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Original Contributions.

A CANADIAN ACADEMY OF MEDICINE WITH ITS BRANCHES vs. LOCAL ONES AT TORONTO AND ELSEWHERE.

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THE movement to establish a Toronto Academy of Medicine brings up for discussion the question, *viz.*, whether it would not be more in the interest of Canadian medicine, in its literature and practice, to establish a Canadian Academy of Medicine, with branches throughout the whole Dominion, than local ones in Toronto and elsewhere. It can be frankly admitted that the establishment of a Canadian Academy of Medicine is a very large proposition and beset with many difficulties, but who would dare to say that these are insuperable, or such that unremitting endeavor and concentration of purpose could not meet and overcome? This great project can be discussed from many standpoints; the writer limits himself to two phases of it: 1. Scientific. 2. Patriotic.

SCIENTIFIC PHASE.

Social and economic conditions, up to the present time, have made the earning of a livelihood the dominant factor in the professional life of most medical men. It need scarcely be added that no censure is implied in this statement, for the object is a most legitimate and worthy one. A physician's time and energy are practically exhausted in the exacting routine of daily duties. How many of us at nine or ten p.m. feel like taking up a work on, say, physiology, anatomy or pathology, in order to prosecute a course of study in any one of these or other medical subjects?

Yet we all admit that without such study we cannot hope to keep abreast of medical progress. Is it not in order then to hold out some great inducement, especially to our young men, not only to keep abreast of the times by systematic study, but to forge ahead in research and original work? Membership in a National Academy of Medicine would doubtless prove a great inspiration to work. A Canadian Academy of Medicine would of necessity have its official organ, the chief purpose of which would be to encourage scientific work, and to be the medium through which at least all meritorious Canadian contributions would be accessible to every member. The different branches would be a great source of emulation to each other. For instance, Toronto would be very anxious to have the character of its work compare favorably with that of the other cities throughout the Dominion. Again, this journal going abroad as the official organ of a national institution would on this account have a prestige that would add great weight to its utterances. A physician's name appearing under the title of an article would challenge attention and command respect. With such a journal going into the medical libraries of the world Canadian physicians would have only themselves to blame if Canadian medicine, in its literature and practice, did not receive recognition. Is there not latent energy enough in our ranks to-day, as well as in the new material coming into our medical colleges, to give to Canadian medicine a national status? Can we not aspire to have physicians in the British Isles and in the United States say, "Well, in Canada they teach and do so and so"? The genius of our people has given national traits to our methods in legislation, finance, commerce, industry, transportation, agriculture, education, etc.; is it too much to ask the physicians of Canada to give a national trait to Canadian medicine in its literature and practice? Up to the present time Canadian medicine has occupied much the same status as that of the so-called semi-ready clothing establishments. The more ambitious of our graduates, like Osler and many others, have had to go abroad to receive recognition. A profession, like a bank, cannot stand too great a drain on its resources. Have we not lost about enough of our best men? What could a local organization, such as a Toronto Academy of Medicine, do to induce ambitious young men to give their best work to the building up of a high professional status in their own country? A union of the different medical societies in Toronto might serve the local interests of the physicians in Toronto, but such a union could have no national significance. It could make no appeal to the profession at large, for it would not have an official organ, and there would be no one, or very few, from outside in its membership. As the Toronto branch of a Canadian Academy of Medicine it would still have every advantage that could come of a union of the different

societies as already proposed, but in addition to this would be in the full enjoyment of all the benefits to be derived from union with a great national organization. It is said, "Let us organize the local ones first, and then later on unite these in a national one." Would this lessen the difficulties any? A Toronto Academy of Medicine would as an independent organization have its own president and other officials, its own property, etc.; Montreal, Halifax, Winnipeg, the same. Would it be an easier matter to change all this at the end, say, of twenty years, than it would be to establish a Canadian Academy of Medicine, and allow the branches to fit into the constitution as they grow? The latter would be along lines of natural development—first the trunk and then the branches, to bear luscious fruit. The former would mean radical disorganization of independent institutions into the branches of a national one.

Again, could there be a more opportune time for instituting a great movement in the interests of scientific medicine than the present? For years our medical journals have been calling attention to the great need of an Academy of Medicine. Osler in a recent address gave the proposition an enthusiastic endorsation. The approaching meetings of the Ontario and Canadian Medical Associations will afford ample opportunities for conference with medical men from all over the Dominion.

Pages could be written on this phase of the subject without exhausting it, but suffice it to say that the greatest needs of our profession are something that will inspire every member to do her or his best, and some source through which the good work done in our ranks can become available for the use of all. Let us endorse in action the sentiment expressed by Homer:

> "By mutual confidence, and mutual aid
> Great deeds are done, and great discoveries made.
> The wise new prudence from the wise acquire,
> And one great hero fans another's fire."

Patriotic Phase.

