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### A DISCUSSION OF THE RELATION BETWEEN HUMAN AND BOVINE TUBERCULOSIS, WITH SPECIAL REFERENCE TO PRIMARY INFECTION IN CHILDREN THROUGH THE ALIMENTARY TRACT.\*

BY

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Until two months ago the presence of the tubercle bacilli in milk has been regarded by the profession in all countries as a possible source of much danger, and although some recent writers have stated that in their experience the danger was but a nominal one, yet in all the more important countries in Europe, the profession has deemed it wise to obtain authoritative pronouncements from their several governments, and legal enactments have been passed to guard the public against what has been declared to be a very serious menace to its health. Nevertheless, at the recent Tuberculosis Congress in London, Koch made the startling statement that the infection of human beings by bovine bacilli is but of rare occurrence; cases in which the disease has been conveyed by the milk or meat of tuberculosis cattle, or by butter made from such milk, are not in his opinion more frequently met with than are cases of hereditary transmission, and therefore the danger arising from this source may be practically disregarded.

By this statement he condemns as useless the precautions which have been declared to be necessary by every Board of Health, and which have been re-emphasized by all of us in our own professional circles:

When asked by Professor Rotch a few weeks ago to read a short

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\* Read before the Suffolk District Medical Society, Boston, October 26, 1901.

paper before this society I thought that it might not be without some interest to briefly review the facts which led up to this general belief in the possibility of primary infection through the intestinal tract by the bacilli in milk, hoping that in the discussion which might follow, the position to be taken by us as a medical profession at the present, might be more clearly defined.

In 1865 Villemin<sup>1</sup> excited the interest of the medical world by his statement that tuberculosis is a specific affection, the cause is an inoculable agent, inoculation of tuberculosis material into the rabbit producing tuberculosis. Chauveau,<sup>2</sup> following him, found that such material may be also effectively introduced into the body through the alimentary canal, and that calves might be rendered tubercular by feeding them with the milk, sputum, or flesh of an infected animal, a fact verified later by Gerlach,<sup>3</sup> Klebs, Orth and Bollinger.<sup>4</sup>

A few years afterwards experiments made by Baumgarten<sup>5</sup> showed that a few ounces of milk to which a quantity of phthisical sputum had been added, were sufficient to produce characteristic tubercular lesions in the intestine of the rabbit with considerable precision and certainty.

Wescner<sup>6</sup> found that when sputum was given with the food of rabbits, the mesenteric glands alone became infected, but when sputum was injected directly into the intestine, intestinal lesions of a virulent character ensued. This difference in the results Wescner attributed to the germicidal power of the gastric juice.

It was in 1882 that Koch discovered the tubercle bacillus and announced to the world that tuberculosis, whether human or bovine, was one disease and dependent in all cases upon the one specific micro-organism; a view questioned by Virchow and others who recognized even then that the contagium of bovine tuberculosis was much more virulent for experimental animals than that met with in human tuberculosis. Koch now maintains that human tuberculosis differs from bovine and cannot be transmitted to cattle, and adds that if one studies the older literature of the subject and collates the reports of the numerous experiments that were made in former times by Chauveau, Gunther, Bollinger, and others, who fed calves, swine, and goats with tuberculous material, one finds that the animals that were fed with the milk and pieces of the lungs of tuberculous cattle, always fell ill of tuberculosis, whereas those fed with human material did not.

Opposed to this view thus absolutely stated let me quote the following: In 1888, Crookshank<sup>7</sup> reported to the Board of Agriculture in England that he had inoculated an animal with sputum from a case of advanced phthisis, which evidently had contained besides tubercle bacilli suppurative micro-organisms, and stated that he had been able

to produce numerous tubercular nodules in the peritoneal cavity of a calf. The animal, however, rapidly succumbed to pyæmic poisoning. Evidently the development of tuberculosis had been greatly favored by the lowered vitality dependent upon the double infection.

In 1893 the following experiments on cattle were carried out by Professor Sydney Martin.<sup>8</sup> Six calves were fed on tuberculous sputum; two of them received each 440 cc. of human sputum containing bacilli in large numbers. One of these after 56 days was killed and was found to be suffering from tuberculosis of the intestine and mesenteric glands; the second was allowed to live for 138 days; when killed it was found to be quite free from tuberculosis. The four other calves received, mixed with their food and in one meal, 30 cc. of human sputum containing numerous bacilli. They were killed at intervals of 33, 63, 85, and 283 days from the commencement of the experiment. The first was slightly tuberculous, the second and third had distinct tubercular nodules in the intestine, whilst the fourth remained free from the disease. In similar experiments carried out with tubercular material of bovine origin the disease came on much more rapidly, and was more extensive. In his report, Martin writes, "It is evident we are dealing in the case of tuberculous sputum with material which is less infectious to calves than bovine tuberculous material, since in those calves fed with human sputum, not only did two not become infected at all, but the others only developed a local lesion of the intestines and mesenteric glands, while in those fed with bovine tubercular material the disease has spread from the intestines and mesenteric glands to the lymphatic glands of the thorax and to the lungs."

In this country important experimental investigations have also been carried on. Frothingham in 1897,<sup>9</sup> reported that he had inoculated calves in the peritoneum, in the trachea, and subcutaneously, with emulsions of tubercle bacilli from human sources, with the result that local nodules were produced. The following year Theobald Smith<sup>10</sup> also reported that as the result of his investigations he found that the tubercle bacilli from bovine sources had in culture fairly constant and persistent peculiarities of growth and morphology, and might to some extent be differentiated from the bacilli of human origin. There was also a marked difference in their pathogenic power. In 1899, Adami,<sup>11</sup> in summing up the evidence, wrote: "Cattle, if treated identically, and given equal quantities of growths of tubercle bacilli emanating from man and from cattle respectively, react to the two cultures differently. In the former only a localized and thus non-infectious disease is produced; in the latter a generalized and consequently infectious disease develops."

These conclusions, however important in themselves, were only on lines of thought and investigation along which pathologists in many countries were working. Strauss<sup>12</sup> and Gamaleia in 1891 had pointed out many differences in culture growth, and pathogenic power for other animals between avian and human bacilli, and for some years it had been generally recognized that although Koch's statement was true that the disease tuberculosis, whether appearing in man, cattle, swine, birds, etc., is dependent upon a micro-organism which has in all cases the same general morphological characteristics and staining reactions, yet as found in each class of animal the bacillus appears to have more or less well marked distinguishing characteristics. It would appear, however, that we have not to deal with absolutely different species, but rather with mere variations acquired by the bacillus in its passage through successive individuals of one species (Adami). Nocard and Roux<sup>13</sup> have shown that in the two forms regarded as most distinct, namely avian and human bacilli, one can by special methods of growth outside the body obtain eventually cultures of the two that are indistinguishable. They have also shown that by enclosing a culture of the human bacillus very carefully in a sterilized capsule of collodion, hermetically sealing this and placing it in the body of a bird, the bacilli thus protected continued to grow, nourished by the lymph which diffuses into the interior of the capsule; growing thus, the bacilli gradually assumed the characters of avian bacilli.

Thus it is shown that variations more or less pronounced may manifest themselves in bacilli by development in different kinds of animals, and it is generally considered that the passage of pathogenic germs through a series of animals of one species leads to those germs acquiring a maximum virulence for that species, and at the same time in many instances a marked diminution in virulence for certain other classes of animals.

An excellent clinical example, as Dr. Adami<sup>14</sup> has pointed out, of this modification of a micro-organism by its passage through a succession of animals of one species, is afforded by what is now definitely ascertained in regard to the contagium of smallpox and cow-pox. For many years it was held that cow-pox in the cow and smallpox in man were two absolutely distinct diseases, an opinion due in great measure to the extreme difficulty that was experienced in inoculating cattle with the virus of human smallpox. We now know they are the same for many observers have shown that if we take matter from a smallpox vesicle and inoculate it with care into calves we obtain, not a typical vesicular eruption, but a few hard papules only. If these are

broken up, however, and inoculated into a second calf, in that calf the result is more typical, and, by renewing the process, after three or four passages we obtain the development of a perfect vaccine vesicle. Lymph taken from this vesicle produces typical vaccinia, or smallpox with localized symptoms as opposed to the smallpox with generalized symptoms, that the original virus would have produced.

Considering these facts, I cannot avoid drawing the conclusion that the first part of Koch's statement that human tuberculosis differs from bovine and cannot be transmitted to cattle, is to be regarded as true only in a modified sense. Here let me also call attention to the fact that although there is much difficulty in inoculating the cow with smallpox virus, there is but little difficulty in inoculating man with cowpox virus. Is it not possible that a similar condition may exist in regard to the bovine tubercle bacillus? Permit me briefly to refer to the evidence pointing to the transmission of bovine tuberculosis to man. From the nature of the case we would expect proof to be difficult. Man is a cooking animal and direct experimentation is out of the question. Cases of accidental inoculation are all liable to be disqualified from our inability to exclude every other possible source of infection. A few, however, appear fairly trustworthy. Professor Jensen, of the Veterinary School of Copenhagen, was severely infected in his hand while performing autopsies on tuberculous cows, and was said to have been saved from general infection only by surgical removal of the lesion. Dr. Thomas Walley, of the Royal College of Edinburgh, was infected in a similar way, and death is said to have resulted from the infection. Ravenal<sup>15</sup> also reports three cases of infection in the same manner, in which, however, the general infection was prevented by removal of the primary lesion and adds that the value of such cases as he has reported in proving the virulence of the bovine bacillus for man, has been questioned on the ground that the lesions resulting from inoculation are usually slight and remain localised; the conclusion being forced that the bovine tubercle bacillus has little virulence for man. All observers, however, agree that the skin offers a very poor soil for the growth of tubercle bacillus as indicated by the slow evolution of skin lesions, and the small number of bacilli as a rule found in them. Chauveau failed entirely to infect calves by superficial scarifications and punctures even with the bovine bacillus, the nodules so formed often disappearing spontaneously; even the guinea pig, one of the most susceptible animals to the infection of tubercle bacillus resists invasion by the skin. Ravenal concludes that it is unfair to consider the local character of the lesions produced by superficial inoculation as an indication of lessened virulence for man.

He also quotes a case reported by Pfeiffer. A man of good family history, and in good health, was wounded in the thumb of the left hand when performing autopsies on tuberculous cattle, the point of a knife entering the articulation between the first and second phalanges. The wound healed without suppuration, but after six months a cutaneous tubercle formed about the scar, and the joint was attacked. The lungs became involved, and the man died eighteen months after the accident. At the autopsy the local lesion was found filled with a caseous mass extremely rich in bacilli.

These cases indicate at least the possibility of direct infection by bovine bacilli. They may also be regarded as an illustration of what has been observed in systemic infection by many forms of micro-organisms, that the amount of resistance offered to infection by an animal varies according to the special tissue attacked, while the possibility of infection is increased by the presence of an already existing lesion.

Shortly after Koch had demonstrated the presence in the tissues of the bacilli, other investigators found the same bacilli in the milk of cattle suffering from the disease. Nocard, Bang, Rabinowitsch, Petri, Ernst, and many others working in this field for many years, have established beyond doubt that true tubercle bacilli are found in considerable numbers in the milk of cows suffering from advanced tuberculosis or tubercular mastitis. They are also found occasionally in the milk of cows giving only slight clinical evidence of tuberculosis, but distinctly reacting to tuberculin. Butter also, frequently contains the tubercle bacilli, but meat comparatively seldom.

Experimental investigations following in the wake of these bacteriological researches proved undoubtedly, as had been stated before, that milk in which bacilli existed in sufficient numbers, was assuredly pathogenic for young animals, and led to general tubercular infection. It is to be noted, however, that the experiments of Adami and Martin at Outremont, near Montreal, corroborating those of observers in other countries, show that to prove pathogenic, even for young cattle, the bacilli must be moderately abundant in the milk. Four calves of healthy stock were tested with tuberculin previous to the commencement of the experiment. They were then kept in special stalls and fed with the milk from a tuberculous cow which had reacted to tuberculin, and in whose milk bacilli in small numbers were found. Tested six months afterwards all of them still failed to react to tuberculin.

Wyssokowicz insists that there is a minimum number of tubercle bacilli which must be inoculated into an animal in order to induce the disease. Two or three bacilli inoculated into the peritoneal cavity

of even a susceptible animal are destroyed. He found that more than fifteen must be inoculated into a guinea pig for the disease to be set up in that animal. It follows, therefore, that they must be introduced in considerable numbers into the alimentary tract before they can, even under favorable circumstances, give rise to general infection.

The consideration of those instances in which the infection is said to have been conveyed to human beings through milk even more than in the case of direct infection through a wound involves the possibility of error. Many instances have been published, but time permits me to refer to only one or two in which the evidence is fairly convincing in its character. Nocard<sup>8</sup> relates the following:—"Dr. Gosse, a well known medical man in Geneva, lost a daughter seventeen years old under the following circumstances: She had been in perfect health up to the year preceding her death, when symptoms of marasmus set in, which, in ten months terminated fatally. The autopsy revealed extensive tuberculous disease of the intestine and mesentery. Careful investigation revealed neither any family history or known personal exposure, but it appeared that every Sunday, Dr. Gosse and his family spent the day at a small estate on the hills where the young girl was in the habit of drinking freely of warm fresh milk. On testing the cows with tuberculin, four out of five on the estate were found to be tuberculous. They were killed, and in two of them tuberculous mastitis was discovered.

Brouardel<sup>19</sup> relates that in a small boarding school in Paris under his care, five of the pupils in one term contracted tuberculosis, the only origin for which that he could discover was the milk of a cow afterwards found to be suffering from tuberculous mastitis, and of which these pupils had drunk freely. Marfan, Olivier and Denune relate similar cases.

As the result of the evidence afforded by experimental researches in animals, and the publication of instances similar to the above, milk was then regarded by the profession as a possible source of tubercular infection, especially in the case of infants and young children, and a committee appointed by the British Medical Association reported in 1895<sup>20</sup> that the mortality from tuberculosis in early childhood was not decreasing in the United Kingdom to the same extent as the death rate from this disease at other ages, and "the opinion that this great prevalence of the disease in childhood is due to infection through the alimentary canal by milk from tuberculous cows, appears to be well founded."

The attention of pathologists was now directed to the paths by which the bacilli effected an entrance into the body, but with the in-

investigation of the seat of the primary lesion doubt was thrown upon the view that infection by milk was the great cause for the tuberculosis of early infancy. The detection of the primary lesion is in many cases difficult, and the result of the post mortem findings have to be read with some caution. In general we are guided by the fact that the lymphatic glands in childhood form a delicate index of the extent and duration of the tuberculous infection in the organs to which they correspond. Their condition is to be regarded as more important in the determination of the duration of the lesion than the condition of the organ itself, or the sequence of clinical symptoms.

One of the first to investigate the pathway of infection in children, was Northrup<sup>21</sup> of New York, who, in 1891, in a paper read before the Academy of Medicine, presented the statistics of the New York Foundling Asylum, which emphasized the fact that in the great majority of cases of tuberculosis in children, the seat of primary infection was in the lymph nodes clustered about the bifurcation of the trachea, and the root of the lungs. In 125 autopsies on tubercular children, he found 88 cases of primary infection through the respiratory tract, 3 apparently of primary infection through the intestinal tract, and 34 in which the seat of the lesion was unable to be determined. He explains these last as cases in which the ravages were so extensive that the seat of primary infection was not clear; "the bronchial nodes were large and cheesy; likewise the mesenteric; the lungs contained tubercles, so did the liver, spleen, kidneys and meninges."

Holt,<sup>22</sup> reporting in 1896 a series of 119 autopsies on tubercular children, stated that he found the intestines involved in forty cases and the mesenteric lymph nodes in 38 of these, but in his opinion primary infection of the alimentary tract was extremely rare. He adds:—"In the series of autopsies above given there was not one in which a careful study of the lesions made it at all probable that the seat of the primary infection was either in the stomach or intestines, while in 63 of the cases the intestines were not infected at all. In those cases where the stomach and intestines were the seat of tuberculous disease, with very few exceptions the disease was only slightly marked in that locality, although very advanced in the lungs and bronchial lymph nodes."

In 1899 Bovaird,<sup>23</sup> of New York, brought up to that date the records of the New York Foundling Asylum, giving the details of 75 additional post mortems to those previously reported by Northrup. In 60 of his cases the primary lesion was found either in the lungs or bronchial glands; in 8 the lesions of the bronchial and mesenteric

glands were so nearly alike that the question of priority could not be determined, and in 7 the records were incomplete.

English pathologists, while acknowledging the great frequency with which infection apparently enters through the respiratory tract, all unite in stating that in from 25—30 per cent. of their cases the primary lesion is connected with the intestinal tract. Colman<sup>24</sup> in 1893 published the details of a series of 60 cases occurring during a year's work in the post mortem rooms of the Hospital for Sick Children, Great Ormond street, London, and stated that as the result of his investigations, while not doubting an infection by milk in some cases, he attached more importance to infection through the thoracic glands as the tuberculous process was more advanced in them as a rule than in the mesenteric glands.

In 1894 J. Walter Carr<sup>25</sup> published the following record from the post mortem room of the Victoria Hospital for Children:—Out of 120 autopsies on tubercular children, he met with four in whom the disease was very generalized, and the infective lesion was not discovered; 79 cases in which the primary lesion was in the lungs or bronchial lymphatic glands; 20 cases in which the primary lesion was in the intestines or mesenteric glands, and 6 in which it was difficult to state which of these two systems was the earlier infected; in 11 the caseous centres were numerous, and it was impossible to say which was the primary one.

Dr. Guthrie in 1899,<sup>26</sup> tabulating the post mortem records of the Children's Hospital, Paddington Green, for the previous eight years stated that out of 77 cases dying of tubercular disease, he found 42 cases in which the primary lesion had been apparently in the respiratory tract; in 19 he met with it in the intestinal tract; in 7 both tracts were equally affected, and in 9 the origin was uncertain.

Dr. Still,<sup>27</sup> of Great Ormond street, in a very interesting paper gives us the following statistics:—

Lung.....	105	} 136	} 153=57%
Probably Lungs.....	33		
Ear.....	9		
Probably Ear.....	6		
Intestine.....	53	} 63	} =23%
Probably Intestine.....	10		
Bones. &c.....	5	} 53=nearly 20%	
Fauces.....	2		
Uncertain.....	46		

While many German pathologists state that in their experience the primary lesion is almost never found in the intestinal tract, a few have met with it in a small percentage of their cases. Spengler<sup>28</sup> quotes the records of 92 cases in which the intestinal tract was alone involved in four.

Kossel,<sup>29</sup> of Berlin, discussing the statistics of 286 consecutive autopsies on children, of whom 22 had died of tuberculosis, met with only one, an infant nine months of age, in which the infection was confined to the intestinal tract.

French statistics corroborate to some extent the English. Marfan,<sup>30</sup> writing in 1899, says: "Tuberculosis by ingestion is certainly rarer than tuberculosis by inhalation. . . . Alimentary tuberculosis is met with especially between the ages of one and five years, and accounts for about eight per cent. of the cases of tubercular infection observed at this period of life. These are the figures given by McFaydean and Woodhead, and they accord with those I have observed myself." Comby<sup>31</sup> writes, "Children become tuberculous through the respiratory tract."

