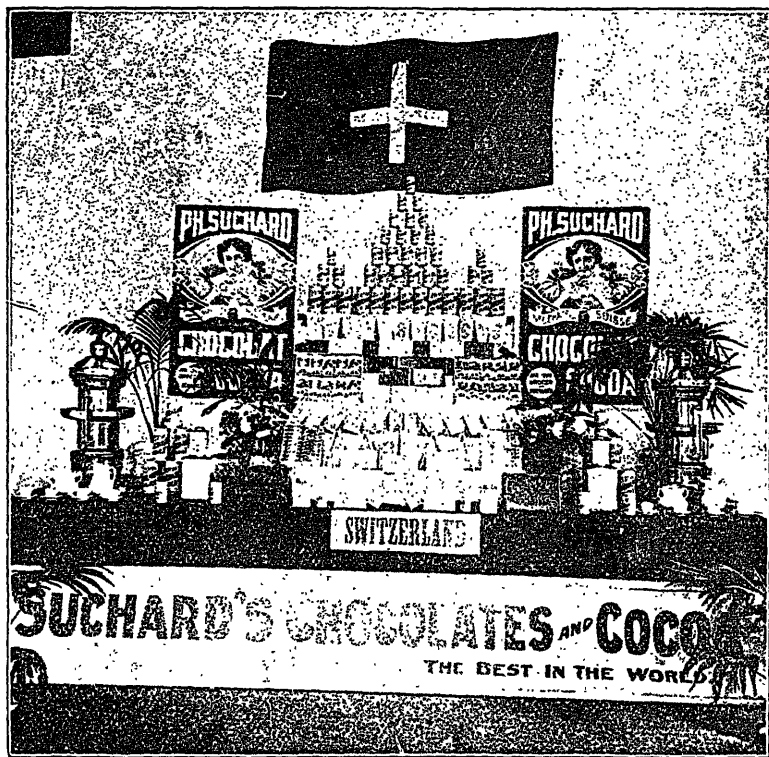


Exhibit of Russ, Suchard & Cie., Serrieres, Switzerland. Chocolate and Cocoa.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

disease, the whole forming an interesting and complete demonstration of the newer therapy.

One was inclined to linger before the space occupied by the Kny-Scheerer Co., the glitter of the instruments, the polished brass of the sterilisers and the clean white enamel of the hospital furnishings being very attractive. They showed a complete assortment of instruments, medical and surgical, of apparatus for the sterilisation of surgical dressings, of water, and of instruments, and a full line of furniture and supplies for hospitals such as operating tables, instrument and dressing tables, instrument cabinets and many other useful articles. And while always keeping the utility of the article before them, they cannot be accused of neglecting the ornamental, for all their articles are most carefully finished. As we pass on we are attracted by a most ingenious method of dispensing powdered drugs of all kinds. We refer to the Konseals which is an improved form of the old cachet. These and the Konseal Filling and Closing apparatus, is exhibited by



Exhibit of Henri Nestlé, Vevey, Switzerland, Nestlé's Milk Food and Nestlé's Condensed Milk.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

J. M. Grosvenor & Co. of Boston. The Konseals are capsules made of rice flour and possess the advantage of being perfectly soluble. By means of the apparatus provided they can be dispensed very rapidly. John Wyeth & Bro., exhibited a selection of their products under the charge of Davis & Lawrence Co., their general Canadian agents. Pills of all sorts, tablet triturates, elixirs and tinctures, a very complete and attractive line of pharmaceutical preparations.

Leeming, Miles & Co. represented a number of firms. They showed specimens of the medicinal plasters and surgical supplies of Seabury & Johnson. They also showed Marchand's peroxide of hydrogen and other oxygenated preparations. Nestlé's Milk Food also had a place here as also the new Coal Tar Product Ammonol. At the other end of this table the Apollinaris Co., showed both the Apollinaris and the Friedrichshall Waters.

The exhibit of Parke, Davis & Co., occupied considerable space and here we must spend a few moments and observe the Professor who is showing the interested observers the action of Taka-Diastase, a powerful ferment for the artificial digestion of starch. This ferment was



Exhibit of Coleman & Co., Norwich, England. Wincarnis, made from Port Wine Liebig's Extract of Meat and Extract of Malt.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

first obtained in Japan; it grows upon bran and surpasses all other preparations in its diastatic power. But there are many other things in their exhibit which claim our attention; serum preparations, digestive ferments, thyroid preparations and a full line of pills, powders and other drug preparations.

Armour & Co., show tablets prepared for nearly every organ in the body, so that it is only necessary for the physician to diagnose with certainty which organ is not doing its work and straightway a little bottle of tablets makes up for nature's deficiencies. There are also samples of their pepsins and pancreatins, as well as Armour's extract of beef.

As we turn from this table the sight of a nurse's uniform makes the physician forget his whereabouts and imagine himself back in the hospital. Gilmour Bros. & Co., exhibit the surgical dressings, plasters, etc., of Johnson & Johnson, of New York. These were in charge of a trained nurse and the visitors watched her with profound attention as



Exhibit of Société des Eaux Mineral des Contrexeville, Paris, France. Eau de Contrexeville for Gout, Gravel, etc.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

she showed them samples of Bernay's sponges, dropping them into a glass of water to show how much of this fluid they would absorb. The spectators seemed to think that there was something of the conjurer's art in the process. The same firm also showed the products of the Upjohn Pill & Granule Co., who manufacture the friable pills which they claim are more readily absorbed than are other pills, being more easily broken down and reduced to a powder. To prove their contention they gave away small pieces of pine board into which had been hammered old pills made by other manufacturers.