The medical profession as such has nothing to do with that brand of spurious patriotism that satiates itself in flaunting the flag for mercenary, partizan and jingoistic purposes. But the spirit of true patriotism, that inspires the worthy citizen to use every honorable means in his power to make his country a desirable one to live in, should animate the soul of every physician. It is not only legitimate, but it is the duty of every Canadian to make known as widely as he can the natural resources of his country—its illimitable wealth in mine, forest, and fertile soil. Is it any less his duty to make known the status of its educational institutions when these are so well worthy of commendation? What better asset can any country have than the services through-

out its whole domain of intelligent, capable physicians? We have been told recently by a very distinguished statesman of the neighboring republic that Canadians are great nation-builders. This is true, for within the memory of some of us—not yet in the "chloroform stage"—Canadian statesmanship has built out of what were heterogeneous provinces, knowing little about, and caring less for, each other, a giant young nation, challenging the admiration and respect of the great world powers. In all ages the genius of medical men has been a potent factor in nation-building. Who have prevented such scourges as smallpox and cholera from decimating the race? The accomplishments of the physicians of ancient Greece and Rome add lustre to the history of these great empires, and what more interesting chapters in the history of Italy, France, Germany, Great Britain and the United States than those to be found in their medical libraries? In neither the literature, art, legislation, press nor pulpit of any of these has there been a higher type of genius displayed than in the case of many of their physicians. How much poorer these countries would have been without a Galen, Pasteur, Virchow, Lister or Flint, who can estimate?

There is a place for patriotism in medicine, for it can be made a great factor in nation-building. This brings up the question, *viz.*, how are we to make the best use of our calling in developing Canada? Would a number of local institutions be as potent a factor as a national one? Can we not get some guidance from both sacred and secular history? The Saviour himself, when He commanded His followers "to go into all the world and preach the gospel," gave utterance to the germinal principle governing all great movements. Had His apostles—and as a matter of history one of them did until his eyes were opened by a vision—taken the same view of Christianity as some of our Toronto physicians take in regard to medicine, they would have sought to unite the churches in Jerusalem and called the new organization "The Jerusalem Church of Christianity." What dire results would have followed such a course! Take another case from biblical history—Jonah was asked to make a national appeal to Nineveh for a higher life. Like some in our day he put self-interests first. Doubtless he thought himself, and was also told by his friends, that any effort to make religion of national interest was only "the dream of a visionary, and beset with too many difficulties." He learned from a tragic and humiliating experience the fate of selfishness. When he became unselfish and patriotic he went forth on a mission that saved a nation and won immortality for himself. From secular history we learn that the Babylonian, Persian, Grecian, and Roman Empires reached the zenith of their power and glory when they were expanding and utilizing the "brawn and brain" of all their possessions. When their capitals

assumed to be *the* nation, became vainglorious and ignored the interests and rights of the provinces, destruction and humiliation, like sleuth-hounds, fell upon him. Do not the lessons of history teach us that if Canadian medicine, in its literature and practice is to become great, it must have national aspirations? The swaddling bands of even a Toronto parochialism would paralyze its growth.

At the meeting recently held in the Medical Library re the instituting of a Toronto Academy of Medicine, the proposal to establish a Canadian one with branches in Toronto and elsewhere raised the following objections, *viz.*: "It would destroy the present movement," "It is too visionary," "There are too many obstacles in the way," "It would be better to start local academies and unite these into a national one later on," "New York, Buffalo, and even Rochester, have their own Academies of Medicine." All of these but the last are matters of personal opinion and have already, in part at least, been referred to in this article. The last is a question of comparison, and as such is only of value in so far as conditions are comparable. Let us briefly compare conditions. These local academies were established when the population of the country probably exceeded seventy millions. The New York Academy of Medicine could easily enlist as large a membership as a Canadian Academy could with the whole Dominion to draw from, so then in size ours would be no more unwieldy than the New York one. The United States has all the component factors of a great nation; we are yet minus the one most important factor in a great nation's outfit—namely, population. We must use every lawful agency in attracting attention to our country, and a Canadian Academy of Medicine would be one of these. Restricting the term American to the United States, we can say that American medicine attained national distinction quite early in the last century. The works of American medical authors are read everywhere throughout the English-speaking world and many are translated into foreign languages. Wealth and population have enabled their great metropolitan medical journals to reach not only all their own physicians, but many of them to find a wide circulation in Canada. There is not a "nook or cranny" in American medicine, in either its literature or practice, that has not been exploited by writers and practitioners. There are uses for New York, Buffalo and Rochester Academies of Medicine, but all the purposes for which an American Academy of Medicine could exist are already accomplished facts. A century ago such an institution could have rendered most efficient service in nation-building had other conditions been as they are now. But then New York was less accessible to Washington than Dawson City is to Toronto now. Then the an[illegible]g of the executive of a national organization would

have involved many and perilous hardships; now, with transcontinental parlor coaches, such a meeting would be a most welcome one as a very enjoyable holiday trip.

We have glanced at the status of American medicine—and for much the same reasons British, German and French medicine may be placed in the same grade—let us briefly consider that of Canadian medicine. Leaving Osler, Cullen, Barker *et al.* aside, as we only furnished these with a semi-ready outfit, what portion of the field of medicine have Canadian authors exploited? A text-book on "Nose and Throat," and one on "Obstetrics" are about the only ones to be found in any of our libraries, and in probably fifty per cent. of them you would not find even these two. Our journals, though very creditably edited, yet on account of their number and of the paucity of physicians compared to the size of our country, can at best only reach a very limited number of readers. These journals, like our authors, can do but very little towards giving Canadian medicine national recognition, either at home or abroad. We think when one of our confreres goes to New York, London or Vienna and takes a post-graduate course he is professionally quite a superior personage. Would a doctor coming from any of these places to Canada for a post-graduate course be welcomed home in any such fashion? Now it may be as individuals we have no need to be ashamed of our work or our scientific culture as members of the medical profession, but what have we done collectively for Canadian medicine? More physicians go to the little town of Rochester, Minnesota, almost any day in the week, to see American medicine as practiced in its surgical section by the Mayo brothers, than visit Canada for a like purpose in a decade. We have produced raw material—*e.g.*, Osler, the late J. E. Graham, and others, in many respects the peers of the Mayos—but hitherto we have not provided such men with the necessary accessories for giving to Canadian medicine national recognition. Is not the need of a Canadian Academy of Medicine an imperative one?

