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SOME PROBLEMS IN CONNECTION WITH THE SUPRARENALS.*

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FIRST, let me express my sincere gratitude for the high compliment which you have paid me in asking me to give the address in Medicine; it was impossible to hesitate about accepting such an honor even had it not been conveyed through Professor Osler, who, hailing from McGill, is now Regius Professor in Oxford. The subject matter of an address in medicine must always be a source of some anxiety to those entrusted with the honor. It may either be on general lines and deal with the history, recent advances, future and relations of medicine, or it may be more special and deal with a single subject. Each course has its own disadvantages; but, after some consideration, I have decided on a special subject, and must beg your indulgence for the following review of some problems in connection with the suprarenal glands.

As is well known, the suprarenals are composite glands consisting of two portions which are distinct from a developmental and from a physiological point of view—the cortex derived from a cœlomic epithelium of the Wolffian ridge and closely related to the genital glands, and the medulla derived from the sympathetic and neuro-ectodermal in origin. These two portions are separated from each other in elasmo branch fishes, the cortical cells forming the single inter-renal gland and the medullary cells a series of paired bodies connected with the sympathetic (Swale

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Vincent). It will be convenient to discuss the cortex and medulla separately.

The Cortex.

The cortex is larger than the medulla and is composed of epithelial cells the structure of which suggests a high degree of functional activity; in Biedl's hands experimental removal of the cortex, the medulla being left intact, was followed by death of the animals; and it is stated that compensatory hypertrophy of accessory suprarenals, when this occurs, after excision of the main glands, is solely cortical. These considerations strongly suggest that the cortex has some important function and that it is essential to life, but in what exact way is as yet unknown. The most certain point about the cortex is that it is quite unlike the medulla. Its cells contain fat and lecithin, the significance of which is unknown, but do not give a green color with ferric chloride (Vulpian's reaction), or a brown color with chromic acid, as the (chromaffine) cells of the medulla do. Physiologically extracts of the cortex are quite inactive and do not raise the blood-pressure. Our knowledge as to the function of the cortex is very imperfect, but some arguments can be adduced in favor of each of the three following views, namely, that it may be concerned (1) with growth and development, especially of the sexual organs; (2) with neutralization of poisons, or (3) in some manner with the internal secretion of the medulla—adrenalin.

1. The relation of the cortex of the suprarenals to growth and development, especially of the sexual organs.—It is now known that there is a definite group of cases in young children, the peculiar feature of the cases being that a primary tumor of the suprarenal body (hypernephroma, mesothelioma, Woolley)[1] is associated with excessive development of the organs of generation, hair, and fat. Bulloch and Sequira[2] have collected ten cases, all but two under eight years of age, two in males and eight in females, showing this precocious development in association with a hypernephroma which, in some of the cases at any rate, was derived from the cortex of the suprarenal; future researches will naturally be directed to determining whether hypernephromas of cortical origin are, as suggested here, specially associated with exaggerated growth, while hypernephromas arising in the medulla of the suprarenal show no such association. Bulloch and Sequira have indeed collected twelve cases of hypernephromas in children who did not show any signs of premature development, and in some of these cases the tumors, described as sarcomas or lympho-sarcomas, were definitely regarded as arising from the medulla of the gland. It must, however, be noted that in adults cortical hypernephromas, which are probably more often seen in the kidney (renal hypernephromas or adrenal "rest" tumors) than in

the main adrenal gland, are not associated with the notable genital development, hirsuties, and obesity seen in children. As rare exceptions to this rule, attention may be directed to Thornton's[3] case of a woman aged thirty-six years, who was covered all over with black, silky hair and had to shave her face, and to a somewhat similar case in a female lunatic aged thirty-two years (Richards), in both of which hypernephromas were present. In passing it is interesting to note the rarity of renal tumors of adrenal origin in children as compared with the incidence of these tumors in adults and with the incidence of hypernephromas in early life. But, although excessive genital development and growth of hair in a child should always suggest the existence of a cortical hypernephroma, it must be remembered that these striking signs may exist without any such lesion in the suprarenals (Guthrie and Emery).[4] As bearing on the connection between exaggerated cellular growth of the suprarenal cortex and the development of the genital organs, a few cases are on record in which suprarenal hyperplasia has been found in individuals with such excessive size of the clitoris that they were erroneously regarded as males. Further, enlargement of the suprarenals has been noted in animals during periods of sexual activity and pregnancy; and it has appeared to me that there is a close resemblance between the cells of the suprarenal cortex, on the one hand, and the luteal cells normally found in corpora lutea, and exceptionally in luteal cysts, on the other hand. This resemblance, both histologically and morphologically, has been insisted on by Mulon,[5] who, from observation on guinea pigs, speaks of the corpus luteum of pregnancy as a temporary cortical suprarenal. It is interesting to compare the developmental anomalies accompanying some cortical hypernephromas with acromegaly, which is usually associated with hyperplasia or adenomatous change in the anterior lobe of the pituitary gland. For, as Schäfer and Herring[6] point out, the anterior lobe of the pituitary and the cortex of the adrenal are alike in several particulars, namely, in the glandular character of their epithelium, in the physiological inactivity of their extracts, and in ensheathing collections of neuro-octodermal cells (the posterior or infundibular lobe, and the adrenal medulla) which, on the contrary, possess extremely active physiological extracts. As bearing in a somewhat remote manner on the relation of the suprarenal cortex to the growth of the body it may be mentioned that evidence is accumulating to show that primary malignant growths of the cortex, like primary carcinomas of the thyroid, have a special tendency to produce metastases in bone (Scudder).[7] This association has also been independently noticed by Prof. Adami. This similarity of the thyroid is of interest in the light of the well-established influence of the thyroid on skeletal growth.

Conversely, hypoplasia of the suprarenals has been found in anencephalous monsters; but the relation between the two developmental abnormalities is doubtful, Zander[8] regarding the lesion of the nervous system as primary and Alexander[9] considering the suprarenal defect as primary. Very possibly, however, the failure of development is concomitant, in any case this association is not a strong argument in support of the influence of the suprarenal cortex on the growth of the body, for the hypoplasia of the suprarenals appears to affect the cortex and medulla equally and not to be especially marked in the cortex. Hypoplasia of the suprarenals has been met with in a few cases of retarded sexual development, and in the case of osteogenesis imperfecta Lovett and Nichols[10] found the internal organs normal with the exception of the small size of the suprarenals. It has also been suggested, but in no way proved, that mollities ossium is connected with suprarenal inadequacy.

There thus appears to be evidence that in some instances pathological changes in the cortex of the suprarenal glands, whether in the direction of hyperplasia or of imperfect development, are associated with similar conditions of growth generally, and especially of the genital organs.

2. The question whether the suprarenal cortex has the power of neutralizing certain toxins is a subject about which very little is known, and on which it is dangerous though attractive to speculate. It was formerly thought that the suprarenal bodies destroyed effete blood-pigment, but this conception has been given up for want of proof. That the cortex may exert antidotal properties is suggested by Myers'[11] observations that cobra poison, after being mixed with an emulsion of the suprarenal cortex was no longer toxic, control experiments with emulsions of the suprarenal medulla and of other organs being negative. Experimental infections with various organisms, such as bacillus, tuberculosis, slow diphtherial intoxication and lead poisoning (Gouget)[12] have been found to give rise to hypertrophy of the cortex of the adrenal glands, thus suggesting increased functional activity. It may be mentioned incidentally that according to Mulon[13] the histological evidence of over-activity (hyperépinéphrie) of the cortex is increased pigmentation and diminished fat in its cells.

Adenomas or nodular hyperplasia of the suprarenal cortex are found in a certain number of autopsies. In 6,200 autopsies at St. George's Hospital, London, adenomas were present in 11 cases, or 0.2 per cent. (Hodge), and at Guy's Hospital in 0.7 per cent. of autopsies (Richards). They are sometimes found in cases of chronic pulmonary tuberculosis, but special attention has been drawn to the association of cortical edenomas with granular kidneys and high blood-pressure, and it has been pointed out that

they are rare in cases of chronic nephritis with low blood-pressure. There would therefore appear to be some relation between their presence and high arterial blood-pressure; as the cortex does not contain any pressor substance it cannot be held that the cortical hyperplasia has any direct influence in causing the increased pressure, and it has been suggested that the adenomas are evidence of an attempt on the part of the cortex to neutralize the toxins responsible for the high blood-pressure (Aubertin and Ambard).[14] As bearing on this it may be mentioned that it is stated that experimental lesions of the kidney lead to hyperplasia of the adrenals (Darré).[15] The main interest of the speculation as to the existence of an antitoxic function in the cortex of the adrenal glands is in connection with the pathogenesis of Addison's disease. The low blood-pressure and extreme asthenia in that disease can be satisfactorily explained as due to an absence of adrenalin or the pressor substance provided by the medulla, but the vomiting, gastro-intestinal disturbance, and the pigmentation suggest irritation of the sympathetic. This has, in the past, usually been attributed to invasion of the adjacent sympathetic by inflammatory changes, or adhesions or to mechanical stimulation of these nerve plexuses by tuberculous masses in the adrenal glands; but this explanation breaks down for cases in which the adrenals are only atrophied. To meet this objection it has been supposed that the absence of adrenalin leads, by perverted metabolism, to a toxemic state and that this toxemia accounts for the irritative manifestations. On the other hand, Addison's disease might be regarded as the outcome of total suprarenal inadequacy, namely, of (*a*) medullary inadequacy which, by the absence of adrenalin accounts for asthenia and low blood-pressure, and of (*b*) cortical inadequacy, which accounts for the irritative symptoms by failure or an antitoxic function exerted by this part of the organ. It is conceivable that, owing to destruction or atrophy of the cortex there is no longer neutralization of toxic bodies, and that these accumulate and irritate the sympathetic. In this connection it may be pointed out that the widespread distribution of pigmentation is more readily explained by a general toxemic irritation of the system in general rather than by a local irritation of the sympathetic. It may also be urged in favor of this hypothesis that it explains why suprarenal extract so commonly fails to cure Addison's disease in the same way that thyroid extract counteracts myxedema; for, although suprarenal extract provides the waning adrenalin, the extract of the cortex, even when given, is not necessarily the equivalent of the activities of the living cells of the tissue.

3. That the cortex is in some way concerned with the internal secretion of the medulla.—Although it does not contain any

pressor substance it is conceivable that the cortex plays an essential part in the early stages of the formation of adrenalin and that the process of elaboration is completed in the medulla, in which part alone the full activity of the secretion is acquired. In favor of this hypothesis Schäfer and Herring[16] point out the analogy between the pituitary and the suprarenal glands; in both, the glandular epithelial parts (anterior lobe and cortex) are inactive, while the neuro-ectodermal parts (infundibular portion and medulla) yield a highly active extract. The close anatomical relation of the epithelial and neuro-ectodermal parts in the two glands suggests that their physiological relation may be equally close.

We have seen that these views at least have been put forward as to the function of the cortex: (1) That it is connected with growth, especially of the sexual organs, (2) that it is antitoxic, (3) and that it plays some part in the elaboration of the internal secretion of the medulla. *A priori* it would appear improbable that the cortex discharges all these three functions, but from experiments on animals Marrassini[17] has put forward the view that the three zones of the cortex—zona glomerulosa, zona fasciculata, and zona reticularis—have different functions; this is little more than a suggestion, but it shows the need of waiting for further investigation. The most definite point about the cortex would appear to be that it is correlated with sexual growth.

The Medulla.

The cells of the medulla provide a pressor substance—adrenalin—which acts on the sympathetic nerve endings. These cells, called chromophil or chromaffine, from their affinity for chromic acid, are not confined to the medulla of the suprarenal glands, but are found elsewhere in contact with the sympathetic, as Zuckerkandl's parasympathetic bodies, the inter-carotid gland which has been described as an accessory medullary adrenal (Mulon),[18] Luschka's coccygeal gland, and some collections of cells in the pituitary body. The medulla of the suprarenals therefore forms the most conspicuous part but not the whole of what has been called the hypertensive glandular system. The importance of this conception is that it explains why cases with destruction of the medullary portions of the adrenals do not always manifest the symptoms of Addison's disease, the remainder of the chromaffine system being sufficient to supply the required amount of adrenalin; conversely in some cases of Addison's disease in which the medulla of the suprarenals is not obviously affected, the hypertensive system as a whole may conceivably be deficient.

1. Alteration in quantity.—(*a*) Complete absence of the internal secretion is met with in Addison's disease, as is proved

by the inactive condition of the medulla when tested physiologically. It has also been shown that the suprarenal medulla may be devoid of adrenalin in patients dying from chronic exhausting diseases, and that though there is often obvious naked-eye change in the glands this is not an invariable accompaniment of the loss of functional activity (Mott and Halliburton). As bearing on the interesting question whether there is normally an equilibrium between the pressor or hypertensive internal secretions of the medulla of the suprarenals and of the other collections of chromaffine cells on the one hand, and the depressor internal secretion of the thyroid on the other hand, it may be pointed out that in Addison's disease a relative excess of the internal secretion of the thyroid might be expected on account of the absence of adrenalin. There is, however, no evidence of this in Addison's disease; there are no symptoms resembling those produced by overdoses of thyroid extract or thyroidism, and so far as this goes it would appear that if there be normally a balance between the internal secretions of the suprarenal and thyroid glands, this balance is partially maintained, possibly by diminished thyroid secretion or by some neutralization of the active thyroid secretion by the tissues of the body, when the internal secretion of adrenalin fails entirely. There is, of course, one manifestation common to Addison's disease and exopnthalmic goitre, namely, pigmentation, but it is very difficult, in the present state of our knowledge, to explain this as the result of one and the same process in the two diseases; it is much more likely that in both cases there is over-excitation of the sympathetic nerves, in exophthalmic goitre by an excessive and abnormal thyroid secretion and in Addison's disease by a toxemia possibly depending on inadequacy of a hypothetical antitoxic function of the cortex of the suprarenals.

(*b*) Diminution in the amount of adrenalin may be considered under the heads of (1) chronic inadequacy; (2) acute inadequacy; (3)relative inadequacy.

(1) Chronic inadequacy.—The existence of cases of larval or fruste myxedema, or benign hypothyroidism, has now long been recognized. The most convincing proof of its existence in a given case is improvement after the administration of thyroid extract. Similarly, there is a condition of deficient adrenalin secretion. Possibly in some cases this defect of the adrenalin-secreting cells may be congenital; and it has been suggested that the status lymphaticus and hemophilia are thus explained (Wiesel). A condition of deficient secretion of adrenalin or partial medullary inadequacy is probably more commonly acquired and the result of morbid changes in the medulla. These changes may be due to tuberculous, syphilitic, or cancerous invasion secondary to disease elsewhere in the body; or toxins conveyed from other parts of the

body, for example, the lungs in cases of tuberculosis, may so act on the suprarenals as to produce degeneration and fibrosis; or again, as the result of acute infections, such as staphylococcal or pneumococcal, the suprarenals may be permanently damaged and suprarenal inadequacy be established; this sequence of events is analogous to chronic nephritis after an acute attack of nephritis. To this condition of suprarenal inadequacy the name Addisonism has been applied by Boinet,[19] who, in thirty-seven cases of pulmonary tuberculosis manifesting Addisonism, found the suprarenal bodies fibrosed in thirty, infiltrated with small tubercles in four, and with caseous tubercles in three. This conception has some bearing on the pigmentation which so commonly accompanies advanced pulmonary tuberculosis and often raises the question as to the existence of Addison's disease. Everyone is familiar with these cases, but as the symptoms are not sufficiently marked to justify a diagnosis of Addison's disease the tendency has been rather to put the factor of the suprarenals aside in attempting to explain the melanodermia of advanced phthisis. Since it has been shown that the suprarenal medulla may be devoid of adrenalin in exhausting diseases (Mott and Haliburton), there appears to be reasonable ground for the view that Addisonism may be present in these cases. Boinet recommends adrenalin in these cases; in order to determine whether there is or is not suprarenal inadequacy the effect of adrenalin on the arterial blood-pressure should be estimated, for O. F. Grünbaum[20] has shown that in healthy persons suprarenal extract has no effect on blood-pressure, but that a rise of blood-pressure, after the administration of suprarenal extract indicates suprarenal inadequacy. This method of diagnosis and treatment deserves further trial. But it must be borne in mind that though low blood-pressure and asthenia may be counteracted by adrenalin, the pigmentation has not been proved to depend on want of the internal secretion of the medulla and hence it cannot be anticipated that the administration of adrenalin will remove the melanodermia, which may indeed depend on a concomitant lesion in the cortex.

Just as numerous symptoms have been referred to benign hypothyroidism, so it is not illogical to suppose that various conditions, characterized by low blood-pressure and debility, both of the involuntary and voluntary muscles, may depend on an insufficient supply of adrenalin. Thus, it has been suggested, but by no means proved, that cyclical albuminuria, and those forms of neurasthenia associated with low blood-pressure are manifestations of adrenal insufficiency.