At the east end of the rink are the handsome cases filled with the drugs manufactured by Frederick Stearns & Co. Here we see their well-known Aromatic Cascara and their Wine of Cod Liver Oil; their Hæmoferrum both in solid and liquid form is likely to prove useful in cases where iron is indicated. But what attracts the eye more than



Exhibit of The Drevet Manufacturing Co., New York, Charles Marchand's Peroxide of Hydrogen, Glycozone and Hydrozone, Marchand's Eye Balsam.

Exhibited by Leeming, Miles, & Co., Agents for Canada, Montreal.

anything else in their exhibit is a huge glass globe filled with various coloured pills, very prettily arranged in layers and forming a unique advertisement of the uniformity of shape and superiority of finish of their manufactures.

The Laurentian Springs Water Co., who are proprietors of the Laurentian Baths in this city, exhibited the soda water and table waters which they supply. These are made from the water of the Laurentian Spring, which is an artesian well of great depth. The water contains the chlorides of sodium and potassium, the sulphate of sodium and the bicarbonates of sodium, magnesia, and lime. The Davis & Lawrence Co. had here a large exhibit of plasters, dressings, and surgical supplies prepared by J. Ellwood Lee & Co. Their anti-septic dressings are put up in an exceedingly convenient form, so that it is easy to remove small quantities without infecting the whole. At

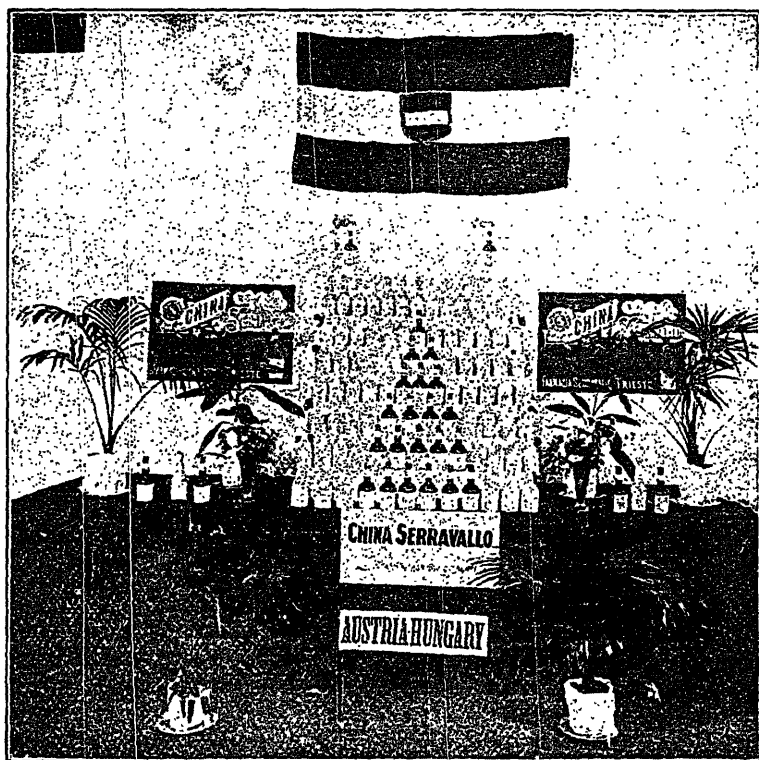


Exhibit of J. Serravallo, Trieste, Austria. China Serravello Ferruginosa. For Weak Persons and Convalescents.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

the end of this table S. Kutnow & Co. were distributing samples of their Carlsbad Powder and their anti-asthmatic powder and cigarettes. These preparations are well-known in England, but have never, heretofore, been introduced in this country to any extent.

Paterson & Foster have a very pretty exhibition of microscopes and microscopic appliances made by C. Reichert, of Vienna. The Formaldehyde generators, made by the Sanitary Construction Company, of New York, open up quite a new field in the way of disinfecting apartments, etc. By means of these generators the work can be done rapidly and much more efficiently than by the old method of burning sulphur. They also show surgical and dental instruments of all sorts as well as batteries and electrical appliances. Evans & Sons showed the preparations manufactured in their laboratories and drug mills: sugar coated pills, elixirs, fluid extracts, Savaresse's capsules (not made of gelatine but of membrane) which do not dissolve until

they have left the stomach for the intestine, and many other preparations. They also submitted samples of the Montserrat Lime Fruit Juice, which is the only kind used in the British Army and Royal Navy.

In another part of the hall the same firm exhibit the Moffatt Formaldehyde generator, which produces this gas directly from wood alcohol, and thus does the disinfecting in the most economical manner possible. Their exhibit of Hansen's rennet and junket tablets, for which they are the sole agents, was worth inspection, for here is an easy way of making junket, which is an exceedingly desirable food for invalids.

Under the gallery on this side of the Rink the Gurney-Massey Co. have placed their hot water heaters, hot air furnaces, stoves and ranges, locks and scales, plumbers' supplies, and many other articles, while directly opposite to them, under the gallery at the other side, is the exhibit of the McClary Manufacturing Co., represented by R. & W. Kerr, manufacturers of stoves, ranges, enamelled ware, and Japanned and stamped tinware. Passing along towards the front of the Rink, an exhibit, interesting to medical men, is met with. It is that of B. Ledoux & Co., of Montreal, makers of carriages. They show a number of vehicles of various sorts, both for winter and summer, which would compare favorably with those turned out from any other factory.