THE DOMINANCE OF THE NUCLEUS. *

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THERE are, it seems to me, two alternative reasons which should govern the choice of a topic for discussion at the meetings of Sections of this Association: either to afford to the general medical public an expression of opinion by specialists upon topics of the time, or, on the other hand, to direct the attention of the public to matters in which it is well that they should be interested. These discussions are not merely for the benefit of the participants; they are published *in extenso* in what has become the organ of the British practitioner throughout the world; and this public aspect must be kept in sight, nor should the debate be allowed to narrow itself into the discussion of minutiae.

It must be frankly admitted that nuclear function is not exactly a burning question of the day. Your ordinary medical man is little concerned about it; your routine physiologist is concerned in the main with mass effects; your pathologist sees, it is true, certain changes in the nucleus in various conditions of cell disturbance, but what these changes indicate are scarce discussed in his text-books or journals. It is for the second of the above-mentioned reasons that this topic has been chosen for to-day's discussion. Though we have not what has become a topic of the time, we have a matter which it is timely to bring forward.

For years individual observers in zoology and botany, cytologists and students of "Entwickelungs-mechanik," physiological chemists and morbid histologists have been recording facts regarding the nucleus, and these facts brought together point to the one conclusion that the nucleus is the dominating structure in the cell; dependent, it is true, upon the cytoplasm, or cell body, but nevertheless dominant. The time has come to realize that general advance lies in a recognition of these foremost properties of nuclear matter, to recognize the fact that within the unit, the cell, is the more intimate unit, the nuclear matter, so that the physiology and the pathology of the future is destined to be nuclear rather than cellular. Or, to be more exact, while the cell remains our natural unit, within that cell the modifications that have taken place must receive their explanation primarily in terms of nuclear change. Possibly this may seem to be a matter of little moment to the practitioner. So I doubt not appeared fifty years ago Virchow's insistence upon the all-importance of the cell. We can but say here, that to the thoughtful man, ever seeking the why

* Read before meeting of the British Medical Association, Toronto, August, 1906.

and wherefore of things, even if the ultimate answer is never to be reached, each successive step onwards towards that ultimate answer is a notable achievement, and this because each such step affords wider generalizations and the recognition of a fuller harmony of phenomena.

And there are other and weighty reasons, first among which is the opportunity this choice affords as a means of rapprochement between the physiologists and pathologists, and, if the remark be not impertinent, as a means of encouragement to the former. It is good and natural that these two branches of medicine should come together. For many years they have tended to drift apart; the problems which have interested the one have had little compelling interest for the other; and I fear it must be admitted that there has been a feeling on the part of pathologists and of medical men in general that the teaching in the one subject has too often not been in the direct line of preparation for the study of other branches of medical science. In short, physiologists were already embarked in the study of mass effects before the cellular structure of tissues was discovered, and had so large a field before them, that for long years organs and their properties occupied their whole attention. Modern pathology, developing later under the guidance of Virchow, has been essentially based on the cell theory; it is the cell and not the tissue that has formed its unit. Only now are there indications, with the development of finer methods and the relative completion of the work upon mass effects, that physiologists in general are by a natural process gravitating from the study of the tissue, its functions and its chemistry, to that of its component cells. Physiology is becoming and must inevitably become more cellular. And it is peculiarly fitting that here in Toronto we should inaugurate this discussion, in recognition of the pioneer part played by Professor Macallum in emphasizing the importance of cellular physiology. It is no exaggeration to characterize Professor Macallum's long-continued work upon the nucleus, its histology and its chemistry, as the most important series of contributions to medical science that has proceeded, not merely from Toronto, but from Canada at large; no exaggeration to refer to him as the first English-speaking physiologist to consecrate his activities to work along these lines.

It is a sincere pleasure to me, coming from another Canadian city, and occupying in this respect the vantage ground of not being a Torontonian, that I can with propriety direct attention to a matter in which Toronto is among us *facile princeps*. I take it that in opening this discussion I shall perform the greater service if I devote myself to a rapid review of the various findings which together compel the conclusion that the nucleus is the centre of cell activity, leaving it to those who follow me to enter more particularly into the evidence of one or other order.

Such a general survey is more especially demanded because, to my knowledge, it has not yet been attempted; or, more correctly, when attempted, what I regard as the inevitable conclusions have not been drawn. While individual workers have demonstrated the controlling powers of the nucleus in one or other respect, there has been a curious disinclination to bring the various orders of data together and deduce their full significance. But here, as regards this morning's discussion, certain limitations must be introduced. The activities of living matter are to be divided into two categories, intrinsic and extrinsic, or vegetative and functional. The observations which have been made upon the nucleus in connection with vegetative activities, with cell multiplication and reproduction, are very abundant. To discuss these along with the data bearing upon the role of the nucleus in the functional activities of the cell would make this morning's debate altogether too diffuse. It has been thought wiser, therefore, to confine ourselves, save in one respect, to the latter—the functional activities. Nevertheless, if I have correctly interpreted my duties as introducing the subject in order to place in a clear light the controlling influence of the nucleus in the life of the cell, I cannot leave these vegetative activities out of count. As opener, I must as briefly as is possible, consistent with lucidity, bring forward the evidence of nuclear predominance as afforded by studies upon cell and individual reproduction. It was the studies upon mitosis that first revealed the high importance of this constituent of the cell.