(2) Acute adrenal insufficiency.—It occasionally happens that death occurs suddenly in patients suspected to be the subjects of Addison's disease on account of some abnormal pigmentation, but

without very definite constitutional symptoms; or that persons previously in fair health and certainly not known to have any disease, suddenly become acutely ill, often with convulsions, and die rapidly from collapse. In some of these cases tuberculous disease of the suprarenal bodies is found at the autopsy and death is perhaps certified to as due to Addison's disease. Though this conclusion is in the main correct, it does not explain the fulminating character of the termination. It is probable that this is due to some form of acute infection attacking the suprarenal glands and leading to suppression of their functional activity, and it can easily be understood that this will occur more readily when the amount of suprarenal medullary substance available has been previously curtailed. In many acute infections, especially in diphtheria, the micro-organisms or toxins produce acute changes, such as cloudy swelling, necrosis, leucocytic infiltration, in adrenals previously healthy. In some instances the damage is so acute that hemorrhage occurs into the glands; this acute condition of adrenal hemorrhage has been specially studied in children and it has been suggested on the one hand that rapidly fatal hemorrhagic smallpox explains some of the cases, thus of ten recorded cases seven were unvaccinated (Riviere),[21] and on the other hand, that the condition is due to food poisoning or an acute toxemia of unknown origin and is possibly a distinct disease (Dudgeon).[22] Acute adrenal hemorrhage may also complicate various fevers such as diphtheria, enteric, pneumonia, erysipelas. The hemorrhages may be punctate, infiltrating or massive, unilateral or bilateral. The most characteristic symptoms of these adrenal hemorrhages are sudden onset with fever, violent pain in the hypochondrium radiating to the loins, convulsions, vomiting, diarrhea, and later tympanites, collapse, and death within forty-eight hours from the onset. No doubt damage is done to the adjacent abdominal sympathetic by the hemorrhage and thus clinical manifestations analogous to those of hemorrhagic pancreatitis are produced. Cutaneous purpura is sometimes associated with hemorrhage into the adrenals, as in variola, and it would, at any rate at first sight, appear probable that some underlying cause—toxemia or bacteremia—is responsible for both sets of hemorrhages. It has, however, been thought that the changes in the adrenals are primary and the purpura secondary (Loeper),[23] that purpura may stand in the same relation to acute destruction of the suprarenals as pigmentation does to chronic destruction (Dudgeon), and that the proper treatment is to give adrenalin. As arising out of this it is worth while to enquire to what extent the low blood-pressure and circulatory failure seen in acute febrile diseases is the result of temporary suprarenal inadequacy, brought about by the action of bacterial toxins on the cells of the medulla of the suprarenal

bodies. The action of toxins on the heart muscle cannot be questioned, but it is conceivable that some of the loss of vascular tone in fever is due to a want of adrenalin and that it is not entirely the result of the direct action of toxins on the vascular system. This question is of practical importance as bearing on the advisability of giving adrenalin in acute diseases with threatened failure of the circulation. That the amount of adrenalin in the suprarenal glands may be greatly diminished by acute disease has been shown by testing the glands physiologically (Mott and Halliburton).[24] In poisoning by diphtheria the medulla of animals is devoid of adrenalin as shown by the color reaction with chromic acid (Elliott and Tuckett),[25] and it had previously been found empirically that adrenalin was of great value in the cardiac failure of diphtheria. An obvious objection to the administration of adrenalin in such condition is that if it increases the peripheral resistance it will of necessity give the failing left ventricle more work to do, and so be harmful rather than beneficial. I have, however, for some considerable time been in the habit of giving adrenalin by the mouth in cases of pneumonia in adults, and in bronchopneumonia in children, and, I believe, with good results; it has appeared to prevent cardiac failure and has not given rise to any bad symptoms such as pulmonary edema. Another objection raised against the use of adrenalin is that experimentally it produces arterial degeneration; as bearing on this I have examined the aorta in a few cases in which adrenalin had been given during life and have not found any recent changes. But I do not lay any stress on this for several reasons—my observations are quite insufficient, the amount and duration of the administration of adrenalin were not comparable with those employed in the experimental degeneration, and even if recent changes were found it might be argued that they were due to toxins of the disease responsible for death. While I believe that adrenalin is a valuable circulatory tonic in acute infections, especially pneumonia, I am anxious that this point should be more thoroughly tested; especially as I have found but little increase in the blood-pressure of febrile patients showing apparent improvement while taking adrenalin.

(3) Relative inadequacy of the internal secretion of the medulla.—By this is meant that if there be normally a balance between the effects of the pressor and depressor glands, any excessive secretion (depressor) of the thyroid should lead, the pressor secretion maintaining the normal mean, to a relative deficiency of the antagonizing internal secretion. The question that arises here is whether the symptoms of thyroidism, of exophthalmic goitre, and the allied toxic manifestations which, as Sir Victor Horsley[26] points out, may sometimes be seen in ordinary goitre,

are in any degree due to a relative deficiency in the secretion of adrenalin. It is clear from Janeway's[27] summary that the blood-pressure is not low in exophthalmic goitre as might be expected if the disease be regarded as due to simple hyperthyroidism, and that it may be very considerably raised as the result of psychical excitement. In the few cases in which I have taken the blood-pressure with a Riva-Rocci sphygmometer, it has been rather above than below the normal. It is true that in some cases of exophthalmic goitre improvement has followed the administration of suprarenal extract; I have seen this myself. But it must be remembered that exophthalmic goitre often improves both spontaneously and after widely different forms of treatment, and that it has not been shown that suprarenal medication is a certain means of counteracting the symptoms of exophthalmic goitre. We have therefore no evidence that an excess of thyroid secretion produces bad effects by means of a relative deficiency in adrenalin.

(*c*) Excessive secretion of adrenalin.—Here again very little is known. The excess might conceivably be (1) due to an excessive secretion of adrenalin by the medulla, or absolute excess, or (2) be relative and depend on a diminution in the amount of the thyroid secretion.

(1) Since the demonstration that atheroma can be artificially produced in animals by the injection of adrenalin (Josué,[28] Pearce and Stanton,[29] and others), the question has arisen whether high arterial blood-pressure in man and its results—hypertrophy of the left ventricle, arteriosclerosis, atrophic changes in the kidneys and so forth—may be due to an excess of adrenalin in the circulation. As it is generally believed that in renal disease a raised blood-pressure is, within limits, useful, it might be assumed that this compensatory process is brought about by hyperplasia of the suprarenal medulla. Let us see how the evidence available bears on this question. From some experiments on animals Marrassini[30] concludes that interference with the renal excretion increases the functional activity of the adrena medulla. A case of parenchymatous nephritis with great hypertrophy of the left ventricle and manifest hyperplasia of the medulla of the suprarenals has been reported (Vaquez and Aubertin),[31] and might be taken to support this view. But as regards this special form of renal disease this would appear to be almost an isolated observation. Wiesel[32] has recorded a number of cases of high blood-pressure, arteriosclerosis, and granular kidney associated with enlargement of the suprarenal medulla and also of the chromaffine cells in the solar plexus. Here it might at first be thought that the suprarenal change was the cause of the high blood-pressure and the structural changes, as in experimental atheroma. It has, it is interesting to note, been suggested (W. Russell)[33] that certain foods, especially proteins,

may lead to increased secretion of adrenalin. It would thus be possible to construct a hypothesis of dietetic excess, absorption from the intestine of toxic bodies which stimulate the medulla of the suprarenals to increased functional activity followed by hypertrophy, and that subsequently the cardio-vascular changes are produced. But Wiesel believes that the cardiac hypertrophy precedes the hyperplasia of the suprarenal medulla and is not due to it. This relation between the sequence of events must be somewhat difficult to determine and the subject is in need of further study. But it is clear that at present there is no proof of the existence of any disease due to excessive adrenalin secretion, and corresponding to exophthalmic goitre in the case of the thyroid, but on this point we must be content to wait for further information.

(3) Relative excess due to a deficiency in the amount of antagonizing depressor internal secretion.—It is conceivable that as the result of the atrophy of the thyroid which so commonly accompanies advancing years, the equilibrium normally existing between the internal secretions of the thyroid (depressor) and of the adrenal medulla (pressor) would no longer be maintained, and that an excess of adrenalin would therefore accumulate in the circulation and thus induce a correspondingly high arterial pressure. In other words, that the rise of arterial blood-pressure as life advances is due to a predominance of the pressor internal secretions. In support of this it might be urged that in myxedema it is common to find arteriosclerosis and granular kidney, which are the results of long continued high blood-pressure; but too much stress must not be laid on this, for the age of myxedematous patients approaches that at which vascular degeneration is common, and in a certain number of cases of myxedema the kidneys are healthy.

To return again to the question whether the hypothetical equilibrium between the depressor and pressor internal secretions may be upset by a deficiency of one, so that the other secretion has a paramount influence, Gioffredi's[34] conclusions are to the effect that normally certain organs and tissues—the liver, the blood, and to a less extent the voluntary muscles—transform adrenalin into an inactive product and so protect the body against the toxic results of an excess of adrenalin which might otherwise result. In order to exert this change the blood must be provided with oxygen and be alkaline, but those conditions are not necessary in the case of the liver and voluntary muscles. It is conceivable that such a compensatory mechanism might fail under the same conditions as those under which the thyroid secretion wanes, and that then a relative excess of adrenalin in the circulation would result. These considerations are highly speculative, but they may perhaps be forgiven because they bear in a some-

what remote manner on an important practical point, namely, the prevention and reduction of the rising arterial pressure of advancing years. For they suggest that the administration of thyroid extract might have this desired result, and that it may prove to be the routine treatment. Iodides which are so widely given in clinical medicine in order to lower blood-pressure have been shown to have no depressing effect on the heart or blood-pressure (Stockman and Charteris);[35] but it is conceivable that they eventually lower blood-pressure by stimulating the thyroid to an increased secretion.

2. Alteration in quality.—Of alterations in the quality of secretions very little is known if we except the gastric juice, but it is reasonable to believe that in the future this factor will attract attention and be shown to have most important pathological bearings. The adenomatous changes in the thyroid in exophthalmic goitre and in the pituitary body in acromegaly may safely be assumed to lead to an altered internal secretion, and so to have a causal bearing on the associated diseases.

In the case of the adrenal medulla nothing is known as to any alteration in the quality of the secretion. It is somewhat wild speculation, but it may be mentioned for what it is worth that possibly intestinal toxins may so act on the cells of the adrenal medulla as to produce an internal secretion of such an abnormal character that the normal process of transformation of any excess into an inactive body, as suggested by Gioffredi, cannot be carried out by the tissues. The excess of such abnormal adrenalin might conceivably cause high arterial pressure, arteriosclerosis and the allied morbid changes.

Mr. President and gentlemen, my address is now at an end, and I feel as I have felt all along since I began it some months ago that I must apologize for its imperfections and for its speculative character. I have tried to comfort myself by thinking that it is well from time to time to take stock of the current researches and hypotheses which sometimes become the working basis for the practice of to-morrow. But I must not excuse myself or make further demands on your patience, and must again thank you for an honor I shall never forget.

References.

[1]Woolley. *Trans. Assoc. Am. Physicians*, 1902, XVII.

[2]Bulloch and Sequeira. *Trans. Path. Soc.*, London, 1905. LVI., 189.

[3]Thornton, K. *Trans. Clin. Soc.*, London, 1890, XXIII., 152. Richards, O. Guy's Hosp. Reps., 1905, LIX., 225.

[4]Guthrie and Emery. *Trans. Clin. Soc.*, London, 1907, XL.

[5]Mulon, P. *Compt.-rend. Soc.: biol.*, Paris, 1906, LXI., 272.

[6]Schäfer and Herring. *Phil. Thans. Roy. Soc.*, London, 1906, Vol. 199, p. 27, Series B.

[7]Scudder, C. L. *Publications of the Massachusetts General Hospital*, 1907, Vol. I., No. 3, p. 82.

[8]Zander's *Zeigler's Beitrage*, 1891, XI., 145.

[9]Alexander. *Zeigler's Beitrage*, 1890, VII., 441.

[10]Lovett and Nichols. *Brit. Med. Jour.*, 1906, II., 191.

[11]Myers, W. *Trans. Path. Soc.*, London, 1898, XLIX., 368.

[12]Gouget. *Comp. rend. Soc. biol.*, Paris, 1903, LV., 1659.

[13]Mulon, P. *Ibid*, 1907, LXII., 905.

[14]Aubertin et Ambard. *Mém. et. Bull. Soc. méd. des hôp.*, Paris, 1904, 175.

[15]Darré. *Thèse de Paris*, 1907, quoted by Beaujard. *Sem méd., Paris*, 1907, 200.

[16]Schäfer and Herring. *Phil. Trans. Roy. Soc.*, London, 1906, Series B, Vol. 199, p. 27.

[17]Marrassini. *Arch. Ital. de Biol.*, Turin, 1906, XLVI., 73.

[18]Mulon. *Arch. gén. de méd.*, Paris, 1904, 2543.

[19]Boinet. *Arch. gén. de méd.*, Paris, 1904, CXCIV., 2324, 2525.

[20]Grünbaum, O. F. *Med.-chir., Trans.*, London, 1907, XC.

[21]Riviere, C. *Trans. Path. Soc.*, London, 1902, LII., 368.

[22]Dudgeon. *Am. Jour Med. Sc.*, Phila., 1904, CXXVII., 134.

[23]Loeper. *Clinique Médicale de l'Hôtel-Dieu*, Paris, 1906, V., 90.

[24]Mott and Halliburton. *Archives of Neurology*, 1907, III., 123.

[25]Elliott and Tuckett. *Journ. Physiol.*, London, 1906, XXXIV., 332.

[26]Horsley. *Clinical Jour.*, 1904, XXIV., 29.

[27]Janeway, T. C. "*The Clinical Study of Blood-Pressure.*" New York, 1904, p. 200.

[28]Josué, O. *Presse méd.*, Paris, 1903, 798.

[29]Pearce and Stanton. *Jour. Exper. Med.*, 1906., VIII., 74.

[30]Marrassini. *Arch. Ital. de Biol.*, Turin, 1906, XLVI., 82.

[31]Vaques et Aubertin. *Compt. rend. soc. biol.*, Paris, 1907.

[32]Wiesel. *Wien. med. Wchnschr.*, 1907, LVII., 674.

[33]Russell, W. *Brit. Med. Jour.*, 1904, 1, 1299.

[34]Gioffredi. *Archivio de Farmacologia sperimentale*, 1907, 145.

[35]Stockman and Charteris. *Brit. Med. Jour.*, 1901, II., 1520.

SOME LAMPS OF SCIENCE.*

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In delivering an inaugural lecture it is fitting that I should address you upon a topic connected with my special subject. But this lecture is also the opening lecture of the session, and is therefore to be especially addressed to the students of the Department, among whom are some who are no longer novitiates in the science of anatomy, and others to whom the methods and principles of that science are as yet closed books. It behooves me, therefore, to avoid both what might seem platitudes to some and what might appear technicalities to others, and to offer the mental pabulum I have to present neither in shallow platters from which only the foxes may partake nor in slender-necked vessels suitable only for the use of storks.

It has seemed on due consideration that a vessel suitable for both the foxes and the storks might be found in the well-equipped stores of history, and that from a repast served therein some food for thought might be offered both to the tyro and to the expert. The history of anatomy and of medicine, for the two have always been intimately associated, carries us back, however, to the dawn of civilization, and it would be futile in the course of a single lecture to attempt even a fairly complete outline of so large a subject; indeed, the time at my disposal would barely suffice for the mere mention of the names of those who have contributed to the development of anatomy. But among these names there are several which stand pre-eminent, which mark eras of development and are the names of men who, with a rod of their own fashioning, have struck the rock until it gushed forth waters—waters which in some cases have indeed been waters of Meribah.

Selecting some of these names, it may profit us to consider what they mean to anatomists, what were the services rendered by the men whom they designate, and what were the methods by which these men achieved pre-eminence. In the case of each one some quality or qualities stand out conspicuously, and a study of these may yield us some clues to success in scientific achievement.

We may first look back to a period somewhat more than three hundred years before the Christian era, at which time a famous school of medicine flourished at Alexandria under the favoring influence of Ptolemy Soter. Among the most renowned teachers

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of this school was Herophilus, a native of Chalcedon and a pupil of Praxagorus, the last of the Asclepiads, the family of priest-physicians who traced their descent from Æsculapius. Little has come down to us concerning the details of the life of Herophilus, nor are any of his works still extant; our knowledge of his achievments is based upon statements made by later authors and especially by Galen. From these references, however, it is not difficult to perceive in Herophilus the founder of anatomy. Before his time anatomy, in the true sense of the word, can hardly be said to have existed. Not that his predecessors were entirely devoid of some knowledge of the parts of the body, but this knowledge was little more than such as might readily be obtained by the inspection of parts as exposed by the mere opening of the body cavities. Of dissection, the careful isolation of parts, there is little evidence in the works of Hippocrates, the greatest physician of classical times, and even from Aristotle, so rich in facts concerning the parts of animals, one seeks in vain for unimpeachable evidence of careful dissections of the human body. The religious beliefs, as well as the mode of thought of the Greeks, were opposed to such procedure. They were more inclined to theorize than to observe, their methods were deductive rather than inductive, and the failure of their philosophy from the standpoint of the scientist is well stated by Whewell. "They ought," he says, "to have reformed and fixed their usual conceptions by observation; they only analyzed and expanded them by reflection; they ought to have sought by trial, among the notions which passed through their minds, some one which admitted of exact application to facts; they selected arbitrarily, and, consequently, erroneously, the notions according to which facts should be assembled or arranged; they ought to have collected clear, fundamental ideas from the world of things by *inductive* acts of thought; they only derived results by *deduction* from one or other of their familiar conceptions." From these words we may form a clear idea of the essentials which go to form the scientific spirit, and lacking these, it is little wonder that under the Greek influence anatomy made little progress.

It is the great glory of Herophilus that he emancipated himself from the Greek method of thought. His master, Praxagorus, had insisted upon the necessity of comparing the structures of the human body with those of lower animals, which were much more thoroughly known, and while opportunities for carrying out his own advice were for Praxagorus few and far between, yet we may believe that the teaching stimulated the pupil and when Herophilus found at Alexandria opportunities for observations on the human body, under the liberal and personal encouragement of the Egyptian king, he did not fail to take advantage of them. Galen tells

us that he made a great many observations not only on the lower animals, as others did, but also upon the human body, and Tertullian speaks of him with condemnation as "Herophilus, that physician or butcher, who dissected six hundred human bodies." Indeed, it is even asserted by Tertullian and by Celsus that he practised vivisection on criminals, but whether this statement may be accepted as reliable or whether it is not rather an exaggeration of an act unusual in itself and magnified by popular repetition, is uncertain.

From the few scattered notices we still possess of his results it is evident that Herophilus added greatly to the knowledge of the structure of the human body possessed by his predecessors, and it is interesting to note that some of the terms employed by him to designate cer ain parts are in use to-day after the lapse of twenty-two centuries. Thus he was the first to describe accurately the duodenum and to bestow that name upon it; he likened the posterior portion of the fourth ventricle to a writing pen (calamus scriptorius); he compared the confluence of the cranial sinuses to a wine-press (torcular Herophili); and he described the membranes of the brain as the arachnoid and dura mater. Furthermore, he recognized the brain as the seat of perception, correcting the erroneous Hippocratic conception of it as a gland which served to secrete moisture; he discovered the retina, which he regarded as the centre for visual perceptions; he traced the origin of the peripheral nerves to the brain and spinal cord; he distinguished arteries and veins by their structure and maintained that both contained blood; he recognized the pulmonary artery and veins, naming the former the venous artery and the latter the arterial veins, thus laying a foundation for the long-delayed discovery of the circulation of the blood; and, finally, he discovered in the mesentery vessels which did not pass to the liver but terminated in gland-like bodies, thus anticipating by many centuries the rediscovery of the lymphatics by Aselli in 1622.