Keeping along under the gallery, we come across a number of ice boxes and refrigerators for the preservation of destructible articles of food. These are exhibited by Geo. W. Reed, and we notice among them several models of ice boxes which are likely to prove useful in the sick room. Further along we notice some very handsome brass and iron bedsteads, manufactured and exhibited by H. R. Ives and Co. While we are standing looking at these we overhear a lady openly expressing her admiration for one of the brass bedsteads, and the attendant kindly offered to give it to her provided she would carry it home, an offer which, strange to say, she did not seem to be particularly thankful for. The same firm also manufacture a very ingenious folding bedstead made entirely of metal, and which is intended to replace the familiar but dangerous mantle-bed. Geo. Gale & Sons also exhibited bedsteads, their speciality being the manufacture of hospital beds upon what is known as the Lawson-Tait model. The principal peculiarity of this is in the spring, which is so arranged, mechanically, that it gives the greatest amount of easy motion with the least amount of sagging,

The firm of John Burns had a full line of stoves and ranges, as well as heating apparatus of all sorts.

Schieffelin & Co. exhibited their coal tar derivatives, antiseptic soaps, and a full line of their pharmaceutical products in the shape of pills, which are of a very high grade.

The Robert Mitchell Co., of Montreal, showed a number of very artistic gas and electric light fixtures, and next to them the Alpha Rubber Co. of Montreal have a large number of specialties made out of rubber: syringes which produce an absolutely continuous flow with one bulb, atomisers, operating aprons, air pillows and rings, and a great number of other articles.

As we turn round the end of this table we come to a regular "Booksellers row." First there is P. Blakiston, Son & Co.; next to them the J. B. Lippincott Co., whose Dominion agent is Charles Roberts, of Montreal, and next again Young J. Pentland, represented by Wm. Drysdale & Co., of Montreal. Lea Brothers & Co., of Philadelphia, and J. A. Carveth & Co., of Toronto, also have a number of books on exhibition. This seems a very popular part of the exhibition to the professional visitor, judging from the number who linger here examining the books.

The American Biscuit Manufacturing Co. are the manufacturers of what they call the Samatose Biscuit for dyspeptics and convalescents. This contains 10 per cent. of samatose, which is a dry extract of meat, and the biscuits serve for both a diet and a food. Bernhard Lindman exhibited the truss of which he is the inventor and manufacturer, and an excellent appliance it is. It is designed on good principles, and rests solely on its pads, applying the force in the direction in which it will do most good. The Hot Appliances Co. of New York are the proprietors of the Geyser Hot Appliance, which is a most ingenious method of applying heat to the body for the relief of pain. It consists of a small boiler with a self-regulating lamp, a rubber coil for application to the body, and rubber feed and return pipes. The ingenuity of the arrangement is most captivating. An appliance for the relief and cure of flat foot is the Improved Instep Arch Supporter of George G. London, of Boston. It is intended to be worn inside the boot, and is likely to prove a great help in the milder forms of this malady.

Going across the hall we find still more marvels to engage our attention. John D. Duncan, of Montreal, who is a licensee for the Walker Gordon Laboratory, demonstrated their method of modifying cow's milk in order to make it more suitable for the feeding of infants. J. Stevens & Son, whose agent in Montreal is W. H. Chap-

man, exhibit a line of antiseptic surgical dressings and sutures neatly and conveniently packed. They also show surgical instruments, knives, needles, scoops, antitoxin syringes, and everything that is necessary for the surgeons' armamentarium. The Galvanic Battery Works Co., of Toronto, have the same agent in Montreal. They exhibit batteries, both wet and dry, electrodes of all sorts, rheostats. An ingenious instrument for electric massage is also seen here. This is Hodgkin's Electric Neurotone, which is recommended in neurasthenia and in painful affections of the nerves.

Welch's Grape Juice is prepared from choice Concord grapes, carefully pressed and sterilised so that the rich colour, fine flavour and medicinal properties of the grapes are preserved. It is without alcohol, no water is added and it is always in new clean bottles.

Lyman, Sons & Co., exhibited hospital glassware of which they have the largest stock in Canada. Surgical instruments, aluminium ether cones, chloride of silver batteries, microscopes by Leitz and many other instruments and appliances, also the fine chemicals manufactured by Howard & Sons.

An exhibition of X-Ray apparatus was given by the Fessenden Manufacturing Co., and this wonderful new aid to diagnosis excited a good deal of interest. They showed the tubes, coils and rheostats in various forms as well as Fluoroscopes. Odell Bros., had a very ingenious filter in which the filtering material consists of a piece of porcelain very much after the method of the Pasteur Filter but somewhat cheaper and equally serviceable. A number of pumps for the compressing of air by means of water pressure was shown by the S. B. Chandler Co., of Toronto, also the compressed air cylinders, pressure regulators and various spray-producing appliances.

The feeding of invalids came in for a good deal of attention in this exhibition and justly so, for it is a matter which most intimately concerns the welfare of our patients. Brand & Co., had a full line of their specialties for invalids, essences and extracts of various kinds of meat, concentrated broths and beef tea, meat lozenges, etc. Then the Vimbos Co., whose preparation "Vimbos" is put up in lozenges and various other portable forms. The Invalid Bovril is specially prepared for use in the sick room and is put up in porcelain jars. It contains all the nutritive constituents of lean beef. The Bovril Lozenges are the same thing more highly concentrated so as to contain the greatest amount of food in the smallest possible bulk.