We can, perhaps, best treat this section of the subject by means of a series of theses:

1. The properties which distinguish the individuals of any race or family from the individual of any other race or family are to be traced back to the constitution of a single cell, the fertilized ovum, from which that individual has been developed.

2. There must, therefore, be something in the constitution of the germ matter of the parent stock which differentiates it from the germ matter of other stocks. Nay, more, no two individuals appear to possess germ matter of absolutely identical constitution.

3. In individuals of gamogenetic origin, resulting from sexual union, the material contributed to the ovum by the paternal spermatozoon and the maternal ovum is, physiologically speaking, of equal value. As demonstrated by Mendel in his observations upon hybrids, like orders of offspring result whether the male cell of stock A be employed to fertilize the ova of stock B, or the female cells of stock A be fertilized by the male cells of stock B.*

It is evident, therefore, that matter of like order is contributed to the fertilized ovum by the two parents.

4. In studying more narrowly the process of fertilization we

*In mammals intrauterine existence would seem to introduce a factor of differentiation. From their mother's womb male and female show constant differences.

find that the only matter contributed correspondingly by both parents is nuclear matter. Ovum and spermatozoon are cells of widely different appearance, and the result of fertilization is that the female cell affords the cytoplasm, or cell substance of the fertilized ovum; the male cell provides the centrosome. The nucleus of the fertilized ovum or new individual is formed of corresponding amounts of nuclear matter (chromatin) from both parents.

5. Not only is this the case, but, most significantly—I shall take up a probable exception immediately—each supplies a like number of chromatin loops or chromosomes, and, as the fertilized ovum undergoes development and proceeds to divide and redivide, the like process of distribution is continued, so that each separate body cell of the fully-developed organism contains equivalent parts of chromatin of paternal and maternal origin.

6. We can proceed yet further and recognize that in certain species, at least, the chromosomes supplied by or derived from either parent while pairing with like chromosomes from the other parent, are not all identical in appearance and size, but vary among themselves, the variation being constant; that is to say, the same types of chromosomes are found in successive generations of cells. This peculiar variation, as has been pointed out more particularly by American observers (Montgomery and Sutton), is frequent in insects in the cells which ultimately give rise to the germ cells. As Moore and Arnold, of Liverpool, have just shown, a like constancy is to be made out in the types of chromosomes seen in the spermatocytes of mammals, even of man himself. The constancy of the particular varieties present in individual species suggests that the chromosomes of different orders possess different properties and determine different characters, or sets of characters, in the cells to which they are distributed, and in the individual formed from the aggregation of these cells. In support of this hypothesis are the remarkable observations, first, of McKlung, of Kansas, and, later, of E. B. Wilson, of New York, that the spermatozoa of sundry insects are of two orders, though there is but one type of egg. The one order of spermatozoon gives rise to males, the other to females, the difference between the two being in their chromosomes. In the maturing spermatocytes which gives origin to the spermatozoa, either the one set of cells possess an accessory chromosome, or, in other cases, a particular chromosome in one-half the maturing spermatozoa is large, in the other half is minute. To quote McKlung:

"A careful consideration will suggest that nothing but sexual characters thus divides the members of one species into two well-defined groups, and we are logically forced to the conclusion that the peculiar chromosome has some bearing on the arrangement."

Here we are not discussing sex, and I do but note these observations in passing. There are other cases, not as yet fully worked

out, in which, as in the Aphides, there would appear to be one type of spermatozoon and two types of ova.

The natural conclusion to be reached from all these data is that the nuclear matter conveys and determines, or controls, the inherited peculiarities of the individual; further, the conveyance is through matter contained in the chromatin loops or chromosomes, while it may be that these individual loops, varying among themselves, determine particular condition.

What we know concerning the spermatozoon points very definitely to the conclusion that the groups of chromosomes distributed to the spermatozoa derived from a single spermatocyte are not identical, each spermatozoon receiving only one-half the number of chromosomes proper to the primordial germ cell, and to the cells in general of any particular species. The ovum on its part exhibits a like reduction. To inquire further into this remarkable reduction process would lead us into the discussion of variation and the Mendelian doctrine. I do but mention these matters here to call attention to the fact that not merely inheritance but variation is seen to be most intimately associated with the nuclear material and that, if we can trust our eyes, the one morphological constituent involved in and responsible for all cases of inherited peculiarities and gamogenetic variation is included in the nuclear chromatin. That the other constituents of the cell have an influence or can have an influence we do not deny. If in the fertilized ovum the nucleus influences the cytoplasm, so, conversely, the constitution of the cytoplasm must tell upon the nucleoplasm. The facts in our possession indicate that the latter is the subordinate process; the influence of the nucleus is dominant. This is best indicated by Boveri's remarkable observation that if the nucleus be removed from the sea-urchin's egg and the enucleated mass of cytoplasm be fertilized by the spermatozoon of another species of echinoderm the resultant larva is of the type of the species that afforded the spermatozoon, that is, the nuclear material; this has conveyed and determined the specific properties of the individual.

Now, if this be so, it must follow that the nuclear matter controls all the essential cell activities, and this because, studied narrowly, it is seen that the morphological properties of a cell are the expression of the constitution of the cell; it is the constitution that determines the properties and functions of that cell. All are bound together every whit as much as are the properties of any given salt and the constitution of the same. What is true of the cell holds also of the multicellular individual; the specific properties of the individual are the summation of the properties of its component cells. If, therefore, nuclear composition dominates the morphology of the individual cell it dominates likewise the properties of the individual.