All these were discoveries establishing the knowledge of the parts of the human body and their relations on an entirely different basis from that which they had held under his predecessors. And when we consider that these are mere fragments of his results, recorded by later authors, we cannot help regretting deeply the loss of his completed writings.

It was then the *lamp of observation* that enabled Herophilus so to enrich the science he professed. Casting aside what Bacon termed "di-gladiation over subtilties," that is to say, the dialectic and sophistic speculation of his predecessors, he lighted this lamp for anatomy and revealed a new world Observation is the keynote of progress in science, and for you as future practitioners of medicine there is no faculty so necessary of cultivation. It is the

possession of the power of keen observation that makes as well the productive scientist as the successful practitioner, and unless the lamp of observation be kept well lighted and trimmed the fulfilment of our responsibilities as scientists and physicians is impossible.

Before the second lamp of anatomy was lighted a period of four hundred and fifty years elapsed. Like Lief Ericssen, Herophilus discovered a great continent only for it to disappear, except as a tradition, and to be rediscovered centuries later, for with his death and that of his contemporary, Erasistratus, the method he followed fell into disuse and his successors were content to accept without question and without emulation the doctrines he had set forth. Actual observations upon the human body were practically abandoned for many hundreds of years, Galen himself, who is our second subject for consideration, confining his anatomical observations almost entirely to apes, dogs, and other lower animals. But while Galen contributed largely to the progress of anatomy by these observations, it is to another side of his versatile mind that I wish especially to direct your attention, considering chiefly the quality which made him the supreme authority throughout the middle ages in matters of medical import, just as Aristotle was the supreme authority in matters philosophical.

Galen was born A.D. 131 in Pergamos and had for his father Nicon, a senator of Pergamos, not without repute for his knowledge of the mathematical sciences and renowned for his acquaintance with the Greek dialects. Under his guidance Galen began his education and until the age of fifteen confined his attention to the humanities, mathematics, logic and grammar. His father, he tells us, made him read in his youth the good ancient authors who wrote in the Greek tongue, and he is said also to have become familiar with Latin, Ethiopian and Persian. From fifteen to seventeen he devoted himself to the study of philosophy, acquiring an interest in that study which he retained throughout life and which he valued highly.

Having thus prepared himself by a thorough grounding in the mathematics, literature and philosophy of his day, he entered upon his medical studies in his seventeenth year. He began these studies at Pergamos and continued them later at Smyrna, still later at Corinth, and finally at Alexandria, where at the age of twenty-eight he completed them, having thus devoted not four or five, but no less than eleven years to learning the principles of the profession of which he became so distinguished an ornament.

Like Herophilus, Galen laid great store by the lamp of observation, and several anecdotes of his keenness of perception as manifested in diagnosis have come down to us. He was an adept in the art of dissection and practiced it extensively, thereby add-

ing many new facts to anatomical knowledge. Unfortunately, however, he lacked the opportunities for the dissection of human bodies enjoyed by Herophilus, and was obliged to content himself with studies of the lower animals, choosing especially those which bore the greatest general resemblance to man. This in itself was not so great a disadvantage, for many of the fundamental facts of anatomy may be as well worked out on the cadaver of a dog as on that of a man. But Galen fell into a serious error in that he assumed that the form and proportions of the organs of the animals he studied were identical with those of the corresponding human organs, and, indeed, he described his observations as if they had actually been made on the human body. This error led to grievous results, for, since Galen's writings became the accepted authority upon medicine throughout the middle ages, the antomy taught in the schools for many centuries was not the anatomy of the human body. Similar errors have frequently been made since Galen's day, and they have ever led to unfortunate results. Let us be warned by these and ever remember that assumptions uncontrolled by observation and stated as actualities should have no place in scientific literature or thought. If an assumption must be made, let it be clearly understood that it is an assumption. "x equals y" is a very different statement from "let us assume that x equals y." Assumptions may frequently be necessary as working hypotheses to be profitably employed as guides for further observation, but, as we value our reputations and that of our profession, let us most carefully refrain from either stating or adopting them as facts. We must not allow our jackdaws to strut in peacocks' feathers.

But while Galen's contributions to the facts of anatomy are thus open to criticism, we must recognize that he gave to his successors through many generations an anatomy more compendious and accurate than any that had seen the light before his day. His osteology was far in advance of that of his predecessors, and although the bones are not described with that minuteness of detail which we find in modern text-books, yet they are described with intelligence and on the whole with accuracy, so much so that many of the names by which we know them to-day trace back to Galen's writings. He rediscovered the fact that the arteries contain blood, a fact already announced by Herophilus but denied by Praxagorus and Erasistratus; and he likewise demonstrated again the origin of the nerves from the brain and cord, the successors of Herophilus having forgotten his teachings and returned to the older view that the nerves had their origin in the heart, a view largely due to the inability of the older authors to distinguish between nerves and tendons. He recognized the relations of nerve to muscle much more accurately than his predecessors

and extended greatly their knowledge of the nervous system, discovering the recurrent nerve, the extension of the vagus nerve to the abdomen, and some of the larger sympathetic ganglia, although he failed to perceive the ganglionated cord. But the enumeration of his discoveries is not to my purpose just now. Let it suffice to know that he worked assiduously in the light of the lamp of observation and gave to the world an anatomy more thorough than had existed before his time and one which served as practically the sole guide to anatomical knowledge for centuries after his death, which occurred in A.D. 201.

The other characteristic that I wish especially to dwell upon was his broad general knowledge. It was the combination of this with highly trained powers of observation that made Galen the medical authority of the middle ages. He worked in the light of the lamp of observation reinforced by that of the *lamp of knowledge,* and it was this latter light that enabled him, the wisest man of his day and of many succeeding generations, to deduce principles from his observations and to place anatomy and medicine upon a philosophic basis. Knowledge was power to him, and it was the very breadth of his knowledge that made him what he was. We have seen that he devoted no less than eleven years in mastering the principles of his profession, and the numerous references in his writings show him to have been thoroughly familiar with the writings of the older authors. His example in this respect lasted throughout the dark ages, the physicians of those days showing a familiarity with medical literature which is worthy of emulation. Chaucer's picture of the "verrey parfight practisour," whom we may take as a type of the mediæval physician, showed him well versed in medical lore.

> "Wel knew he the olde Esculapius
> And Deiscorides, and eek Rufus;
> Old Hypocras, Haly, and Galien,
> Serapyon, Razis and Avicen;
> Averrois, Damascien, and Constantyn,
> Bernard and Gatesden and Gilbertyn."

But Galen's knowledge was not limited by the necessities of his profession; his was a broader knowledge and hence a greater power, and it is to this that Galen himself attributed his success. I have mentioned his continued interest in the study of philosophy; let us hear what he himself says as to its value. "I did not," he says, "begin yesterday or the day before yesterday to love and study philosophy; it has attracted me from my youth. After I had devoted myself to medicine, as the result of a dream of my father, I continued throughout my life to cultivate the two

sciences. It is not, then, astonishing that having studied diligently while others paid visits in the town and supped with the rich, I should have acquired a knowledge of all that the ancients have discovered and should have placed myself in condition to profit from them in the exercise of my profession."

Even at the expense of repetition I must insist upon the combination of observation and knowledge as the source of Galen's extraordinary influence upon succeeding generations, and I would emphasize further the correlation of his power for good with the breadth of his knowledge. What was true for Galen is true for each of you, and if you keep the lamp of knowledge lighted and allow its beams to light for you not only the narrower field of your specialty, but also the broader pastures of general science and the humanities, you cannot fail to add to your success as physicians, your usefulness as citizens and your enjoyment of the better things of life. I know the amount and variety of information you will be supposed to acquire or be forced to acquire during your student days; I know that the dentrites of your cortical cults will be kept quivering from early morn till dewy eve—nay, until midnight or after, in the endeavor to seek out new association paths, but still I hold that you can and should find time, even as Galen did and many another has done, to cultivate both medicine and philosophy, using that word in in its etymological significance. He who can find his happiness in

"A Book of Verses underneath the Bough"

without even the accessories demanded by the Persian philosopher-poet, has mastered the secret of happiness in this life, for he will have learnt to find interest in everything and everywhere.

I would like to dwell on the value, or rather I would say the essentiality, of breadth of knowledge for the "verrey parfight practisour," but there are other lamps to be considered. I shall therefore content myself by quoting to you the words attributed to Dr. Radcliffe in that delightful picture of the London physicians of the eighteenth century, entitled "The Gold-headed Cane," which I trust each one of you may some time read and enjoy. Radcliffe says, "As I have grown older, every year of my life has convinced me more and more of the value of the education of the scholar and the gentleman to the thoroughbred physician."

After the death of Galen evil days fell upon the science of anatomy and it was fated to languish for many centuries. With the decadence of the Roman empire and the irruption into intellectual Europe of the Goths and Vandals from the north and later of the Saracens from the east and south, there came a period

during which the cultivation of the arts and sciences was practically neglected. The reign of Charlemagne forms a bright spot in the history of intellectual development in the dark ages, but the disruption of his empire which followed upon his death and new invasions of barbarians soon brought again days of gloom for the sciences. Then came the martial frenzy of the Crusades, which, though at the time fatal to progress in the arts and sciences, nevertheless brought in their train the revival of learning.

It was not, however, so much the unrest of Europe that acted as a depressant on anatomy as it was the resulting unrest of the East. Europe had never fostered that science, but being under the influence of the intellectual methods of the Greeks had preferred the freedom of speculation to the more restraining practice of observation. It was to the East, as we have seen, that we owe the foundation of anatomy, and it was not until the close of the middle ages that interest in it was clearly manifested in Europe. In the four hundred and fifty years that elapsed between Galen's death and the conquest of Egypt by the Saracens, but two men stand out conspicuously as writers on medicine, Oribasius, the friend and physician of the Emperor Julian the Apostate, and Ætius, who flourished at the Court of Constantinople about the beginning of the sixth century, and both there received a part at least of their medical education at Alexandria. Then came the Saracenic conquest, and it was interesting to note that it was this very people, to whom the unrest of the dark ages was so largely due, who kept alive an interest in the sciences and subsequently were the exponents to the Occident of the works of Galen and Hippocrates. From the tenth to the fourteenth centuries the masters of medicine were Arabian physicians trained in the schools of Bagdad, Herat and Cordova, but while they held anatomy in high esteem as the foundation of the healing art, its practice was forbidden them by their religion and they could but follow the teachings of Galen. No advance followed their supremacy in anatomy, they but kept alive an interest in Galen's teachings.

In the eleventh century, however, there arose in Italy, at the town of Salerno, the first European school of medicine. The Benedictine monks of the near-by monastery of Monte Cassino, founded by St. Benedict himself in 528, had always, in accordance with the rules of their order, cultivated the useful arts and sciences as well as theology, and had therefore practiced medicine. Later Saracen or Moorish physicians, trained in the Moorish college at Cordova, established themselves in the town, and thus the Cross and the Crescent combined in the establishment of the Salernitan school, which became as celebrated in its day as the

Alexandrian school had been in earlier times. But the anatomy that was taught was the anatomy of the Arabians, and this, we have seen, was the anatomy of Galen. That the Salernitans dissected is certain, but it seems probable that the cadavers they studied were those of pigs; one Kopho, a professor of the school toward the close of the eleventh century, wrote a treatise on the anatomy of these animals.

In the thirteenth century rivals of the school of Salerno began to develop and soon its reputation as a seat of learning was eclipsed by the growing renown of the Universities of Bologna, Montpellier and Paris, and at Bologna and Montpellier the dissection of human bodies was practiced in the fourteenth century. Mondino of Bologna wrote a treatise on anatomy in the early part of that century in which he states that he had himself dissected the human body, and Guy de Chauliac of Montpellier in his Surgery written in 1363, describes the order in which his teacher, Bertuccius, was accustomed to proceed in demonstrating the parts of the human body.

This, you will note, was at the beginning of the period known as the Renaissance, when men began to think and observe for themselves. But the renaissance of anatomy was not yet. The supreme authority of Galen which had endured for so many years was not easily overthrown, and men had less confidence in their own observations than in the Galenic traditions. I speak of them as traditions because at this time Galen had come to be more generally known through Arabian commentaries than in the original, and what passed for Galen was frequently Latin translation of an Arabic version of the original Greek. So great was the Arabian influence that in the works of both Mondino and Guy de Chauliac Arabic terms are frequently employed to designate parts of the body, while references to Avicenna, one of the most celebrated of the Arabian physicians, are frequent.

But the relighting of the lamp of observation was a great step towards the renaissance of anatomy, for even although theory and servile imitation continued to hold sway for another two hundred years, yet the leaven was working, observation was becoming both possible and popular and there was needed but a man who could feel sufficient faith in himself to cast aside the shackles of tradition and rely upon the evidence of his own senses.

I have treated thus summarily the history of anatomy throughout the dark ages in order to set before you in the greatest possible prominence the value of another lamp of science, the *lamp of independence.* That was *the* lamp of the Renaissance, and while it was shedding the full brightness of its light in the field of literature during the fourteenth century, the century of Dante, Petrarch, Boccaccio and Chaucer, and in the field of art

toward the end of the fifteenth and the beginning of the sixteenth centuries. the age of Leonardo, Michael Angelo, Titian, Velasquez, Durer and Raphael, it was not until half a century later that it suddenly burst into flame for anatomy. Leonardo da Vinci, it is true, cutting loose the bonds of tradition, observing for himself and thinking for himself, as an anatomist as well as an artist, a sculptor and an engineer, worked out the structure of the human body in such a manner as to evoke from William Hunter the encomium, "I believe Leonardo was by far the very best anatomist of his time." But Leonardo's lamp of independence was lighted for himself alone; the book which he planned and which he outlined with so broad a scope was never written and his drawings illustrative of his dissections remained unpublished until recent years. It was not until 1543 that the renaissance of anatomy was accomplished by the publication of the *De corporis humani fabricâ* of Andreas Vesalius.

Vesalius was born in 1514 at Brussels, and in certain respects his early years remind us of those of Galen. His father was a physician of repute and his grandfather had published commentaries on the works of the Arabian Rhazes and on part of the Aphorisms of Hippocrates. Like Galen, Vesalius was thoroughly grounded in both Latin and Greek and he also mastered Arabic; his zeal for study was boundless, and even in his youth his powers of observation were trained by the dissection of animals. In his fourteenth year he went to Paris and there studied anatomy under Sylvius, devoting himself to his studies with such assiduity and ability that in 1537, that is to say, in his twenty-third year, he was appointed to the professorship of anatomy in the University of Padua.

His teachers, Sylvius included, were fast bound by the Galenic traditions, founded as we have seen upon the anatomy of the lower animals. Vesalius cast these traditions from him, freed himself from the constraining bonds of what good old Sir Thomas Browne has called "adherence to the dictates of authority," and relied upon his own observations. For him the lamp of independence shone brightly and he gave to the world a new era of anatomy. At first his assertions that there were errors in the anatomy of Galen called down upon his head the vituperations of the Galenists, but he had not lighted his lamp in vain nor hidden it under a bushel, it was not to be extinguished. A new anatomy had been created in which were combined the results of a keenness of observation like that of Horophilus, a breadth of knowledge like that of Galen, and an independence of tradition, which was the great contribution anatomy owes to Vesalius.

The value of the lamp of independence can hardly be overestimated. It is the lamp which has lighted the way to all great

achievements in literature, art and science; it is the lamp by which both Shakespeare and Darwin worked. It is the lamp whose light has shown the way to progress and whose absence leads to retrogression. But yet, let me warn you that it is a lamp that must be used with circumspection. A healthy scepticism is one of the chief assets of a scientific thinker. But let us be assured that it is a healthy scepticism, that is to say, a scepticism based on observation ad controlled by knowledge. Without such basis and control scepticism is pernicious; without them the doubter remains for ever in subjection to the everlasting Nay, with them he passes through the centre of indifference and reaches finally the everlasting Yea. Far better is blind adherence to authority than wanton doubt. Vesalius illumined his scepticism by the lamps of observation and knowledge and it became an additional light upon the path of progress.

"Insist on yourself, never imitate," is the advice of Emerson. But see to it that your self-reliance be not founded upon and magnified by ignorance. Vesalius insisted on himself and the renaissance of anatomy resulted; Darwin insisted upon himself and a new philosophy was given to the world. But in both these cases the insistence was based on observation and knowledge; it was not the empty insistence of a fallow mind. The lamp of independence must follow those of observation and knowledge or it may but intensify instead of illuminating the darkness. I have quoted to you the remarks of Dr. Radcliffe bearing on the value of the lamp of knowledge. In connection with the lamp of independence let me cite for your salvation the warning of another great physician, Sir Charles Bell: "Of all the lessons which a young man entering upon our profession needs to learn, this is, perhaps, the first—that he should resist the fascinations of doctrines and hypotheses, till he have won the privilege of such studies by honest labor and a faithful pursuit of real and useful knowledge."

The effect of Vesalius' emancipation of anatomy from the control of tradition led at once to an activity of investigation and an abundance of discoveries, without parallel in the earlier history of anatomy. The achievements of the century which succeeded the death of Vesalius are alone sufficient to stamp his work as the foundation of modern anatomy, for in that period discovery followed fast on discovery, and results were obtained which completely revolutionized the physiological ideas of the day. And two of these results are especially noteworthy as yielding two of the most fundamental conceptions of modern medicine, I mean the circulation of the blood and the absorptive function of the lymphatics.