When one sees the name of Henry K. Wampole & Co, one naturally thinks of their tasteless Cod Liver Oil, so well-known is this preparation. Their specialty is the exceedingly pleasant way in which

their medicines are disguised, making them very palatable and easy to take. They exhibited a large number of such specially prepared articles. The California Fig Syrup Co., exhibited the preparation from which they take their name. This has the reputation of being a very efficient and pleasant laxative. A preparation which has quite recently been placed on the market and which is making a strong bid for popular favour, is Abbey's Effervescent Salt. This is a pleasant effervescing aperient intended to take the place of the various nauseating mineral waters.

J. H. Chapman, Montreal, has certainly a very beautiful display of surgical instruments and apparatus, and as it was most tastefully and artistically got up, occupying also a prominent position near the centre of the rink, it proved a drawing card to judge by the doctors who thronged around it. Many of the articles shown were of quite recent design and all appeared to be of fine quality and finish; among those we noticed were, Hoppe's Universal Splint; Serum syringes of many patterns; Schimmelbusch's Portable Steriliser for instruments and dressings; Anatomical preparations from Tramadon of Paris; Metzgers Centrifugal Machine for urine and blood; Hayem & Nachets Hæmatimetre; Whitman's Plates for flat feet; but there were so many equally interesting articles that we could go on "ad infindim" if space would permit. Mr. Chapman is Canadian agent for a number of English and French manufacturers, among whom is M. Nacet of Paris, who sent out a special exhibit of his microscopes, which was the finest ever seen here. In deformity apparatus, trusses, supporters and belts, operating tables, etc., all of his own manufacture, the display was excellent, and the goods certainly appeared to be much more durable than those made in the United States or Germany.

SPECIAL NOTICES.

ALASKA FEATHER AND DOWN CO., 290 Guy Street, Montreal.
—Manufacturers of elastic felt mattresses. This mattress is recommended for hospitals and all institutions where sanitary material is desirable. Send for particulars.

THE LONDONDERRY LITHIA WATER CO., Nashua, N.H.—The purity and general excellence of this water makes its universal use the strongest testimony to its high quality.

ANGIER CHEMICAL CO., Boston, Mass.—Angier's Petroleum Emulsion, palatable, creamy and received by the most sensitive stomachs without any disturbance, is at once a valuable expectorant. Literature on application.

THE DOW PORTABLE ELECTRIC ASSISTANT CO., Brain ree Mass., A. E. Putnam, 100-102 Confederation Life Building, Toronto, Canadian Agent.—Internal illumination, galvanic and faradic current, and electrolosys. Valuable in diagnosing. Send for particulars.

GEORGE BARRAT, Optician, 259 St. James Street, Montreal.
—Oculists' prescriptions carefully filled. Write for catalogue.

GEORGE TIEMAN & CO., Park Row, New York.—Surgical instrument makers, also hard rubber covered steel ecliptic insoles. Write for circulars.

TURKISH BATHS HOTEL, 140-144 Monique Street, Montreal.
—Bathing apartments (other than Turkish) also marble swimming baths free to guests. Rates, \$2.00 per day.

NAP. TOURANGEAU & CO., 718 Craig Street, Montreal.—The Tourangeau system of artificial limbs superior to all others for lightness, durability and cheapness. Specialty. crutches of every description. Send for catalogue.

EIMER & AMEND, 205-211 Third Avenue, New York, N.Y.—Manufacturers and importers of chemicals and chemical apparatus.

STALLMAN & FULTON, 10 Gold Street, New York, N.Y.—Sole agents for the United States and Canada for Nosophen, Antinoline and Eudoxine, the ideal antiseptics for every field of practice. Sample and literature gratis.

ROBERT DALGLISH, 22 St. John Street, Montreal.—Sole agent for the Dominion of Canada for Louis Roederer, Reims, the old reliable champagne, the finest wine exported from France. Highly recommended by the medical profession.

VAPO CRESOLENE COMPANY, 69 Wall Street, New York.—Evans & Sons, Limited, sole agents for the Dominion. For sufferers from whooping cough or croup. An efficient remedy and preventative from diphtheria, scarlet fever and bronchial troubles. Descriptive booklet with price list on application.

WALLACE DAWSON, Chemist, Montreal.—Manufacturer Royal Emulsion. Absolutely the most stable, palatable preparation of Cod Liver Oil prepared.

NEW ENGLAND VACCINE COMPANY, Chelsea Station, Boston, Mass.—Vaccine virus, pure and reliable. 60 paged new illustrated pamphlet mailed free.

W. L. CHIPCHASE, 639 Craig Street, Montreal.—Surgical instruments ground and repaired. Mail orders promptly attended to.

JACOB J. TEUFIL & BRO., Philadelphia.—Manufacturers of surgical, dental and veterinary instruments.

A. A. MARKS, 701 Broadway, New York.—Marks' improved rubber hands and feet are natural in action, noiseless in motion and the most durable in construction. Send for catalogue.

DE LOSEY HOLDEN CHAMPAGNE.—Gillespie & Company, Montreal, agents for the Dominion of Canada.

DR. FRANCIS C. MARTIN, Roxbury Station, Boston, Mass.—Yaccine virus.