A very interesting class of statistics are those cases of latent tuberculosis in children who die of disease other than tuberculosis, and in whom the presence of tuberculous lesions has frequently not been recognized during life. Still<sup>32</sup> speaks of 43 cases dying of other diseases in whom the primary focus of infection was easily determined on account of the comparatively early period at which they were enabled to make the examination, and the local character of the infection. Of these the primary lesion was found in the respiratory tract in 26 cases, in the intestinal tract in 16 cases, and in the ear in 1 case.

Kossel,<sup>33</sup> in his series just referred to, met with tuberculous lesions in 14 children who died from other disease, and who, during life had not been recognized as suffering from tuberculosis. Of these 14 latent cases, in 10 the bronchial glands, and in 4 the mesenteric glands were infected.

To interpret these records aright we must recognize:—

1st. The peculiar susceptibility of pulmonary tissue to the growth and development of the tubercle bacilli.

2nd. That generalisation of the infection is a striking feature of tuberculosis in childhood, due probably to the activity of the lymphatic circulation in the child. It may, however, be also an indication of virulence in the infecting bacilli.

3rd. That tubercle bacilli, gaining access to the body through the intestines, may be readily conveyed from the lacteal ducts by the

lymph stream through the thoracic duct into the right side of the heart, and thence directly into the lungs.

4th. With our present knowledge of the distribution of the bacilli from human sources it is extremely probable considering the way children are allowed to creep upon the floor, and the tendency they have to put everything into their mouth, that bacilli may frequently be introduced on their fingers or on their playthings. It is also probable that much more frequently than the germs of typhoid fever human bacilli may be introduced with the food. The ingestion of bovine bacilli conveyed in milk is, therefore, by no means the only source of intestinal infection we have to reckon with.

From these statistics, however, we must conclude, that in the past the general profession has unquestionably exaggerated the danger of infection from ordinary milk. We have been misled perhaps by the frequency with which bacilli have been reported to exist in milk, for many investigators have mistaken other acid-fast bacilli found both in milk and in butter for true tubercle bacilli.

We have also been unduly afraid of a few bacilli in otherwise normal milk. Holt<sup>34</sup> is undoubtedly right when he says, "Unless the udder is the seat of disease, the number of bacilli contained in cow's milk is so small that infection from this source can hardly be considered as anything more than a possibility. There is little doubt that tubercle bacilli in small numbers may be introduced into the stomach with the food almost with impunity, traverse the intestinal tract and be discharged without ever attaching themselves to its mucous membrane.

The mixing of the milk from the whole herd also lessens the number of bacilli in any given quantity of the milk. At least it is probable that it does so in America, for tuberculosis in cattle does not exist to anything like the extent it does in England and in many European countries.

It is also to be remembered that tubercle bacilli do not develop in milk under ordinary circumstances as many other micro-organisms do, and that if they are not actually destroyed their virulence is at least inhibited by the many modes in which the milk is prepared for the child.

Although contrary to our experience in America, careful and recent records like those of Still, demand much consideration. It may be regarded as some explanation of the difference between his statistics and those of Northrup, Holt and Bovaird in America to point to the much greater frequency of tuberculosis in the cattle in Eng-

land, and the fact that the children attending the English hospitals whose records we have quoted, are children drawn almost entirely from the congested central districts of London. As one writer says, "They are children that rarely see more than the four walls of their home." American children have more fresh air at home, and to a much greater degree are they taken out into the country. These children are, therefore, pre-eminently children of low vitality, and Crookshank's experiment in which his unwittingly introduced pyemic bacteria increased greatly the virulence of the human bacilli and led to systemic infection of the cow, may assist us in understanding the frequency of intestinal infection in them. This thought is also corroborated by the greatly increased frequency with which tuberculous affections are met with in infancy and early childhood in London and the continent, to what they are with us in America. Holt refers to this, and certainly in Montreal tuberculosis in early infancy is very rarely seen. We have also very little tuberculosis in cattle.

In this connection we may ask the question, do those cases in which the mesenteric glands are alone affected, represent truthfully all the possibilities of infection through the intestinal tract and by food? Does not Koch himself give us another suggestion, perhaps somewhat unwittingly, when describing the post mortem findings in animals who had eaten the bacilli of bovine tuberculosis, he says, "These animals had without exception severe tubercular disease, especially tuberculous infiltration of the greatly enlarged glands of the neck and of the mesenteric glands, and also extensive tuberculosis of the lungs and spleen." With such rapid generalisation occurring in a tuberculosis of only three months standing, namely, from the administration of the infected food to the killing of the animal, may we not find an explanation of some of those cases rejected by Dr. Northrup when he says, "34 cases were indeterminate; cases in which the ravages were so extensive that the seat of primary infection was not clear; the bronchial lobes were enlarged and cheesy, likewise the mesenteric; the lungs contained tubercles, so did the liver, spleen, kidneys and meninges."

Leonard Pearson has also recently shown by many feeding experiments under the auspices of the Pennsylvania State Live Stock Sanitary Board, that animals fed with tuberculous material may develop pulmonary tuberculosis, and in some instances fail to show lesions in any other organ.

A clinician on these matters must speak with some diffidence, but from these statements and others, it would appear probable that in a certain percentage of those cases in which the respiratory tract is

involved, the infection may have been originally conveyed in the food, but it also follows that the bacilli in these cases were of a virulent character. When discussing these points with Dr. Adami one evening he suggested that it was perhaps possible to differentiate in childhood, two types of the disease, one of human origin, the other perhaps from bacilli of bovine origin. He has kindly favored me with his views in writing, as follows:—

“I might point out what very possibly has been pointed out by others, though if so I have not noticed any reference to such a statement, that, more especially in the young, we meet with two types of tuberculosis—the rapidly, and the slowly progressive forms. Concerning the former I need say little; it corresponds to the fatal tuberculosis of early adult life save in this, that it appears apt to be still more rapid, to generalise simply, and to end in acute miliary tuberculosis, or tubercular meningitis; its very rapidity indicating that the young are even more susceptible to virulent tuberculosis than are adults. It is to the slowly progressive form, however, that I would especially draw your attention—the form which shows itself as scrofulous lymphatic glands and tubercular peritonitis—a peritonitis often so mild that it can be cured by inunctions of mercurial ointment and other drugs setting up a mild irritative process. I remember how I used to be struck by these cases when a house physician years ago. Here is something very different from ordinary tuberculosis, and our general conceptions of the disease.

One explanation of this slowly progressing form, which immediately presents itself, is that the progress of the disease is dependent upon the powers of resistance on the part of the organism and of the attacked tissues, and that in these slowly progressing cases we are dealing with the development of tuberculosis in those relatively insusceptible. But on consideration not a little is to be said against this view. For, granting, as all will I think grant, that with advancing age—and especially after early adult life—there is a progressive insusceptibility to the disease, then, were this reason correct, we ought to meet with this slow form most frequently between the ages of twenty-five and forty. It is just at this period that we do not come across it to any extent.

Another explanation appears more probable; namely that the relative rapidity of the systemic infection in different individuals is not due to a variation in tissue susceptibility so much as to a variation in the pathogenic properties of the bacilli. It is especially at the milk drinking period of life, and in connection with the alimentary tract that this milder form manifests itself (for infection of the cervical

lymphatics would seem secondary to infection from the mouth, tonsils, etc., and tubercular peritonitis is evidently closely associated with the intestines.) Is it not, therefore, possible that infection with bovine tubercle bacilli leads in the first place to the production of this relatively mild form of tuberculosis, while the more acutely progressive form is due to bacilli which by passage through a series of human beings have acquired heightened virulence for man? I do but suggest this tentatively; to prove it, or seek to prove it, requires careful study of a full series of cases.

That this mild form at times culminates in acute miliary tuberculosis, is freely admitted, but this after all is what is to be expected. As Nocard's observations upon avian bacilli fully demonstrated, after long continuance in the body of birds, the ordinary (human) tubercle bacilli acquire for birds the character and virulence of avian tubercle bacilli, so, long continuance in the human body would eventually modify bovine bacilli—they would acquire increased proliferative powers and toxicity against the human tissues."

Associated with these suggestions of Adami may I briefly refer to the investigations of Kossel,<sup>35</sup> who, in a series of 63 children from one to ten years of age, hospital out-patients, tested with tuberculin found that out of these 63, 28 gave the reaction. He was not content with one typical reaction but in all cases he insisted on having two. Of these 28, in 24 no physical signs were found. Kossel believed that two-thirds of these cases of latent tuberculosis were cases of involvement of the bronchial or mesenteric glands, the other third he considered represented involvement of the cervical glands, bones, etc. He believed that these 28 cases, or 40 per cent. were nearer the truth as a representation of ailing children affected with tuberculosis than the 12 per cent. he found at autopsies. "Jederman hat ein bisschen tuberculose."

Hitherto we have given all the credit to the improved health and environment of the patient in withstanding the attack of the bacillus; perhaps in some cases the source from which the microbe originally came has also much to do with the result. In this somewhat hurried resume, I have endeavored to place before you, the more important facts, thus far ascertained, which have a bearing on this very interesting question. The more one considers them, the more is one convinced that much clinical and bacteriological work still remains to be accomplished before these latest statements of Koch can be either accepted or contradicted absolutely.

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# THE ADMINISTRATION OF THE CIVIC HEALTH DEPARTMENT.

BY

J. E. LABERGE, M.D.

As you are aware, the Montreal Health Department has been completely reorganized. It was thought proper in order to facilitate the working of the Department to divide it into four sub-departments, which remain under the control and enlightened direction of the Medical Health Officer, Dr. Louis Laberge. I have been appointed head of the sub-department concerned in combatting contagious diseases. Counting upon by your co-operation and support in the arduous task of directing this department, I accepted the position. The responsibility that falls upon me is great and the means that we have at our disposal to effectively combat contagious diseases is very small. However, with the assistance of the profession I venture to hope that the work can be carried out with happy results, without a great deal of difficulty.

It is with this hope that authorized by the chairman and our Chief Physician, Dr. L. Laberge, I have the honor of appearing before you to treat the important question of the combatting of contagious diseases; how to employ the means at our disposal in order to obtain the best results. I have certainly not come before you to ask you to establish the fact that the means at our disposal are insufficient; I come simply to pray you to aid me in doing the best with what we have..

If we cannot do more this year, we can at least lay the basis of an organization. Let us hope that next year the city council will grant the funds necessary to establish upon an efficient footing, this important department upon which public health depends. It would certainly not be proper to review here the reasons that should move every physician to make it a constant duty to seek to improve the hygienic condition of his surroundings; of his patients and of the city generally; it is the duty of every physician worthy of the name, to do all in his power to prevent disease. By acting thus he wins the affection of his patients, the respect of his confrères and does a truly patriotic work.

The science of hygiene is comparatively new, but the public interests itself greatly in those questions, not only because upon the observance of its laws depends one's well being, but also on account of its novelty.

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It is therefore very easy for the family physician to become an apostle of hygiene, the propagator of the laws, the educator of the people. The citizen attacked in his family by the scourge of contagious disease, if properly advised by his physician, will always receive the health officers kindly and will help to render the accomplishment of their duties less arduous. If he properly understands that the officers of the department visit his home for the purpose of seeking to prevent the spread of contagion or to stamp it out and render his dwelling more healthy, I ask myself why, he should not be pleased with such a visit.

I do not believe in the effectiveness of draconic legislation in hygienic matters; I think that much more can be obtained by persuasion. This is why I consider your co-operation to be indispensable to fight effectively against contagious diseases (which unfortunately frequently visit us), in order to dissipate the prejudices amongst ignorant people, prejudices that exist against all that comes from those who wear yellow buttons.

Every time that a case of contagious disease occurs in the practice of a physician, he is obliged by law to notify the Health Department as soon as possible. Then the Department has to take the measures necessary to protect the population against the infection. It is therefore the duty of the Health Department to take charge of or to watch carefully every case of contagious disease in the interests of public health.

It is desirable that whenever a case of contagious disease cannot be properly isolated at home, the patient should be sent to the contagious diseases hospital as soon as possible, and the house disinfected immediately after his departure. When the patient is kept at home, he should be confined to his room, which should be completely isolated from the other apartments.

Everything likely to become infected by microbes that can be disinfected only with difficulty, should be removed from the patient's room, such articles are carpets, curtains, upholstered chairs, etc., etc. A sheet should be suspended at the door of the room to prevent currents of air from escaping from it. This sheet should be kept constantly moist with a disinfectant solution. No one but the attending physician, the health inspector, and the nurse, should have access to the patient. A placard pointing out the danger of infection should be posted at the door of the house. If these precautions are taken and followed out rigorously to the satisfaction of the Health Department, it is not absolutely necessary to quarantine the entire house; when the family is opposed to sending the case to hospital, and it is

not possible to isolate the patient at home, it is absolutely necessary to completely isolate the whole house, to prevent any of the occupants from going out, and to forbid the entry of strangers. When these rules are violated, it is necessary to place a guard day and night at the door, whose duty it is to see that the quarantine regulations are observed.

The Department has two physicians to attend to the inspection of these cases, and see that the regulations of the Board of Health are carried out. When the family agrees to send the patient to hospital, the family physician should telephone to the Civic Hospital for the ambulance, always stating the nature of the disease; the ambulance is at once sent for the patient, and a nurse invariably accompanies it. After being used, the interior of the ambulance and its contents, blankets, mattress, are disinfected. Immediately upon his arrival, the patient receives the attention that his case requires. The family physician is admitted to visit his patient whenever he judges proper; but such visits should always be made in company with the hospital physician, who has charge of the patient, and administers the treatment. Unfortunately, the hospital is so arranged that only three kinds of infectious diseases can be received there; namely, scarlatina, diphtheria and smallpox; we have no accommodation for other infectious diseases, which must necessarily be isolated at home. When all danger of contagion has passed, either through the restoration to health of the patient or his removal to hospital, the family physician should notify the Health Department to disinfect, which is done with sulphur or formaline, in the case of the rooms, and with steam under pressure in the case of carpets, mattresses, etc. A special, tightly closed vehicle is sent to bring the effects to the disinfecting apparatus; another vehicle returns them to their owners, after disinfection; while their houses are being disinfected, the occupants can remain in the reception house, No. 700 Mount Royal Avenue, provided for them by the city. There is only one disinfector employed, but in case of necessity, others are engaged. On an average eight houses were disinfected daily last year; the smallest number was two, and the greatest eighteen per day. To obtain from a disinfection its maximum efficiency, either with sulphur or formaline, the holes, cracks, in fine, all the openings must be closed. The work is lengthy, and one man cannot do more than four houses a day, if the work is to be done conscientiously, as it should be. The disinfection by the steam apparatus is conducted by an engineer, who also collects the goods to be disinfected, and returns them to their owners after disinfection. He makes out a list of all the articles to be brought to the apparatus, which the owner signs

upon delivery, and upon their return the list is deposited in the Health Department. Many articles cannot be disinfected by the apparatus; such are those composed of leather, fur, rubber, etc. They should be left in the room exposed to the action of the disinfectant vapors. Besides this disinfection by the employees of the Health Department, the family physician should make people understand the importance of a thorough house cleaning. He should get them to make a further disinfection themselves, by washing with bi-chloride of mercury or other agent to be gratuitously furnished them by the Health Department, the furniture, floors, walls, and ceilings of their houses. Disinfection is never too well done; it is certainly the main precaution taken to protect public health against epidemics of all kinds. This operation is not so simple as it is too generally believed to be; it requires a sufficient and competent staff. Some physicians believe, with a certain amount of reason, that disinfection but half done is more dangerous than useful, for where there has been no disinfection at all, we know that there is danger in such or such a house, precautions are taken, people do not go into them; but if the disinfection has been badly done one remains under a false sense of security, and the consequence may be serious.

The diseases at the present time considered contagious, and that physicians should always report to the Health Department in order that the necessary precautions may be taken to prevent their dissemination are the following: Diphtheria, scarlatina, smallpox, chicken-pox, typhoid fever, measles, tuberculosis.

(1) *Diphtheria*.—When a physician finds amongst his patients a case that he has reason to suspect to be of a diphtheritic nature, he should at once apply the swab to the exudation, and after rubbing it over the surface of the coagulated serum in the tube, send the latter to the bacteriological laboratory at the Civic Hospital; twenty-four hours after the reception of the tube, an examination will be made of the culture, and he will be notified of the result. While awaiting the result of this examination, as a matter of precaution, the patient should be isolated from the other members of the family; and it would be better to make an injection of anti-toxine serum immediately. This treatment presents no danger when administered at the onset of the disease, and prevents the infection of the system, if we have to deal with a case of diphtheria. I think that the city should furnish the serum free of charge, in the case of the poor to be utilized in those doubtful cases upon demand of the attending physician. If the bacteriological diagnosis establishes the fact that we have to do with diphtheria, the patient should be isolated in a room containing neither carpet nor up-

holstered furniture. This isolation should be carried out to the satisfaction of the Health Department. The attending physician should give instructions that the patient should not spit upon the floor, but collect the sputum rags which should be burned, or better still, he should expectorate in a cuspidor containing a disinfectant solution. It is also to be desired that the physician should send a postal card to the Health Department, stating that a case of contagious disease has occurred in his practice, the probable source of contagion, and the address of the patient, the school frequented by the children, the establishment where the parents are employed, the name and address of the milkman, and the sanitary state of the house. This information is of the greatest use in order to permit of every source of contagion being dealt with. If the parents consent to send the patient to hospital, the ambulance will be sent, but only upon the demand of the family physician. After the departure of the patient, or after his cure, which should always be established by means of a negative culture upon coagulated serum, the Health Department carries out the disinfection. The department, according to the information obtained from the family physician which is absolutely confidential, notifies the school authorities as to the nature of the disease with which the pupil is attacked, notifies the parents, employers, and the medical inspectors visit the schools and factories to ascertain whether there are not other cases, and take the necessary measures to indicate the causes of the contagion. Special attention is directed to the milkman. Although the department of the food analyst is different from that which deals with contagious disease, they are all connected, and the division of the department does not prevent united action.

(2) *Scarlatina*.—This is an eminently contagious disease for which we have no specific treatment, a special reason why isolation and disinfection should be attended to in a thorough manner. Every physician, even in the presence of a doubtful case, should notify the sanitary authorities, who will send a medical inspector to aid him in his diagnosis, and divide with him the responsibility. The patient should be isolated in a separate apartment; the person in care of the patient should remain isolated with him, no one else but the family physician and the medical inspector being allowed to enter the room. If suitable isolation cannot be had in the house, the patient should be removed to hospital or else the whole house quarantined, no one being allowed either to enter or leave it. All the linen used by the patient should be immersed in an antiseptic solution, awaiting its being sent to the steam disinfector. The sick room should contain only such furniture as is absolutely necessary and can be easily disinfected; the nurse should

be recommended to frequently wipe the floor with a cloth moistened with a disinfectant solution, remove all the dust; all the particles that may fall from the skin receive upon old pieces of linen that may be afterwards burned without any considerable loss and also with the exudations from the nose or mouth of the patient. After convalescence or after the departure of the patient, a thorough disinfection should be carried out by the Health Department; the clothing that cannot be put into boiling water, the mattresses, carpets and curtains should be disinfected by the steam disinfecting apparatus. When the disinfection is completed a thorough house-cleaning should be recommended: washing of the floors, walls, furniture, wood work, with a disinfectant solution. The drain should be disinfected and put in proper order. The period of incubation in scarlatina is supposed to be 8 days, it is therefore advisable to wait that time after disinfection before sending children to school.