A partial index of the results obtained in the century in ques-

tion is furnished by our anatomical nomenclature, which still retains the names of several of its discoverers. Thus the name of Fallopius, one of the immediate successors of Vesalius, is well known to every student of anatomy; Eustachius, who died in 1570, in addition to many important discoveries, among which is that of the tube which still bears his name, inaugurated the investigation of the minuter anatomy of organs, showing that their parenchyma, a name first employed by Erisistratus, was not a homogeneous substance as had been supposed, that of the kidneys, for instance, consisting of tubules; Aranzi or Arantius, a pupil of Vesalius, who subsequently became professor of anatomy at Bologna, demonstrated the independence of the maternal and fetal circulations and contributed important facts concerning the structure of the fetal organs; Varolius, also professor of anatomy at Bologna, by his observations upon the brain prepared the way for the future work of Willis; and Vidius, Spigelius and Botalli have all had acknowledgment of their contributions to anatomy from our nomenclature.

But the discoveries of these men, important and suggestive as they were, are overshadowed by that of the circulation of the blood. For Galen the blood simply oscillated to and fro in the vessels, the veins as well as the arteries leading from the heart. Servetus, a contemporary of Vesalius, described the passage of the blood from the right to the left side of the heart through the lungs, his views, however, being still largely tainted by the Galenic physiology, and his views were essentially those recorded in the works of Vesalius and his pupil Columbus. How far these ideas concerning the pulmonary circulation may have contributed to the final discovery of the major circulation may be a matter for discussion, but it is generally admitted that the demonstration by Fabricius, the pupil and successor of Fallopius, of the valves of the veins and their significance was much more important. Harvey, for whom was reserved the honor of the great discovery which he announced in 1628, was a pupil of Fabricius.

As regards the lymphatic system, we have already seen that it was detected by Herophilus, but was entirely overlooked by succeeding writers. In 1622 Aselli, professor of anatomy and surgery at Pavia, rediscovered in a dog the lymphatics of the mesentery and traced them to a group of mesenterial lymph-nodes, and in 1647 Pecquet, while still a student of medicine at Montpellier, traced the same vessels past these nodes to the thoracic duct, whose course up the thorax to its entrance into the subclavian vein he was able to follow. Later the observations of Caspar Bartholin and Rudbeck revealed the existence of other groups of lymphatics and the system became fully recognized, although it awaited the closing years of the eighteenth century

for a full exposition by Mascagni. The great importance of this system from the surgical standpoint has, however, become emphasized in recent years, and it has been one of the tasks of the last decade, admirably fulfilled by Gerota, Poirier, Cunéo, Most, Staler and others, to elucidate systematically the regional anatomy of the lymphatics.

The discoveries recounted above are the most striking results of the century succeeding the death of Vesalius, and if one considers their number and importance in contrast with the sterility of the twelve preceding centuries, one can form a fitting estimate of the value of the lamp of independence as it was used by Vesalius and his successors.

There is yet another lamp to which I would refer were it not that I have already trespassed sufficiently upon your time and patience. It is the *lamp of thoroughness,* and with it I would couple the name of Jacob Heule, whose handbook of systematic anatomy, written half a century ago, is still a model of descriptive anatomy and a book to which the anatomist still turns for information and inspiration. Heule not only worked in the light of the lamps of observation, knowledge and independence, but also employed that of thoroughness, which served to increase manifold the brilliancy of the others. The value of this lamp to all of us in whatever we may be called upon to do needs no comment; in making use of it we are but following the scriptural injunction, "Whatsoever thy hand findeth to do, do it with all thy might." Let me advise you to make thoroughness a habit and to that end practice it continually from the very beginning of your course.

Train yourselves, therefore, to observe, gather knowledge that you may be able correctly to interpret what you observe, cultivate independence of thought, but see that your independence rests upon observation and knowledge or woe will be to you, and, finally, develop the habit of thoroughness. With these four lamps to guide your feet your path will be sure, your goal evident and your success certain.

PRESIDENT FALCONER'S OPENING ADDRESS—UNIVERSITY OF TORONTO.

It gives me great pleasure to welcome you to the work of another session in the University of Toronto. Many of you already know the University well. Others begin your acquaintance this year, as I also do. I earnestly hope that for us all the coming session will prove to be thoroughly satisfactory.

He would be devoid of imagination who could look upon such an assembly as this without being deeply impressed. Probably there is no place in our Dominion where there could be gathered together so large a body of youth with such promise. You have come from good homes; you have been in good schools; you have lived under stable government; you have received as good moral and religious training as any youth anywhere. And now you are bringing this inherited capital that you may learn to invest it to the best advantage. Nor will you require to bury your capital in the earth for lack of occasion to invest, because in our young nation there are opportunities large enough to satisfy the ambitions of the most eager of those whom I address. I welcome you especially because of this very time in our national life, and I rejoice that you have before you such vast possibilities lying ready for exploitation.

I will ask you to consider what the university may give you as you enter upon your career or look forward to its completion. The university can provide you with something which you cannot get anywhere else, and it may be summed up in this—the being imbued with the university spirit. This spirit is unique; it is different from what you knew at school; you will not find it when you go out afterwards into business or professional life. Nearly every university man looks upon the years he spent in college as the most formative period in his life. It was the new era of discovery—a veritable renascence.

I wish to analyze this university spirit into some of its elements. It will not take you long to discover that the university stands for "Freedom." At matriculation you are approaching maturity and are presented with the fateful gift of freedom. You may prove unable to discern the worth of your gift, and may speedily squander it by exchanging it for its base counterfeit—licence. It rests with you to demonstrate whether you are competent to use this gift; whether, now that the refining and restraining influences of home are more or less removed, you will master your new environment, or will yield to "the contagion of the world's slow stain." There are those who think that youth can be drilled into character by moral discipline, and it may be that some will get more from a military school than from the

university. Every year unfortunates succumb to their privileges, but the university must take the risks of freedom in the conviction that under it there will be a greatly overbalancing development of self-directing manhood.

Freedom, however, always involves obligation, and another prevailing conviction of the university man is that there is a reign of law. You learn in your scientific courses to investigate its workings in nature and in history; you discover that its reach is not narrow, nor its defects doubtful. In his recent address, as President of the British Association, Sir David Gill tells us that "accurate measurement and the spectroscope have revealed two majestic processions of stars travelling through space in opposite directions, and these stars of both streams—some of them suns possibly 100,000 times more luminous than our sun—are alike in design, alike in chemical constitution and alike in process of development." So wide in its sweep is the reign of law. Should you penetrate through the husk of your scientific teaching and assimilate the kernel which it contains, you will get much of the wisdom of life, learning that the sequence of cause and effect is relentless, and that when youths or young nations tamper with law and forget its reign they are courting disaster.

At your entrance into the university you are also ushered into the strong atmosphere of intellectual freedom. Under competent teachers you will attain to this liberty in almost every department of study. Accuracy in thought and expression is an element—and an immensely important element—in intellectual freedom. Much untruth is covered up in phrases and in sentences carelessly written or spoken, which if rightly analyzed would be seen to be dishonest. The study of classical and other languages and literatures enables us to learn what words mean, to criticize our thoughts, to escape from meaningless repetitions of phrases, and to be delivered from slavery to the letter.

You will also enter into the arena of the pholosophical disciplines, and this may seem to some of you—and those probbaly the best students—to issue for a time at least in your intellectual undoing. You will discover that there is nothing too sacred in your religious, social or moral beliefs to be submitted in the class-room to the clear, cold inspection of the severest scrutiny, and at certain stages you may perhaps wonder whether there is any such thing as established truth. You may find yourselves again and again breathing an atmosphere that seems too strong for you, and fear lest you may not survive. I shall not be surprised if for a period of your student life some of you may be "wandering between two worlds—the one dead, the other powerless to be born." And yet these mental processes are essential to intellectual growth and to the mastery of truth.

Intellectual freedom will also come to those who engage in scientific pursuits; for in the halls of science you are taught to search for facts and to observe things for yourselves. Under proper scientific training you gain independent knowledge won for yourselves. Scientific knowledge is based upon an accurate observation of facts. At first sight you may seem to have a comparatively easy task, but the older you grow the clearer it will become to you that facts are elusive. Many a weary hour may be required to get at the facts of a case, but the truth cannot be known until the facts are known. To know just what facts mean is a proof of supreme ability, and the mark of a highly trained mind. To learn to distinguish between opinions and truth is to learn a very great lesson. You will not be so absolutely certain about some things as you were, but you will have received from the university an endowment more precious than gold if you have acquired the habit of penetrating to the fundamental facts of your problem. Any man who faces a large task in life to a great extent faces the unknown. It looms up before him, and his ability to master his future, his capacity for rising in his profession, are based upon his power—first of gauging facts correctly, and then of applying to the facts which he has correctly gauged the underlying principles of the profession which he has been studying in the university. The university should give the student a sense of freedom for the facing of his large problems and duties in a brave and heroic spirit.

There are, of course, dangers attendant upon the process of intellectual awakening. The expanding student is apt to be unduly aggressive in his consciousness of developing strength. He treats weakness or incompetency with scorn; he worships intellect, capacity and manifested power; his tender mercies are not so compassionate as they will be when he discovers that he too is finite. This discovery comes with age. I do not urge you to refrain from the use of intellectual freedom. I should rather urge you to rejoice in it, but also to seek to modify the defects of your virtues by the practice of as much humility as you deem to be consistent with your present dignity; and even when you have gone as far in this direction as your conscience will allow, to throw in as much more modesty as possible.

The next element in the university spirit to which I will refer is "Comradeship." You will form here such friendships as you never formed before and will never form afterwards. It is true that students are individualistic, but they are also gregarious, and ideas rapidly infuse the common student mind. The university is the home of generous enthusiasms which are kindled and fed by rich and worthy friendships. College intimacies are more easily fostered in halls of residence, and partly through the gen-

erosity of our friends we shall be able to provide more adequately in the future for those who prefer this kind of life. But I believe that the great body of Toronto students will continue to live a more or less solitary life in rooms—along with one or only a few companions. In this university both types of student life will doubtless be found to suit the preferences and meet the requirements of various classes. One of our aims, however, must be to create as wide intercourse as possible among the students within the university. Students of retiring and studious disposition are tempted to withdraw themselves from the common life. Some few have a daily beat from their lodgings to the class-rooms and laboratories and back again, the rest of their time being filled in by study. Such men are missing a large part of a university education, forgetting that ability to live with others, capacity for friendship, knowledge of human nature, are immensely important factors of success in life. We face many of our hardest intellectual problems not in the class-room, but among our friends; they compel us to look squarely at issues which we might otherwise shirk. They also confront us with moral decisions. It is one thing to sit alone and deal theoretically with temptations; it is altogether another thing to face them as they confront us concretely, and to live among our fellows a life straight, honorable and pure, instead of merely dreaming about it in our rooms.

Unquestionably the college spirit grows more rapidly in the small college than in the large university where the life is concentrated in faculty units. I was a student in a university where there were 3,600 students, and I remember how the faculties were separated. In Arts the students were younger, but they were more varied in character, because men looking forward to almost every kind of professional activity were found together. The law student dwelt apart high and mighty. The medical man was housed in handsome buildings by himself and held little intercourse with the law man, regarding himself probably as more human if less aristocratic. In those days the engineering students were a feeble folk. But times have changed. I do not believe that this faculty spirit should be diminished; rather would I urge that each student be loyal to his faculty. This, however, is not inconsistent with the development of a larger university spirit in which each student should take pride, and which varsity colors should represent, loyalty to the faculty being completed in a larger loyalty to the university. I hope also that as time goes on some method may be devised of giving better expression to the common university spirit. If there were something like a students' parliament or representative council it would be an immense unifying power in the university, and it might remove

some of the asperities that are apt at times to occur between the different faculties.

This comradeship is also intensified through athletics, which serve to arouse the enthusiasm and satisfy the pride of a very large number of students. I know that I am touching upon a difficult subject. A large section of the community know little else with regard to the university than its record in the world of sport. But I do you the honor of believing that few among you place athletics first and the duties of the class-room second. You know that athletics should be engaged in for recreation, and that they cease to be recreation when they usurp a place as an absorbing interest. Educated men should be able to distinguish their use from their abuse. A student should engage in athletics not only for recreation, but that he may keep in such good bodily condition as will enable him to use all his powers to the best advantage.

While men broken down prematurely because of excessive bodily training are pitiful spectacles, even more so are students of high intellectual distinction who are physical wrecks, having disregarded the plain truth that if the mental strain is unrelieved the strength will be sapped and collapse follow. Athletics should not be left to the few; nor is their function served when a score or so of men do all the play and the great body of students simply stand by as interested and often excited spectators. Too few instead of too many are engaged in the athletic life of the university.

In a university the Greek conception of the athlete should prevail. At their best the Hellenes had a worthy ideal of physical training, for in spite of frequent lapses into fleshliness and occasional brutality the Greek athlete practised as one who was in training for service in the state. He was to do his share in upholding reason and beauty and truth in the conflict with barbarism, and he helped to save much for our western civilization. In Canada to-day we need the strong body and the sound mind along with moral control and buoyancy, that we too may go forth to uphold the university ideals. From the university a standard of clean sport should be shown forth; here above everywhere must be exhibited a true discernment of values; and honor be so supreme that a game won in any other way than by what is square and manly is not only no proof of worth, but is such a disgrace that we shall seek to forget that the game was ever won.

A third distinctive element in the university spirit is "Loyalty." There is indeed a fictitious loyalty which is in its last analysis a form of selfishness; but true loyalty is akin to gratitude for favors received; and assuredly the university should evoke such loyalty. You will occasionally hear a man speak indifferently of his college on the ground that his alma mater was

to him a niggardly benefactress; but as a rule such men are passing an unfavorable judgment upon themselves, for we are all to some extent debtors to our university. There most of us have formed our closest friendships. There also we met professors who revealed to us the meaning of devotion to a high intellectual ideal, men whose consuming passion it was to further their department of knowledge, and in whose presence we were constrained to be modest because they were so far beyond us. Such men are as a rule most generous of their intellectual and spiritual wealth, for knowledge, unlike gold, increases in value as it is communicated to others. The poet sings for the joy of finding harmonious utterance; the good man sacrifices himself for the joy of doing his duty; the scholar proclaims his truth for the joy of announcing his discovery and to quicken others to join with him in his search. Every true teacher knows the satisfaction of teaching. He is eager to be spent in the service of his subject, and cannot fail to render his class debtors to him.

All university men can look back to some great teachers. I remember those who gave me impetus in any course. Certain days and weeks stand out in my memory, when under the guidance of men of outstanding personality and great learning I was pioneered into new worlds. As an old college man looks back over the past and turns to his university with affectionate regard, it is not the material equipment of which he thinks; but in memory he crosses the grounds, enters the college gateway and passes along the cloister to some class-room, where he sees before him in dim outline, which, however, the years will never entirely efface, the features of the greatest teacher he has ever known. Others more famous he may have since met, men it may be of equal or even greater power but for him that silent figure remains the greatest of all his teachers. A university is great according to the number of such teachers it possesses, and it will be fruitful in loyal students and alumni, as it has enabled them to come within the range of such rich personalities.

During the summer tourists drive round these grounds in multitudes, and their guides proclaim in loud tones as they point to the buildings that this is the University of Toronto. Doubtless the tourists are moved to admiration by the beauty of the buildings and the grounds. But these tourists have not seen the university. A ship tied to the wharf, empty, sailless, and without a crew, arouses little of the admiration that is occasioned by the sight of the vessel in mid-ocean, speeding over the waves with every sail set to the breeze, with rich cargo and a full complement of men. It is the professors and students who really constitute the University of Toronto. Every student should regard himself as an integral part of this University, and remember that he

shares in making or marring its reputation. Among students a careless individualism is often exhibited in forgetfulness of the fact that every deed which passes beyond the boundaries of fun into folly is damaging not only to the man but to the university. Are you industrious? Then the university is productive. Are you honorable? Then the university has a high standard. Are you gentlemen? Then the university becomes a home of true culture. Descent from a noble family is a powerful restraint on the recklessness of an individual member of the house. A worthy past is a partial guarantee of a worthy future. In a university, also, an honorable spirit is transmitted from year to year so that it becomes an atmosphere in which the life that comes to it anew with each session is tempered and fostered by its worthy ideals. If the university, like a larger subliminal self, constantly surrounds you, it will so restrain you that while being true to yourself you will be loyal to your alma mater.

What is the prevailing tone of 'Varsity? Surely honor in all things and the gentlemanly instinct that is the surest remedy against cowardice, brutality or unfair treatment. Be certain of this, that the average man will carry into his profession the standards which he formed for himself in college. I can conceive of no higher function of the university than the production of such a spirit that our graduates in medicine will have a high code of honor; in engineering will be thoroughly trustworthy; in law and politics unselfish and patriotic; in teaching kindly and cultured; in the church true and courageous. In the hands of such men scholarship and research will be safe.

Further, let me remind you that if this academic spirit is to be maintained the finer side of your manhood must assert itself. Should the standard of conduct be low it will not be due to lack of gentlemen in the university to give it the right tone, but it will be because they have allowed things to go by default. And this is a serious factor in our present-day conditions. In the state, in municipal affairs, in co-operative schemes of business, in labor combinations, the better element has too often been unwilling to do its duty and has capitulated to evil doers. The students have a duty to the university. You may make its good name or allow it to be marred. Begin to do your duty here and you will find your duties as citizens in the future all the easier.

Of the three thousand or more students of this university it will be impossible for me to know more than a comparatively small number. This I regret, because in the past my students have been among my teachers. However, I wish you to believe that if at any time you think that I am in a position to be of any special help to you, it will give me pleasure to meet you and to do all that my other duties and my judgment will permit.

THE INTERNATIONAL CONGRESS OF SCHOOL HYGIENE.

BY HELEN MacMURCHY, M.D., TORONTO.

It is a difficult, if not an impossible, task to convey in words any adequate idea of the importance, the magnitude of the success of this interesting gathering—a success that was the fruit of three years' self-denying labor on the part of the greatly-esteemed and beloved President, Sir Lauder Brunton, and his assistants. This band of workers gave not only labor, but brains, enthusiasm and personal devotion to the Congress, and everybody was willing to do anything. Thus the Rt.-Hon. the Earl of Crewe, Lord Resident of the Council, who opened the Congress as His Majesty's representative, also acted as President of Section IX., and Lady Ramsay and her assistants not only presided over the most cordial and graceful hospitality, but sat in the Ladies' Reception Room from morning to night every day of the week, answering inumerable questions, removing insurmountable difficulties, conversing at any moment in another new language, placing themselves absolutely at the service of the delegates. The Official Programme, a book of 50 pages, contained the names of almost all the chief authorities of School Hygiene, and covered a wonderfully wide range of subjects.