It must now be asked, What evidence do we possess estab-

lishing that this is really the case? That evidence may be dealt with under many heads. We have to deal with the evidence afforded by: (1) The natural and experimental enucleation of cells; (2) gross changes observed in the nucleus as the result of cell activities; (3) the finer changes in the same which may be seen to follow functional activity; (4) the histological changes in the nucleus associated with morbid conditions; (5) the chemistry of nuclear and cytoplasmic matter respectively; and (6) the ferment actions of the cell and their relationship to nuclear activity.

I believe that we have the good fortune to see here to-day those who have conducted investigations along each of these lines. Let me now lay before you the main data that have been gained under each of these headings, and the conclusions that may reasonably be deduced.

1. The Effects of Removal of the Nucleus.

The cell which, like the erythrocyte, undergoes natural loss of its nucleus may continue to exist for a considerable period, and during that time actively perform function. The mammalian red corpuscle, for example, according to W. Hunter, Quincke, and others, exists from fifteen to thirty days. While it exists we see no evidence of growth, and certainly it never propagates itself. The same holds good for cells artificially deprived of their nuclei; they do not necessarily undergo immediate disorganization; they can be the seat of certain metabolic activities. According to Klebs, the enucleated cells of the alga, Spirogyra, can in the sunlight produce new starch granules; can, that is, synthesize starch from the carbon, oxygen, and water absorbed, the starch thus formed in the sunlight being used up in the dark; and this may continue for as long as six weeks. They may further continue to exhibit motion in response to external stimuli (Lacrymaria olor, Verworn); they may actively ingest food particles. But, on the other hand, the testimony is unanimous that higher metabolic activities are incomplete. Unlike nucleated portions of a vegetable cell, the enucleated is unable to develop a cell wall of cellulose. Among protozoa, also, Verworn has noted that enucleated pieces of foraminifera show not the slightest capacity to form the internal calcareous skeleton. If the enucleated cytoplasm of *Thalassicola pelagica* ingest foreign particles, it is unable to digest them wholly, and while the enucleated cytoplasm can develop a new centrosome (E. B. Wilson) it cannot give rise to new nuclear material. It may be laid down that if it can form new paraplasmic substances, like starch, it cannot form new cytoplasm and cell substance proper—that is to say, it cannot increase in bulk and undergo cell division and multiplication, or, otherwise, these observations conclusively prove that the nucleus is essential,

not merely for the vegetative activities, but also for the higher metabolic activities of the cell and their due co-ordination.

That the nucleus alone, deprived of surrounding cell substance, cannot regenerate the cell is another matter. It has freely to be admitted, with Verworn, Boveri, and Lillie, that there must be a certain minimal quantity of cytoplasm associated with the nucleus before regeneration can take place. But what this proves is not that the nucleus is not the dominating portion of the cell complex, but only that the association of nucleus and cytoplasm is essential for full cell activity. By the lack of perception of this distinction it may be noted that Verworn's treatment of the whole subject of cell processes is greatly weakened if not vitiated. His facts prove that nucleus and cytoplasm are equally essential for the full function of the cell, not that they are of equal value. We may as well argue that in the community of bees the individual drone or worker is of importance equal to the queen, because we find that the queen-bee, if separated from the rest of the community, is incapable of obtaining food for herself and so starves to death. I shall refer later to what I regard as the right conception of the relationship between cytoplasm and nucleus.

2. Gross Changes in the Nucleus during Activity.

Among these may be noted, (1) alteration in the position of the nucleus in cases in which there are indications of localized as distinct from diffuse cell activities, and (2) alteration in size and shape of the nucleus accompanying active function.

In the animal organism possessing cells with a body which is small in proportion to the size of the nucleus, examples of the first order would appear to be rare, though they are not entirely wanting. Thus Korschelt has shown that in the egg rays of the water scorpion (Nepa) with their cells having remarkable branching nuclei, long branches from two adjoining cells send out processes which come into close proximity. In the space between these a chitinous deposit gradually shows itself, and when the mass of chitin is fully formed the processes are withdrawn. In the plant, movement of the nucleus towards the area of new formation in the cell is relatively common; thus when there is the active formation of a thick cell membrane along one aspect of the cell it has been noted that the nucleus becomes eccentric and approximated to the region of new development. There is a similar eccentric localization of the nucleus during the development of root hairs (Haberlandt). I need but mention instances of the second, namely, of alteration in size—they are now so well known. The earliest observations were those of Heidenhain years ago upon the different appearance of the nuclei of salivary glands when at rest and after stimulation. In more recent years we

have had the striking observations of Hodge, confirmed by Gustav Mann, Lugaro, and others, upon the nuclear alterations in the motor ganglion cells of bees, birds, cats, and other vertebrates, brought about by natural and experimentally-produced fatigue.

These observations also clearly demonstrate that the nucleus is not merely the vegetative centre of the cell, but is involved in its functional activities.