(3) *Small-Pox, Varicella, Vaccination.*—Because of the resemblance between these two diseases at the commencement and the regrettable mistakes that may result, and in order to stamp out, as far as possible, a disease which, while not very grave, is very contagious and exceedingly disagreeable, I believe that the Health Department should disinfect the places where varicella has occurred and as far as possible rid the city of this troublesome and annoying disease. Smallpox is the scourge which can most easily be eradicated here, because every one affected with smallpox must be removed to hospital. Immediately after the patient's departure the house is disinfected, and the persons who have been in contact with him are quarantined for two weeks and vaccinated. This is a rigorous by-law, but in view of the results obtained within the past five years its efficiency and necessity must be recognized. There is a preventive treatment for this terrible disease which you all know, it is vaccination. It is unfortunate to witness the apathy, the indifference of certain families to a treatment so simple and that costs nothing. It is in this connection that the physicians should come to the assistance of the Health Department, either by vaccinating their patients themselves or inducing them to be vaccinated by the physicians of the Health Department without waiting for smallpox to reach our very doors. Every day we vaccinate, free of charge at the Health Department, those presenting themselves. Vaccine is furnished gratuitous to every physician applying for it and, when asked for, a public vaccinator is sent to vaccinate at the domicile. We are in duty bound to take the measures necessary to prevent the scourge which had so many victims in 1885, and that cost the city so much, from again getting a foothold in Montreal. The only means of preventing

these disasters is vaccination; but we cannot obtain satisfactory results without your help. We therefore count upon your assistance to attain the end we seek in this matter.

(4) *Typhoid Fever*.—Although by means of certain measures its infection can be destroyed, it is nevertheless an infectious disease which every year has only too many victims. The contagion, as you are aware, is communicated either by the evacuations from the intestines or by the urine, and in an indirect manner by water and milk. It is therefore important that the Department should be notified of all cases of typhoid fever that may occur in your practice. In order to facilitate its diagnosis the Municipal Bacteriological Laboratory will supply the sero-diagnosis, whenever you desire it. You have only to send a drop of blood from the patient to the Laboratory and you will receive my answer the same day. In this, as well as in the other contagious diseases, great precautions must be taken to avoid contamination. The stools and urine of the patient should be disinfected. After cure, the disinfection of the house should be done by the Health Department. As milk is a vehicle which often carries the contagion of typhoid fever, it is desirable that the Health Department should know the name of the milkman supplying the family attacked by the disease.

(5) *Measles*.—Unhappily, we have no hospital accommodation for cases of measles. The Civic Hospital is so arranged that there is room only for diphtheria, scarlatina and smallpox cases, yet this disease is eminently contagious. It is necessary to isolate the patient at home, and the greatest precautions should be taken if the dissemination of the disease is to be prevented.

As far as possible isolate the patient in a separate room, that no one is allowed to enter except the physician. When the disease is at an end, the family physician should notify the Health Department as he did at the outset of the disease. Measles, it is true, is not considered to be a very serious affection, yet it has a certain number of victims to its credit, and I do not see why the population should not be protected against so contagious a disease, and one that is more serious than is commonly thought. Therefore, here as in other affections of a contagious nature, isolation and disinfection should be carried out.

(6) *Tuberculosis*.—Consumption is caused by a bacillus with which you are all familiar. This bacillus increases in considerable quantities in the lungs of the tuberculous subjects, and the sputum of these patients contains a more or less considerable number of bacilli. When the sputum dries in the room, it may become pulverized, the particles being disseminated in the air; and persons who breathe it may inhale the bacilli and become tuberculosed after a shorter or longer time.

How many of those cases do you encounter in your daily practice. As you know, consumption is not an hereditary disease, it is purely and simply the worst kind of a contagious disease.

I believe, therefore, that it is the duty of the Health Department to make a strenuous effort to stamp out as far as possible this scourge which makes such great ravages; but in order to obtain good results, a hospital is necessary to receive and treat consumptives, who roam about the streets, contaminate our hospitals and infect public buildings. I do not think that we can stamp out tuberculosis with the means at present at our disposal, but we should do something; and even that would be much. We might, for example, seek for the tuberculous bacilli in the sputum sent to our department, do for tuberculosis what we are now doing for diphtheria and typhoid fever. If all the cases of tuberculosis were reported, we could keep a record of the cases in a register which would be oftentimes very interesting to consult; but particularly, we could disinfect every infected house, after the departure of the patient. In New York and Boston, cleanliness is recommended; the patient himself sees to the disinfection of his sputum; he is made to understand the advantages resulting therefrom to himself; in the first place, in preventing auto-infection, and in the next place in preventing the infection of the people in his vicinity. Then the house where a tuberculous patient has been should be disinfected, as in the case of a house where diphtheria or scarlatina has occurred. Since in these two large cities, this line of conduct has been adopted, the mortality from consumption has considerably diminished. Allow me to enumerate without comment, and as briefly as possible the staff composing the important department of which I have charge:—

1st. A clerk and his assistant, who receive the complaints and reports concerning contagious diseases.

2nd. A disinfector and his assistant, whose duty it is to disinfect houses where infectious diseases have occurred.

3rd. Staff of the Civic Hospital.

4th. An engineer to disinfect with steam under pressure.

5th. An ambulance driver who removes the patients and calls for the articles to be disinfected at the disinfecting apparatus, and who returns them after disinfection.

In closing, allow me to tell you, that my object is not to discredit what has been done in the past, my object is not to revolutionize a system already established.—I come before you simply to expose facts and to study with you this important question. The fight against contagious diseases calls for your co-operation, your help, in order to es-

tablish upon a solid basis the wall that should protect us against contagious diseases. The Board of Health is composed of aldermen without special knowledge of this subject, and who, therefore, are not very much impressed with the danger that contagious diseases present to the population.

But I have every reason to believe that those gentlemen would receive with pleasure the suggestions you may be pleased to offer and be thankful for your assistance. Doctor Louis Laberge and myself hope to see the city of Montreal provided with a good Department to fight efficiently against contagious diseases.

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## MYXOMATOUS DEGENERATION OF THE CHORION.

BY

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The comparative rarity of the condition in the specimen I now show has induced me to think it may be of some use to the Society. It is an extremely well marked example of the vesicular mole, hydatidiform mole, or myxomatous degeneration of the chorion, as it is variously called.

The patient is multiparous, aged 33, and under the care of Dr. J. J. Ross. She has had five children, the youngest, three and a half years ago, was nursed. The recoveries in all instances have been good; no miscarriages. The last menstrual period occurred from the 21st to the 24th of January. The woman supposed she was pregnant, and everything was supposed to be going on well until May 1st, when she was suddenly seized with abdominal pain and profuse uterine hæmorrhage. She was kept in bed for a week or two and then allowed up, but continued to lose blood in varying quantity until the beginning of June, when she was again seized with severe pain and profuse hæmorrhage; I was then asked to see her.

There was symmetrical, uniform enlargement of the abdomen, decidedly greater than that which belongs to the presumed stage of pregnancy, as estimated by the date of the last menstruation. The feel was of elastic fluctuation, no foetal parts could be detected; no heart sounds were heard, but a distinct uterine souffle on the right side. Through the vagina, high in the pelvis, the cervix was discovered slightly dilated. It admitted the tip of the finger; but no pre-

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sentation or foetal part, only something elastic could be felt. During this day and the following night the hæmorrhage was alarming.

On the next afternoon she was sent to the Royal Victoria Hospital. On the way up in the ambulance she expelled portions of the growth. Under ether the uterus was cleared out. The os was considerably dilated and the mass of vesicles was scraped away without difficulty. No trace of foetus or placenta could be detected. The uterus contracted satisfactorily. What might be supposed to correspond to the placental site presented characters differing from the rest of the uterine cavity. It was elevated, uneven, lobulated and firm. The patient made an excellent recovery.

The fresh specimen in quantity was quite equal to half a pailful. It has been in formalin solution for three weeks; and in consequence has lost something of its normal appearance, the vesicles being considerably shrunken.

The future condition of this patient will be one to watch and be of great interest because of the well known relation of the vesicular mole to the recently much-studied syncytioma malignum. The development of this most interesting form of malignant disease may follow normal pregnancy, but it is especially frequent after mole pregnancy, and particularly after the vesicular mole. By some authors, 45 per cent. of the cases have been found to develop after the expulsion of the vesicular mole.

The recent symptoms in this case are of suspicious character.

#### DISCUSSION.

DR. E. W. ARCHIBALD had examined small portions of the tumor, both from the grape-like exterior and from the more solid remains of the placenta in the interior, but as such large portions had degenerated myxomatously, the microscopical sections did not show very much. All that one could find was myxomatous degeneration of the chorionic villi. Apart from this there was degeneration, the nature of which was not determined, showing as an unstained mass in the section and looking partly granular. In view of what Dr. Gardner had referred to, as to the possible occurrence of deciduoma malignum after these moles, two pieces had been especially examined for a possible evidence of any overgrowth of the syncytial cells, but Dr. Archibald was unable to find anything to suggest such an occurrence.

DR. F. A. LOCKHART thought the symptoms were practically of the type which one always got in these cases. Dr. Gardner had not said anything regarding the origin of the disease. This was a very disputed question. He believed the latest theory was that suggested by Dr.

Berry Hart, who claimed that the foetal thyroid was intimately concerned in the development of myxomatous into higher tissue. The foetal thyroid appeared about the third week of life and where it was not developed sufficiently one got this form of myxomatous degeneration. He cites as an example the umbilical cord which acts as an insulating material for the umbilical vessels. The cord is supplied by the maternal blood and not by the foetal, therefore it cannot obtain any of the secretions of the thyroid.

DR. W. W. CHIPMAN had looked over the sections made by Dr. Archibald and was rather interested to find that the active process was confined exclusively to the core of the villi, the covering seeming quite intact. He remembered seeing a case of this kind three years before, where one could trace the epithelial covering of the villus directly into the decidua of the uterus. It was at the time of the contention as to whether deciduoma malignum was of epithelial or mesoblastic origin, and this showed undoubtedly, that these cells as they had grown into the tissue of the uterus were epithelial. Metastases in the lung in this case were also of the same type.

Another singular case of this nature had been reported in the Edinburgh Obstetrical Society some years ago, where a woman had died with a deciduoma malignum growth in the brain. The question, of course, had been how it had got there, and it was explained that evidently the growth had begun in the first place in the lung, and had crossed from the pulmonary to the systemic circulation.

With regard to Dr. Hart's contention, he goes on to say that after the removal of the decidua it is well to give the patient thyroid extract in order that if any remains are left they can be hurried on through the myxomatous stage to the adult fibroid stage and therefore the risk of their becoming malignant is lessened.

DR. PERRIGO had had two cases of this condition, one a woman in her first pregnancy. She was supposed to be about five months pregnant but did not seem to be increasing in size. Every other day or so she had a slight show of blood with moderate pain. On making an examination he had found something presenting which, as he had already seen a case, he recognized as a vesicular mole. She was treated in the usual way and made a good recovery. Another case, which he had seen about three years ago, was supposed to be further advanced in pregnancy and had as a first symptom a profuse hæmorrhage. The vagina was plugged with iodoform gauze for two or three days, and then on making a proper examination the condition had been recognized from the presenting part, and an anæsthetic administered and the uterus emptied. The recovery was perfectly smooth, only that the

uterus had been some days in properly contracting, the woman being in a flabby condition and very anæmic. Up to the present, three years, she has had perfect health.

DR. GARDNER, in reply, stated that he had omitted to emphasize the fact that the development of the uterus in size had been disproportionate to the duration of the pregnancy, judging from the date of the last menstrual period. In May the uterus had developed to quite the size of a seven month's pregnancy, although only three months had passed, and the increase had been relatively rapid towards the last.

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### A RAPIDLY FATAL CASE OF SCARLATINA.\*

BY

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On February 6, 1901, Mr. H. C. telephoned me that his little boy had just died, and, as no doctor had seen him, asked me to go to his house and endeavour to ascertain the cause of death.

The following history was given me:—Freddy C., a boy of two years and eleven months, had seemed well until five o'clock the previous afternoon. At that hour he came in from play, complained of feeling sick and vomited. During the night he had a loose, dark-coloured motion, but on the morning of the day of his death he awoke quite bright, and played with his brother in bed. He slept some during the forenoon, and at twelve lay on his father's knee and ate a baked apple. His eyes were heavy; but apart from this, his parents, who are both intelligent people, did not feel anxious about his appearance. About three p.m. his mother noticed his feet cold, and shortly afterwards he had a convulsion, followed by a state of stupor. He had several more convulsions and died about half-past five p.m., without regaining consciousness.

The body was seen about four hours after death and a partial examination was made. The body was that of a well-nourished child with signs of moderate rickets. Reddish patches were present on the abdomen and thighs. The glands at the angle of the jaw were enlarged, and, on prying open the mouth, the tonsils were seen enlarged and reddened, and the redness extended upwards on to the palate. The peritoneum, stomach and intestines were free from inflammation. The lungs were very dark and hyperæmic, but not consolidated. The veins over the heart were much distended.

This hasty examination combined with the fact that a scarlatinal

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epidemic was raging in the city at the time, led me to regard scarlatina as the probable cause of death. This opinion was confirmed by the fact that his brother was taken down with scarlatina nine days later. The duration of the disease, in the case reported, from the first symptom was between twenty-four and twenty-five hours.

While this form of scarlatina is well recognized, cases as rapid as this are sufficiently rare to be worthy of notice. The most rapid case mentioned in Nothnagel's System of Medicine was twenty-six hours. Goodhart saw a case die inside of thirty-six hours. Keating's Cyclo-pædia says cases die inside of twenty-four hours, but does not cite instances.

One of the most interesting contributions to the literature of this subject is a paper read before the Montreal Medico-Chirurgical Society twenty-five years ago, by Dr. W. E. Bessey.<sup>1</sup> There had just been a severe epidemic of scarlatina in the city, and he reported a number of malignant cases, in one of which death occurred at the end of twenty-four hours. He thought that malignant cases were more common in those parts of the city which were most poorly drained and most insanitary, and that a poor constitution, especially a strumous cachexia, increased the likelihood of the disease assuming a malignant type.

DR. ANDERSON thought this case was extremely interesting from a pathological standpoint, and suggested uræmia as the probable cause of death. He related his experience with two cases, in which a well marked albumin ring and the presence of numerous casts had shown the presence of grave renal affection without any symptoms to point to such a lesion.

DR. ENGLAND had never heard any explanation of the reason why different epidemics varied so much in virulence. From 1885 to 1890 scarlatina in Montreal had been of a mild type and was almost as little thought of as measles, whereas in the years following it had been of a particularly severe type, many cases of sudden death such as this being reported. He did not think we should look to the kidneys as an explanation of this, but rather to the peculiar virulence of the epidemic.

DR. W. E. DEEKS suggested that one explanation of the difference in virulency of epidemics might be in the attenuation of the bacillus. Bacteriologists could now attenuate in various ways all sorts of organisms and bring about in the lower animals less virulent forms of disease.

DR. GIRDWOOD offered as an explanation of the variability in virulence the recent climatic conditions, an exceptionably mild spring and winter pointed to the possibility that the germs did not get the usual

<sup>1</sup> Dr. W. E. Bessey, Notes and Observations on Malignant Scarlatina and Allied Affections, *Canada Medical Record*, 1875, III., 453-463.

amount of freezing. There had been great vegetable growth this year and an abundance of warmth and moisture, which were productive of increased growth of all kinds of fungi. He suggested that by comparing the climatic conditions for a number of years with the virulence of the infectious diseases for the same time, one might be able to determine whether this was a factor or not in altering the virulence.

## INTESTINAL OBSTRUCTION BY A FOREIGN BODY.

BY

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AND

D. D. MACTAGGART, M.D.,

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The following interesting case is worthy of putting on record both from the unusual cause of obstruction which was found post mortem in the intestine and the rapidly fatal result.

W. P., male, aged 52 years, fitter in the Grand Trunk Railway, had always been a healthy man. Eleven years ago he had an attack of typhoid fever, and for some years past has been a heavy drinker.

On the morning of October 27, 1901, he rose in his usual good health, took a hearty breakfast and went for a walk. On returning, a short time before dinner, his wife gave him half of an orange, cut diametrically. He removed the pips, expressed the juice, and evidently swallowed the pulp (umbrella fashion). After this he ate a hearty dinner and felt well until supper time, when he complained of an uncomfortable feeling over the epigastric region, which remained until he went to bed. After sleeping well all night, on awakening the next morning, he still had the same pain, but it was more severe in character. At 6 a.m., he went out, took a glass of gin and went to work at 7 a.m., without taking any breakfast. The pain, now spasmodic in character, gradually became more intense until at 11 a.m. he was compelled to give up work and go home. After reaching the house he lay down on the bed, and at 2 p.m. sent for his wife who was absent for the day. When she arrived she gave him a teaspoonful of "painkiller" which was followed by a slight relief. Shortly afterwards he commenced vomiting a foul-smelling fecal matter and the pain became agonizing.

I saw him about 5 p.m., when he seemed to be in a state of great collapse. The temperature was subnormal, the pulse almost imperceptible, ranging between 140 and 150, the extremities cold, the face

\* Read before the Montreal Medico-Chirurgical Society, Nov. 15, 1901.

pinched, and the abdomen rigid, especially on the right side. I ordered heat to the extremities with hot turpentine stupes to the abdomen, and suggested that he be removed to the hospital for surgical interference, if such should prove necessary. He, however, refused to go to the hospital so I left him, intending to return in an hour or so. He died at 6.30 p.m., before he could be moved, and a postmortem was obtained through the indirect kindness of Dr. Hutchison and the direct kindness of Dr. MacTaggart whose report follows:—

On opening the body, and examining the small intestines, none of the usual forms of obstruction, such as volvulus and kinks in the intestines were to be found. At a point about three inches above the ileo-cæcal valve a hard mass could be felt completely filling the lumen. Above this point for the full length of the small intestines there was gaseous distension, and the bowel contained a considerable amount of fluid. On pressing the contents of the bowels down from above, this mass already described became enlarged. On opening the bowel at the point at which the mass was situated, it was found to be formed by a portion of an orange. The orange had evidently had the outer rind removed and then had been cut in halves across the segments; and the portion contained in the bowel consisted of nine segments, or about three-quarters of the half orange. The pulp had all been digested; but the segments were not separated from each other and apparently lay in such a position in the bowel that the fluid contents of the bowel expanded the segments sufficiently to block the lumen, and thus caused the orange to act as a valve preventing all passage of fluids.

### PECULIAR CASE OF BLADDER REFLEX.\*

BY

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I make so bold as to report this case, not with the view of startling you all with theories of my own manufacture, but on the contrary to obtain the benefits of a discussion by those whose experience entitles them to theorize. The case is a most peculiar one, principally from the fact of its being of such an obscure nature, and the symptoms of such a fleeting character.

The following is as full a history as I could obtain from the patient:—

*August 25, 1899.*—H.S., bachelor, aged 71 years.

*Complaints.*—Occasional attacks of (a) slight dizziness, (b) irregular

\* Read before the Montreal Medico-Chirurgical Society, June 21, 1901.

pulse, (c) fluttering heart, (d) passage of large amount of urine, with (e) frequency of micturition.