The eleven sections, which met daily in the University of London, the Imperial Institute and other buildings, accomplished a vast amount of hard, practical thinking. The visits, arranged in the afternoons to places of educational, historical, literary and general interest, were a great attraction. The special entertainments given by the Marchioness of Londonderry, the Mayor of Westminster, and others, were delightful, and it is but right to mention especially the entertainment of the Ladies' Committee in the Royal Botanic Gardens, where Lady Ramsay, Lady Shirley-Murphy, and Miss Brunton received in the Palm House, and the guests passed from there into a Fairyland—a never-to-be-forgotten dream of beauty. August though it was, and everybody out of town, the officers and others with great hospitality welcomed many of the delegates to the own homes.

The seven books prepared for the delegates were in themselves of great use and value, and in many cases the countries represented went to great expense to present volumes, in English, such as that on schools and school hygiene in Finland—over 100 pages—beautifully executed and illustrated. The weight of opinion, experience and thought, represented by the hundreds of papers presented, is impressive enough, but to those two or three thousand who were privileged to be present there was one thing more impressive, and that was the character of the men and women gathered to hear and discuss these papers. Not only did

Swedes and Swiss, Turks and Russians, Greeks and Portuguese, Spaniards, Italians, French, Germans, Australians, Danes, Egyptians, Persians, Hindus, Mahomedans, Norwegians, Finlanders, Dutch, Bohemians, Bulgarians, Hungarians, Japanese, Americans, Australians, New Zealanders, Afrikanders, Canadians sit and work side by side, but one recognized here an Earl and there a small tradesman, here an archdeacon and there a guardian, or a county councillor, or a J. P., or an education authority, lawyers, physicians, nurses, teachers, government officials, university professors, ambassadors, soldiers, members of parliament, society ladies, authors, English squires, and last but by no means least, the British matron. The serious, dignified, business-like aspect of the gathering was remarkable. A few quite young, a few quite old, but the most of them in the prime of life. The distances these people had come, the duties they must have left, the ideas they took away, are sufficient evidence of the working of the health conscience of the world, and the conviction that in the school must begin the working out of the problems of national health.

Among the definite results of the Congress may be mentioned the Resolutions, one moved by Sir Victor Horsley, That the principles and practice of hygiene should form part of the education of every citizen, and the other, moved by Mrs. Watt Smith, That practical and other ethical instruction in personal and school hygiene should form part of the curriculum of all Teachers' Training Colleges. These were unanimous findings of the Congress.

The deliberations of the Congress and the announcements of the British Government and other Governments have made clear that a change has taken place in the official relations of the medical profession, and preventive medicine is coming to its own. We are now recognized, or about to be recognized, as an integral part of the national educational system. The teacher in future will have a right to the assistance of the school physician, and the educational authorities, both local and central, from the Minister of Education to the rural trustee, will have expert advisers from our profession. This is our right and their right, our responsibility and our opportunity.

In addition, a small permanent council has been named to act for the Congress and manage its affairs. The organization of this great Congress was noteworthy—nothing seemed to have been forgotten, and the comfort which the delegates enjoyed could only have been secured by much hard work on the part of all the officers and their assistants, especially the secretaries. It seemed that one had only to wear the beautiful bronze badge, specially designed for the Congress by Mr. T. W. Cutler, in order to find all doors opening and all difficulties banishing.

Laryngology, Rhinology and Otology

IN CHARGE OF
PERRY G. GOLDSMITH, M.D.
TORONTO.

MISTAKEN OVER-ZEAL.

SEVERAL years ago Sir Felix Semon delivered two lectures at the Medical Graduates' College and Polyclinic entitled, "Some Thoughts on the Principles of Local Treatment in Diseases of the Upper Air Passages." These lectures should be read and re-read by every one who does nose and throat work. In all special departments there are those who carry their ideas to extreme ends, and this is found no less in the throat department than in others. The *furore* for operations seems in recent years to have gone a great pace, and the following, taken from Semon's lecture, is strongly to the point: "But whilst thus warmly pleading the cause of local treatment in diseases of the upper air passages, where it is really needed, I have no word of defence for the notion which, I am afraid, is very prevalent nowadays, that the discovery, often enough accidental, of the slightest deviation from the normal—or what the observer may consider as a deviation from the normal—should be immediately pounced upon as a signal for local interference, and should be visited by some operation or other. Not every crest or spur on the septum requires the saw, the chisel, or the trephine, not every little puffiness of the mucous membrane over the turbinated bones the galvano-cautery, or the snare. No immediate radical operation is necessarily indicated when a drop of pus is seen in the middle meatus of the nose, nor has the turbinotome to come into play each time the posterior ends of the lower turbinated bones appear a little fuller or more rounded than they usually are. Not every little bunch of adenoid tissue, by chance discovered in the vault of the pharynx, needs be removed, nor ought every tonsil to be cut which slightly projects beyond the palatal arches. Not every granulation or every visible vein on the posterior wall of the pharynx demand the application of the galvano-cautery, nor must the uvula inevitably be clipped because to the man who considers it his duty to 'do something' it appears to be a little longer than he would like to see it. No long course of astringent applications is peremptorily indicated when the vocal

cords appear slightly pinkish in the case of a professional voice user, and not every singer's nodule demands operative treatment.

"I know well enough that such views are diametrically opposed to that teaching according to which every abnormality should be set right, lest it should ultimately cause mischief of some kind. But whilst fully admitting that prevention is better than cure, I do not hesitate to say that one may go too far, even in the laudable intention to prevent mischief; that life is quite endurable, nay, even enjoyable, though one should be the possessor of a small spur in the nose, or of some granulations in the throat, and that I honestly believe that local tinkering of the kind just described is equally little in the interest of the patient and in the interest of the good name of the profession. Yet this is what I am afraid is going on at present on a large scale, and of which one not only hears on all sides, but actually sees too many examples."

TREATMENT OF CATARRHAL PHARYNGITIS.

THE *Revue internationale de médicine et de chirurgie* points out that the following prescriptions are of use in acute attacks of pharyngitis. The patient must gargle gently, slowly and for some time, either with barley water, marshmallow decoction sweetened with honey, or with a salicylic solution:

℞ Sod. Salicyl..... ℥i
Syr. Rhorados..... ℥i
Decoct. Althaeae ..... ad ℥viii

As soon as the inflammation has subsided a little, slightly astringent preparatons, such as the following, may be used:

℞ Sodii Biborat ..... gr. xlv
Tinct. Benzoin..... ℥iii
Syr. Mori..... ℥iss
Aq..... ad ℥viii

After all inflammation has gone the patient will obtain much benefit and relief from the application of

℞ Sodii Biborat ..... gr. xlv
Glycerini..... ℥i ℿ

Acute attacks, however, are, as a rule, incidental to a chronic affection, and this must be taken in hand when the acute affection has passed off. Topical applications of a more energetic nature are required, the most efficient being resorcine, iodine and chloride of zinc.

℞ Sodii Biborat ..... gr. xlv
Resorcine ..... gr. xxx
Glycerini ..... ʒgr.
Aq. Menth. Pip. ..... ad ʒvj

Or

℞ Pot. Iodidi ..... gr. xxx
Iodi ..... gr. v
Menthol ..... gr. iiss
Glycerini ..... ʒi ℥

The effect of these applications can be increased by using gargles.

℞ Acid Carbolici ..... ʒiii
Resorcine ..... gr. xv
Glycerini ..... ʒi
Aq. Menth. Pip ..... ʒiss
Aq ..... ad. ʒviii ℥

Chloride of zinc is most useful in the chronic variety (granular sore throat, chronic pharyngeal tonsillitis). The application must be made by a medical man, with a light touch, and only at intervals.

℞ Cocain Hydrochlor ..... gr. iv
Zinci Chloridi ..... gr. xv
Glycerini ..... ʒiss
Aq. Dist. ..... ad. ʒi ℥

While these applications are all of service so far as local treatment is concerned, there are many cases in which further measures are indicated. Young, anemic girls not infrequently have a granular throat, which rapidly recovers under a course of Blaud's pills. Those who dine, wine and smoke too much are more benefited by correcting these points, and ordering a liver stimulant and a course at golf. The gouty and rheumatic should take colchicin intestinal disinfectants, salicylates and guaiacin. Then again the pharyngitis due to chronic lacunar tonsillitis can only be cured by complete removal of the offending gland. Congestive catarrh, involving the entire mucous membrane of the upper air passages and presenting the clinical appearances seen in chronic rhinitis, pharyngitis and laryngitis, is not infrequently seen in heart disease even before failure of compensation has occurred. Asthmatic and emphysematous patients, whose bronchi are filled with tenaceous secretion which requires severe efforts to remove, suffer from catarrh of the pharynx and larynx. Mouth breathers suffer from a chronic pharyngitis which disappears on removal of the cause. Chronic nasal suppuration, syphilis, infectious diseases, gastric fermentation, bad teeth, alcohol (spirit drinkers), hawkers, etc., are also points to consider in dealing with acute or chronic pharyngitis.

P. G. S.

ABSTRACTS.

Eye Injury from Fire-Cracker—Treatment.—Geo. W. Gracy, of Uhrichsville, Ohio, reports the following case of eye injury from a fire-cracker, with the successful treatment employed: W. G., aged nineteen; occupation, clerk; right eye injured by a cannon fire-cracker; iris torn from its mooring, about one-quarter of its attachment; arterial chamber filled with blood, choroid injured, lids bruised, vision reduced to light perception. Treatment, dionin and bandage. On July 5 anterior chamber was almost clear, conjunctiva still very much swollen, vision slightly improved. On July 6, conjunctiva still swollen, vision, 1-200; July 7, vision, 5-200; July 10, vision, 10-80; July 13, vision, 10 20; media clear, and no detachment. Prior to July 13, it was not possible to get a good view of the fundus. Dionin was used but once in this case; subsequent treatment, atropine and rest, with alteratives internally.—*Correspondence.*

Treatment of Scarlet Fever.—A number of applications have been employed in this disease with variable success. Ichthyol locally has given W. T. Marrs, of Peoria Heights, Ill., gratifying results of late, and henceforth he will depend upon it. He uses a mixture of ichthyol made up with glycerin and water, and applies it to the entire body. No substitute or "just as good" preparation should take the place of ichthyol when we would be sure of results, the writer insists. In this disease every gland and emunctory should be made active. Colomel and salines in appropriate doses are valuable remedies. Potassium citrate is a cooling diuretic. Acidulated drinks are desirable. During the stage when there is the greatest hyperemic condition of the kidneys the child should subsist mainly upon milk, preferably buttermilk. Ventilation should be so arranged as to prevent chilling the patient, and the danger of nephritic trouble is thereby lessened. —*Correspondence.*

Treatment of Morphine Habit with Dionin.—For the cure of the morphine habit, James P. Haines, of Beloit, N.Y., uses dionin, as follows: If the patient uses 3 grn. of morphine per day, substitute for it 1½ grn. morphine with 1½ grn. of dionin, gradually reducing the morphine daily by 1-6 grn., for ten days, and correspondingly increasing the dionin, so that at the end of the period dionin only is being given, 3 grn. continued for three days. The dionin is then reduced, 1-6 grn. less per day, until nothing but water is being given. The writer thinks it just as well to continue treatment for about three months, giving as a tonic 1 grn. of quinine per day, and either veronal or somnos for insomnia. In using dionin and morphine together, the writer states, the effect of the dionin is observed much sooner, but it never increases the effect of the morphine. Another point he makes in favor of dionin is that it does not make the mouth sore, as he has observed codeine and atropine to do.—*Correspondence.*

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Doctors will confer a favor by sending news, reports and papers of interest from any section of the country. Individual experience and theories are also solicited. Contributors must kindly remember that all papers, reports, correspondence, etc., *must be* in our hands by the first of the month previous to publication.

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Editorials.

PASTEURIZED MILK FOR HAND-RAISED INFANTS.

In many cities, at home and abroad, close attention is paid to the production and care of dairy milk. It is indisputable that sound, well-fed, well-groomed cattle, clean premises, and cleanly methods of dairying, should be obligatory. A milk may, however, be shipped from a dairy in good condition and yet, through exposure to infected air or house flies in the home, may prove a

source of disease to hand-fed infants. In a paper read at the Exeter meeting of the British Medical Association (Section of State Medicine), Dr. Routley, M.H.O., Aldershot, proved this proposition. He showed that the urban district of Aldershot is divided into two parts, military and civil, separated from each other by a well-defined line of demarcation. The population is roughly 15,000 and 19,000, respectively, but, owing to there being a greater number of young married persons in the camp population as compared with that of the town, the number of births in the camp is nearly equal to that of the town. The actual class of population is similar in both cases, the inhabitants of the town belonging mainly the working classes, from which the great part of the army strength is drawn. The following table shows the infantile deaths from diarrheal diseases for each district and year from 1902 to 1906:

Year	Town	Camp
1902	4	1
1903	7	2
1904	11	0
1905	10	1
1906	30	13
	62	17

Another table shows the whole of the deaths from the same diseases, occurring in children under the age of 5 years, for the same period:

Year	Town	Camp
1902	5	1
1903	8	4
1904	19	2
1905	11	2
1906	33	14
	76	23

The births in the two districts for the five years were in the proportion of four to three, namely, 2,800 in the town and 2,090 in the camp. The original source of the milk supply is common to both districts, that is to say, from neighboring farms. One would not unnaturally expect that the infantile mortality in the two contiguous districts, composed of a population equally careless and equally ignorant of hygiene, would present a close similarity. On the contrary, the infantile mortality from diarrheal diseases shows a marked contrast. With almost the same number

of births, with a history of artificial feeding in the same proportion (namely 85 per cent.) of fatal cases, with the same class of population, the number of infant deaths from diarrheal diseases in 1906 was more than twice as great in the civil as in the military population. Dr. Routley asks in what lies the distinction between the two classes of the popualtion of Aldershot, and how does one account for the difference in the incidence and fatality of epidemic diarrhea. As far as regards the source of the milk, and the intervening period between the time of milking and delivery to the customer, the bad effects of either or both must bear equally on both districts. The distinction must, therefore, be sought in the households, and it unquestionably can be found there. In the military camp cleanliness is compulsory and is generally conspicuous in the rooms of the married quarters. The apartments are comfortable and periodically cleansed; overcrowding is absent; army sanitation is ideal.

On the other hand, the soldier who is married "off" the strength has to support his family on a very small allowance in town, and frequently inhabits a single room, or at most two rooms. Inquiries into the fatal cases which occurred in the town showed, in a very large number of instances, the presence of *marked poverty,* accompanied with *insanitary household conditions.* Uncleanliness and the deliberate dislike of open windows favor the presence of the common house fly in swarms, and point out an easy source of infection of milk. This article of food is commonly fetched in dirty vessels, allowed to stand without cover the whole day in close and dirty rooms, the air and dust of which must be reeking with micro-organisms. The process of milk poisoning is thus self-evident. Dr. Routley thought that the evils of the farm-yard had been exaggerated, and that the real requisite in dairies was more attention to the health of the cattle (tuberculin test, feeding, grooming, stabling, etc.). He thought that farm contamination of milk had little to do with the diarrhea of infants and young children, and that it was in the home that milk is infected with disease-producing organisms. He contended that the comparisons made between the two sections of the population of Aldershot, which were similar in all particulars except in the important point of home hygiene, seemed to show that cleanliness of the home is the most important factor in the health of young children.

Dr. Starkey, Professor of Hygiene, McGill University, Montreal, who discussed Dr. Routley's paper, evidently favored the view that milk is contaminated by micro-organisms about the home. He gave an instance, showing that an insanitary condition of the ground surrounding houses in a certain area of Montreal had been accompanied with epidemic infant diarrhea in hot weather. After the area of polluted soil about these houses had been removed, an immediate drop in the return of cases of diarrhea was noted. The houses and their inmates remained much the same as before, and the milk supply remained of a fairly level character. This evidence goes to prove that contamination of milk in or about the home causes diarrhea in children, particularly during hot weather. The average dairy farmer declines to believe in milk-borne diarrhea, and probably thinks that more infants die of want of milk than of diseases contracted from milk. All the same, urban districts should see to it that the milk supply is pure *when it leaves the farm.* This would call for, among other things, quarterly inspection of dairies by a veterinarian, monthly inspection of dairies as to water supply, feeding, stabling, grooming of cattle, dairying methods, etc.—a costly process. In summer, however, the use of raw milk by hand-fed infants is risky, even if the supply is clean when it leaves the farm. Hence the common resort to the pasteurization and boiling of milk intended for the use of such infants. Neither Dr. Routley nor Dr. Starkey gave any information on that point.

Professor Kenwood, who read a paper on infant mortality and the milk supply in the same section of the British Medical Association, contended, *inter alia,* that the testimony to the evil effects of pasteurized and sterilized milk was trifling. He showed that only ten deaths occurred in London, England, from scurvy among infants under one year of age during the three years, 1903, 1904, 1905; whereas, for every such death, about eight hundred deaths were certified from diarrhea (stated to be due to food), epidemic diarrhea, infantile enteritis and diarrhea not otherwise defined.

Dr. Variot, at the "Goutte de lait," Belleville, France, who has observed 3,000 healthy as well as unhealthy children during many months, has failed to observe infantile scurvy resulting from the use of sterilized milk.

The late Professor Budin, at his "Consultations," established all over France in order to help French mothers in the raising of healthy children, declared that he had not seen a case of infantile scurvy resulting from the use of sterilized milk.

A few facts stand out prominently in respect to a milk supply for hand-raised infants: The difficulty of enforcing common cleanliness in or about the homes of civilians and the spoiling of milk by foul air or house flies in homes, even though the milk may have been clean when delivered to the customer. In view of these facts and the large mortality arising from diarrheal diseases among hand-fed nurslings, particularly in hot weather, together with the London statistics showing that practically there is no evidence that pasteurized milk has caused deaths from infantile scurvy, the feeding of hand-raised infants with pasteurized milk should be recommended in a great many instances, particularly during hot weather. J. J. C.