The illustrations appearing in the description of the exhibits in the museum of the British Medical Association are from cuts kindly loaned by the *Montreal Pharmaceutical Journal Company*.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

VOL. XXVI.

NOVEMBER, 1897.

No. 5.

THE MONTREAL GENERAL HOSPITAL AND THE CIVIC HOSPITAL.

When the governing body of an institution is changed it is the natural course to review the results which have been obtained during its administration and to forecast as to the probable success which will accrue from the change.

Following this idea it is in order for us to consider the work done by the Montreal General Hospital while in charge of the Civic Hospital for contagious diseases. The arrangement whereby the Hospital assumed this care for the city was terminated by the city in August last.

On May 3rd, 1895, the Civic Hospital was opened to the General Hospital and by May 9th, the building was prepared and the first patient admitted. From that date till May 13th, 1897, there were treated 598 cases, 405 being of diphtheria and 193 of scarlatina.

The greater interest attaches to the treatment of diphtheria, as here, for the first time in Montreal, was antitoxin used regularly and methodically, and its effects studied and noted in a large number of cases.

The period of occupancy is divided by two changes in the personality of the resident physician and the results are shown to be as follows: During the first twelve months there were treated to conclusion, 158 cases of diphtheria with 13 deaths, a mortality of 10.1 per cent.; of these, 22 showed marked signs of laryngeal involvement and the mortality in these was 22.7 per cent. Of the laryngeal cases, 6 required intubation and 4 tracheotomy, with or without an intermediary intubation. The mortality was respectively 16.6 per cent. and 50 per cent.

With greater experience in the treatment by antitoxin and an increase of public confidence in the hospital the second period of twelve months shows the treatment of 216 cases with 21 deaths, a mortality of 9.7 per cent. Laryngeal cases 26, deaths 9. Mortality 34.6 per cent. Intubations, the majority of which were performed prior to the child being sent in to the hospital, 10, deaths 7, mortality 70 per cent. One tracheotomy which died.

From May 13th, 1897, to Aug. 13th, 1897, 31 cases were treated with but one death, a mortality of 3.1 per cent. Laryngeal cases 3, all intubated, all recovered.

Taking the period of occupancy as a whole there were admitted and treated to a conclusion, 405 cases of diphtheria with 35 deaths, a mortality of 8.6 per cent.

Such results have seldom been equalled and, one might say, never surpassed by all the flood of statistics which has been accumulated by the believers in antitoxin.

The treatment of scarlatina shows good but not remarkable results. In the first summer there was an approach of an epidemic and two of the Infants' Homes of the city furnished the majority of the severe cases. There was a total number of 193 cases treated, with a mortality of 15.5 per cent.

SMALLPOX IN MONTREAL.

The smallpox outbreak in Montreal, which at one time assumed a serious aspect, due in great measure to the difficulty experienced by the City Health Authorities in locating the origin of infection, which still remains undiscerned, now loses some of its importance in the fact, that the latest reports prove decisively, that the disease has been fought to a most satisfactory conclusion, no new cases having been reported to the authorities for one month since the removal of the last patient to the Civic Hospital, the period of incubation being thus safely passed. A fact worthy of note, is the occurrence of a fresh case, three weeks subsequent to the removal of the previous case to the hospital, there apparently being no common source of infection. The disease throughout has assumed a varied type, although for the most part severe, no occurrence of the hæmorrhagic form has been reported. In regard to vaccination, the percentage has been satisfactory considering the mildness of the epidemic, about fifty-five thousand points having been utilized. We are pleased to note the few instances of resistance to the ordeal, which so characterised former outbreaks of the disease.

The following table gives the present status of the disease in the city and suburbs.

THE PRESENT STATUS OF SMALLPOX IN MONTREAL AND SUBURBS.

Municipality.	Date of Outbreak.	Total cases since Outbreak.	Died.	Recovered.	Still Sick.
Montreal, City.....	2nd July..	17	9	4	4 (a)
Westmount	26th July..	5	1	4	0
Ste. Cunegonde.....	28th Aug..	1	1 (a)
Total	23	10	8	5

(a) In the desquamating period.

N.B.—No more cases since Oct. 4th, 1897.

McGILL MEDICAL SOCIETY OF UNDERGRADUATES.

OFFICERS :—Hon. President, Dr. F. J. Shepherd; President, W. L. Barlow, B.A.; Vice-president, S. A. Banfill; Secretary, W. S. Galbraith; Assistant-Secretary, W. A. Wilson; Treasurer, W. A. Wilkins; Pathologist, D. A. Whitton; Reporter, H. B. Cushing, B.A.

COUNCILLORS :—Dr. Martin, Dr. Evans, H. Ross, B.A.

PROGRAMME COMMITTEE :—S. A. Banfill, W. S. Galbraith, H. Ross, B.A.

The following programme has been arranged for the meetings during the coming session :

FRIDAY, October 8th—1, Paper, "Gastric Ulcer," W. L. Barlow, B.A.; 2, Paper, "Functional Dysmenorrhœa," S. A. Banfill; 3, Paper, "The Bearings of General Biology and Embryology on Physiology and the Science of Medicine," E. R. Secord; Exhibition of Pathological Specimens.

FRIDAY, October 22nd—1, Paper, "Summer Diarrhœa of Infants," H. B. Cushing, B.A.; 2, Paper, "Pigmentations, Physiological and Pathological," W. H. Dalpé, B.A.; 3, Paper, "Differences in Blood for Different Groups of Animals," J. E. M. Carnwath; Exhibition of Specimens.