*History of Present Illness.*—About five years ago patient had what he calls his first paroxysm, which came on during the night. He was awakened with a desire to urinate, and simultaneously with this there was a species of dizziness, fluttering of the heart, with very irregular intermittent pulse. He would have to urinate about four or five times during the next three hours or so, the urine passed during this time being about one-half or three-quarters of a chamber. It was very light in colour, as patient says, "almost like water." After this the polyuria passed off, but the irregular heart action lasted about twelve hours longer, when all symptoms completely disappeared, leaving him as well as before.

These attacks have been occurring ever since at intervals of from two to six weeks. Some of these have been so severe that patient has had both to urinate and defæcate at the same time, the one being just as bad as the other. There was no apparent cause for these attacks that patient could assign. Two attacks came on at intervals of six or seven days.

*Past History.*—Patient was born in Scotland in 1822, lived in Bengal, India, from 1847 to 1878, then came to this country where he has lived ever since. Has always enjoyed excellent health. During his 32 years of life in India he worshipped freely at the shrines of both Venus and Bacchus with the result that in 1853 he contracted a very severe gonorrhœal urethritis and cordæ. The urethritis lasted three years, was never treated by any physician, but only by chewing of herbs obtained from local sources, so that the condition was never properly cured. On several occasions he contracted chancroids, which he said he treated by burning them out with caustic, as was a common custom among the Europeans there; never had syphilis. Had a very severe attack of influenza last February, but this did not aggravate his present symptoms. Fourteen months ago he took a trip alone around the world, lasting eighteen months.

He has had occasional attacks of gout for the past six years, especially after the free use of alcoholic stimulants. Has had a double inguinal hernia for the past nineteen years. He also states that he had fluid in the right side of the scrotum for nineteen years, which was removed (a black fluid) while he was in New York about a year ago.

*Family History.*—Good.

*Present Condition.*—Patient is a very bright, active, intelligent, old man, who appears much younger than his years.

Pulse, 60; respirations, 18; temperature, 98°F.

Examination of the thorax shows that both the lungs and heart are quite normal.

Examination of the abdomen shows all the abdominal viscera to be healthy. No evidence of floating or movable kidney. On the right side there is a large, direct, reducible inguinal hernia, while on the left there is a small, indirect, inguinal hernia. Both of these herniae are kept up by means of a truss.

Locomotor and nervous systems healthy.

Digestive system.—Tongue clean and moist, appetite good, bowels regular.

Genito urinary system.—On examination of the scrotum and testicles there is no evidence of hydrocele nor of any change in the epididymus. No urethral stricture. Prostate was found considerably enlarged on examination of the rectum, especially the left lobe. There was no tenderness, however, and immediately after voiding his urine two ounces of residual urine was withdrawn from the bladder by catheterization.

Urine.—Beyond the fact of its being somewhat acid in reaction, it was quite healthy. No threads found in the urine, and no sediment whatever.

At this time I concluded by a process of exclusion that the patient might possibly be suffering from these attacks of tachycardia and polyuria secondary to some reflex from the bladder brought on, by the enlarged prostate.

*Treatment.*—I followed a simple course of treatment, namely, the withdrawal of residual urine after his having voided his urine, and a wash of boric acid.

The following is a tabular account of the duration and intervals between the attacks for six months:—

1900, Dec. 30, 4 a.m.

1901, Jan. 16, 1.30 a.m. (11 days.)

Jan. 19, 4 a.m. (9 days.)

Feb. 8, 3 p.m. (20 days.)

Feb. 19 4 p.m. (11 days, polyuria only.)

Feb. 25, 2 a.m. (6 days.)

Mar. 26, 4 to 6 a.m. (moderate, 29 days.)

April 27, 4 to 6 a.m. (32 days.)

May 19, 2 to 6 a.m. (23 days.)

June 11, 1 to 4 a.m. (23 days.) Attack moderate in severity.

Urine (June 11th, during attack) sp. gr. 1010, very slightly acid. watery, and almost colourless. (June 12th) sp. gr. 1020, clear amber or straw coloured.

## AN UNUSUAL TUMOR OF THE SOFT PALATE.

BY

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The patient whose history is here presented, was a male of about forty-five years of age. He came to the writer's clinic with the following complaint:—For the past twenty-four or forty-eight hours he had been suffering great pain and inconvenience with what he described as a painful swelling of the throat.

On questioning him, the following information was elicited. He had always been strong, and healthy, never having suffered from any illness, with the exception of two or three attacks of pain and swelling in the metatarso-phalangeal joint of the great toe, and about the same number of attacks of a similar lesion to that for which he now sought relief.

Examination of the mouth and pharynx demonstrated a tender mass of vivid pink color, the size of a marble, situated on the right half of the soft palate.

This on palpitation was firm and without fluctuation. The following interesting fact was mentioned by the patient at the time of examination.

He had noticed that the inflammatory attacks in the metatarso-phalangeal articulation had never occurred at the same time as the attacks similar to that for which he now sought relief, and further, it was his fixed conviction that such inflammation migrated from his foot to his throat.

On consideration, the diagnosis rested between a syphilitic gumma, and a lesion due to gout. The former is by no means rare, but the latter is exceedingly so. The history and the appearance pointing against the possibility of this tumor being luetic in origin, the patient was treated for gout, which was followed almost immediately by a marked and rapid resolution of the tumor, and all symptoms then present. This case is of interest from a diagnostic standpoint, as the similarity of the tumor to a gummatous infiltration was most marked, and indeed, it is quite unlikely that the diagnosis made, would have been possible, although one could not help noticing the extraordinary coloration quite characteristic of gouty lesions of these parts—if it had not been for a strong anti-venereal history, combined with one typical of what is commonly known as gout.

# SOME GENERAL PRINCIPLES OF INTER-POLAR CURRENTS, AS THERAPEUTICAL AGENTS, WITH SPECIAL REFER- ENCE TO THOSE OF THE STATIC MACHINE.

BY

S. FAIRWEATHER WILSON, M.D.

A general survey of the subject of electricity cannot but impress upon one the all-important fact that electrical energy, whether generated by the revolving plates of the static machine, through the coils of a Faradic, or from the cells of a galvanic battery, is but the manifestation of the self-same force in nature, that it is governed by the same general laws, whether used as a mechanical or therapeutical agent, and, that the primary difference in all electrical currents lies solely in the relative ratio of the two physical qualities—voltage and amperage. This being the case, it must follow, that to be able to use electricity intelligently, to know which form of electrical energy to apply and the manner of applying it, when to expect and when not to expect favourable results, one must at the outset, not only have a knowledge of its own general laws, but (as will be shown later) must also have an intimate knowledge of the nature of the structures to which this agent is to be applied.

In the same way as one would not expect to get the styptic properties of the tincture ferri mur. from a solution of citrate of iron (although the iron is present in each case), one would not expect to get from a current of galvanism, the penetrating power of the high voltage static current, although in both instances one may be using electricity; nor could one expect the same physiological effect from the simple continuous current passing through the tissues, that would be expected from that of a current of many interruptions or alternations.

### *Polar and Inter-Polar Actions Distinguished.*

The action which takes place at or in the immediate vicinity of either electrode, is known as the polar action (positive or negative) while the action which takes place in the tissues between the electrodes, is termed the inter-polar action, and to the changes effected in the latter instance, is given the name catalysis. Catalysis includes a certain amount of electrolysis, cataphoresis and accelerated osmosis; processes now to be explained briefly as necessary to an intelligent knowledge of the inter-polar current.

*Electrolysis.*—Around each electrode, when the current is of sufficient

energy to overcome the chemical affinity existing between the atoms or elements of substances, there is set up a process of decomposition termed electrolysis.

The decomposition of electrolysis differs from that of galvano-cauterization, in that, in the former, the electro motive force and the polarity of the current and that of the elements is the active agent; whereas in the latter (galvano-cauterization) the active agent is the heat which is generated by electric energy in the presence of resistance.

In Electrolysis the substance to be decomposed is known as the electrolyte. The elements into which the electrolyte is decomposed, are termed *ions*. When an electrolyte is decomposed, the ions which are generated at the negative appear at the positive pole, and are termed *anions*; while those generated at the positive pole, appear at the negative pole, and are termed *cations*.

It is in accordance with the general law, that like poles repel and unlike attract, that the anions, which are electro-negative, appear at the positive pole, and the cations which are electro-positive, appear at the negative pole.

The anions or electro-negative elements, in human tissue embrace:—Oxygen, nitrogen; chlorine, sulphur, etc., etc. The cations, or electro-positive elements, include:—Hydrogen, potassium, sodium, calcium, etc., etc.

The anions are known as the acid radicals, and because of their polarity, they must always be attracted to, or around, the positive electrode during electrolysis; while the cations are known as the basic radicals, and they, for a like reason, must tend to, or do, accumulate, around the negative electrode.

*Cataphoresis*.—The process of carrying substances into or through the tissues by the electric current is known as cataphoresis, and is made use of very extensively when the local action of drugs is required.

Some would maintain that this process of cataphoresis is purely a physical act of the current, and that consequently as the current always flows from positive to negative the substance should always be applied through or on the positive pole. That this is an erroneous idea, and that the diffusion depends entirely on the polarity of its elements, can be practically shown by experiment.

*Osmosis*.—It is known that if two fluids of different densities be separated by a porous diaphragm, there is always a continuous flow of the lighter to denser fluid called osmosis. If a current of electricity is passing in the same direction, this natural flow is increased, whereas if the direction of the electrical current is reversed this osmotic action is also reversed, with the electric current from the denser to the less dense fluid.

This power of electric currents of increasing osmotic action and influencing it in its own direction, probably in some measure explains the part played by electricity in hastening the absorption of fluids effused into jointed or serous membranes.

*The Therapeutical Action of Inter-Polar Currents.*

The effects on human tissue, of a current, the electrical energy of which is not of sufficient strength to perceptibly overcome the chemical affinity of the elements composing the tissue through which it passes, constitute its therapeutical action.

When one wishes to get at the primary action of glandular structures, or of any functionary secreting or excreting organ, or to excite to action nerve cells, or nerve or muscular fibre, if he can make use of an agent, the primary action of which is directly on the cellular elements of these tissues, and the inherent action of which is to increase or diminish the cellular activity as required and encourage all physiological processes, I think it must be admitted that he has a power which must be of great importance in getting therapeutic results. Let us consider in how far the inter-polar current fulfils these indications:—

(1) There is the local increase or decrease in *cellular activity*, depending on the direction of the current.

(2) The *changes* brought about in the *structural elements* of the tissue.

(3) The physiological effects on human organism.

*Cellular Activity.*—If the electrode of a galvanic current be placed over the salivary gland, the saliva will be increased or diminished according to whether the negative or positive electrode, respectively, be used over the gland, while there will also be imparted to the mouth, a distinct metallic taste.

This increased flow of saliva is due to increased activity in the cellular elements, which causes an increase in the blood supply. This increase in the supply of blood to the gland, must be through the nervous system, by the current exciting a secondary action on the central nerve centres. The blood vessels become dilated, not in any way through the muscular tissue, because the primary effect of a current on muscular tissue is to cause it to contract. This localized increased activity in the cellular elements, in addition to increasing the flow of saliva, must also increase the metabolism and promote any functional process. And, to generalize, that which occurs in the case of the salivary gland must also take place in all other tissues along the line of force of the current.

*Changes in the structural elements of tissue.*—When considering the polar actions on human tissue of currents of sufficient strength, elec-

trollysis and cataphoresis have been shown to take place at the points of contact of the electrodes with the tissue, according to the electromotive force, the polarities of the currents, and the polarities of the elements in the tissue make-up.

When an inter-polar current of similar intensity is passing through similar tissue, it must in the same way, (though perhaps in a somewhat less degree) influence all elements along its lines of force with respect to their polarity, whether applied locally or generally. The same chemical and electrical laws hold good, but it must be admitted, however, that the more complex the electrolyte, and the more general the application of the current, the greater the number of decompositions and combinations that must necessarily take place. Hence it would take an expert analytical chemist and electrician to determine all the changes which would actually take place along the course of a current passing through the human body.

However, we know, (1) that about seventeen elements, oxygen, hydrogen, nitrogen, chlorine, potassium, sodium, etc., enter into the composition of human tissue in varying proportions, and combinations; such as water, common salt in solution, albumen and mucin, etc.

(2) We know that each of these elements will under all conditions preserve its polarity in reference to the current of electricity, and (3) we know that the majority of these compound substances can be broken up by all currents of density sufficient to overcome the chemical affinity existing between the elements or ions.

(4) Althaus, 1866-67, by a series of microscopical observations on the changes brought about by the galvanic current, proved that the degree of disintegration was directly proportional to the electro-motive force, and to the softness and vascularity of the structures.

(5) Again it has been clearly shown by Dr. Stone, in his Lumleian Lectures before the College of Physicians, London, that the human body, after the passage of a continuous current through it, will for some hours after give off a current that is capable of deflecting the needle of the galvanometer, as high as 12 ma., or, in other words, that the body becomes a secondary battery, storing up in its tissues, a certain amount of electricity; and we know that there can be no storing up of electricity, without some decomposition or chemical action.

(6) Mr. Weiss has conclusively shown that if a continuous current of electricity be passed for a time through muscular tissue, the contraction produced will gradually decrease, but that if the current be reversed, the contraction will again appear. This action can only be explained on the principle of polarization, as is an ordinary battery; and polarization can only take place where there is decomposition or chemical

action, as before. If rest would at once restore this contractile power to the muscle, its loss of contractility might be attributed to fatigue, but such is not the case, whereas the reversing of the current destroys the polarization and at once restores its contractility. Therefore, it is not unreasonable to assume that a certain amount of electrolysis and interchange of elements does take place through all the tissues, along the lines of force through which the current passes, and it is also very reasonable to assume, that the lower the vitality of the tissues, where the cells cannot recuperate themselves so well as the normal cells, where the "state of stress" of the internal atoms of the molecules or the "surface tension" of these molecules offers less resistance to any directional activity imparted to it, the greater is the decomposition and interchange that must take place among the atoms or molecules. Furthermore, it is even claimed by some, that the microscope reveals many minute structural changes in the tissue through which a continuous current has been passing.

The *physiological effects* of the inter-polar current on the human organism, are a consequence of this increased cellular activity and electro-chemical decomposition or electrolysis.

The effects manifested by magnetism or electric fields are the same as the changes induced by the inter-polar current, when generally or centrally applied, and they have been carefully investigated by Prof. W. J. Herdman of the University of Michigan by experiments on animals and man. The results of his work are as follows:—Magnetic energy is in some way transformed into physiological energy, and this increased energy manifested itself in the increased weight, growth and development of the animals experimented upon, and in the increased elimination of water, and urea in man. Further investigation by Dr. Herdman showed that over-stimulation caused the death of the animals from exhaustion. From these experiments on animals and man, he says one cannot escape the conclusion, that alternating magnetic fields and quickened tissue metabolism stand in the relation of cause and effect. These effects have been corroborated by Prof. l'Arsenal, of Paris, by laboratory experiments on man and lower animals, that is, that the production of water, carbon dioxide, and urea is increased 40 to 50 per cent., and Prof. Renzi has shown that 50 per cent. more sulphur is oxidized, producing sulphuric acid.

The inter-polar current in its passage through tissues, must by the decompositions taking place, and by its action on the oxygen present, develop more or less ozone, and hence it must have a powerful stimulant, tonic and probably germicidal action.

Again it has been conclusively shown that it increases the flow of

blood, lymph and other fluids, through the tissue, in the direction of the current; or in other words, increases the osmotic action always going on, and thus increases absorption and improves nutrition generally.

Therefore from these established facts taken collectively, our conclusion can be none other than that any inter-polar current, whether galvanic, faradic or static, when applied in accordance with electrical laws and the indications present, by virtue of its electro-motive force and its polarity, acting on all nerve and muscle fibre, cells, molecules or atoms, by encouraging all capillary and lymphatic circulation; by accelerating all electrolytic, cataphoretic and osmotic processes, and by increasing the absorption of oxygen, and the elimination of carbon-dioxide, water, and urea, by transforming electrical into physiological energy, must either directly or indirectly improve each and every functional process, such as that of the kidneys, skin and digestion. This fact once established, we must admit that there is a rational explanation for treatments by electricity properly administered in such diseases as hysteria, neurasthenia, rheumatism, etc., and also that it should prove itself a valuable adjunct in anæmia, indigestion, convalescence after exhausting diseases, and the like.

#### *Static Electricity.*

In the static machine, we have an agent by which we can impart to the whole body of the patient all the nutritional effects that can be got locally by the polar current of any other battery, and in addition, when required, one can, by means of special electrodes, so apply the current to any particular organ of the body, as to stimulate any desired local function.

Assuming now that we have an efficient static machine, say of 16 to 24 or 32 plates of from 28" to 32" in diameter; that we have it grounded in order to insure us its full working capacity, that we have our platform properly connected with the sliding pole of the prime conductor, that our platform is properly insulated and made so as not to leak off the current; that we have all the necessary electrodes, what then, are the different forms of treatment?

*General Electrification* embraces (a) Simple continuous, (b) Spark gap, (c) Potential alternating currents.

In these treatments the patient removes only outdoor garments and ornaments of metal and is seated comfortably on the insulated platform which is connected with the sliding rod of the positive or negative prime conductor, while the other rod is properly grounded and the machine set in rapid motion.

In the *simple continuous* form of general electrification the prime

conductors are widely opened beyond sparking distance, whereby no interruption to the current flow occurs.

In the *spark gap* or *potential alternating* forms, the prime conductors are opened to any sparking distance, or there is some other device introduced into the circuit whereby the current flow is broken and an active rapid change of potential from the maximum to zero is incessantly secured.

Very soon the patient is enveloped in an atmosphere charged with electricity and, when needed, large quantities of ozone can be constantly generated, which, being inhaled by the patient, imparts a general stimulating tonic influence. At the same time this rapid motion and large number of plates ensures a current of little amperage, but of very high potential—a potential estimated at from 500,000 to 1,000,000 volts. Such a potential:—(a) Can overcome and illumine the vacuum of Crooke's tube, which the current from no other form of medical battery, galvanic or faradic, is capable of doing. (b) Can break through the insulation of an air space of several inches; even from the finger of an insulated patient; separated at some distance it will cause the enclosed wire of an ordinary installed incandescent globe to glow. (c) Can penetrate and electrify the atmosphere around an insulated patient, with sufficient electricity for three or four feet, that its presence can be felt and easily proved; or (d) which can produce a spark between the terminals of the discharging rods, that will cause an oscillation or vibration in the air, felt throughout the whole room synchronous with the sparks from the terminals. (e) Can readily overcome the great, but to it, comparatively slight resistance of the human body; (f) and then when in addition to the very high potential or electromotive force of this current, its enormous power of accumulation, condensation and diffusion, and the conductivity of the tissues and fluids of the human organism is considered, is it not reasonable to conclude that when a patient is insulated and in connection with this current flow, that the electricity will penetrate all tissues of the body, even down to the cellular elements, and then by its polarity, so influence the polarities of these tissue elements (atomic and molecular) and effect such electrolytic and phoretic action on them, (although the changes may be imperceptible to the naked eye) that all the effects just described under inter-polar currents must be secured—and that the body, as also shown in remarks on inter-polar currents in general, must be practically converted into a large storage battery? Furthermore, would it not be reasonable also, to assume, that should this human storage battery become polarized or rendered inactive by disease or otherwise, (as manifested by functional inactivity, as of the kidneys or liver) or by any

functional derangement (as manifested by pain, as that of lumbago) that this static current, by its enormously wide range of potential change and by its polarity and power of penetration, would so influence the polarities and potential of at least the seventeen electric elements entering into tissue formation, by imparting to them, the same potential as it has itself, or by effecting an equalization of their polarities, that it would depolarize and renew the energy of this human battery; liberating the potential energy of the cellular elements, exciting all that cellular activity as explained under the remarks on the actions of inter-polar currents, causing the same demand for blood and oxygen as therein shown, and thereby accelerating the metabolism and metamorphosis? This increase which has been variously estimated at from 20 to 40 per cent., and thus by promoting all these functional processes through this general increased cellular activity, it must restore the appetite, induce sleep, relieve pain and promote nutrition generally. This is the form of treatment by electricity, so favorably referred to and recommended by Dr. Lewis Jones, in the *British Medical Journal* of Nov. 24th, 1900, for certain forms of mental disease and by many other observers since that date.