3. Finer Changes Occurring in the Nucleus During the Course of Cell Activities.

If I am not mistaken, it was a native of what we regard as the youngest of the civilized great countries of the world—Professor Ogata—who first, in 1885, clearly recognized the finer nuclear changes associated with secretory activity. He called attention to the granules, or *plasmosomes*, appearing in the nucleus at the beginning of secretory activity—granules which take on the characters of nucleoli and pass from the nucleus into the cell body. In these he held that the zymogen granules are developed, which eventually become (part of) the protoplasm of the cell. In 1887 Lukjanow made confirmatory observations. He noticed in the secreting cell outside the nucleus an agglomeration of little spherules which in form, size, and reaction to dyes were closely related to certain nuclear bodies (*Kernkorperchen*). He drew the cautious conclusion that "it appears in any case that the hypothesis of a connection between the nucleus and the cell body has in itself nothing improbable—a connection shown outwardly by certain structural elements of the nucleus passing over into the cell body and there undergoing further change." In the following year F. Hermann noted the apparent discharge of similar minute globules in mucous goblet cells during secretion, and also called attention to the fact that these in staining powers resemble the nucleolus. These he found were absent from the resting cell. In 1890 Professor Macallum made his first report upon similar phenomena. He pointed out that in the nuclei of developing ova of Necturus (the Lake Lizard, found here in Lake Ontario), as also in that of the frog, at one stage the chromatin is principally collected in the form of nucleoli at the periphery immediately beneath the nuclear membrane. These nucleoli are usually spherical and vary somewhat in size. At this stage yoke granules are absent from the cell. With an indigo carmine dye he found that the nucleus and cell body stained red, whereas the nuclear bodies took on a deep blue. At what appeared to be clearly a later stage yolk spherules made their appearance, and when this happened the whole ovum stained blue, the nuclei being diminished in size. What appeared to be an intermediate stage was seen in ova in which the nucleoli and the cell substance in their imme-

diate neighborhood exhibited a blue stain, while the rest of the nucleus and the main mass of the cytoplasm still stained red. It was difficult from these observations to arrive at any other conclusion than that the nuclear matter becomes differentiated into nucleolar, and that this diffuses gradually through the nucleus and then into the cell substance, the diffusion coinciding in point of time with the formation of the yolk granules. Macallum thus regarded the yolk granules as formed by the union of a derivative of the nuclear chromatin with a constituent of the cell protoplasm. And we here note that these yolk granules chemically are composed in the main of lipoid material, of lecithin, a compound to which I shall refer later. In the pancreatic cells Macallum found—and Steinhaus has made similar observations—that the nuclei possess safranophilous nucleoli, while the rest of the nucleus with double staining takes on a deeper red color of haematoxylin. As the nucleus loses its safranophilous substance, the cell protoplasm acquires safranophilous granules. He concluded that the chromatin of the nucleus gives rise to a substance prozymogen; sometimes it is dissolved in the nuclear substance, sometimes collected in masses (plasmosomes); finally it diffuses out into the cell protoplasm, there meeting with a constituent of the latter to form the zymogen proper.

I might proceed to detail a long series of confirmatory observations by Carlier, by Bensley—made here in Toronto—by Maximow, Solger, Nicholas, E. Muller, Krause, Galeotti, Vigier, Garnier, Greenough, and others, all agreeing—save in minor details—and all bearing upon the processes seen in gland cells. All describe the smallest and first seen granules as situated in the immediate neighborhood of the nucleus; describe these as identical in character with the plasmosomes or nucleoli seen within the nuclear membrane, and have observed that as they pass to a further distance from the nucleus they enlarge into definite secretory granules. It is with the exact stages of this process that there has been and still is some debate; whether they project as buds from the nuclear membrane or make their way out from pores opening into the same; whether they finally dissolve within the cell or undergo solution when discharged into the external medium. But Professors Macallum, Carlier, and Bensley are all here, and I must not further steal their fire. I would only add that what has been determined in the animal cell holds for the plant cell also. Thus, Torrey has described a succession of changes in connection with the nucleus and cell body in the germinating maize seed associated with the production of diastase. The processes are of an identical nature: deep staining granules are first seen in the nuclei whence these exude in small streams into the cytoplasm; scattered at first through the cell, these later become collected at that end next to the endosperm, where they

become ultimately dissolved. It is following upon their dissociation that the first action of a ferment upon the cell wall and matrix of the endosperm becomes evident.

Nor is it only in connection with secretions possessing ferment action that we have evidence of nuclear function. In plants Schniewind Thies has observed nuclear changes in the nectar cells of flowers in connection with the elaboration of nectar. In animals, the curious vacuoles in the nuclei of fat cells which have been known for several years have more recently been shown by Shattock to contain and to give the reaction for fat.

These data almost justify us in accepting Claude Bernard's remarkable prevision of more than a quarter of century ago that the cell substance is the seat of vital expenditure, while in the nucleus resides the power of organic synthesis. This does not, however, in our opinion, exactly represent the relationship, for the nucleus is also the seat of expenditure, nay, appears often to determine that expenditure. But clearly the indications are that the higher syntheses, those associated with growth and those governing the specific enzyme actions of the different forms of cell are determined and initiated by the nuclear matter.

4. The Nucleus in Pathological Conditions of the Organism.

Purposely when passing in review vegetative and proliferative phenomena I did not call attention to the evidence afforded by the study of the nucleus in cases of aberrant cell growth. It appeared advisable to consider the pathology of the nucleus by itself and from all aspects, and that, more particularly, because while the normal vegetative activities are not subjects for discussion this morning, there are those here present who, from their studies upon tumors, are prepared to speak upon the abnormal. At this point we have to call attention to the evidence of nuclear dominance afforded (1) by cases of abnormal cell growth, (2) by cases of disturbed function.