THE OPENING MEETING OF THE ACADEMY OF MEDICINE, TORONTO.

The opening meeting of the Academy of Medicine, Toronto, (Medical Section) took place in Queen's Park on Tuesday evening, October 8th, when the President, Dr. W. J. Wilson, took the chair at 8.30. The meeting was well attended, those present numbering nearly fifty. The Academy has been recently thoroughly renovated and makes a most cheerful and attractive meeting place for its members.

The programme consisted of a very interesting paper by Dr. J. T. Fotheringham entitled, "When and How to Resume Normal Feeding in Typhoid Convalescence." This paper and discussion we hope to give our readers in our next issue.

Dr. J. S. Hart exhibited two patients to illustrate a paper in which he reported three cases of acute anterior poliomyelitis. They came under Dr. Hart's professional care on three consecutive days, August 18th, 19th and 20th, 1906. The first was very rapid in its progress and the respiratory centres were early affected, the child dying three days after the onset of fever and one day after the first recognized signs of paralysis. Accumula-

tion of mucus in the pharynx with cervical rigidity and retraction of head were the first evidences that the fever was the precursor of an infantile paralysis.

The second and third cases, though seen first on the 19th and 20th, both became ill on the same day. In these cases a marked retention of urine was the first sign of want of muscular tone. There was constipation also. By the third day there was complete paraplegia in one case extending, as nearly as could be determined, to the waist, in the other involving the lower limbs. In both there was definite loss of power in the upper extremities, which was restored by the end of the second week. The worst case—the one with the more extensive involvement—suffered from marked opisthotonos and with dysesthesia, though both complained when touched or moved. At first the paralyzed parts were rather dark in color, early became cold to the touch and atrophied. The reflexes were absent, and when faradism was tried in about two weeks the most severe case showed no response over the affected part, and but slight reaction was found in the other. In none of the cases was there any mental aberration.

The cases were presented and manifested little deformity, the one showing in the left foot slight talipes equinus and the other patient a degree of valgus more marked in one foot than the other. This patient walks awkwardly without aid, the limbs being everted from action of the unbalanced adductors of the thigh, the quadriceps extensor being incapacitated. The other does not show much eversion, from the adductors being involved with the extensors. The result is that he cannot walk, but bears his weight and walks feebly with help. Each has some lordosis, and in one the ligaments of the knee are relaxed.

A fact to be noted is that of the four more or less paralyzed legs, three show no response on percussion of the patellar tendon, while in the other the reflex is exaggerated. The question was raised as to the infection in this disease, and, pseudotyphoid being prevalent at this time, whether there was any causative relation.

The discussions that took place were lively and most instructive, and Dr. Wilson as chairman and Dr. Harley Smith as secretary are to be congratulated upon the business-like manner in which they officiated. We trust, however, that arrangements will be made after this that the meeting will start not later than eight o'clock.

A suggestion was made by Dr. Alex. McPhedran that in arranging the programme for the winter meetings the different evenings be allotted to symposiums on different subjects in medicine. He suggested, and wisely so, that three or four members of the Academy present papers upon a certain subject, one discussing the Causation, another the Symptomatology, and a third the Treatment. By this means a most instructive evening could be spent, so that every one present could feel that by spending an evening at the Academy they would come away after having studied the particular subject thoroughly. We trust that the President will arrange this. Another suggestion was made that a full detailed programme should be mailed to each member at least one week before the meeting opens, so that every one intending to be present might take the opportunity of reading up the subject and thereby be enabled to take part in the discussions and add interest to the meeting. The formation of the Academy of Medicine is a distinct step in advance and its privileges should be taken advantage of by every member of the city profession, so that by regular attendance, as well as by prompt payment of fees, the Executive would receive every possible encouragement.

W. A. Y.

THE LARYNGEAL MIRROR AND THE X-RAY PICTURE AS AIDS IN THE DIAGNOSIS OF ANEURYSM OF THE AORTA.

The diagnosis of aneurysm of the aorta by ordinary clinical methods is beset with difficulty during the patient's lifetime. Oftentimes the existence of this lesion is unsuspected, and may not be discovered at all, unless an autopsy is made. Recently, July 1st, 1907, Dr. Westenhöffer, at a meeting of the Society of Internal Medicine, Berlin, Germany, exhibited an aneurysm of the aorta, which had been discovered at the autopsy of a man whose death had resulted from stenosis of the trachea. The autopsy revealed an aneurysm of the aorta compressing the trachea just above its bifurcation. The aneurysm had burst into the right bronchus; fresh blood filled this bronchus and its ramifications. The bursting of the aneurysm had occurred during the last moments of the deceased, and hemoptysis had not been observed. Examination of the specimen revealed signs of syphilitic aortitis,

and there was also a general hardening of the lymphatic glands of the body. Strange to relate the deceased had been the father of twelve children, all of whom are in the enjoyment of good health.

Laryngologists have better opportunities than general practitioners for making an early diagnosis of aneurysm of the aorta. Thus the discovery of a paralysis of one of the vocal cords puts a laryngologist on the track of a causative aneurysmal lesion. Radioscopy clears up the suspicion, and hypothesis becomes changed into certainty.

A good article on the diagnosis of aneurysm of the aorta, written by Dr. Garel, Lyons, France, appeared, February, 1907, in *Annales des maladies de l'oreille, du larynx, du nez et du pharynx* (t. xxxiii., pp. 97-107). Having made a great number of X-ray pictures of patients, he thinks that aneurysm of the aorta is commoner than it is generally supposed to be. As is well known, the existence of certain special symptoms in a patient induces the attendant to have an X-ray picture of the patient's heart taken, and Dr. Garel gives a comprehensive analysis of the suspicious symptoms, which point to the existence of aneurysm of the aorta. An aneurysm may be traced from a laryngoplegia, a paralysis of one or more muscles of the larynx. There are different forms of paralysis of the larynx. Thus Savill says, in "A System of Clinical Medicine," Vol I., p. 247: "They may arise from organic or functional conditions, but each is so characteristic that it can be readily identified. Thus hysterical paralysis is always double and very nearly always due to adductor paralysis. Abductor paralysis is generally—and if unilateral, always—organic in origin. If the left vocal cord cannot be abducted, it is almost certainly due to pressure on the left recurrent laryngeal nerve, and this, in nine cases out of ten, is due to aneurysm of the aorta." The patient consults because his voice has become low-pitched and hoarse, and the condition has come on suddenly. According to Dr. Garel there is a sort of apoplexy of a vocal cord. Having recognized a laryngoplegia, the laryngologist seeks for its cause in some intra-thoracic or extra-thoracic lesion. If caused by an aneurysm of the aorta the laryngologist observes in the larynx tremulous movements, which are synchronous with the heart beats, appreciable in the larynx at rest in the inspiratory

position, and particularly at the edge of the epiglottis. When examined in Kilian's position the trachea may be observed to beat throughout its entire length. An X-ray examination of the aorta confirms the diagnosis. Another variety of aneurysm of the aorta is revealed by a cough, which is due to compression. The cough —hoarse, brassy, deep and sonorous—is often the first diagnostic sign of aortic ectasia. One advantage in connection with this symptom is that the clinician's attention is not withdrawn from the mediastinum or the lower part of the patient's neck. If this symptom coincides with a laryngoplegia it shows that the latter condition depends on an intra-thoracic cause. The cough results from a narrowing of some portion of the trachea or one of the bronchial tubes. If the patient be a child, tracheo-bronchial adenopathy might be the etiological factor; but if such a cough should supervene, for the first time, in an adult, the attendant should have his suspicions aroused as to the presence of a lesion in the mediastinum, and particularly an aneurysm of the aorta.

Aneurysm of the aorta may also be revealed by dysphagia, which depends on the fact that the tumor, instead of exerting pressure on the recurrent laryngeal nerve, or the bronchi, presses on a part of the gullet. If difficulty in swallowing be the only symptom complained of by a patient, a physician should not conclude that the dysphagia depends on an essential disease of the gullet, or a cancer of that region, and, in particular, he should be careful not to practice catheterism of the patient's esophagus, for, under the mask of dysphagia, aneurysm of the aorta may be concealed.

Another form of aneurysm of the aorta is revealed by dyspnea, respiratory croaking (stridor) and tracheal tugging. The diagnosis may, in this kind of case, waver between descending goitre, tracheal syphilis, and aneurysm of the arch of the aorta. An X-ray picture will settle the question. These symptoms reveal a rather advanced form of the disease.

Other forms of aneurysm of the arch of the aorta are: (1) The pseudo-neuralgic type, described by Huchard, with radiating pains, attacks of angina pectoris—the pains being modified by change of position; (2) the pulmonary type; (3) the gastric type, described by Destol.

In all the different forms of aneurysm of the arch of the

aorta, according to Dr. Garel, auscultation of the heart gives only complemental information, and, in some cases, none at all. In suspected cases of aneurysm, therefore, the physician who is a general practitioner should consult with the laryngologist and should likewise secure an X-ray picture of the patient's aorta.

J. J. C.

EDITORIAL NOTES

The Opinions of French Dentists on the Treatment of Pyorrhea Alveolaris Agree with an Opinion Expressed in Canada.—At the First Congress of Stomatology, held at Paris, August 1-5, pyorrhea alveolaris was discussed, among other subjects of dental interest. The general impression gathered from the opinions expressed by several speakers was that an important effort had been made, and considerable progress accomplished, in the treatment of this disease. Although an absolute cure, a *restitutio ad integrum,* still remains an unrealized ideal, in many cases a clinical cure, an almost entire arrest of the morbid process, has been effected. The clinical cure may be made lasting by means of a special and rigorously observed hygiene of the buccal cavity, if a timely medical treatment of the patient has modified the morbid tissues of his body (*terrain morbide*). These opinions by leading French dentists as to the curability of pyorrhea alveolaris resemble, in the main points, the conclusions expressed by Andrew J. McDonagh, D.D.S., Toronto, in a paper read at the Toronto Western Hospital Clinic (see *The Canada Lancet,* September, p. 37): "Can pyorrhea be cured, and how? If taken in time, most assuredly it can be cured; and, if the disease has progressed to any extent, local treatment, consisting of proper curettage and medication, being always careful of asepsis, is absolutely necessary. Nevertheless, in the majority of cases, as pyorrhea is so often the indication or the cause of systemic trouble, it is wise for the physician and the dental surgeon to work together for the best interests of the patient." From the French and Canadian data quoted above, one may conclude that if the constitutional vice in the patient be treated with proper medication, diet, hygiene, etc., operation on the pus cavities in the gums and subsequent attention to buccal asepsis will effect a cure. To the dental surgeon the more important part of the work

of saving the threatened teeth belongs, and to the thoroughness with which his work is done should the victory be credited. To the co-operating physician may be accorded an interest in elucidating the somewhat obscure etiology of Riggs' disease, with recommendations as to diet, personal hygiene and, in some cases, special medication.

A Solution of Tartaric Acid Destroys Typhoid Bacilli on Raw Vegetables, Oysters, Etc.—Dr. Whitman, of the laboratory of the Department of Health, Chicago, advises the following method of destroying typhoid bacilli on raw vegetables, fruits, oysters and clams. Recent experiments conducted in the laboratory have demonstrated that typhoid bacilli, which may be found on fruit or vegetables which are to be eaten raw, can be killed by immersing these articles of food in a 5 per cent. solution of tartaric acid for half an hour and then removing the acid by rinsing in clean water. Such a solution may be prepared by dissolving one tablespoonful of tartaric acid in a pint of water. It will kill all the typhoid bacilli that may be on celery, lettuce, radishes, or other vegetables and fruit, as well as on oysters or clams that are to be eaten raw.

Bulletin No. 135, Spirituous Liquors.—Bulletin No. 135, Spirituous Liquors, from the laboratory of the Internal Revenue Department, Ottawa, Canada, shows that the whiskey sold in Alberta and Saskatchewan is not adulterated. The samples which form the subject of this report were obtained at public bars, etc., and may, therefore, be taken to represent the average whiskey of the provinces in which they were sold. The chief analyst, Mr. A. McGill, says: "It is gratifying to find that no drugs nor poisonous additions of any kind have been found in these liquors. The absence of methyl alcohol has been proved in every instance." The report further says: "Canada has no generally accepted or legally established spirit strength for alcoholic liquors. The British Foods Act fixes 75 per cent. proof as the limit of reduction by water. On the basis of such a standard the whiskey samples reported may be classified as follows:

	Saskatchewan	Alberta
Samples within 2 degrees of 75 per cent. proof....	4	30
Samples below 75 per cent. proof.....	12	5
Samples above 75 per cent. proof.....	5	8
Total examined	21	43

Percentage of the number examined, which were found equal to, or above, 75 per cent. proof strength: In Saskatchewan, 43 per cent; in Alberta, 88 per cent."

The Reason of the Disappearance of Malaria from Strassburg, Germany.—Formerly in Strassburgh, Germany, and the vicinity, malarial fevers used to cause a good deal of sickness, amounting to 73 per cent. of all cases of internal disease in the period between 1825 and 1828. Since that period, from 1859 to 1862, malarial diseases fell steadily to a mean of 9 per cent.; from 1884 to 1899, to 0.24 per cent.; to-day malarial diseases are only exceptionally met with in Strassburg. The almost complete disappearance of malarial fevers from that city seems to have been brought about by numerous and extensive drainage works, by the straightening and diking of the Rhine, and by the construction of a canal between the Ill, a tributary of the Rhine, and the Rhine, which provides a sure source for the discharge of the upper waters of the affluent into the river. These different works have, in part at least, put a stop to the flooding of the land bordering on these rivers, have provided channels for stagnant water and drained the swamps which, up to quite recent times, used to be common in the neighborhood. However, these changes in the soil about Strassburg have not been accompanied by the disappearance of mosquitoes, and mosquitoes among which the anopheles variety is noted, are quite common in Strassburg. Dr. Goldschmidt, who writes a paper on this subject which appears in the *Revue d'Hygiene,* concludes that (1) malaria may disappear from a region in which it has raged for a long period, although the anopheles continue to be present; (2) in spite of the presence of the two factors recognized as suitable, if not indispensable, for the dissemination of malarial fevers, the latter may not appear; (3) by the simple drainage and sanitation of the soil, a population may be protected from malaria without making war on the mosquitoes or providing for the destruction of their larvæ. These facts, he says, do not plead in favor of the origin of malarial diseases from the anopheles, but, on the contrary, seem to show that they may arise from a cause quite different to their introduction by the anopheles. In fact, they show that malarial diseases may be transmitted in different ways, instead of in one way.

The Use of Rubber Gloves by Physicians and Surgeons.—A good many surgeons use rubber gloves when operating, especially in septic cases or when examining septic parts of the body. While protecting himself from infection, the surgeon who uses rubber gloves does not expose the patient to infection derivable from the naked hands of the operator. The reason is obvious: Rubber gloves can be sterilized by heat so great as to be inapplicable to the naked hands. Obstetricians frequently have occasion to use rubber gloves in their practice. In certain cases the use of rubber gloves is indispensable to the physician. For instance, in exploring septic parts of the body, or regions from which contagion may be contracted (digital examinations of the rectum or vagina, syphilitic or diphtheritic ulcerations, smallpox), and especially when making an autopsy, rubber gloves give the wearer the best protection against filth or inoculation with disease. Country doctors, who practice surgery, midwifery and medicine, should use rubber gloves. A country doctor may have to attend a case of labor one hour after he has opened an abscess, or he may have to make an incision for the relief of a strangulated hernia, a few minutes after having examined a woman suffering from puerperal infection.

The Opthalmic Reaction to Tuberculin.—In a paper read before the Academy of Sciences, Paris, June 17th, 1907, published in *La Presse Médicale,* July 13th, 1907, Dr. Calmette, Lille, described a method of diagnosing tuberculosis which was based on a reaction of the conjunctiva to a strong solution of tuberculin. If one drop of a solution of tuberculin, 1-100, be dropped into the eye of a tubercular person, the eye afterwards becomes red, particularly at the inner portion. The subsequent congestion of the eye, variable in extent and intensity, lasts two or three days, is not accompanied with a general reaction, and, after disappearing, leaves no trace behind. If the individual experimented on is not tubercular, no change whatever is observed in the eye. This method of diagnosis, which has been called "the ophthalmic reaction to tuberculin," has been tried by a good many clinicians in France. A good article on the subject from the pen of Dr. J. Comby, one of the physicians of the Hôpital des Enfants Malades, Paris, appears in *La Presse Médicale,* August 10, 1907, and we give herewith a few of the details of his

method. Dr. Comby has found that the solution used by Dr. Calmette produces a strong reaction in some cases, and prefers a solution of tuberculin of half that strength, viz., 1-200. He has applied the test to 132 children, and finds of that number 62 reacted and 70 did not react. Four children of the positive group died; and their autopsies confirmed the diagnosis of tuberculosis. Six children of the negative group also died, and their autopsies showed that they were quite free from tuberculosis. Dr. Comby thinks the ophthalmic reaction is a safe and trustworthy method of diagnosing tuberculosis in children. If applied in time, suitable treatment could be adopted in the case of those who are found to be affected with tuberculosis. Professor Grasset reports his results with this new method in *Prov. Med.*, 1907, No. 28, p. 357. He tried it in 31 cases, tubercular and non-tubercular; a positive reaction ensued in 17, a negative reaction in one case—a woman, who for several months had suffered from bilateral pleuro-bronchitis, Koch's bacilli not being found in the expectoration. Of 15 cases in which there were no clinical signs of tuberculosis, the ophthalmic reaction proved negative in 14, positive in 1 case—an epileptic who had seemed quite free from signs of tuberculosis. Of 8 cases in which the clinical diagnosis of tuberculosis was doubtful, the ophthalmic reaction was positive in 5 cases, negative in 3. In a subsequent number of this journal we hope to be able to give information as to the application of the ophthalmic reaction in Canada, and the results. J. J. C.

DEATH OF DR. H. E. BUCHAN, OF LONDON INSANE ASYLUM.

News was received on October 16th of the death in Owen Sound of Dr. Humphrey Buchan, assistant medical health superintendent at the London Insane Asylum. The cause of death was the result of a paralytic stroke.