#### Case Reports.

*Sciatica.*—Mrs. O. applied for treatment, complaining of great pain throughout the whole length of her thigh and leg, and the sensation of coldness of the limb at all times. She gave the following history:—

In March, 1897 she was seized during the night with a violent pain in the leg, so severe that she was obliged to call in medical aid. She was relieved by morphine of the intensity of the pain, but from that date until the present, October 5th, 1901, she has been under the medical supervision of her local doctor, and one of the Montreal surgeons, who had given her all forms of treatment, local and constitutional; with no absolute relief from pain, which at times was very severe.

*Present condition.*—Aged 70, anæmic, weak, tired on little exertion, poor appetite and much distress in stomach after food, although taking only the very plainest, sleepless nights, and complaining of more or less pain at all times throughout the whole length of one lower extremity, which was increased by placing her foot on any uneven surface while walking, to the extent that she was liable to fall. She also complained of a cold, unnatural feeling throughout right foot, unrelieved by heat; tender points along course of sciatic nerve. Urine scanty, but no albumen, no exaggeration of tendon reflexes, has failed much in general health and strength during the last three years, but

more particularly during the last year, probably due in a great measure to the unceasing pain, the very limited dietary, and avoidance of outdoor exercise and recreation, except during the most favorable weather.

*Treatment.*—General electrification with positive insulation, for five minutes. Negative insulation and convective spray discharge over general surface of body, particularly over spine, kidneys, epigastrium and sciatic nerve, five minutes. General electrification, positive insulation, with crown, five minutes.

This resulted in relief of pain lasting about twelve hours daily; no change in cold sensation of foot. Sleeping better, otherwise condition much the same.

Second Week.—General electrification with potential alternation and spray as before, five minutes. Mild percussive sparks over sciatic nerve and frictional sparks to foot, whole length of leg and hips; five minutes. General electrification, with crown, five minutes; also ordered more liberal diet.

Result:—Entire absence of pain in limb, with only occasional ache; slight improvement in feeling of foot, appetite improving, sleeping much better, and on the whole, general condition improved.

Third Week.—Negative electric water bath to foot (five minutes), 70 m.a., followed by the same static treatment as in second week. Ordered unrestricted diet and outdoor exercise daily, regardless of weather.

Result:—No pain whatever, in leg or foot; foot remains warm about ten hours after treatment without any artificial heat. General condition much improved. Appetite better.

Fourth Week.—Same as third. Still free from pain; foot retains warmth sometimes for 24 hours, can walk on street as she expresses it "with head erect," and with no danger of falling by stepping on an uneven surface; out all kinds of weather, cold or raining, in November; feels like another person. The points noted in this case are:—

- (1) The chronicity of the case, 3½ yrs.
- (2) Relief from pain for 12 hours; after first week's treatment.
- (3) Freedom from pain after second week.
- (4) No restriction over diet or outdoor engagements.
- (5) April 17th, nearly six months passed, and reports no return of pain.

II.—*Sciatica.*—Mr. M., aged 25 years, January, 1901.

General health good; came complaining of sciatica of three days standing—could walk up steps only with difficulty, the pain was so

severe. Gave a history of a former attack three years ago, which lasted six weeks or longer, under ordinary treatment.

Static electricity relieved the pain entirely, but it returned in about six hours. Three subsequent treatments made an entire cure, in so far that up to date, pain has not returned.

*III.—Sciatica.*—F.M., aged 25. Came on after a wrench, stepping in a hole while walking; of three weeks duration, and growing worse.

Pain relieved after first treatment, and returned during that night, but has not been felt since fourth treatment.

I have chosen these from a number of such cases, in all of which cures were effected, as well as a number of brachial neuralgias.

In no form of pain or disease have I had more satisfactory results than in the treatment of lumbago by electricity. As many, no doubt, would fail to see the benefits of electricity in anæmia, I have notes of one case.

*Anæmia.*—Mrs. S., an anæmic, highly nervous young lady, 24 years of age, with the following history:—

Since 15 years of age, has always been pale and weak; unable to do any kind of household work, except of the lightest kind; almost continually under medical attendance, yet gradually getting worse, so that when she applied to me December 1st, '99, she was unable to ascend an ordinary flight of stairs without stopping to rest. Always feeling tired during day, and unable to sleep at night. Appetite poor, unusually nervous, menstruation scanty, pale and irregular, profuse leucorrhœa, and constant pain in back. Hæmic murmurs distinctly heard over cardiac region.

Treatment was begun December 1st, and continued until December 21st, 22 sances. On the 21st I considered her general condition so much improved that static electrical treatment was discontinued. As the leucorrhœa continued, I recommended curetting of uterus or local galvanism, intending to use inter-uterine copper electrode. She chose the curetting, which I did one month later, in January, 1900.

*Present Condition.*—Fifteen months after treatment, is all that could be desired; she is the picture of health, good color, good appetite, able to walk any reasonable distance, menstruation regular, and flow sufficient. Has required no treatment since leaving me.

I should say that contrary to the usual methods of treating a case of this kind, instead of rest in bed, she was instructed to walk daily, the distance to depend on her own feelings. Medical treatment, Blaud's pills only, of which also, she had previously taken many, but with no marked effect until electro-static treatment was added.

RETROSPECT  
OF  
CURRENT LITERATURE.

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Medicine.

UNDER THE CHARGE OF JAMES STEWART.

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**Pneumonia as a Complication of Typhoid Fever.**

FISHER, HENRY W., M.D. "Typhoid Fever Complicated by Croupous Pneumonia; with a Report of Four Fatal Cases." *Amer. Jour. of Med. Sciences*, August, 1901.

The diseases which have many clinical features in common in their onset are yet often indistinguishable even after many days. The complication of typhoid fever with pneumonia masks the diagnostic features of the former so as to deceive the very elect. The finer methods of diagnosis, such as Erlich's diazo-reaction and the Widal test, are not of much value, since in regard to the former, it is known to be present in pneumonia, while it would appear from this report that the serum reaction, often delayed, may be constantly absent even until death. It is an interesting question whether certain concurrent infections do not modify the typical characteristic Widal reaction. Dr. Fisher's diagnosis in each case found ample confirmation in the autopsy examination, although in No. I., on the 16th day of the disease there was a weak Widal reaction, while it was absent on the 18th day. In case IV. no such reaction was obtained.

In Dr. Fisher's interesting paper he points out:—

(1) That the complication is not very unusual, occurring in 3.6 per cent. of the cases.

(2) That in many cases the pneumonia is due to a mixed infection.

(3) That it is very fatal, about 77 per cent. of all cases dying.

(4) That it is more common since the cold bath treatment although less fatal.

(5) That the sharp pain in the side and rusty sputum are seldom observed.

**Paget's Disease.**

FREDERICK PACKARD, M.D., J. DUTTON STEELE, M.D., THOS. S. KIRKBRIDE, JR., M.D. "Osteitis Deformans (Paget's Disease)." *American Journal of the Medical Sciences*, Nov., 1901.

This article jointly prepared, although brought to a conclusion by Drs. Packard and Steele owing to the demise of Dr. Kirkbride, contains a careful study of this rather rare affection which was first described in 1877 by Sir James Paget.

The results of their studies in their own case and in the literature are arranged under two heads: (A) from the clinical standpoint, and (B) from the pathological standpoint.

(A.) From the clinical standpoint.

(1) Besides our own case, 66 true cases of osteitis deformans are found in the literature.

(2) Osteitis deformans is a distinct disease of obscure etiology, but possibly allied to, although not identical with, osteomalacia fragilitas ossium and acromegaly.

(3) The disease is one of later adult life. The earliest onset was in the 21st year of life. Of the 67 cases, 61 per cent. occurred in males. Trauma seems to play some part in the etiology, while there appears but little evidence for family tendency.

(4) There is a striking resemblance in the features of subjects of the disease, in enlargement and forward projection of the head, dorso-cervical kyphosis, prominence of clavicles, spreading of the base of the thorax, diamond-shaped abdomen crossed by a deep sulcus, relative increase in the width of the hips, and outward and forward bowing of the legs.

(5) The bones most frequently affected are those of the cranium, the tibiæ and femurs, and the deformity is usually first noted in the cranium and tibiæ. The left side seems to have been the part first involved; sometimes, however, the enlargement was crossed in its distribution.

(6) The association with malignant disease would seem to be not quite so frequent as is usually stated.

(B) From the pathological standpoint.

(1) Osteitis deformans is a disease affecting the skull, vertebræ and certain of the long bones. Its essential characteristics are:—

(a) Absorption of the compact substance, causing enlargement and confluence of the Haversian canals.

(b) Formation of new bone, which runs diffusely through the affected and adjacent healthy portions. This new bone remains uncalcified and is in turn re-absorbed.

(c) The conversion of the medullary substance into a vascular connective tissue containing fat cells, giant cells and leucocytes. In a small proportion of the reported cases, cysts filled with the gelatinous material and giant-celled sarcomata occur in the medulla.

(d) As a consequence of the three processes the ordinary relations of the compact substance and medulla are destroyed. The bones become exceedingly thickened and asymmetrical but since the new tissue remains uncalcified, its elasticity permits of great deformity of the long bones from the weight of the body, and fractures do not occur.

(2) The whole picture of osteitis deformans, from its pathological aspect, is so very characteristic that it must be considered a distinct disease, and its pathological diagnosis correspondingly easy.

(3) The etiology of the condition is as obscure as when Paget first described it. Some predisposing tendency, probably trophic, must be assumed, and the exciting cause may be mechanical:—in the skull, extremes of heat and cold, and in the vertebræ and long bones the ordinary traumata to which these bones are exposed. Lesions of the nervous system are inconstant and rare, and are probably not a causal factor.

#### **Treatment of Phthisis by Electricity.**

CHISHOLM WILLIAMS, F.R.C.S. Ed. "The Treatment of Phthisis by means of Electrical Currents of High Frequency and High Potential." *Brit. Med. Jour.*, Oct. 12, 1901.

There is promised in this paper a new era in the treatment of pulmonary tuberculosis, as well as the prolongation of life to many so afflicted, without that isolation so irksome and so depressing to many such patients. Dr. Williams in a few words lays before the profession the results of his treatment of 43 cases of pulmonary tuberculosis in the most overcrowded and unhealthy parts of London. Those who would adopt the method herein described must look further than this article for a satisfactory description of the technique, although it contains a comprehensive statement of Dr. Williams' appliances.

The cases were all picked by other medical men for the severity of their symptoms. The effects were almost without exception most helpful. Forty-two of the patients put on weight, lost all their symptoms, except in a few where slight cough remained, and a few bacilli are found occasionally. After the treatment is begun, the temperature is seen to rise after each application or sitting, and when the prognosis is good this reaction does not recur, normal temperature being maintained after the high frequency currents are applied. The cough, and indeed all the symptoms, are marvellously relieved under this treat-

ment. Attention is given to diet and fresh air as much as possible in their surroundings.

This treatment may be adopted at home and by all practitioners who have an efficient X-ray apparatus. The duration is about three months in severe cases. During the first month daily applications are made, second month, every other day, and third month twice a week.

#### **Enteric Fever in a Military Hospital.**

H. D. ROLLESTON, M.D., F.R.C.P. "Notes on Enteric Fever at the Imperial Yeomanry Hospital, Pretoria." *Brit. Med. Jour.*, Oct. 5, 1901.

Notes on typhoid fever are always of interest and those here presented by Dr. Rolleston set forth some of the features of the disease as it developed in those under the stress of war in a new country. Altogether the writer reports that 681 cases were treated in that hospital; many of the patients, however, went there for convalescence, while some left for other institutions for the same purpose, so that this large number is reduced to 244, whose reports alone are available.

Among the features of difference found in the African enteric fever, Dr. Rolleston points out that numerous cases of second attack of typhoid were seen in the present campaign. Relapses occurred in 21 per cent. of cases, double that in Osler's statistics. The study of the incidence of enteric fever in those individuals inoculated, as well as the course of the disease when it did occur, is an important contribution to our knowledge on this subject. Inoculations with antityphoidal serum had been practiced upon 52 individuals among the personnel of the hospital and military officers. Although the numbers are too small for any reliable conclusions on this subject, yet the author with this in mind remarks, that (1) antityphoidal inoculation does not absolutely protect against a future attack of enteric fever, (2) when enteric occurs in an uninoculated person there is as a rule at least six months, (3) inoculation protects against a fatal termination to the disease.

In treating of the onset of typhoid fever in Pretoria, it is shown that this is not infrequently quite sudden. Dysentery seemed to be a forerunner in a certain number of cases. Diarrhoea was decidedly exceptional; a rapid pulse rate was not uncommon, even in the cases running a favourable course. This appeared to be connected with the continuous hard work involved in "trekking" previous to the onset of the fever.

Hæmorrhage from the bowels occurred in 8.7 per cent. of the cases, or 21 cases among the 244. The fatalities in these cases was high, 76 per cent. In this connection it is interesting to note that in some of

these the rose spots were purpuric. Perforation of the intestine was curiously rare, and only one occurred in one case. The commonest sequela was phlebitis, although definite statistics on this point are not to hand. The undue frequency of this sequela may be explained by the absence of fresh vegetables from the diet, or by the hypothesis that the veins of the leg owing to the fatigue during the marching, were more readily diseased.

Nerve symptoms were rare; respiratory complications occurred as follows:—bronchitis was rarely observed; pneumonia, four cases, two of which were fatal; pleurisy was not uncommon; arthritis was rare and joint pains occurred more frequently. There was one case of myositis which was localised in the extensor brevis digitorum of the right foot. Parotitis occurred in three cases. In three cases the testes were inflamed, and in one of these an abscess with rupture occurred. Jaundice was observed in but one case, while solitary abscess of the liver occurred in but one case. In but one case in which there had been incontinence of urine, numerous subcutaneous abscesses developed.

#### **General Infection in Gonorrhœa.**

ULLMANN, DR. HANS. "Ueber alogemein infection nach Gonorrhoe."  
*Deutsch. Archiv. f. klinische Med.*, 1901, *LXIX*, p. 302.

WARD, ARTHUR H. "On Generalised Infection in Gonorrhœa."  
*Brit. Med. Jour.*, Vol. II, p. 755, 1901.

Among much that has been written upon gonorrhœa during the current year, these two articles stand out as setting forth the most important characteristics of this disease from the general infection point of view, while at the same time each article seeks to emphasize some special points. For example, in Dr. Ullmann's article attention is directed to the prostate as a structure to be carefully examined in all cases of "cryptogenetic septicæmia" in men. In four of the five cases which this writer reports the prostate was the seat of abscess formation. In the fifth case a local (urethral) gonorrhœal infection was rapidly followed by chill, polyarthritis, which was most severe in the left hip. Within a few weeks death ensued under manifestations of a septicæmic process in which the endocardium and pericardium were involved. An autopsy confirmed the diagnosis. No purulent metastases were found.

Mr. Ward's thesis is as follows:—"The gonococcus in its process of growth in the human body produces an irritating toxin. This toxin is the direct cause of all the symptoms of the disease. In all cases it is absorbed into the system where its presence causes systemic degenerations of varying degrees of severity. Gonorrhœa is thus a general

toxic affection, but the microbes which form the toxin are generally localized in or around a mucous tract. The microbial invasion may extend to the organs communicating with the infected tract, or it may penetrate into the tissues either by direct extension, or by a process of growth through the tissues affected."

Dr. Ward further states that invasion is rendered possible by the paralyzing effects upon the leucocytes wrought by the toxins absorbed in advance of the microbe preventing encapsulation. Wherever the micro-organisms become stranded in the peripheral capillaries there development of inflammation takes place and more toxin is produced. The invasions already referred to are favoured in many instances by the energetic early treatment chiefly in the urethra.

Mr. Ward's article is replete with references to the most important work done to support his thesis, and no abstract could do it justice. In speaking of treatment gentleness is enjoined upon all who are called upon to deal with early gonorrhoeal infections of the urethra. High pressure injections, abortive antiseptics and instrumentation are all prohibited. When infection is found to have become general, as it does according to the best authorities in from 1.5 to 2.8 per cent. of the cases, Mr. Ward would recommend quinine as that drug which holds out the best hope of benefit. In the event of failure, resort to mercury, arsenic or the salicylates. Oxidation and elimination of the toxins is indicated when toxic degenerations are threatening. "Potassium iodide with quantities of water with the idea of washing out the soluble poison, together with baths, massage and change of air."

*W. F. Hamilton.*

# Gynaecology.

UNDER THE CHARGE OF WILLIAM GARDNER.

## Pregnancy Complicated by Tumours.

CUMSTON, C. G. "Fibroids and Pregnancy." *Amer. Gyn. and Obstet. Jour.*, Oct., 1901.

When pregnancy occurs in a uterus which is the seat of a fibroid growth, abortion usually occurs, set up by hæmorrhage which is the result of the pathological condition of the endometrium, or by inability of the uterus to properly increase in size.

Where, in addition to the presence of the tumour, the uterus is retroverted, both mother and child are placed in imminent danger at the time of labour on account of transverse presentation occurring or of actual blocking of the passage by the growth. Another instance of the danger caused by these tumours is where a large one fills the abdominal cavity and is pushed up against the diaphragm by the enlarging uterus, thus producing compression of the abdominal viscera. Delivery in such a case is apt to be followed by dangerous hæmorrhage or suppuration.

Treatment resolves itself into (1), induction of premature labour; (2) enucleation of the growth per vaginam or through the abdomen during pregnancy; (3) Porro's operation and total extirpation of the gravid uterus. Of these methods of treatment Cumston disapproves of the first in any case. Where the fibroid is a polypoid of the cervix, it may be removed during the progress of gestation, but where the growth is of the subserous variety no general rule can be laid down in regard to treatment, each case being a law unto itself. The choice of total hysterectomy should be made in preference to supravaginal amputation in two cases, first where the fibroid growth affects the cervix and, second, where there is a septic process going on in the uterus. The presence of a fibroid during the puerperium increases the danger of hæmorrhage, necrosis or suppuration.

## Pelvic Infection.

ALLABEN, J. E. "Infections of the Soft Tissues of the Female Pelvis; Diagnosis and Treatment; Report of Cases." *Amer. Gyn. and Obstet. Jour.*, Nov., 1901.

The micro-organisms in these cases are (1) the gonococcus, (2) the

streptococcus, and (3) the staphylococcus albus and aureus; and their usual place of entrance is the vagina. These produce pelvic abscesses, that is, any suppurative condition of the soft tissues of the pelvis.