Regarding the first of these I shall be brief.

It may be stated unhesitatingly that the majority of pathologists at the present moment regard neoplasia or blastomatosis as essentially a condition of aberrant cell growth, brought about not by the constant stimulus of intracellular parasitism, but by some primary alteration of cell environment. As a consequence of such alteration, if I may quote myself, the energies which, had the cells remained in their normal relation, would have been devoted to functional activities, become diverted to vegetative and proliferative. Your active malignant tumor cell has characteristically all the attributes of a vegetative cell, or, as it is usual, perhaps unfortunately, to express it, is of the embryonic type.

Associated with this we find that the growing tumor exhibits abundant mitoses, and, what is more, the growth being aberrant, we find a well pronounced tendency for the mitoses also to be irregular. We thus encounter a great variety of changes, (1) dispersion of chromosomes in the cell body as the result apparently of rupture of the threads of the achromatic spindle, (2) asymmetrical mitoses, (3) multipolar mitoses, (4) hypochromatosis with diminution either in the number or in the size of the chromosomes, (5) hyperchromatosis with increase whether in number or size of the chromosomes. (6) Associated with degenerative changes and rapidly growing tumors we may encounter the development of paranuclear bodies (Nebenkerne), sometimes of large size and modified staining properties, lying in the cytoplasm and clearly derived from the nuclear matter.

The existence of these abnormal nuclear conditions in connection with tumor growth is most significant. Beyond this statement, that it is difficult to arrive at any other conclusion than that there is an intimate relationship between these nuclear vagaries and the abnormal cell growth seen in malignant tumors, I feel it is unsafe to venture; for, as Dr. Bashford, who is here with us, has frankly acknowledged, more advanced hypotheses based upon these abnormalities have not stood the test of extended investigation.

Turning now to observations upon the nucleus in pathological conditions other than those associated with aberrant growth, it may, in the first place, be noted that cases may be recalled bearing upon the cell when it passes into a latent or dormant condition. While we cannot go as far as Grawitz and accept the existence of "slumber cells," in which the nucleus and its chromatin have become so shrunken as to be invisible, we can, I think, note that with the arrest of cell function and passage into an inert state, the nuclei undergo shrinkage, becoming extremely small and attenuated, as in the fully-formed connective tissue, fully-formed fat cells, etc.

It is in connection with cell irritation and the commoner acute degenerations that the nuclear changes become most evident. It is a matter of familiar knowledge that pronounced changes take place in connection with cloudy swelling and, to employ the old term, fatty degeneration, as distinct from fatty infiltration of the cell. In cloudy swelling, which so commonly accompanies the acute fevers and conditions of intoxication, we note, more particularly in the cells of secretory glands, that the nuclei, which in the first stage of irritation may become more intensely stained, rapidly lose their staining property and become indistinct, and the cell body becomes filled with granules of albuminous nature. Stolnikow was apparently the first to make accurate studies upon the changes that occur in these degenerative processes; many

others have since noted the same collection of the chromatin in the region of the nuclear membrane; the discharge into the cytoplasm (well seen in the liver cells in phosphorus poisoning); have described these little masses as first staining like nuclear substances, and later losing the nuclear stain completely, the cell body becoming filled with shell-like clear-staining globules. The more recent work of Schmaus and Albrecht, Lubarsch and others has confirmed and extended these observations, the former observers calling particular attention to the formation of nuclear buds, as also to the hyperchromatosis and karyorrhexis in gradual death of the cells of various organs. There are, needless to say, other changes seen in the degenerating cell—pyknosis, or contraction and clumping of the nucleus and nuclear material; karyolysis, or complete disappearance of the chromatin. These are evidently post mortem conditions (that is, in the cell), and need not here be considered. From those first mentioned it would seem that the cell may recover. They represent exaggerated conditions of normal processes, but, where the latter stages show themselves, regeneration of the cells becomes hopeless.

As to the significance of this discharge of nuclear material. I shall have a little to say after we have discussed the chemistry of the nucleus. Professor Ewing is here, and he and others will, I trust, discuss the relationship of these modified nuclear discharges to the intracellular appearances which by many have been regarded as cancer and vaccine or variolous organisms.

5. The Chemistry of Nuclear and Cytoplasmic Matter Respectively.

Here, in studying the chemical composition of the two components of the cell, we meet with certain remarkable facts, for not a few of which we are indebted to our colleague, Professor Macallum. There are certain substances of great chemical activity bound up in the nuclei which are present to but slight extent, if, indeed, at times they can be recognized in the cell body. Notably is this the case with phosphorus (Lilienfeld and Monti, Macallum), as also with "masked" iron—iron, that is, in fairly firm combination, so that it is only loosened and made to respond to the tests for free iron after having been subjected to preliminary dissociative treatment. On the other hand, certain substances found to be present in the cell body are absent from nuclear matter. Among these, as Macallum has pointed out, are potassium and chlorides. When now we come to study the proteid contents of the nuclei, we find that these, unlike ordinary proteids of the cell body, are undigested by gastric juice, and that the undigested material consists of the nuclear network and its chromatin and the nucleoli. We owe especially to Kossel's investigations the

explanation of these peculiar features. Cell nuclei, that is, contain as a main constituent a special group of proteids—the nucleoproteids. These nucleoproteids split up into albumen (histon) and nucleins, and it is these nucleins in particular that resist the action of gastric juice, and further, are characterized by high phosphorus content. These, like the nucleoproteids, are of a proteid nature; upon further decomposition they yield albumen and nucleic or nucleinic acid, and can be further broken down into the xanthin bases or purin bodies. It is more particularly the existence of phosphorus and these xanthin bases that differentiate the nucleus from the cell body. How the iron is combined is as yet undetermined. We know at most from Spitzer's observations that it is the iron-containing products of dissociation of the nucleoproteids that retain the oxidative properties. But clearly in the nucleus we have as essential constituents compound proteids of great complexity of organization. As Spitzer, Herter, and others have indicated, the iron is of the utmost importance in bringing about oxidative processes, while the phosphorus likewise would appear to favor oxidative changes. These and other chemical considerations tend to the conclusion that nuclear material possesses in itself potentialities superior to those of any ordinary constituent of the cell body, and again support the view that the nucleus is the centre or source of the higher cell activities.