FRIDAY, November 5th—1, Paper, "Gonorrhœa in the Male," S. M. Dickson, B.A.; 2, Paper, "Post-partum Hæmorrhage," G. S. Tifany; 3, Paper, "Paranoia," F. T. Tooke, B.A.; Reporter's Statement; Exhibition of Pathological Specimens.

FRIDAY, November 19th—1, Paper, "The Pulse in Disease," C. Ogilvy, B.A.; 2, Paper, "The Puerperal Breast," J. West, M.A.; 3, Paper, "The Physician a Naturalist," R. F. Beattie; 4, Paper, "The Relation of Evolution to Physiology," L. G. Cameron; Reporter's Statement.

FRIDAY, December 3rd—Debate: Resolved, "That the usual treatment of typhoid, more especially as regards hydrotherapy and milk diet, is faulty." Speakers in affirmative, R. G. Duncan, H. R. Macaulay; speakers in negative, C. Davidson, C. A. Peters.

FRIDAY, December 17th—Address, Dr. A. D. Blackader.

FRIDAY, January 7th—1, Paper, "Herpes: Cause, Distribution and Treatment," J.

W. Blackett, B.A.; 2, Paper, "Purpura Hemorrhagica," C. H. Brown, B.A.; 3, Paper, "Hernia," J. A. Lamb; 4, Paper, "The Relation of Physiology to Athletics," E. F. Murphy; Exhibition of Pathological Specimens.

FRIDAY, January 21st—1, Paper, "The Face and its Expression," B. W. Gilites; 2, Paper, "The Sputum in Disease," F. W. Harvey, B.A.; 3, Paper, "Muscular Development and its Relation to Health and Disease," F. J. Haszard; Exhibition of Pathological Specimens; Reporter's Statement.

FRIDAY, February 4th—1, Paper, "Tabes Dorsalis," A. M. Smith, B.A.; 2, Paper, "The Significance of Fever," N. Grace; 3, Paper, "Salivary Secretion," F. J. Nicholson, B.A.; Exhibition of Pathological Specimens; Reporter's Statement.

FRIDAY, February 18th—Debate: Resolved, "That in Eclampsia the uterus should be emptied as rapidly as possible." Speakers in affirmative; R. U. Patterson, R. B. Deane. Speakers in negative; R. Telford, J. N. MacLean.

FRIDAY, March 4th—1 Paper, "Causes of Jaundice." L. J. O'Shaughnessy; 2, Paper, "Biology: its Relation to Medicine and Surgery;" F. S. Jackson. This paper will be illustrated by lantern views.

FRIDAY, March 18th—Closing Address, Dr. F. J. Shepherd.

PRIZE COMPETITION.—The Medical Society offers this year a first and second prize in senior subjects. Competition open to all undergraduates; and a first and second prize in junior subjects. Competition open to junior years only. For further particulars refer to the by-laws.

LIBRARY OF THE PROVINCIAL BOARD OF HEALTH.

We have received from the Board of Health of the Province of Quebec a catalogue of their library. We learn from the officials of the Board that the medical profession is invited to make use of books there, and the catalogue will be furnished on application. We note among the volumes catalogued a number not hitherto accessible in any of our libraries, such as the complete series of the Registrar General of England's statistical reports, the complete series of the reports of the Local Government Board, (which forms a complete record of the modern sanitary history of Great Britain) and also the complete file of the Annales d'Hygiene publique since its commencement in 1827, which is the best record of the sanitary and medico-legal progress in France. A fair collection of the standard works on sanitary subjects in the English and French languages, as well as a number of sanitary reports, monographs and pamphlets are also listed.

It is to be hoped that some of the other scientific libraries in Montreal will endeavour to issue catalogues of each book or journal registered in a printed catalogue, which will be of more service to the profession than twenty which can only be learned of by making a personal voyage of discovery to a library. The admirable plan which has been followed in some American cities of cataloguing not merely

books in the public libraries, but also, in addition, obtaining from private owners, lists available in private libraries, of writers in their possession not in the library catalogue. If carried out here this would, without any additional expense, greatly enhance our present facilities for literary research. An inter-library association is much needed.

Circular No. 4.

LABORATORY OF THE BOARD OF HEALTH,
OF THE PROVINCE OF QUEBEC,
MONTREAL, October 1st, 1897.

To the President of the Board of Health of the Province of Quebec :

SIR,

The simple technique recommended by this Laboratory for the serum diagnosis of Typhoid, by means of dried blood, has been found, after a year's trial, quite satisfactory for the practical work of diagnosis.

At the same time, (as was recently explained by a Committee of the American Medical Association, of which I was a member) although for routine diagnostic work even the very simplest methods may give good practical results, yet for recording scientific observations quantitative methods should be selected. This is especially necessary in reporting exceptional cases at variance with the general results of others, or where the observations are made the basis of generalisations.

I have found that good uniform quantitative results can be readily obtained with the dry blood method by taking in the first instance drops of uniform size, collected by means of a wire loop (I use 20 guage copper wire 2 mm. inside diameter), which is returned with the outfit, and used subsequently to obtain dilutions of known strength. The method has been described more fully in a joint paper by myself and Dr. Harold Thomas before the British Medical Association at Montreal, on Sept. 2nd, 1897.