Infection by the gonococcus is much more commonly met with than that by any other organism, and the inoculation is usually affected by sexual intercourse; while infection by the streptococcus or staphylococcus occurs during the management of an abortion or of a confinement, or else the poison is introduced by an examination conducted with unclean instruments. The two latter organisms set up the most virulent form of disease.

The diagnosis of the character of the infection is not difficult to make. In gonorrhœal infections the history of vaginal discharge, etc., will usually guide one. The pulse is rapid but otherwise good, and the temperature varies from normal to 102 to 103° F. Streptococcus infection is more serious from the first. One gets a history of abortion, confinement or intra-uterine instrumentation. The patient often has a chill followed by a temperature of from 101 to 105° F., with a rapid, soft and feeble pulse. Recovery is slower and much more uncertain than in gonorrhœal infection.

The treatment is expectant or radical, the former consisting in rest, morphine, salines and antiseptic hot douches, but more radical measures are usually requisite. Where the condition is acute and masses can be distinctly felt per vaginam, vaginal puncture and drainage are indicated; but where the condition is more chronic the masses should be removed through the abdomen.

### Genital Carcinoma.

MILLER, C. J. "Carcinoma of the Female Urethra." *Amer. Gyn. and Obstet. Jour.*, Nov., 1901.

Cancer of the urethra is a rare disease and is more infrequent in the female than in the male. When present it is usually of the squamous type. The primary form arises from the epithelium and the glands of the floor of the urethra, and becomes either a pedunculated or an ulcerated structure. Where it is peri-uterine it spreads, not to the surface of the urethra, but all around this structure, converting it into a rigid tube which bleeds readily upon touch.

Lymphatic infection is early and operation is limited to early cases on account of the involvement of important organs, and even when seen early the total removal of the urethra and base of the bladder gives the only hope of cure. When too late for this the formation of a vesicovaginal fistula may be required to relieve the difficulty of micturition caused by constriction of the urethra.

**Genital Tuberculosis.**

BEYEA, HY. D. "Tuberculosis of the Portio Vaginalis and Cervix Uteri, Its Pathological Diagnosis and Treatment." *Amer. Jour. Med. Sciences*, Nov., 1901.

The patient of the author was 25 years of age and had a family history which was free from tuberculosis. Menstruation began when she was 18 years old and had been scanty and irregular, only coming on every two to five months. Profuse and offensive leucorrhœa had been present for about three years. Since puberty she had felt attacks of pain in the left groin, the attacks being quite independent of menstruation but aggravated by exercise. She had gradually failed in health from her 19th birthday. Two weeks before admission, she was seized with severe pain in the left side of the abdomen, backache, frontal headache and pains in the legs. She also had fever and a rapid pulse.

On making an examination of the genitalia the cervix and upper part of the vagina were found to be the seat of tuberculosis. The treatment adopted was curetting, high amputation of the cervix, and removal of both ovaries and tubes. This was followed by great amelioration of her condition, and six months after the operation she had gained several pounds in weight.

This made the 69th case of this rare disease collected by the author, 30 of which were from post mortem records, where the tuberculous disease had seriously affected other parts. The age varied from 17 to 79, but that of greatest sexual activity, viz., from 21 to 30, showed the greatest liability to it. In 19 cases the disease was confined to the portio vaginalis and in 6 to the cervical canal. In the rest both regions were affected.

The disease may be clinically divided into three varieties. (1) Tubercular ulceration of the cervix; (2) tubercular papillary hyperplastic endocervicitis; and (3) miliary tuberculosis of the cervix.

The treatment is operative, but if there is at all extensive disease in other parts of the body nothing should be attempted to cure the local condition. If the disease is entirely local, complete hysterectomy should be carried out; but where it is especially confined to the cervix and corporal endometrium, curetting and amputation of the cervix have been known to cure.

F. A. Lockhart.

## Pharmacology and Therapeutics.

UNDER THE CHARGE OF A. D. BLACKADER.

### On the Treatment of Diabetes Mellitus.

WILLIAMSON, R. I.—“On the Treatment of Diabetes Mellitus.” *The Medical Chronicle*, August, 1901.

In trying to form an opinion as to the value of any method of treatment in this disease, it is important to bear in mind that occasionally in some of the milder cases the sugar excretion may for a time disappear, apart from any influence of diet or drugs; also that the occurrence of complications such as phthisis, nephritis, etc., may cause a marked diminution in its excretion which, if care be not exercised may appear to be the result of treatment. Furthermore, it is important to distinguish between the results due to diet and those due to drugs. For therapeutical purposes three forms of the disease are recognized:—

1. The mildest form, in which the sugar excretion ceases when a rigid diet is given—these cases are to be distinguished from those of temporary glycosuria by the persistence of the excretion.

2. The more severe form in which the sugar excretion does not cease on a rigid diet.

3. The most severe form in which not only does a rigid diet fail to arrest the sugar excretion, but in addition the urine gives a dark brownish red coloration with perchloride of iron. In this form there is great danger of coma developing.

This classification of cases is not a scientific one but is a very practical one for treatment. Before prescribing, it is also important to examine the lungs for signs of phthisis, especially in the 2nd and 3rd forms and to examine the heart for signs of dilatation or other disease, especially in patients of more advanced age.

The weight of the patient should also be taken and a record kept of it at regular intervals. In Dr. Williamson's opinion the weight of the patient is even a more important guide in carrying out treatment than is the exact amount of sugar excreted.

In prescribing a dietary, Continental physicians have endeavored to calculate the value of the various food ingredients in calories; according to the rule that 1 gm. of proteid equals about 4 calories; 1 gm. of carbohydrates equals about 4 calories; 1 gm. of fat equals about 9 calories.

From the total value of the diet in calories thus estimated the value

in calories of the sugar loss is subtracted and the remainder should be not less than 2,300 calories, the amount required daily by a healthy man. Such an estimation may be of service in indicating when the diabetic diet is deficient, but there are reasons for believing that such an estimation is not quite so scientific and valuable as at first sight may appear.

In commencing the dietetic treatment of diabetes a very rigid diet of nitrogenous and fatty food is prescribed at the outset to ascertain whether it is possible to arrest the sugar excretion thereby. This is useful in the first and second forms of the disease, but in the third form, in which the urine gives a reaction with perchloride of iron, it should not be tried lest with a too rigid diet coma may supervene. Although a careful diet will cause the sugar excretion in the mildest cases to cease, in some the addition of even the smallest quantity of carbohydrates to the diet will induce a return of the sugar excretion, while others will be found to tolerate a certain amount of the carbohydrates and in such cases it will be necessary only to restrict the diet sufficiently to prevent the excretion of sugar. It is also found that sometimes after an arrest for a short time by a rigid diet that the patient can tolerate more and more carbohydrate, but in others again, even after a prolonged period of rigid dieting the addition of a small amount of bread or other carbohydrate, will bring back the glycosuria. In such cases should the patient on a rigid diet be found to lose weight rapidly, it will be necessary to relax and to be content if by moderate restriction we can keep the daily excretion of sugar down to about 500 grs. In the second form the diet demands much care; if it is found that on a rigid diet the sugar excretion remains abundant and the patient's general condition becomes worse, a certain amount of carbohydrate food must be allowed in the form of ordinary bread and milk, fatty food, and especially cream and butter.

With regard to the third form Dr. Williamson emphasizes Ebstein's rule that the appearance of a perchloride of iron reaction in the urine is an indication for diminishing the albumin and increasing the carbohydrates in the diet. In this form fatty food is especially indicated, and a small quantity of spirits may frequently be of service in aiding its digestion. Milk contains about 4 per cent. of objectionable milk sugar, but also much valuable fat and albumin; cream contains less milk sugar and seven times the amount of fat, and therefore may be allowed freely in all forms of diabetes. Dr. Williamson has prepared an artificial milk, pretically free from sugar, which he says may be taken in unlimited quantities by diabetic patients in all forms of the disease. Four tablespoonfuls of cream are added to a pint of water

and well mixed, the mixture is allowed to stand in a cool place and at the end of twelve hours the fat of the cream will have floated to the surface and can be skimmed off, to this are now added, water, the white of an egg and a little salt, and, if desired, a trace of saccharine. By practice an artificial milk can thus be prepared modified to suit the patient's tastes.

In preparing the dietary for diabetes it is to be remembered that of the various carbohydrates starch is less injurious than sugar; fruit sugar is less injurious than cane and grape sugar, but fruit which contains much sugar should as a rule be forbidden. Bread is the article of diet which gives the greatest difficulty when a rigid diet is demanded. The substitutes usually employed are often unreliable and their taste disagreeable. Dr. Williamson prefers to have the bread substitute prepared in the patient's house or in the hospital, as being less expensive and more reliable. The following are, in his opinion, the most useful: Gluten, Soya biscuits and bread, almond cakes and cocoanut cakes. The directions for preparing these are as follows: 4 oz. of almond or cocoanut flour mixed with a little water and German yeast, the mixture is allowed to stand in a warm place for about 20 minutes, an egg is then beaten up and a little water added, and the whole made into a paste. This is divided into cakes and cooked for 15 or 20 minutes. Ebstein recommends Aleuronat as an excellent substitute, and Dr. Williamson says that he has found that from mixed aleuronat and cocoanut powder very palatable cakes can be easily prepared. His directions are:—2 oz. of desiccated cocoanut powder mixed with a little German yeast and water and kept in a warm place for about 20 minutes, then 2 oz. of aleuronat are added and one egg and a little saccharine solution. The whole is well mixed, divided into cakes and baked. When freshly prepared they are said to be very palatable, but by keeping, the taste may become unpleasant. Recently Ebstein has recommended another vegetable albumin, Ergon, an albumin from rice, and Pickardt has employed Roberat, an albumin derived from corn. All these may be used in the preparations of puddings and other articles of food for diabetic patients. For the relief of thirst dilute acid drinks are preferable to beer.

The patient should be relieved of mental anxiety and worry as much as possible and the hours of work, business, or study should be diminished; a holiday with complete rest from work often has an excellent effect on such patients. While in the mild form open air exercise may be of service, in the more severe forms vigorous exercise is injurious, and the fatigue induced by long railway journeys may be dangerous. It is well known that marriage has a most injurious effect on diabetic patients.

In reference to the medicinal treatment of diabetes Dr. Williamson says opium, morphine, and codeine have been shown to have a beneficial action in some cases, diminishing the sugar excretion; but in the more severe forms these drugs rarely do much good, while they generally give rise to a most obstinate constipation. Heroin hydrochloride has also been tried and found in a few cases of some benefit but in others it gave rise to severe vomiting. The drug from which Dr. Williamson obtained his best results was sodium salicylate, strongly recommended by Ebstein many years ago. Dr. Williamson writes: "In some cases I demonstrated clearly by repeated trials that sodium salicylate has a marked action in decreasing the sugar excretion apart from any restriction of diet. Sodium salicylate, however, does not usually produce any marked diminution in the severer forms of the disease and it is not advisable to give it if serious complications be present or if the patient appear to be losing ground rapidly. The drug requires to be carefully watched as fairly large doses are necessary to produce decided results. Dr. Williamson commences with ten grains three, afterwards four, times a day and increases this amount slowly up to fifteen grains four or five times a day watching carefully for toxic symptoms and discontinuing the drug if these appear. In a few cases recently I have employed the new compound known as Aspirin with good results.

In the more severe forms of the disease when the urine gives the brownish red coloration with perchloride of iron, Dr. Williamson has obtained benefit from the use of sodium bicarbonate in large doses, 200-400 grains daily. if coma is threatening he has given as much as 900 grains in the 24 hours. He adds that it is remarkable how well such large quantities of sodium can be taken by diabetic patients. It may be given either in large quantities of ordinary drinking water, in soda water, or in milk. In these severe cases it is very important to keep the bowels open by the use of some mineral water; at the same time any circumstance which might tend to increase this complication should be avoided, such as fatigue and anxiety and sudden change of diet.

#### **On the Treatment of Croupous Pneumonia.**

WILSON, JAMES C.—"On the Treatment of Croupous Pneumonia."  
*Philadelphia Medical Journal, Nov. 2nd, 1901.*

Nearly half a century ago Trousseau, the greatest clinician of France since Lænnec, wrote "Pneumonia is not uniform in character; the forms which it assumes, its intensity and extent, the influence of the prevailing medical constitution, the personal specialities of the patients

in respect of age, sex, temperament and previous health, the diseases which may complicate it and the unfavorable conditions which may supervene during its course, all demand particular enquiry on the part of the physician." Since then, both medicine and therapeutics have undergone many revolutions and made great advances, but the facts observed by the bedside remain the same. The high mortality in certain localities and years, the comparatively favorable course elsewhere and in other seasons, the resistance manifested in early adult life, the helplessness of old age, the unfavorable influence of previous disease and alcoholism, the disastrous effects of complications, and the fact that croupous pneumonia is frequently a terminal event in many chronic diseases, and in most healthy persons of advanced age, are recognized by all as familiar and abiding truths. The uniformity of the symptom-complex in well developed frank pneumonia is no less remarkable than the diversity of its manifestations in cases of aberrant type. Such facts are not only the cause of much diversity in therapeutic indications, they are likewise the cause of a most bewildering diversity and perplexity in the therapeutic conclusions. Thus Petrescu, after an experience of 13 years with enormous doses of infusion of digitalis in a series of 1,192 cases, reported a mortality of 2.66 per cent., while 500 cases from the recent records of the Pennsylvania Hospital, (May 1897 to August 1901,) treated upon the expectant symptomatic methods, showed 125 deaths, or 25 per cent. Are we to conclude from the comparison of these figures that the treatment of pneumonia with large doses of digitalis which created such excitement when first announced, is so much more efficient than the expectant symptomatic plan, or that this difference in the result is to be explained by difference in the treatment alone? The observations of Petrescu were conducted in the military hospital upon selected cases, young strong men in previous good-health, under proper hygienic conditions and free from alcoholism; the cases at the Pennsylvania Hospital occurred in persons of that class who seek such an institution only from necessity, many of whom were actually destitute, others overworked, badly nourished, aged, and addicted to alcohol. Of 34 of these cases known to have been drunkards, 23 died, a mortality of 67 per cent. The results of treatment as modified by age is especially interesting, the larger number, namely 136, occurred in the third decade with 25 deaths, a mortality of 18 per cent. In the succeeding decades with a decreasing number of cases the mortality rises rapidly and in the fourth reaches 26 per cent., in the fifth 43 per cent., in the sixth 53 per cent, in the seventh 77 per cent. These results may be compared with those of Aufrecht who in 377 cases of pneumonia between 5 and 20 years, all hospital

patients, had a mortality of 2.64 per cent., and of Riessell, who in 127 persons between 20 and 30 years of age had only 2 deaths, a mortality of 1.8 per cent. Neither of these used the digitalis treatment. Pel of Amsterdam in a recent article writes, "Although the admirers of the digitalis therapy furnish cases of pneumonia which have recovered with large doses of digitalis, they have failed to prove that it was just this heroic use of the remedy which caused the favorable termination."

More than any other disease croupous pneumonia demands a very large series of cases to establish the efficacy of any line of treatment.

In regard to specific treatment, Pel calls attention to the fact that we know four infectious diseases in which we are able to meet the causal indication by Maeb medication; malaria by quinine alone, syphilis by mercury and the iodides; rheumatic fever by the salicylates and analogous substances; and diphtheria by its antitoxin. It would be a remarkable fact if croupous pneumonia, a disease due to a specific micro-organism should yield to treatment by a number of different drugs, such as the salicylates, iodides, quinine, mercury, creosote and carbolic acid; certainly it does not seem desirable to repeat the futile experiments already made in regard to pulmonary tuberculosis, scarlet fever and other acute infections. The effect of indifferent antiseptics and germicides upon parasitic micro-organisms must be at a definite relation to the masses of the circulating blood in which they are diluted and which may be roughly estimated as from 12 to 14 pints in the adult. Experience has shown that the parasite is equally as tolerant of their action if not more so than the host. "By their use we diminish the prospect of cure since we complicate the disease with the effects of a poison." With specifics like quinine in malaria the case is wholly different. In croupous pneumonia it is probable that the pathological process is fully established upon the occurrence of the chill and that the pulmonary lesion is far advanced before a positive diagnosis can be made. The pneumo-toxines produce the initial chill, the fever, and the prostration. Dr. Wilson's remarks are in opposition to Aufrecht's advocacy of quinine (Nothnagel's System), which has recently excited interest. This observer's statistics, extending over a period of ten years, show that during the last two years under quinine treatment the mortality fell to 6.6 and 8.2 per cent., although in former years it fluctuated between 9.8 and 25 per cent. The favorable effect from the use of such drugs as indicated by mortality statistics is, however, more apparent than real, since wide variations in a short series of cases are constantly encountered. Nevertheless, it must be conceded that thoughtful researches in the direction of specifics are justifiable. Clinical experiments with antipneumococcus serum have not yielded

satisfactory results. Dr. Wilson's observations in the German Hospital did not encourage him to continue its use; nor was his experience with hydrotherapy more satisfactory, in regard to its effect either upon the immediate course of the disease, or upon the death rate. Dr. Wilson details the general course of treatment pursued in the service of the German Hospital as follows:—

A calomel purge is commonly administered shortly after the patient is admitted to the ward; if there be nausea and vomiting the drug may be given in fractional doses; but in the absence of these symptoms a single laxative dose is administered and if necessary followed by a saline. Early in the course of the attack two or three large flat icebags are applied to the affected side; they relieve pain and add to the comfort of the patient. In addition, if the temperature exceed  $104^{\circ}$  F., cold sponging may be repeated at intervals of two or three hours, but under ordinary circumstances the sponging takes place only at night and morning with water, the temperature of which is regulated by the sensations of the patient.

The diet consists chiefly of milk and light broths; in private practice sometimes ice cream and raw or stewed fruit may be allowed; water is given in abundance but not more than 2 oz. at any one time. Alcohol is given in the majority of cases; in general the amount does not exceed 4 or 6 ozs. in the 24 hours, but larger quantities are given to those accustomed to its use. If there be great pain morphine is administered hypodermically. In any case Dover's powder in the form of tablets of 2 or 3 grains is administered every two or three hours throughout the greater part of the course of the attack, the dose is so regulated as to produce a slight continuous drowsiness from which the patient may be readily aroused. By this means suffering is diminished, cough to some extent controlled and the excitement and apprehension common in pneumonia are allayed. Dr. Wilson states that no evil effects have been attributed to this use of opium.

Towards the close of the attack, Dover's powder is given with increasing frequency; expectorants are rarely employed; aconite and veratrum viride are never given and digitalis only when the pulse becomes small and frequent, and especially if it become irregular. It may then be given in full doses, but Dr. Wilson has in many cases found that strophanthus answered better; strychnine may also be given as a cardiac stimulant and the nitrites, especially nitro-glycerin to relieve a laboring right ventricle. If these measures fail and signs of failure of the right heart supervene such as the development of small mucous râles with cyanosis, venesection is practiced. In some cases of pulmonary œdema atropin has been given hypodermically and has many

times appeared to avert the fatal issue. Dyspnoea is regarded as an indication for the use of oxygen, care being taken that in its administration it is freely diluted with air. Nervous symptoms and delirium are to some extent controlled by the systematic administration of Dover's powder. Their appearance demands an increase in the quantity of alcohol and the application of ice to the head. In young robust individuals delirium tending to pass into coma has been treated successfully by cold affusions to the head and neck repeated at intervals of three or four hours. Neither poultices nor cotton jackets are allowed. Blisters are not used unless resolution is delayed, when a series of small fly blisters may be applied. At the crisis the patient is carefully watched. If the Dover's powder has been discontinued, a hypodermic injection of morphine or an opium suppository may sometimes be administered with benefit. In some cases ammonium carbonate, alcohol or hot coffee appears to be indicated. Collapse is very rare. During convalescence an abundant nutritious diet is given. The patient is permitted meat as soon as he desires it, but Dr. Wilson is in no haste to yield to the patient's wish to allow him out of bed.