Deceased, who was born in Paris, Ont., in 1841, was second son of the late David Buchan, for many years bursar of Upper Canada College. He was educated at Upper Canada College and Toronto University, taking his degree as M.D. in 1865. For several years Dr. Buchan was one of the medical officers of the Provincial Lunatic Asylum, Toronto. In January, 1893, he was removed to the Kingston Asylum, and about five years later became assistant superintendent at the London Asylum. He has left a widow, one son and several daughters, all of whom are grown-up. He was a brother of Col. Lawrence Buchan, and a brother-in-law of Chancellor Sir John Boyd.

PERSONALS.

Dr. J. D. Thorburn, of Toronto, has been stricken with typhoid fever. Fortunately the attack is a mild one.

Dr. Newbold Jones begs to announce to the profession that he has opened an office at 42 Prince Arthur Avenue, and will confine his attention to ophthalmic and aural practice.

Dr. Harry Morell has relinquished the business management of the *Western Canada Medical Journal,* which has been taken over by Mr. Reginal Phillips. The editorial department remains as before in the hands of Dr. G. O. Hughes, Winnipeg.

Dr. Charles R. Dickson, after attending the meetings of the Canadian Medical Association in Montreal, went on to Boston and took part in the meetings of the American Electro-Therapeutic Association, and was re-elected for three years a member of the Executive Council of that body. A couple of days were spent in New York and a week with a house party at "Cedar Crest," Davenport Neck, New Rochelle, N.Y., the handsome new summer residence of Dr. and Mrs. Emil Heuel, of New York, situated on the most beautiful part of Long Island Sound.

Dr. J. H. Elliott, up till recently Medical Superintendent at Gravenhurst Sanatorium, has moved to Toronto and taken up house at 611 Spadina Avenue. Dr. Elliott will devote his time largely to diseases of the chest. We are pleased to announce to the profession that Dr. Elliott has consented to identify himself with the editorial staff of THE CANADIAN JOURNAL OF MEDICINE AND SURGERY, and his name appears, commencing with this issue, under our Department of Medicine. We feel that our readers may look forward with confidence to "hearing from" Dr. Elliott from time to time, his contributions to the medical press always being worthy of study.

News of the Month.

"THE NEW HOMEWOOD," GUELPH.

NATURE has designed an ideal situation for the Homewood Sanitarium at Guelph. The lofty bank sweeps round in long, easy curves, showing the ancient course of the stream, now the quiet Speed, resting and hiding under its fringed bank in the distance. Along this steep descent the touches of the landscape gardener are so light and delicate that art blends imperceptibly with nature, and the smooth, green terraces are lost in the natural shrubbery that crowds about the ancient and gigantic pines, maples, elms and beeches. The level flat below has been transformed into a bowling green, and cricket crease, with a cornfield and vegetable garden separated by an irregular belt of natural woodland. Thus the lower plane affords scope for work and play, the two most potent regenerative influences. A grove of natural woodland, extending down the hill and across the lower level, sweeps along the bank of the river, preserving in its recesses the floral treasures of the virgin forest, and the tall trees rise with towering energy to struggle for the revivifying sunlight and air.

These stately sentinels, from sombre pine to spreading beech and maple, are survivors of those very forests which, centuries ago, sheltered the Huron Indian and the fiercer Iroquois. Here, too, are companion trees to those "Gothic aisles of overarching elm," which John Galt, the novelist, the founder of the town, described in his memoirs of sixty years ago.

Along the borders of the irregular, wooded stretches, the aster and golden rod are bearing their part in the natural decoration of the season, but in the deeper shades there are abundant proofs of the floral richness of spring. The feathery sprays of Solomon's seal bear rows of large blue berries. The mitered, but faded, leaf of the blood-root is ready to fall. The baneberry displays its rich waxen spike of coral and ivory. The twin leaves of the wind ginger are strong and vigorous, and the hepaticas are prepared to survive the coming frosts. It is easy to picture the seductive scene when the violets are in flower, and all offerings of spring hold out a restful invitation. This is truly an ideal spot for the man or woman whose nervous system has proved unequal to the exacting strains of modern life.

Philanthropic enterprise has taken full advantage of nature's design, and the three handsome buildings that surround the curving hill, modern and perfect in design and equipment, contain every possible provision for the comfort and care of sufferers from mental and nervous diseases, and all appliances for the recognized methods of medical and surgical treatment. Gymnasiums, billiard rooms, music rooms, a bowling alley, card tables and a well-selected library are among the means of indoor recreation. In the open air there is a healthful round of sports and exercises, according to the tastes and inclinations of the patients. These include walking, driving, bowling, cricket, tennis, quoits and croquet, with skating, coasting and sleighing in the winter. Some find interest in gardening and cultivation of flowers. In such surroundings, with good, wholesome food, healthy amusements, cheerful conditions, and all the privacy desired, free from any suggestion of dulness or monotony, regular habits and perfect immunity from worry or annoyance, the conditions are most favorable for restoring shattered nerves and developing health and strength of body as well as of mind.

"The Manor," the first erected of the three buildings, contains the administration department, and has two sections devoted to habit cases. Victims of alcohol, morphine, cocaine or other drugs are given the care, attention and treatment their respective cases require. There is also a home for incurable mental cases.

"The Colonial," recently built, and up-to-date in every particular, with broad, spacious verandahs, magnificent corridors, large sitting rooms, and well-ventilated bedrooms, is not surpassed on the continent for beauty of design or arrangement for the observation and care of acute mental and nervous cases.

"The Vista" is a small, modern building, well-designed and sanitary in every particular, for the care and comfort of any patient for whom temporary isolation is essential to recovery.

These buildings are of Guelph lime-stone from the adjacent quarries, are designed by experts in sanitarium architecture, and present a magnificent appearance from the wooded bank of the Speed, which borders the grounds to the south. Equipped with the best modern appliances in heating, lighting and ventilation, they show the development of an institution established in 1883, and enlarged to keep pace with the demand for its accommodation and treatment. The buildings just completed and the equipment installed have entailed an outlay of $150,000. The equipment includes, in addition to the modern surgical medical appliances, a suite of rooms containing a fully-equipped apparatus for hydrotherapy according to the Baruch method, and the latest appliances for electrical and massage treatment.

The staff consists of the Medical Superintendent, Dr. A. T.

Hobbs, who, with his seventeen years' experience in the treatment of mental cases, is well qualified to conduct the management of the institution. Besides the Superintendent, there are two resident physicians, who are always on hand to give the patients the benefit of their advice and supervision, and a corps of well-trained nurses experienced in the care and handling of mental and nervous cases. Large and modern kitchens are superintended by a matron who is a graduate of the Macdonald Institute of Guelph. The entire staff, numbering between fifty and sixty, is well organized and efficient. The names of Mr. J. W. Langmuir, the President, and Hon. Robert Jaffray, Vice-President, attest the standing of the institution and the character of its management.

Guelph, a busy and prosperous city, in a splendid agricultural district, is well chosen for such an institution. On the main line of the Grand Trunk Railway, forty miles from Toronto, sixty from Niagara Falls, eighty from Buffalo, one hundred and fifty from Detroit, and only ten hours from Montreal, it is readily accessible by those who suffer through the strenuous life of the modern city. It is in a community of well-to-do people, with an atmosphere of thrift and contentment. Aside from the sanitarium feature of "Homewood," the place itself, just beyond the noise of the busy city, is an ideal spot for resting one's tired nerves back to health and strength.

VARSITY'S NEW SCIENCE HOME.

THE splendid new physics building which has been built on the university grounds, under the new regime was on Sept. 27th formally declared opened by the Lieutenant-Governor, Sir Wm. Mortimer Clark, in Convocation Hall, before a large and representative assemblage of Toronto's professional and social classes. Dr. Falconer presided, and amongst those seated on the platform were: Premier Whitney, Hon. Dr. Pyne, Hon. Col. Matheson, Sir Wm. R. Meredith, Chief Justice Moss, Dr. Pritchett, and G. R. R. Cockburn. Lady Clark and Miss Clark were present.

Dr. Falconer introduced Dr. Loudon, the ex-president of the University, who prefaced his detailed sketch of the steps which had been taken and of the difficulties which had been overcome in founding the department of physics in the University and of bringing it to its present pitch of prosperity by publicly offering to his successor, Dr. Falconer, his hearty congratulations upon his appointment. He had been the day previous, he continued, highly gratified in hearing Dr. Falconer's conception of the place and function of the university in the state, and also by the

unanimity with which Dr. Falconer's appointment had been approved by the other universities represented, by the faculties, by the alumni, and by the friends of the institution.

He explained that the establishment of the physical laboratory had been the outcome of long and acrimonious discussion, and from its modest beginnings in 1858 down to its present magnificent proportions, they had been compelled to surmount many obstacles. About 1870 the claims of technical education were brought before the legislature and steps were then taken to establish an agricultural as well as a technical college. Strong representations were, however, made against either institution having any connection with the University, and at that time and for years afterwards their students of science did not enjoy the privileges and advantages of practical instruction in the laboratory. The first equipment for the physical laboratory was provided in 1878. And the disastrous fire of 1890 had in many ways proved to be a blessing in disguise, as it led to expansion.

In the early days the volume of work in the laboratory was very small, compared with what it had since become, and in 1878 the strength of the staff consisted of one-half of a professor. (Laughter.) This strength had now been increased about tenfold. In recent years the rooms had become so congested and so supersaturated that it was decided to inaugurate a public movement in order to secure a new laboratory. Their appeal to the government of the day for this improvement fell on deaf ears, and in these circumstances they turned to the Alumni Association. This appeal was not made in vain, and a new laboratory was provided. It was fitting in this connection to acknowledge the royal support and valuable services rendered the University by the Alumni Association, as well as by the authorities of Victoria and Trinity Colleges, and by the Royal College of Dental Surgeons.

But eventually and now happier days had dawned, and most important changes had been made in the equipment of this department, improvements which had only been rendered possible through the recent improvement in the finances of the University.

Her ship had at last come home, and her golden age was just begun. The phrase, scientific equipment, now possessed a new and extended meaning, and many labor-saving devices now practically abolished former difficulties connected with experimental work. It was at the present time only necessary to touch a button and the thing was done.

He repeated for their comfort and consolation in the future what had been said to him in their early days, so full of difficulty. Asked by an eminent scientific man abroad how the new laboratory was progressing he had told this gentleman that their efforts

in respect to it had brought nothing but ill-will. "Then," replied this gentleman, "you are getting on." (Applause.)

In regard to the department of physics under its new head he expressed the hope that after a long and fitful fever it had entered upon a period of well-earned repose, during which it would devote itself in peace to its great work. That the students, learning to use their hands as well as their heads, would imbibe the true scientific spirit. That this department would be the home of research, and that its staff would unite with the other departments in an organized band, in order that the country might realize, as it had not yet done, that the true object of the university was to add to the sum of human knowledge, whether in the domain of arts and letters, or in the world of science. (Applause.)

Prof. McLennan warmly commended the rapidity shown in the erection of the new building, which enabled them to begin their professional work in it next week, and expressed his hearty acknowledgments to those who had forwarded the work. The building was graceful and well-balanced in design, and a fitting complement to convocation hall. Its foundation was laid in concrete, and the first story was built of sandstone, while the remainder was constructed of brick with Roman stone facings and finishings. The floors were laid with concrete and covered with tile. They possessed practically a fire-proof building, or, perhaps, it would be better described as a slow-burning building. A fire must pass through at least nine inches of brick, and then through ten inches of solid wood before it could reach the next room. Hence it was virtually a fireproof building. Their lecture-rooms would be quite distinct from those devoted to laboratory instruction. The lecture-rooms were situated in the front of the building, the laboratories in the rear. At this stage, the plans of the building, showing its different floors, were exhibited upon a screen.

The professor explained that the large amphitheatre on the ground floor would accommodate 550 persons, although their student requirements did not exceed 250.

This had been provided in order that it might serve as a general university-room, as well as a laboratory. The building was furnished throughout with the most modern appliances, with which the most delicate experiments could be made. On the first floor the library was placed, and every room on the second floor was supplied with electricity at 110 volts.

The keynote of the entire laboratory was labor-saving devices, which were to be found everywhere and at all points throughout the building.

All the physical energy was located in the power-house, outside of the physical laboratory, and the building would be heated

by exhaust steam. It was, indeed, a magnificent building in all its appointments, and he earnestly hoped that advantage would be taken of it to the full. He also desired that these splendid facilities for the advancement of knowledge would be freely thrown open to all; that the building would be used in the evenings as well as in the day-time, in the summer as well as in the winter months. (Applause.) And he would be very glad to throw open its doors to anyone, no matter whence he or she came, who wished to carry out or to make any scientific experiments. (Applause.) Owing to the liberality of W. T. White, who had always assisted him in every possible way, the portraits of distinguished physicists would adorn the walls, and a few of these portraits were already in place. (Applause.)

Dr. Falconer observed that the University now possessed one of the finest physics buildings to be found upon this or upon any other continent, and warmly congratulated Dr. Loudon and Dr. McLennan upon the results of their labors and upon the work which they had accomplished.

Dr. Pritchett, of New York, declared that this was one of the great universities of the world, while it possessed one of the great laboratories of the world. And there, no doubt, existed in it a spirit of truth and of hearty, determined work, which would render these walls full of life. He sincerely congratulated the president upon such a position, and particulary upon the addition of this great laboratory to their teaching resources, a striking contrast, indeed, with the state of things a generation ago, when neither a laboratory of physics nor the teaching of applied science existed in this university.

In one man's life they had progressed so far that this age had come to be called distinctly the scientific age, which was a matter of tremendous importance. What did this great change mean? And what were the results of half a century of scientific progress and of scientific evolution?

The true mission of the university was not to increase wealth and utilitarian ends. It should be the centre of spiritual and of intellectual power, and it would thus serve most directly those material ends which eventually would most assuredly be benefited. (Applause.)

He then proceeded to discuss the results of this half a century of scientific work, in which field the Englishman, Charles Darwin, and the Frenchman, Louis Pasteur, had been pre-eminent, and declared that men had applied the knowledge thus obtained to the solution of the practical problems of life. Indeed, the great feature of science in this last half-century had lain in the enormous number of the practical applications of science, and all the possible combinations of the elements had at last come within the

power of the chemist. In point of fact, in fifty years the progress of science had profoundly affected the philosophy of life, as well as the religious faith of civilized man.

No man could stand in intimate relation to these things with which the chemist and the physicist dealt and treat the great problems which they must consider without at the same time having his mind drawn to those great truths with which our race had wrought from the beginning of history to this day. In all this course of scientific evolution and progress, it was natural and inevitable that some confusion should be created in men's views on religious life.

Tradition.

The stress of that spirit of investigation had passed by, but its effect had been enormous. And while the result of this progress had swept away much of that which had to do with tradition, it had left true religion as clear and as strong and as influential as it ever was in any day or at any time. (Applause.)

The central figure of that religion stood out to-day all the clearer because of the very fact that a certain veil of tradition and of legend which had obscured it in the past had been removed. Men of science to-day stood not merely for those things which were material, but also for those things which were spiritual and eternal. (Applause.)

Prof. Cox, of McGill University, said that he had no criticism to offer upon this building and its appliances, as it must rank second to none upon this continent. In it beauty and gracefulness were combined, while in point of proportion and in choice of materials it was a complete success. In conclusion, he affirmed that Canada needed the best men in every field of human thought and activity, and added that it was poor policy to be satisfied with the second best merely because that second best was home-made. (Applause.)

Dr. Hoskin then introduced the Lieutenant-Governor, Sir William Mortimer Clark, who said he felt it a very great honor to have his name in any way connected with this great University. He called it a great university advisedly, because the number of students attending its classes was greater than the number in attendance at any university in the British Empire, with but one exception, the University of Edinburgh. And if the same progress was made in the next couple of years that had been accomplished in the past, this difference would also disappear. (Applause.) He felt much sympathy with the many difficulties with which Dr. Loudon had had to contend.

The late pres dent, to use a vulgar phrase, had never had a chance at all. (Applause.) He congratulated both Dr. Loudon and Dr. McLennan very highly upon what they had accomplished,

and was confident that under Dr. McLennan the department of physics would progress in the future as it had progressed in the past. The study of physics was to his mind exceedingly attractive. It opened up vast vistas of truth.

A large number of the manufacturers of the Dominion were at present in the city, and he would like to see them take a deep and lively interest in Canada's physical laboratories, for in the great field of commerce we had lost heavily in consequence of the lack of technical education among the young men interested in our manufacturing industries. They all knew how fast Germany had forged ahead owing to the great attention which was given in that country to technical education, and he hoped to see a wider, a keener, and a much warmer interest among our people in the study of physics, which would, beyond question, be to the great advantage of the whole community. He had great pleasure in declaring the new physics building open.

Dr. and Mrs. Falconer then held a reception in the new building, which was thrown open to general inspection.

Refreshments were served and an orchestra was in attendance.

VICHY.

A visit to Vichy, which is possibly the best-known of all the health resorts of France, was so timed as to enable us to be present when the official season opened on the 15th of May. To Dr. Felix Fau, a consulting physician, and Mr. G. Seneret, one of the directors of the State-owned springs, we are indebted for many courtesies and the opportunity of making personal investigations regarding the various springs and the uses to which these renowned gaseous alkaline waters are put in the treatment and alleviation of many pathological conditions. The members of our profession there whom we met were kindly and friendly, exhibiting high scientific attainments and a charming tolerance of the rather indifferent brand of French language imported from Toronto.

Vichy is situated in the department of the Allier, in a beautiful valley of the river of that name, about six hours by train south from Paris, and thirty-two miles south-east of Moulins. It was once a place of strength, and has been celebrated for its "cures" since Roman times. In 1853 the Government gave the right of exploiting the springs to a company. In 1862 there were 17,401 registered visitors, and the number has increased rapidly, last year mounting up to 98,000.

There is an excellent medical library open not only to the resident, but also to visiting physicians, where are to be found

numerous works on climatology, health resorts and mineral springs, as well as the current medical literature.

At the present day the action of the waters is being studied scientifically, with, it is said, increasing benefit to the sick who visit this spa. The doctors recommend patients to begin with reserve, drinking one glass in the morning and another in the afternoon, then increasing gradually according to the case, from four to five glasses, but rarely more than a pint a day—although in earlier times the ordinary dose seems to have been twelve glasses.