For quantitative work, the blood is dried on an ordinary glass slide, or non-absorbent paper can be used if preferred. One of the outfits will be sent, when a quantitative estimation is desired, or to any who are practically interested in the matter. As already stated, I do not find quantitative work necessary for routine diagnosis, preferring to employ cultures having a sensitiveness so low as to give no reaction at all with non-typhoid blood.

In addition to the previous observations made by myself and Dr. D. D. McTaggart as to the use of attenuated cultures, I wish further

to call attention to the importance of paying special care to the reaction of the test culture media. Bouillon cultures showing after 24 hours growth of typhoid at 37° C., a slight uniform cloudiness only, and quite free from scum or sediment, offer the greatest security against pseudo-reactions. I find that such cultures can be obtained by using bouillon just on the verge of litmus acidity, giving no blue whatever to the red paper. From 3 per cent. to 4 per cent. of normal alkali (I employ 3.5 per cent.) are required to make this bouillon neutral to phenol phtalein.

Cultures which give a heavy bouillon growth are the ones which are most liable to give pseudo-reactions, *i.e.*, to clump in a deceptive manner spontaneously or with non-typhoid blood. If the culture is too acid the reaction may be defective. With a proper culture, I have never met with the typical reaction apart from typhoid fever. On the other hand, by employing certain incorrect methods of preparing the culture I can obtain at will very perplexing pseudo-reactions with a large proportion of non-typhoid bloods. This may be the explanation of a number of anomalous published results, though the difficulties can be also doubtless avoided by other means than those indicated here.

I have the honour to be, Sir,

Your obedient servant,

WYATT JOHNSTON,

Bacteriologist to the Board.

INFANTILE SCURVY.

The American Pediatric Society is making a Collective Investigation of Infantile Scurvy as occurring in North America, and earnestly requests the cooperation of physicians, through their sending of reports of cases, whether these have already been published or not. No case will be used in such a way as to interfere with its subsequent publication by the observer. Blanks containing questions to be filled out will be furnished on application to any one of the committee. A final printed report of the investigation will be sent to those furnishing cases.

(Signed).

J. P. Crozer Griffith, M.D., Chairman, 123 S. 18th St., Phila.

William D. Booker, M.D., 853 Park Ave., Baltimore.

Charles G. Jennings, M.D., 457 Jefferson Ave., Detroit.

Augustus Caille, M.D., 753 Madison Ave., New York City.

J. Lovett Morse, M.D., 317 Marlboro St., Boston.

Committee.

Dr. Adami, Professor of Pathology in McGill University, has been invited by the University Medical College of New York to deliver a course of lectures on general pathology, and has accepted the invitation. He gave his first lecture on October 15th.

In the *Viertel Jahrsche f. Gerichtliche Medicin* supplement for 1897, is the text of a recent order by the Prussian Government permitting the sale of beef containing cysticerci (measly beef) which has been kept for twenty-one days in cold storage, the researches of R. Ostertag having shown that after this period the cysticerci in the raw meat were no longer in a condition capable of conveying infection. A number of personal tests were made, all with satisfactory negative results by Ostertag and his pupils. The report recommending this innovation is signed by Virchow.

The office of the Institut International de Bibliographie has been moved to 93 Boulevard Saint-Germain. To this address should be sent all letters, etc., intended for this Journal.

The office of the Montreal Branch of the British Medical Association has been removed to the rooms of the Montreal Medico-Chirurgical Society, 2426 St. Catherine Street.

Dr. F. A. L. Lockhart has been appointed Gynæcologist to the Montreal General Hospital. He has also assumed charge of the private hospital of the late Dr. Alloway.

Dr. J. D. Cameron has been appointed Assistant Gynæcologist to the Montreal General Hospital.

Obituary

THOMAS JOHNSON ALLOWAY.

It is our painful duty to have to record the death of our esteemed colleague, Dr. Thomas Johnson Alloway, Associate Professor of Gynaecology in McGill University and Gynaecologist to the Montreal General Hospital.

Doctor Alloway was born in Queen's County, Ireland, in 1844, and came to this country with his parents at an early age, his father the late Captain Arthur Alloway, being a retired officer of H.M. 4th King's Own. His early education was received in Montreal, and he graduated in medicine in McGill, in 1869. He proceeded immediately to Edinburgh, where he qualified himself for a position in the Royal Navy, by passing the conjoint examination of the Royal College of Physicians and Surgeons. While waiting for an appointment, he spent a year as resident surgeon of the Wandsworth Infirmary. Later, he was attached as assistant surgeon to H.M.S. Hercules of the Channel fleet, where he served for a period of three years. He then returned to Montreal, and entered into general practice. For a number of years he was connected with the Montreal Dispensary, as gynaecologist; resigning in May, 1887, when appointed assistant surgeon to the Montreal General Hospital; and two years later, having decided to devote himself exclusively to gynaecology, he was appointed assistant gynaecologist to that institution. On the resignation of Dr. William Gardner, to accept his present position in the Royal Victoria Hospital, Dr. Alloway was appointed in his place as gynaecologist-in-chief. He continued in that capacity up to the time of his death, and in fact performed an important and difficult operation only three days before. He became attached to McGill Medical Faculty as demonstrator in gynaecology and was rapidly promoted to the position of lecturer, assistant professor and associate professor.