A. D. Blackader

## Reviews and Notices of Books.

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**HUMAN PHYSIOLOGY.** Prepared with special reference to students of medicine. By JOSEPH HOWARD RAYMOND, A.M., M.D., Professor of Physiology and Hygiene in the Long Island College Hospital, etc. Second edition, entirely rewritten and greatly enlarged. Philadelphia and London, W. B. Saunders and Company, 1901. Canadian Agents, J. A. Carveth & Co., Toronto, Ont. Price, \$3.50 net.

This book contains a great number of valuable abstracts of recent papers on physiology and allied subjects, special prominence being given to those having a direct bearing on pathology and practical medicine. Among the interesting questions taken up we may mention: the food value of alcohol, the effect of removal of the human stomach with illustrative cases, the rival glycogenic theories of Claude Bernard and Pavy, recent suggestions on improved army rations, photography of the larynx and its bearing on theories of voice production.

The book is well printed and attractively illustrated, and as an applied physiology for medical practitioners or even as a handy book of reference for teachers of physiology, it is entitled to much praise and we do not hesitate to recommend it.

There is, however, another point of view from which to regard the book, namely, that of the medical student, for whom it claims to be written. For his purposes the matter is not sufficiently digested, and in order to make room for the numerous abstracts of recent work to which we have referred, those portions of physiology which we are accustomed to look upon as fundamental have been too often omitted or lightly touched upon.

In the nervous system, the writer clings to the unhappy suggestion of Schaeffer, of applying the term "neuron" to the axis cylinder process instead of to the whole cell. A distinction is made between dendron and dendrite, which is scarcely justified by current usage. The course of nerve impulses is not given with sufficient fullness for medical students. For instance, in describing the pyramidal tracts a jump is made from the cerebral cortex to the pyramids without explaining how these are connected. The nervous control of circulation is most inadequately treated. No reference whatever is made to the cause of the heart beat. The account given of the nervous control of respiration is scarcely in

accord with recent views. Para-peptone and pro-peptone are incorrectly classed with the true peptones. Such statements as that methæmoglobin is also called reduced hæmatin, and that Fick's spring manometer is called a myograph, must surely be misprints.

Sufficient has been said to indicate that while we can recommend the book to those in search of a convenient résumé of recent work, we do not consider it by any means the best text-book for students.

*W. S. M.*

**THE READY REFERENCE HAND-BOOK OF DISEASES OF THE SKIN.** By GEORGE THOMAS JACKSON, M.D. (Col.), Chief of Clinic and Instructor in Dermatology, College of Physicians, New York, etc., etc. Fourth edition, thoroughly revised. Lea Brothers & Co., Philadelphia and New York, 1901.

The fourth edition of Jackson's dermatology does not differ in any essential from previous ones. The book has been thoroughly revised to bring it up to the most recent work on dermatology, and this has necessitated the addition of a dozen new diseases or varieties of disease. The author still believes in retaining the alphabetical arrangement of his subject matter rather than in following any system of classification, but he has inserted Crocker's modification of Hebra's classification. While there is much to be said in favour of the alphabetical arrangement in the present state of our knowledge, we cannot help thinking that even a faulty grouping of the various diseases is better for the student for teaching purposes, and for this reason we cannot commend the book for undergraduates' use. Of the new sections added, many are of so-called new forms of disease which have been reported in recent dermatological literature by various writers, and which in time will no doubt be found to be but varieties of some of the well-known forms; others, again, are tropical parasitic diseases which are only seen in the habitat of their particular parasite. The addition of these latter makes the work much more complete in its avowed object as a reference handbook.

**THE MEDICAL NEWS VISITING LIST FOR 1902.** Seal Grain Leather, Lea Brothers & Co. Philadelphia and New York.

**THE PHYSICIAN'S VISITING LIST (LINDSAY AND BLAKISTON'S) FOR 1902.** Fifty-first year of its publication. Philadelphia, P. Blakiston's Son & Co.

The visiting list has become a necessity now to every practicing physician and the enterprise of the publisher has adapted it to the wants of every one by issuing a variety of styles.

The Medical News Visiting List is issued in four styles, viz., weekly,

dated for 30 patients ; monthly, undated for 120 patients per month ; perpetual, undated for 30 patients weekly per year ; and perpetual, undated for 60 patients weekly per year. It contains the usual tables likely to be found useful, such as : Diseases with approved remedies, Doses, Examination of Urine, Artificial Respiration, Incompatibles, Poisons and Antidotes, etc., etc. The book is leather bound in a wallet-shaped book with a pocket, pencil and rubber.

The List issued by Blakiston can be had in the regular, perpetual, and monthly editions. The regular edition is arranged for from 25 to 100 patients per week in yearly or half-yearly volumes. The perpetual and monthly editions are undated and can be started at any time, and in the latter the patient's name only requires to be written once each month. The List contains besides the usual tables of Doses, a Comparison of metric and apothecaries weights and of Centigrade and Fahrenheit thermometers, and one for Calculating the Period of Uterogestation, etc., etc. The List is neatly bound in black leather in a wallet-shaped book with a pocket pencil and rubber.

THE

# Montreal Medical Journal.

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

EDITED BY

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## THE EARLY DIAGNOSIS OF MASTOID DISEASE.

Disease of the mastoid following suppurative otitis media is by no means infrequent and so serious in its nature when it does occur that every medical practitioner should be as familiar with the practical considerations involved in the management of these cases as he is with any of the ailments he is liable to meet with in the course of ordinary work. Mastoid disease is well known to occur at any time in the course of a chronic suppurative otitis media, but as most of these cases present complex conditions which are beyond the scope of general practitioners, the writer will confine his remarks to a consideration of those mastoid complications which are the immediate sequel of ordinary acute suppurative otitis media.

Of these, there are two distinct classes: *viz.*, those in which the discharge from the middle ear continues uninterruptedly, and those in which the discharge through the meatus from the middle ear has ceased for days or weeks, without perfect recovery from the local and general symptoms.

In regard to the first of these, if a profuse discharge from the ear continues for many days and is associated with pains in the mastoid

region, and perhaps some swelling or œdema of the overlying tissues and tenderness on pressure behind the ear, or at apex of mastoid or about its posterior border, and especially if there be neuralgic pains extending from the ear upwards over the side of the head, or into the corresponding temporal region, it may be regarded as reasonably certain that the mastoid antrum and adjunct cellular spaces are involved in the suppurative processes. It is always an ominous symptom if pain in the ear and adjunct parts continues, or recurs after rupture of the membrana tympani has occurred in the course of suppurative otitis media; and this symptom in itself nearly always indicates involvement of the mastoid. In some cases the discharge from the ear becomes scanty but the mastoid symptoms continue.

In the second class of cases the acute ear symptoms have subsided, and discharge from the ear has ceased altogether, or only occurs occasionally. The patient does not recover his usual health but has a sallow, hollow-eyed, worn, listless appearance, and suffers from neuralgic pains radiating from the middle ear or mastoid. Deafness and sometimes vertigo and insomnia are present, but there are several local symptoms which help to establish the diagnosis. The most constant of these is redness with crowding down of the inner part of the superior and posterior walls of the meatus, so as to distinctly narrow the canal in this situation. Tenderness on pressure over the supra-meatal triangle is the next in importance, with or without tenderness at the apex or posterior border of the mastoid. If there be œdema of the superficial mastoid tissues or swelling in the neck below and behind the mastoid with the previous history and continued pain, etc., just mentioned, pus in the mastoid cells may be diagnosed with certainty, but the facial expression, neuralgia condition of the auditory canal, and one or two tender points on pressure are sufficiently characteristic without any definite swelling or œdema of the parts, to justify a diagnosis and warrant operative interference. If a good surface thermometer is obtainable it will often show a difference of from  $\frac{1}{2}$  to  $1^{\circ}$  F. higher on the diseased than on the healthy side. The surgeon must, however, take the temperature himself in order that he may know that the comparison is exact or reliable. The method is only of value in the absence of marked swelling or œdema of the parts.

It is very doubtful whether purulent mastoiditis, *i.e.*, pus in the antrum and cellular spaces of the mastoid, ever undergoes a spontaneous cure by absorption of the products of inflammation, and it is well known that neglected cases of this kind often terminate fatally. It is, therefore, the duty of the surgeon to recommend operation as soon as pos-

sible, if the diagnosis be justified or rendered probable by the presence of the signs and symptoms enumerated.

The operation is practically devoid of danger in itself, if performed by anyone moderately familiar with operative work and possessed with an accurate knowledge of the surgical anatomy of the mastoid region. The real danger lies in the direction of unnecessary delay.

NEW BOOKS, ETC., RECEIVED AND NOTED.

*J. B. Lippincott Company, Philadelphia.*

International Clinics: A Quarterly of Clinical Lectures and Specially Prepared Articles, etc. Edited by Henry W. Cattell, and Collaborators. Vols. I., II., and III. Eleventh series.

A Treatise on Surgery by American Authors. Edited by Roswell Park, A.M., M.D. Third edition, enlarged and thoroughly revised. 1901.

*Baillière, Tindall and Cox, London.*

On the Cure of the Morphia Habit without Suffering. By Oscar Jennings, M.D., M.R.C.S. Second edition, revised and enlarged. 1901.

Menstruation and its Disorders. By Albert E. Giles, M.D., B.Sc., F.R.C.S., M.R.C.P.

*W. B. Saunders & Co., Philadelphia and London.*

First Aid to the Injured and Sick. By F. J. Warwick, B.A., M.B., and A. C. Tunstall, F.R.C.S.E. 1901.

*Lea Brothers & Co., New York and Philadelphia.*

Anatomy, Descriptive and Surgical. By Henry Gray, F.R.S. Edited by T. Pickering Pick and Robert Howden. A revised American from the fifteenth English edition. 1901.

*W. B. Saunders & Co., Philadelphia and London.*

American Edition of Nothnagel's Encyclopædia. Typhoid and Typhus Fevers. By Dr. H. Curschmann, of Leipzig. Edited with additions by William Osler, M.D. 1901.

Saunders's Medical Hand-Atlases. Bacteriology. By Prof. Dr. K. B. Lehmann and R. O. Neumann. From the second enlarged and revised German edition. Edited by George H. Weaver, M.D. In two volumes. 1901.

An American Text-Book of Pathology. Edited by Ludwig Hektoen, M.D., and David Riesman, M.D. 1901.

A Laboratory Handbook of Urine Analysis and Physiological Chemistry. By Charles G. L. Wolf, B.A., M.D. 1901.

A Text-Book of Pharmacology. By Torald Sollman, M.D. 1901.

*D. Appleton and Company, New York.*

A Text-Book of Medicine. By Adolf Strümpell. Third American edition. Translated by permission from the thirteenth German edition by Herman F. Vickery, A.B., M.D., and Philip C. Knapp, A.M., M.D. Dith Editorial Notes by Frederick C. Shattuck, A.M., M.D. 1901.

*Government Printing Office, Washington.*

Index-Catalogue of the Library of the Surgeon-General's Office, United States Army. Authors and Subjects. Second Series, Vol. VI. G.—Hernette. 1901.

## Proceedings of the McGill Medical Society of Undergraduates.

### McGILL MEDICAL SOCIETY.

*Meeting, November 15, 1901.*

The fortnightly meeting was held in No. III. Lecture theatre, the President in the Chair.

The first paper presented was on "Neuritis" by J. Roddick Byers, '02. Many of the clinical features, such as the gait and deformities, were illustrated by pen and ink sketches. The pathological conditions were shown by large coloured drawings and these formed a very interesting feature of the paper.

The second paper by S. B. Thomas, '03, was entitled "Malaria from Marsh Poison to Mosquito Bite." It was illustrated by lantern slides showing the development of the parasite, and by a microscopic slide from a recent case in the Montreal General Hospital.

J. C. Fysche, '04, read a very interesting paper entitled "A Few Anthropological Notes."

*Meeting, November 29, 1901.*

This was the largest meeting in the history of the Society, over two hundred being in attendance, to hear the most interesting programme so far this year.

A paper "The Modern Bullet, Its Effects and Their Treatment," read by R. C. Cox, '02, proved most interesting, the observations of surgeons in the South African war being compared with those of the War of the Rebellion.

Dr. Shepherd then gave an interesting and instructive lantern demonstration on Skin Diseases, paying particular attention to small-pox, a subject which in view of its prevalence at present over the whole of this continent was most apropos. Among the slides shown were a number from photographs taken by Dr. Secord of the Montreal General Hospital House staff last summer. The exhibition was highly appreciated by everyone present.

D. W. McKechnie, '04, gave a paper on "Longevity" in which he dealt with the lease of life of the different species of the animal and vegetable kingdoms, mentioning especially the human race. He as-

sured his hearers that members of the medical profession belonged to the long-lived class.

"Diseases of Occupation" was treated in a very successful manner by W. A. Lincoln, '04, who deserves special mention for undertaking to read up such an advanced subject.

The members of the third and fourth years learned with much regret that Dr. E. W. Archibald had been obliged to resign from the Royal Victoria Hospital staff on account of ill health. He will be greatly missed at the Out-Patient clinic where his demonstrations were greatly appreciated. We trust he will soon be able to resume his practice.

Dr. C. B. Keenan, D.S.O., of the class '97, has been appointed to fill the position vacated by Dr. Archibald.

**The Charity Ball.**—Much pleasure is expressed by the students that this annual event in aid of one of the branches of the faculty of medicine is to be held in the Medical building. The medical students have never been able to give a ball on account of having had no halls available for the purpose; but now that this is no longer the case it is to be hoped that a Medical Dance will be added to the list of University entertainments.

**The Freshmen.**—A noticeable feature of this year's class of freshmen is the youthful appearance of many of the members, several having hardly passed the knickerbocker stage. The year includes three aged seventeen, eleven aged eighteen, and eleven aged nineteen years. From the fact that these young men, if they are successful in passing all their examinations, will graduate at the early age of twenty-one to twenty-three years, it would certainly have seemed wiser for them to have taken first a B.A. degree and thus have secured a good all round education. Many of the larger universities are now insisting that matriculants in medicine shall have such a degree or its equivalent.

A large band of students from the four years in medicine marched to Bonaventure Station on the evening of Dr. N. D. Gunn's departure for New York in order to wish him *bon voyage* and good luck in his approaching marriage. It was a very appreciative and demonstrative gathering, and the cause of its assembling was quite unaware of why so many of his students happened to be at the station until they expressed their approval in their usual manner.

**Compulsory Vaccination.**—In accordance with the request of the Provincial Board of Health calling for a general compulsory vaccination in this city, the Governors of the University arranged to have all students vaccinated. This has been accomplished by the members of the Faculty of Medicine assisted by the students of the fourth year.

## NEURITIS.

BY

J. R. BYERS, '02.

Neuritis or inflammation of nerves may occur in all gradations from a small localized lesion to many extensive ones. When involving several nerve trunks, and resulting from a general cause, we speak of it as multiple neuritis or polyneuritis.

*Etiology*:—In looking into the causes we find it is best to divide them according to the above grouping—taking them: 1st—Localized neuritis, one finds that two of the most frequent etiological factors are cold and exposure, and hence we often hear the term rheumatic neuritis.

Again, traumatism and pressure is often the history given. It is not infrequent to hear of a person, who has fallen asleep during a debauch, with his arm over the back of a chair, and awakened with a paralysis of the extremity. Pedlars are often the subjects of a neuritis of the brachial plexus caused by pressure from their straps over the shoulder, from which their load is slung.

Neuritis is often secondary to an extending inflammation of adjacent tissues, or may be secondary to some specific virus circulating in the system.

In thirty-three consecutive cases admitted to the Royal Victoria Hospital for treatment, seven were of traumatic or pressure origin.

Of these seven cases, six had the upper extremities affected, and one the lower.

Multiple neuritis, although divided off by most writers from localized neuritis, must appear as a very much exaggerated form of the simpler type, and this is strengthened by the fact that we may have all gradations of severity and extent of the symptoms and effects.

The usual classification of causes is as follows:—

1st—The poisons of the infectious diseases.

2nd—Organic poisons.

3rd—Some of the metals.

4th—Cachetic conditions and malignant disease.

5th—Endemic neuritis or "Beriberi."

6th—Overexertion and exposure to wet and cold.

Among the cases admitted to the Royal Victoria Hospital from January, 1895, to May, 1900, causes were recorded as follows:—

Alcohol.. . . . .	8 cases	4 females	4 males
Diphtheria.. . . . .	4 do.	1 do.	3 do.
Lead.. . . . .	2 do.	.....	1 do.
Copper.. . . . .	1	.....	1 do.
Arsenic.. . . . .	1 do.	.....	1 do.
Septic.. . . . .	1 do.	.....	1 do.
Cold.. . . . .	1 do.	1 female	
No definite cause.. . .	8 do.	3 do.	5 do.

*Morbid Anatomy*:—It must be remembered that in an extending inflammatory process from other regions to a nerve trunk, that the ordinary events of inflammation will occur in the protecting coats of a nerve and for a time at least the lesion may be an epineuritis, when we find the fibrous sheath of the nerve, swollen and infiltrated, red in color and at this stage during life there is great pain due to the pressure upon the nervi nervorum.

The process may go deeper and next become a perineuritis, and in this way is the interstitial neuritis in which there is an accumulation of inflammatory exudate between the nerve bundles. As yet the nerve fibres may not appear to be involved, but the neurilemma has an increase in the number of its nuclei. Progressing further, we may note the following changes:—1.—The myelin becomes fragmented; 2.—nuclei of internodal cells swollen; 3.—the axes cylinders present varicosities; 4.—undergo granular degeneration, and 5.—ultimately the nerve fibres may be completely destroyed, sometimes containing much fat, the so-called lipomatosis neuritis of Leyden.

In other conditions the changes are more of a parenchymatous nature, resembling Wallerian degeneration following section from the cell proper. In this class the interstitial tissues are little affected unless secondarily. The principal changes noted are: 1st, the myelin becomes segmented, and divided into small globules and granules; 2nd, the axes cylinders become granular broken and divided, and ultimately disappear; 3rd, the nuclei of the sheath of Schwann proliferate, and 4th, finally the fibres are reduced to atrophic tubes without a trace of normal structure. Due to these changes the muscles necessarily show great atrophic changes too, and the nerve sheath seems to extend directly into the interstitial tissues of the muscle (neuritis fascians of Eichorst).

*Symptoms—Localized Neuritis*.—Pain, this is usually of a stabbing character, and occurs not only over the nerve trunk, but the parts supplied by the impaired nerve.

Sensitiveness or tenderness, over the nerve as before mentioned due to the affected nervi nervorum, and first suggested by Weir Mitchell.

Sometimes there is a redness, and oedematous swelling along the course of the nerve, in other words the outward sign of an acute inflammation.

Muscular action of the parts supplied, and tactile sensation are both diminished.

Herpes and effusion into joints sometimes occur, and a rise in temperature is not uncommon.