The chief springs in the possession of the State are nine in number. "Celestins" owes its name to the convent and juts out from a pile of rocks which served as the foundation of the old Vichy and gives birth also to the spring "L'Hospital." Its output is about 50,000 pints in twenty-four hours. The water contains considerable carbonic acid, with bicarbonate of sodium, potassium, magnesium and strontium; it is fresh and sparkling, and recommended for gout, rheumatism and diabetes, as well as other affections. The name "Le Grande-grille" comes from a large iron grating which formerly protected the spring from animals. There is a circular basin in the centre, into which the water gushes and bubbles because of the subterranean pressure of the great amount of carbonic acid gas with which the spring is charged. In order to keep the water from contact with the air, the basin has been hermetically closed by means of glass. There is a large output both for drinking and baths. It is used most of all in affections of the liver. The waters from the spring "L'Hospital" are reputed to be effective in cases of gastric embarrassment, while "Chomel" is prescribed for those whose respiratory organs are affected. "Lucas" has a very large output, 200,000 pints, which is moderate in temperature and used chiefly for baths, particularly for those suffering from skin diseases. In the neighborhood of Vichy, at Cusset, is the spring "Mesdames," somewhat ferruginous, and seems to be specially indicated in cases of debility and anemia, while the "Andreau" waters are employed in renal, genito-urinary and uterine disturbances.

It would seem that the waters of Vichy, rather than being laxative and debilitating, as was formerly thought, are bracing and produce constipation.

Outwardly, in the baths, the waters of Vichy rid the epidermis of all the fatty materials which are deposited there. To this is joined the stimulus given to the skin by the mineral elements in the water and the gas which it contains. As a result of this double action, a keener impulse is given to the circulation. Taken inwardly, the result is chiefly a cleansing of the passages in a manner analagous to the external effect produced by the baths.

There is a more abundant production of gastric juice in the stomach, and this is revealed first by a considerable increase of appetite, a feeling of general revivification, and a power of resisting fatigue. The waters act less as medicines than as rebuilders charged with rendering back to the system a proper performance of organic life. Their action is lasting, because they do not remove merely the symptoms of disease, but its causes, that is, the lack of nutrition which gave it birth.

The town is well provided with the usual accessories of a spa. Its climate and amusements are not very unlike those of Paris. —*Exchange.*

A NEW FORM FOR POST MORTEM REPORTS.

A NEW form for the use of doctors conducting post mortem examinations has been prepared by Dr. Arthur Jukes Johnson, chief coroner, and has been adopted by the Attorney-General's Department.

It is now being sent out to all the coroners throughout the province, to be used at every inquest.

The idea is to get definite, detailed and uniform medical information for use at trials. Dr. Johnson has drawn up a form much after the style of an insurance form. It is hoped that it will do away with the conflict of medical testimony which often interferes with the cause of justice. The doctors will be enabled to put down in black and white the information desired on the points given.

AN ADDRESS TO DR. REEVE.

AT the annual meeting of the Alumni Association of the University of Toronto it was resolved to present the following address to Dr. R. A. Reeve, ex-President of the British Medical Association, on his retirement from the Presidency of the Alumni Association, which he had held since its inauguration in April, 1900; the address was presented by Principal Hutton, Acting President of the University of Toronto:

"This Association cannot permit Dr. Richard Andrews Reeve to vacate the office of President, which he has adorned for seven years, without giving expression, however inadequate, to some of the gratitude and appreciation with which they regard his unequalled services and untiring devotion to the society.

"When Dr. Reeve became the first President of the important organization, which has since become a power in the land, it was

not to office, still less emolument, but to hard labor and unceasing solicitude that he was called. It is largely due to the courage with which he faced that anxiety and those tasks that the same office of President has now become an honor, if not a sinecure, in the hands of his successor."

(Publisher's Department.)

STIMULATION OF THE NATURAL OPSONIN INDEX.

BY H. SYLVESTER, LONDON.

THE medical world has been deeply interested for the last few years in the experiments and reports of Wright and Douglas, who claim that the immunity of the organism is due to the influence of opsonins on the leucocytes. The leucocytes are only able to properly perform their duties as phagocytes, when the opsonic index is normal. To the average practitioner, this question of opsonins, of Pleiffer's theory of a serum which destroys bacteria and allows the phagocytes to do their work, and of Ehrlich's side chain theory, are speculative, and to those who have attempted to understand something of these yet obscure questions, there appears to be much that is far from practical, and which require further investigation.

Nevertheless, the work done in Wright's laboratories is on the lines of progress, and we may hope that with time, something definite will result from this earnest effort, something of wide application, not only applicable to a few particular infectious diseases, but of general utility. Other papers have so fully exposed the theory of the opsonins (see Hektoen, *A. M. Journal,* May 12th, 1906) that it is unnecessary to recapitulate what has been already published. One fact, however, must be remembered, viz., that the leucocytes taken from a serum containing opsonins against any particular bacteria, when washed and placed in normal saline solution, will not exert a phagocytic action again on that particular bacterium. If, however, the bacteria are treated with serum containing their own particular opsonin, and are then washed and placed in normal saline solution containing leucocytes, the latter will immediately have a phagocytic action, and the average number of bacteria digested by the phagocytes will be the opsonic index. In normal health this opsonic power must of necessity, therefore, be elaborated within the body itself, and its prophylactic properties will be the measure of the natural resistance of immunity to bacterial invasion; that is to say, the body is able to elaborate by some yet unknown internal secreting organ, a distinct opsonin for each form of bacteria. For the

opsonin which renders the phagocytes active against the tubercle bacillus is useless against the streptococcus pyogenes, or the latter opsonin against the staphylococcus, etc. After all, then, and with all due respect to the work of these investigators, until they are able to evolve something definite from the present chaos of theories, let us ask ourselves if we are not already, by certain internal therapeutic agents, actually stimulating the particular kind of opsonin necessary to render the leucocytes active in destroying bacteria. It is true that cures have been claimed by the infection of dead bacilli of tuberculosis, thus raising the opsonin index, and that Olmacher, of Detroit, claims to have cured various infections by similar methods to those of Wright (see *A. M. Journal*, Feb. 16th, 1906). But it is a question whether the time is yet ripe for the adoption of this therapy by the average practitioner. Many observers have not been able to confirm the favorable result claimed for the use of opsonins, and we are probably actually getting equally good results with drugs by indirectly stimulating Nature to produce the necessary opsonins. Does not quinine increase the leucocytes count?

Do we not, therefore, by such chemiotatic action, practically gain that which is claimed for the opsonins?

Again, in mixed bacterial infections, especially in tuberculosis, bronchitis, influenza, and catarrh of the air passages or gastro-intestinal tract, do not such well-known formulas as Kugloids (glycero-phosphate of quinine dissolved in benzoates of creosote and eucalyptol) stimulate the natural increase of the opsonin index and phagocytic destruction of the tubercle bacillus, staphylococcus, streptococcus, Kleb's Loeffer bacilli, etc.? (Similar examples of other therapeutic agents could be multiplied *ad lib.*)

And since each bacterium (according to Wright) requires its own opsonin to render the leucocytes active, the matter becomes very complicated.

Wright has shown that bacteria must be sensitized, as it were, by something in the blood serum, before the leucocytes will ingest and digest them, and this something cannot be formed by and in the blood *per se*, but must be derived from vital cells of the body. One theory is that the enzymes formed in the protoplasm of the leucocytes cause a bacteriolysis of the ingested bacteria, and at the same time destroys their toxines, and where this does not occur we have a toxemia. The leucocytes also probably excrete enzymes into the blood serum which sensitizes the invading bacteria, and if this is the case, then, whatever increases leucocytosis will increase a corresponding phagocytosis. We know that opium and other drugs, which lower the leucocyte count, lower the resistance or opsonic index. Where there is not a violent and

unopposed bacterial invasion and diminished chemiotaxis, all pyogenic infections actually stimulate leucocytosis, and by so doing induce a destructive phagocytosis. More light on the opsonins is wanted, and in the meanwhile we must be content to rely on our clinical experience and our materia medica in our struggle with pathogenic organisms.

"LA PRESTE" MINERAL WATER.

"La Preste" is a French mineral water containing sulphur and silicum. The sulphur is represented by gr. .0028 of monosulphide. The following is the analysis as made by Dr. Willm:

Carbonic Acid (bicarbonates)	0. gr. 0507
Free Carbonic Acid	0. gr. 0033
Sodium Sulphide	0. gr. 0099
" Hyosulphite	0. gr. 0008
" Carbonate	0. gr. 0541
Calcium Carbonate	0. gr. 0059
Magnesium Carbonate	0. gr. 0006
Silicum	0. gr. 0399
Iron Oxide	0. gr. 0006
Sodium Sulphate	0. gr. 0275
Potassium Carbonate	0. gr. 0049
Sodium Chloride	9. gr. 0031
Lutrium Chloride	traces
Borates, Phosphates	"
Arsenic	Slight Traces
Organic Matter	0. gr. 0271
Anhydrous Carbonates	Previously Dissolved
Sodium Bicarbonates	0. gr. 0765
Calcium "	0. gr. 0085
Magnesium "	0. gr. 0009

This water may be shipped anywhere without deterioration. Together with the advantages derived in general from the use of sulphur, "La Preste" water has a special action on the urinary organs. There are three main indications for "La Preste" mineral water:

1st, Uric acid lithiasis, non-surgical (brick dust deposits without renal or vesical calculi). The water acts by considerably increasing the urinary secretion and in particular the elimination of uric acid.

2nd, Chronic infection of the urinary system, whatever its origin or its degree: pyelonephritis, uretero-pyelitis, cystitis, vesical catarrh and urethro-prostatitis. "La Preste" water is especially beneficial in the pyelo-nephritis so frequently met with in cases of stricture and prostatitis, in the treatment of which

we are frequently completely helpless. It is well known that in cases of phosphatic gravel, and in infections of the urinary system, strong alkaline waters are contraindicated. "La Preste" water, on the other hand, has a most marked effect.

As was stated so authoritatively by Prof. Landouzy in Sept., 1903, in a lecture at "La Preste" before more than 120 French and foreign physicians, this watering place is destined to acquire some day a world-wide reputation, because its waters have a special therapeutic action which belong to them alone. Chronic rheumatism, gout, congestions of the liver, diabetes, dyspepsia, dry cutaneous affections, are here treated with success, but "La Preste" is above all the Mecca for patients suffering from urinary troubles.

Urinary lithiasis, uric acid and phosphatic calculi are improved and often cured by "La Preste" water. The indications are so exact that they can be reduced to the following equation:

La Preste.—Chronic infections of the urinary tract. In a remarkable report on severe cystitis presented in Oct., 1903, before the Congress of Urology at Paris by Dr. Leon Imbert, lecturer on the Faculty of Montpelier University, former Interne of the Necker Urinary Clinic, reviewing all the therapeutic agents made use of in the treatment of this affection, expresses himself thus: "The waters of 'La Preste' in the Eastern Pyrenees are particularly efficacious. They are different from all others in that they are sulphurous and silicated. I have often obtained excellent results in cases of long standing cystitis rebellious to treatment. Even tuberculous cystitis is happily influenced by the waters of 'La Preste.' Under its action hematuria sometimes ceases completely, even when numerous applications of various antiseptics had had no effect."

There are also deep seated inflammations of the urethra which are uninfluenced by the action of antiseptics because they are a part of a general condition: Lymphatic, herpetic, arthritic, but which readily give way to the hydro-mineral treatment. Many cases of urethritis and prostatitis due to infection of long standing, especially in herpetic subjects, are, according to Dr. Lamarque, completely cured by the sulphur treatment.

In a recent work on diseases of the urinary system, the distinguished surgeon of the hospitals of Paris, Dr. Bazy, insists on the treatment of cystitis, pyelo-nephritis and chronic rheumatism in its various manifestations by the cure at the waters of "La Preste." Gouty subjects are also benefited by this cure.

Besides the above affections one must bear in mind that the waters of "La Preste" act more favorably in cases of dyspepsia, which so frequently accompany the uric acid diathesis, as well as in attacks of congestion of the liver.

Contraindications.—Large renal and vesical calculi, non-compensating cardiac lesions, pulmonary and renal tuberculosis, visceral carcinomata and cachetic conditions.

CHRONIC PARENCHYMATOUS NEPHRITIS.

Mr. B., a prominent business man, came to Dr. R.'s office two years ago complaining of headaches. Urine analysis showed albumin, which, however, cleared up in about six weeks, but patient was advised of his condition and told that he must live a quieter life. This he evidently did not do, but returned to Dr. R.'s office a year later, December, 1906, saying that in September, on account of failing eye sight, he had gone to an optician, who gave him glasses, but that he was growing worse, and came to the doctor and asked him to do something for him. The symptoms that he complained of at that time was his complete inability to attend to business. His failing vision, nocturnal eneuresis and seminal emission. Urine analysis showed two-thirds of one per cent. albumin. Patient was sent to an oculist, who reported albuminuric retinitis, an advanced case, and gave three months for the patient to live.

Patient was put on Nephritin, five tablets three times a day, and there was immediate and continued alleviation of the symptoms, until at the present time, ten months later, symptoms have all cleared up with the exception of the vision, which, although it has been relieved, shows an apparently permanently affected condition, but the patient is able to give a great deal of his time to his business.

Meningococcic Serum.—The therapeutic properties of the meningococcic Serum have already been tested in a considerable number of cases of cerebrospinal meningitis. These investigations have shown that Jochmann's serum has a very favorable influence on the course of cerebrospinal meningitis—excepting in very advanced cases in the hydrocephalic stage. The majority of the patients reacted at once with a fall of temperature. In some cases the fall was transitory, but it became more prolonged on continuing the injections with larger doses of the serum. The injections were first given hypodermically; later intralumbar injections were also given. The treatment was not followed by any appreciable injurious secondary effects. The mortality of the patients treated with the serum was 27 per cent.; of those not so treated, 53 per cent. The intralumbar injections appear to be more efficacious than the hypodermic, and it is advisable to at once inject fairly large doses (20-30 ccm.) into the spinal canal after lumbar puncture and the

withdrawal of 30-50 ccm. of lumbar fluid. The injections should be repeated every day if necessary, until a visible action is produced on the temperature curve. After the injections the patients should be placed for 12 hours with their heads low. For prophylactic purposes Jochmann recommends the hypodermic injection of 20 ccm. Meningococcic Serum is issued in original glass vessels containing 10 ccm. It is manufactured by E. Merck, Darmstadt, Germany.

Hunyadi Janos Natural Laxative Water.—The medical profession in general recognize the value of Hunyadi Janos natural laxative water as a remedy for constipation and diseases or impeded conditions of the intestines and rectum, and largely recommend its use in cases of this kind. Its prompt action, the small dose (half a glass on rising), the fact that it produces no griping or unpleasant after-effects, and its tonic action upon the stomach make it an especially safe and desirable remedy. We quote from the *Progrès Médical,* of Paris, France, as follows "Nothing can be justly compared with the nutritive and regenerative effects brought about by Hunyadi Janos water, which is eminently absorbable, and the curative effects whereof appear to penetrate even the finest capillaries of the interstitial circulation, causing them to disgorge their morbid elements and promoting molecular interchanges tending to the purification of the tissues and to the normal renovation of their anatomical constituents."

An Ideal Mouth Wash.—H. Koerner recommends as a superior mouth wash perhydrol, which is an absolutely pure preparation of hydrogen peroxide (30 per cent. by weight and 100 per cent. by volume). An ideal mouth-wash must be absolutely harmless, since small amounts will always be swallowed accidentally or will be absorbed by way of the oral mucous membrane. It should possess strong disinfecting properties, though it will never be possible to rid the mouth altogether of germs. Lastly, there should also be a mechanical factor in cleansing. The perhydrol mouth wash fills all these requirements in an ideal manner. In order to mask any slight taste due to evolved oxygen, a small amount of peppermint oil has been added to the lotion, together with a red organic dye, to give it a pleasing appearance. For use, the wash is diluted with two parts of water and is allowed to act upon the mucous membrane of the mouth for two or three minutes after every meal. In all diseased conditions of the mouth and gums, it is best to use the 3-per cent. wash undiluted. —*Aerztl. Vierteljs.-Rundschau.*

BOOK REVIEWS.

Animal Therapy: Its Relation to Immunity in the Treatment of Tuberculosis. By Dr. Gilliford B. Sweeny, Pittsburg, Pa., U.S.A.

In a forty page monograph the author reviews the work done by himself and other physicians who aided him in his laboratory and clinical experiments.

Having been a pupil of Metchnikoff at the Pasteur Institute, Paris, Dr. Sweeny became deeply imbued with the doctrine of phagocytic defence in seeking for an immunizing agent with which to free the human organism from the tubercular germ.

Subsequent work with Prof. von Behring in Germany convinced the author that it was possible to render young domestic cattle immune to tuberculosis by inoculating them with a sterile emulsion containing tubercular bacilli, this emulsion being injected into the jugular vein.

After demonstrating that this acquired immunity could be transmitted to other cattle, whether they were healthy or already tuberculous, by inoculating them with the lymph drawn from the thoracic duct of the immunized animal, Dr. Sweeny proceeded to inoculate tuberculous patients in a like manner. For five years the author and his colleagues continued their experiments in America and Europe before he announced the results of their work in his monograph upon the subject.

Dr. Sweeny does not claim that his remedy, which he has called "anti-tubercular lymph," is a specific for all forms of tubercular infection, but he states that where the blood of the patient has not been seriously depleted by the operation of the tubercular bacillus, remarkable results may be looked for.

Even in cases where pulmonary cavities of considerable size have existed previous to the administration of the lymph, some of his most brilliant results have been obtained. The remedy is injected hypodermically in the subscapular region in doses ranging from ten to twenty minims daily. No unpleasant reaction is observed. The influence of the lymph upon the opsonic index is prompt and unmistakable. Night sweats and excessive expectoration, as well as the acute pleuritic pains, are controlled even in cases which go on to a fatal issue.

The results reported in Dr. Sweeny's monograph is of sufficient interest to warrant a careful reading of his article, which also deals with the subject of immunity and infection in an interesting and original manner.