For many years Dr. Alloway occupied a leading position among the practitioners in Montreal. While in general practice, he was esteemed highly both by his professional brethren and by the general public. It was, however, as a specialist in gynaecology that he developed those traits which will make him long remembered. As an operator he was distinguished for his caution as well as his boldness. His many triumphs in the field of uterine surgery were not the result of reck-

lessness, but the outcome of long and careful preparation and attention to details. He was dexterous to a degree, and always ready to meet the most unlooked-for emergencies with a confidence born of an intimate knowledge of the subject which he had so much at heart. As a teacher he was clear, impressive and enthusiastic. He had the faculty of communicating to his students that intense interest which he himself felt in his work—the best of all evidence of a good teacher. To his many friends, especially those in the profession, his death will come as a deep personal loss. His kindly, gentlemanly ways made him many friends.

His devoted wife and daughter have in the profession in Montreal and elsewhere many sympathisers in their affliction.

RICHARD NORRIS WEBBER, M.D.

By the death of Dr. Webber, which took place on Aug. 11th last, the town of Richmond lost one of its oldest and most respected citizens :

He was born in Concord, Vt., seventy-five years ago, lived in St. Johnsbury and other towns in Vermont, and finally in 1832, came to Stanstead, Que., with his parents, where he received his early education.

In 1844 he commenced the study of medicine in the office of the late Dr. Colby of Stanstead, father of the Hon. C. C. Colby. In 1846, he entered Harvard University and while he was there ether as an anæsthetic was first introduced, and he witnessed in the operating theatre of the Massachusetts General Hospital, the second operation ever performed under ether, the operation being amputation of the lower third of the thigh, the operators being Bigelow and Warren.

He then left Harvard and went to Bowdoin College, Brunswick, Me., in the fall of 1846, and graduated M.D. in the spring of 1847, the subject of his thesis being Ether Anæsthesia, for which he received great praise from his professors. He came to Richmond in June, 1847, and for fifty years practiced his profession there and in the surrounding country,

His early experience would make the modern graduate quail. There being no roads, horseback was the only means of travel and very often he had to walk miles on foot. He acquired an extensive practice, covering a territory of over 20 miles in every direction from Richmond. He was the poor man's friend and would respond to calls night and day, even when he knew there was no fee in view. For a man of his time he was well up in his profession but preferred the older to the more modern plans of treatment. He possessed an iron constitution and an iron will and usually carried out whatever he

undertook. He was a mathematician of the highest order. Had good judgment. He possessed a ready wit and had an answer for everybody. He was a public spirited citizen, taking great interest in matters political and municipal, acting in the various capacities of Mayor, Councillor, School Commissioner, &c. He took a great interest in educational matters, being one of the founders of St. Francis College, Richmond, and continued its firm friend up till his death. He was a great advocate of temperance and opposed vigorously the use of alcoholic stimulants in his practice. He gave his hearty support to every good cause, and he died without a blemish on his character, beloved and respected by every body, and truly it may be said of him "he rests from his labours and his works do follow him."

A. D. S.

NEW BOOKS, ETC., RECEIVED AND NOTED.

American Academy of Railway Surgeons. Vol. III., 1898. Edited by R. Harvey Reed, M.D., Columbus, Ohio.

International Clinics. Vol. II. Seventh Series. July, 1897. J. B. Lippincott Co., Philadelphia.

The Roentgen Rays in Surgery. By Carl Beck, M.D. Reprint from International Medical Magazine, June, 1897.

The Treatment of Complicated Ulcers of the Cornea. By Clarence A. Veasey, A.M., M.D. Reprint from Therapeutic Gazette, July 15, 1897.

The Appendix "in the Interval"—A new Method of Studying its Pathology. By Robert Abbe, M.D., N.Y. Reprint from Medical Record, July 10th, 1897.

The Liverpool Medico-Chirurgical Journal with proceedings of the Liverpool Medical Institution. July, 1897.

The Treatment of Alcoholism. By J. M. French, M.D. Reprint from Medical and Surgical Reporter, September and December, 1896, and May, 1897.

Bulletin 53. Report on Crops, Live Stock, etc., in Manitoba. Winnipeg, August 20th, 1897. Issued by the Department of Agriculture and Immigration.

A plea for a uniform Diastase Test. By C. C. Fitem, M.D., New York. Reprint from Journal of American Medical Association, Aug. 28, 1897.

Tuberculosis of the Genito-Urinary Organs. By N. Senn, M.D., Ph.D., LL.D., Chicago. W. B. Saunders, Philadelphia.

The Physical Signs of Acute Bronchitis. By J. N. Hall, M.D., Denver. Reprint from the Medical Fortnightly, St. Louis, Mo., Aug. 2nd, 1897.

Phthisis Originating in Colorado. By J. N. Hall, M.D., Denver. Reprint from The Denver Medical Times, March, 1897.

Interrupted Respiration; A study of certain Physical signs of Diseases of the Chest. By J. N. Hall, M.D., Denver, Col. Reprint from Journal of American Medical Association, July 17th, 1897.

A case of double pulmonic murmur with diastolic thrill. By J. N. Hall.

The Relation of Oxaluria and Uric Acid Excess to Genito-Urinary Inflammation and Disorders. By Bransford Lewis, M.D., St. Louis, Mo. Journal of Genito-Urinary and Cutaneous Diseases, July, 1897.

Medical Climatology. By S. Ed. Solly, M.D., M.R.C.S. Lea Bros. & Co., Philadelphia, 1897.

L'agriculture, L'elevage, L'industrie et le Commerce dans la Province in 1896 La Plata.