In more chronic cases, the pain which has been of a dull, harrowing, sickening degree, occurring in sharp paroxysms, may disappear or occur in the same lesion at different times.

And lastly, starting at the periphery of a nerve, the lesion may travel upwards, termed then an ascending or migratory neuritis, going possibly as far as the spinal cord and causing a myelitis.

*Alcoholic Multiple Neuritis*:—It is best to divide the symptoms of this division under headings of causes, and as Alcoholic neuritis, is by far the most important we will place it first—(being equally divided male and female).

Although the figures from our hospital do not agree with the following, it does, however, occur in women oftener than men, and no doubt later, when more cases have been reported, this will be proven here as it has been elsewhere.

As a rule it does not occur in the "blow out" kind of drinkers, but in the "wee nippy" ones who regularly indulge.

It is usually marked by a gradual onset starting at the periphery and may be preceded by neuralgic pains.

In several case reports I noticed that the first symptoms were epigastric pains, and persistent vomiting.

Paralysis begins as a rule in the feet and goes upwards, affecting the extensors more than the flexors, so that there is wrist and foot drop. In the eight cases reported, the following occurred:—

Lower extremities alone affected. . . . .	4 cases.
Upper and lower affected. . . . .	4 cases
Pain, first symptom. . . . .	5 cases
Paralysis, first symptom. . . . .	3 cases
Foot drop alone. . . . .	3 cases
Foot and wrist drop . . . . .	2 cases
No foot or wrist drop. . . . .	1 case
Deep reflexes present. . . . .	4 cases
Deep reflexes absent. . . . .	4 cases

Sensory symptoms are variable and we may get all gradations of pain.

Swelling of the hands and feet sometimes occurs. I remember one

case reported in which the left leg was greatly swollen. The gait is valuable in making a diagnosis, the extensor and peroneal muscles being paralyzed gives an equino-varus condition of the foot. As the patient raises the member, the toe drops so that he has to lift it high to clear the ground which he does by using his thigh, and thus presents a high knee action, the foot is then thrown forward "flail like" and comes down on its outer border. It has been termed by Charcot the "steppage-gait." Mental symptoms are frequent; there may be delirium and extravagant hallucinations.

*Acute Febrile.*—Acute febrile multiple neuritis may follow cold or over-exertion, or may occur spontaneously. It is usually ushered in with a chill, pain resembling acute rheumatism. There is a rapid rise in temperature going often as high as 104° F.

Sensitiveness of nerve trunks in the entire limb. Loss of muscular power, at first marked in lower limbs and extending with the features of an ascending paralysis (this is not constant). The muscles soften and waste so much that "flabby paralysis" is present, and to such an extent sometimes, that respiration may be carried on by the diaphragm only. The course is variable. It may end in ten days by paralysis of the heart, or extend for six weeks, followed by a slow recovery.

The paralysis of some muscles may last for some time.

*Recurring.*—Recurring multiple neuritis, by which we mean a recurrence with much the same symptoms as before described. They may occur several times.

*Infectious.*—Multiple neuritis in the infectious diseases.

These are particularly common following diphtheria, the lesion being of a peripheral nature. As a rule the soft palate and pillars of the fauces are the first muscles to show paralysis. There may as yet be no pain, and regurgitation of food through the nose may be the first thing to draw the patient's notice to it. Four cases of diphtheritic paralysis have been recorded at the Royal Victoria Hospital since '95.

In these four cases the following points were prominent:—

Males.. . . . .	3	3 yrs.	7 yrs.	22 yrs.
Females.. . . . .	1	25 yrs.		

Paralysis was the first symptom in all four, and in three cases the pharynx, extremities and accommodation of sight.

*Arsenical Neuritis.*—This lesion has been the means of turning the poor classes of England's population, if not into abstainers from beer, at least into sceptics of its nutritious powers. The cases are usually accidental. Many cases used to give history of having been in contact with cheap green wall paper.

In case No. 1087, R. V. H., the patient, was a man of fifty-five years, who had been exposed to "Paris green dust." His first symp-

tom seems to have been a pustular eruption, followed by slow sensory disturbances and later paralysis of the lower limbs and pain in the sacro-iliac region.

It resembles alcoholic neuritis, in that foot drop is present, and the characteristic steppage gait.

*Endemic*.—Endemic neuritis or beri-beri is most common in India, China, Japan and the Strait Settlements. It is probably due to a micro-organism, and seems to have some connection with fish diet. An outbreak of the disease occurred among Cape Cod fishermen some years ago.

The acute pernicious form has three prominent symptoms, namely, fever, anemia and general anasæra. In other cases, numbness, loss of reflexes, areas of anæsthesia and muscular atrophy are present.

The mortality is variable, running from three to fifty per cent.

*Lead*.—Lead palsy is rarely a primary manifestation of the poison, but usually occurs afterwards without fever. The most frequent form is the anti-brachial type, in which the musculo spiral nerve is involved, causing paralysis of the extensor muscles of forearm and fingers, and hence the characteristic wrist drop. Another form is the brachial type which is manifested by atrophy of the scapulo humeral muscles. It is usually bilateral, and sometimes follows the anti-brachial form.

Again, there is a type called the Aran-Duchenne, marked by wasting of the thenar and hypo-thenar eminences of the hand, and may suggest to the practitioner poliomyelitis anterior chronica. It is most common amongst tailors.

In other cases the extensors of the lower limbs are affected, and the "steppage gait" is produced. This class is termed the peroneal form.

In the Laryngeal form adductor spasm has been noted as the chief symptom.

Besides the foregoing differentiated palsies, there may be generalized paralysis, which may be slow and progressive, beginning with the characteristic wrist drop. More often it is rapid, producing complete paralysis of the part in a few days. Optic and neuro-retinitis may develop.

In two cases of children at the Royal Victoria Hospital, all the extremities were involved, foot and wrist drop being present. One of the cases took on recurrent character, there would be an improvement for about two months, and then a relapse with a return of symptoms.

*Diagnosis of Neuritis*.—Owing to the injury or irritation of the nerves, electrical tests in multiple neuritis may show marked departures from the normal in different cases, and frequently in the same case at different times. Early in the days of the disease electric excitability to faradic and galvanic currents, may be increased. As a rule this lasts but a short time and is usually followed by diminished fara-

dic response. As faradic excitability lessens the voltaic current augments in power, and gradually presents some or all of the items of the reaction of degeneration. The history of the case is very valuable in making a diagnosis. The alcoholic cases are usually distinguished by wrist drop, foot drop, steppage gait and congestion of the hands and feet. Lead palsy can be based upon a history of lead colic, and the blue line in the gums.

The gait, which is often termed pseudo-ataxic, and absence of motor power, girdle pains, Argyle-Robertson phenomena, and gastric and intestinal crises distinguish neuritis from locomotor ataxia.

In poliomyelitis, the onset is usually sudden and the entire limbs involved at once, no mental symptoms and the lesion is not usually symmetrical.

In myelitis:—The deep reflexes are usually exaggerated, bed-sores common and sphincters are usually beyond control of patient, while in neuritis bedsores are very rare and sphincter control seldom interfered with.

It is the rule for deep reflexes to be diminished or abolished in neuritis. Occasionally, and only at first, they may be exaggerated, but ankle clonus is never encountered.

*The Prognosis* depends upon the degree and character of the lesion and should in most cases be guarded.

*Treatment*:—In all cases *rest* is absolutely necessary, and the best way of obtaining it is to put the patient in bed. Pain may be allayed by morphia and hot applications of lead and opium are valuable. In the alcoholic form stimulants should be gradually withdrawn. As in rheumatism the salicylates have a beneficial effect in the rheumatic variety.

Potassium iodide is extremely useful in multiple neuritis arising from the poisons and in the diphtheritic type starting with small doses. Strychnine can usually be administered in maximum doses with good results. Bedsores though not common should at all times be guarded against. Very gentle friction may be employed from the onset, and as the pain passes away, massage and the use of interrupted current are beneficial.

Contractions may be overcome by passive movements. The weight of the bedclothes should be removed by the use of cages so as not to press the toes down.

Vessication and irritating applications must be avoided as they are liable to cause indolent ulcers.

The question of anodynes is one requiring mature judgment, the coal-tar derivatives act well and are not so objectionable as opiates and

cocaine ; chloral and the bromides combined are the surest sleep producers.

In cases of long standing where contractures are strongly developed, recourse to stretching under anæsthetics and fixative dressings should be used. This failing, tenotomy is in order.

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## HYPNOTISM.

BY

N. W. STRONG, '03.

Hypnotism must not be regarded as an outgrowth of modern civilization. It has been in use for thousands of years in the East. Take for example the custom of the Egyptians of looking into vessels and crystals for divinations. They, like the fakirs of India, threw themselves into the hypnotic state by fixation of gaze. The practices of the magicians, the laying on of hands, the expulsion of evil spirits, and the belief in witchcraft, may be regarded as the forerunners of Modern Hypnotism.

During the Middle Ages, the influence of the heavenly bodies upon mankind was believed in, and from this a belief gradually developed that human beings also influenced one another and that man could magnetically heal the sick. Mesmer was the first to draw universal attention to animal magnetism. He constructed a somewhat complicated apparatus filled with a liquid which he termed "electrical fluid," and connected by a series of wires to handles which were to be held by the subjects. By grasping these handles thousands professed to be cured. It was afterwards discovered that there was no electricity in connection with the apparatus. Since the time of Mesmer, researches have been made more or less continuously in most of the countries of Europe, in Great Britain and to some extent in America.

About the year 1820, Dr. Braid of Manchester, became interested in the subject. He induced sleep by fixation of gaze and called the phenomenon hypnotism, a name which it still bears.

He employed hypnosis as a therapeutic agent especially as an anæsthetic in surgery. Some forty years later, Liébeault, a country practitioner, who later moved to Nancy, took up the investigation and became the real founder of suggestive therapeutics.

In 1878, the late Prof. Charcot began his public classes, while a little later, Bernheim, a pupil of Liébeault, opened up a second school in France,—the school of Nancy.

Then followed the contest between the school of Charcot, better known as the school of Paris or the Salpêtrière, and the school of Nancy. Suggestion is the chief cause of contention.

The Nancy school claims that hypnosis is a purely psychic process, due to mental action only, and that therefore, the phenomenon can best be produced in persons of good mental action.

The Paris school, on the other hand, believes that the true hypnotic state can be produced only in those whose nervous system is in an abnormal or diseased condition. They also affirm that suggestion is not necessary to produce many of the phenomena observed. At a conference held in Paris in 1899, the views of the Nancy school were given supremacy in general.

Hypnotism has been making substantial progress within the last few years. Much has been written on the subject, but the best works are in German and French. Considerable investigation is being carried on in the United States, but at the same time, it is made the instrument of quacks and charlatans which retards and discredits its scientific study.

Hypnotism may be defined as a nervous condition resembling ordinary sleep, in which the subject is in rapport with another person known as the hypnotist or operator.

Is hypnosis then the same as ordinary sleep ?

So little is known of the actual condition during natural sleep that we have little means of comparison except from external appearances. In natural sleep the brain becomes pale and partially bloodless, the will is abolished and consciousness fades away as blood is pressed out by the arterioles. During hypnotization, ideas arising in the mind of the subject are sufficient to cause such changes in the blood supply as will produce sleep. In natural sleep, then, the brain is comparatively bloodless, while in dreams there is a partial return of the blood to the vessels. The state of consciousness in the dreamer is one in which the higher functions are dormant.

From dreams we may pass on to common somnambulism, which may include, not merely sleep walking, but the simpler stages such as talking in sleep. Many astounding feats have been performed during somnambulism. It differs from hypnosis in that the actions are self suggested and can be accounted for by the laws of association, while in hypnosis the subject is under the control of another and is governed by his suggestions.

There is then a close resemblance between sleep and hypnosis. In the latter state, the subject, if left to his own devices, sleeps quietly ; this resembles natural sleep. If he receives a suggestion from the operator he passes into the condition of activity, but his higher faculties are still dormant. This is very similar to the dreaming and somnambulistic state. There is this difference ; in hypnosis there is greater torpidity than in sleep and greater activity than in dreaming and

somnambulism. This torpidity of the higher faculties combined with the abnormal activity of the lower, is one of the most interesting phenomena of the hypnotic state.

Many methods are employed to produce hypnosis, all of which are more or less efficient. They may be classed as physical and psychical, but there is probably no method purely physical. The followers of Mesmer believed in the passage of a magnetic fluid from the operator to the subject. This theory is disregarded at present as it has been shown that neither magnets, electricity nor electrical variation are essential to the process. Then there is the theory that the will of the operator is the potent factor.

Dr. Elliotson, as early as 1820, proved that the will of the operator played no part; Dr. Hart, former surgeon to the West London Hospital, came to the same conclusion after a series of experiments. So long as the subject believes that the will of the hypnotist is that he should sleep, sleep follows. Absolute indifference on the part of the operator, will not affect the result so long as the usual methods are employed. The condition of hypnosis is then always subjective. It is independent of the operator's will; passes and gestures are unnecessary. Stripped of all mysticism the existing methods are all different forms of the same, namely, suggestion, and in no way can ideas be better conveyed to the subject than by the sense of hearing.

*The use of hypnotism as a therapeutic agent.*—The opinion of those who have given suggestive therapeutics a fair trial is, on the whole, very favorable. Hypnotic treatment is employed quite extensively in Europe, and to a less extent in the United States.

Perhaps the most cogent reason why suggestive therapeutics have been overlooked to such an extent by the medical fraternity is the unfriendly attitude of the laity. Some are sceptical and doubt that such a state can be induced, while others believe that only a very few possess the power of hypnotizing, and these they are inclined to regard as very suspicious characters, possessing supernatural power of a questionable source. Before hypno-suggestion can be beneficially employed, the public must be disabused of the prejudices against it. This will duly be accomplished when the medical profession as a whole, take up the subject, wrest it from the hands of the quacks and showmen, and present it to the world in its true form untarnished by the exhibitions of those whose highest aim is money attained by hood-winking a superstitious public.

Many physicians, on the other hand, do not approve of suggestive therapeutics, mainly, I have no doubt, through lack of knowledge. It seems to me that only those who have given this form of treatment a

fair trial are entitled to express an opinion, or to condemn the use of hypnosis.

Dr. Wetterstrand of Stockholm, in his works on Hypnotism, gives the history of 128 patients. Amongst the diseases treated, were insomnia, habitual headache, neuralgia, chorea, paralysis, stuttering, neurasthenia, hysteria, alcoholism, morphinism, and other drug habits. As a result of suggestion during hypnosis, there was improvement in almost all cases, while in the majority a permanent cure was established. Bernheim of Nancy, and Peterson of Boston, report like successes.

The particular kind of diseases adapted to treatment by psycho-therapeutics may be classed under one heading,—functional nervous diseases. These represent a large number of the ailments met with in general practice; they are usually difficult to cure with drugs, hence it follows that if suggestive therapeutics can be advantageously applied, there is here a wide field of usefulness.

With regard to the dangers and disadvantages of hypno-suggestion, I will quote one or two opinions on the subject. Dr. Eskridge of Denver says,—“He who resorts to hypnotism is dealing with a potent agent and he should use it as carefully as he would a deadly poison.”

“Hypnotism,” writes W. J. Morton in the *N. Y. Medical Journal* of 1897, “is a pernicious practice in that it lessens one’s power of resistance and so degrades the patient both morally and intellectually.” So far as I have been able to ascertain, the exact opposite of the latter view is held by the leading hypnotists of Europe. Compare for example, the statement of Wetterstrand when he says, “I have induced hypnosis about sixty times and I have never seen or heard that anybody suffered any bad effects afterwards.” Such testimony as that is most convincing.

Charcot and his disciples employed a partially physical method, to which it seems probable, many of the bad effects attributed to hypnotism, may be traced. Prolonged staring at bright objects, the use of a loud sounding gong, and of a powerful electric spark, are some of the means which he employed. Any hurtful impression that may be left in the mind of the patient is generally due to the ignorance or inexperience of the operator.

There is a tendency on the part of some to overestimate the value of suggestive therapeutics. “It seems to me,” says Eskridge, “that much injustice has been done hypnotism as a therapeutic agent by the extravagant claims made for it by some physicians, whether it has or should have a place in therapeutics, we must decide after giving it a fair trial. So many of the results alleged to have been obtained by hypnotism seem so exaggerated that one is led either to doubt the honesty of the physician or to suspect that his judgment has been

warped by enthusiasm." Nevertheless the fact that hypnotism is sanctioned by such men as Forel, Moll, Kraft-Ebing, Berillon Delbœuf, Lloyd-Tuckey, Janet, Tokarski and Dumont-Pallier is a most convincing proof of its efficacy.

The question whether such cures are permanent is important. According to Liébeault and Bernheim, who have both had a very wide experience, the cures are in many cases real and lasting. Forel claims that the benefits are of permanent duration, while Van Reuterghem and Van Eaden of Amsterdam compare the results with those of a surgical operation.

Opinions differ as to the efficiency of hypnotism as an anæsthetic. A moderate opinion is that it can and should be used where other anæsthetics are contra-indicated, for example in cardiac and pulmonary disease. Many cases are on record where it has been successfully employed.

In the treatment of the insane, Voison of the Salpêtrière claims success. The insane and inebriate are difficult to influence. In cases of simple melancholia and the milder forms of insanity hypnotic treatment seems to be indicated. Apart from the power of suggestion the production of sleep would, in many cases, be invaluable.

It seems to be a common belief that only certain persons can hypnotize. Of course this is not so. Any one can succeed if they take the trouble to learn. In order to have any marked degree of success tact is essential, the educated must not be approached in the same manner as the ignorant, the former will require more instruction, as they will resent any process which they do not comprehend, they require to know the nature of the operation. Over-anxiety to sleep is fatal to success. The sceptic and the critic are hard to influence. The favorable subject is the trustful, confiding, truthful one as opposed to the restless, nervous, and egotistical.

Authorities differ as to the percentage of hypnotizable patients. Dr. Patrick of Chicago, gives from ten to twenty per cent, as a fair average.

Bernheim has succeeded with ninety per cent. of his patients, Wetterstrand with about eighty per cent. The ratio will vary with locality, race and age. Success often follows after numerous previous failures. Wetterstrand succeeded in hypnotizing a woman after seventy vain attempts.

The results obtained do not seem to be so much the result of imagination as of volition. It is the will that is strengthened. Eskridge says of this, "the value of hypnotism in each individual case depends upon whether the mental impression made by the hypnotist upon the subject in the state of hypnosis is capable of removing and taking

the place of another mental impression of which the subject is possessed.

Thus it is not so much suggestibility that is necessary, but the power of applying the suggestion on the part of the patient, or as Peterson puts it, "what one looks for is a slight receptivity for outside impulses and as great a centralization of psychic functions and the ideoplastic capacity as possible." Where such a combination exists many patients can be benefited while in the first stages of hypnosis or even in the waking state.

Apart from its therapeutic value, hypnosis is of much psychological interest on account of the mental and psychical phenomena which it presents, such as hyperæsthesia, of the senses and post hypnotic suggestion, but time will not permit of discussing them here.

I have endeavored to show you that hypnosis is not a "cure-all," that in the words of Dr. Patrick, "hypnosis constitutes no 'short-cut' to therapeutic success, in medicine as in other walks of life, there is no royal road to fortune," and he who would use this diagnostic and therapeutic aid must be the careful, sensible, wise physician still."

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