6. The Ferment Actions of the Cell and Their Relationship to Nuclear Activity.

Jacques Loeb, indeed, has been led to the conclusion that the nucleus is the centre of the oxidative processes of the cell, and the correctness of this view has of late been demonstrated by his pupil Lillie. It would open up too large a field to detail and weigh the data indicating that nuclear matter is the essential source of these bodies which afford the enzyme actions of the cell. We would merely note in passing that it is now universally accepted that much of the cell function—I do not say all—is the outcome of enzyme action, and I would recall the data already brought forward to show that in the absence of the nucleus the higher specific cell activities are at a standstill; the existence also of the relationship of the nucleus to the formation of zymogens.

Referring to the discharge of plasmosomes or spherules of nuclear matter into the cell body it may now be asked, What chemical processes do these indicate? It is suggestive that under normal conditions this discharge has been noted in cells affording specific secretions, and in abnormal conditions accompanied by the accumulation in the cell body of modified paraplasmic granules or globules. It is at least suggestive that in autolysis (the self-digestion of tissues removed from the body under aseptic condi-

tions) we note a diffusion out of nuclear chromatin, and following upon this the formation in the cell body of myelin granules and masses. Everything indicates that these myelin masses so formed are complex lipoid bodies; they contain fatty acids, more particularly oleates, and studying the composition of what is regarded as the simplest group, the lecithins, we find that they are compounds of a nitrogenous base (cholin), with glycero-phospheric acid and a fatty acid. Where these make their appearance in the cell undergoing autolytis (and probably in other conditions), we must conclude that the glyco-phospheric acid is of nuclear origin, and, leaving aside for the moment the question of the seat of origin of the nitrogenous base, remembering that the nucleus of the ordinary cell is devoid of fat, we are led to regard these lecithins as combinations between matter of nuclear origin and fatty matter from the cell body. These lecithins are bodies having very remarkable properties, both chemical and physical; they have great powers of holding other substances in solution, and this is true of all the myelin bodies. It may well be that the suggestive series of nuclear changes and cell accumulations which we find in the cloudy and fatty groups of degenerations, represents successive stages in which the development and dissociation of bodies of this type play the essential part. In our studies in Montreal during the last three years on calcareous and fatty degeneration this matter of the formation of compounds of albumen and fat has constantly been brought before us. Dr. Klotz (in this following upon the conclusions of Brucke long years ago) has brought forward data favoring the view that direct union may occur between the two; but he will be the first to admit that an absolute chemical proof of the existence of such compounds is singularly difficult to adduce. It is true that working with Professor Aschoff at Marburg, we have recently demonstrated the combination between nitrogenous bases, such as cholin and oleic acid, but this is another matter—nitrogenous bases while built up into proteids are not proteids. But if we are not as yet wholly certain of the existence of oleates of albumen, it is a well-ascertained chemical fact that lecithin can combine directly with albumen to form albuminates. Thus lipoids of the nature of the lecithins afford us the necessary linkage bodies between various albumens and between albuminous and fatty acids.* As regards their importance in this connection we would only call attention to Preston Kyes's remarkable observations upon the part played by lecithin as complement, or linkage body, between certain serum proteids and cell proteids and snake

*The mucins would seem to represent a parallel group of carbohydrate-proteid compounds, and the histological observations of Steinhaus, Maximow, and others demonstrate most clearly that nuclear matter is concerned in their development; indeed, in goblet cells, according to Steinhaus, there is a total conversion of the old nucleus of the cell into mucinogen. The figures given by this observer are of the same order as those afforded by Lewing of nuclear changes in epithelial cells in connection with vaccinia and variola.

venom. It is interesting to note how almost simultaneously during the last few months independent workers in Germany, France, the United States, and England, approaching the subject from wholly different points of view, have converged to the same conclusion—that the lipoids are of singular importance in the cell and in relationship to metabolic processes. We seem at the threshold and in its shadow, and see already the light within. But here at the threshold I must stop.

Before closing, however, there is a question which I doubt not has arisen in your minds, and one which must be answered: "You arrogate," it will be said, "all these powers to the nucleus. What part is played by the cytoplasm?" To this I would answer that, passing further and further backwards in our endeavor to comprehend what is life, if we believe in living matter and that vital phenomena are the expression of the effects of physical and chemical forces acting upon that matter, then our ultimate conception of life must be that it is the function, or the sum of functions, of a special order of molecules. For convenience, we would term these ultimate molecules of living matter *biophores*. However much we strain our imagination it would seem impossible to conceive the existence within the cell of two orders of molecules of widely different type, but of equal value, which, by their interaction, initiate vital processes. We must premise that there is in each form of life one primal order of living matter. If so, the biophores must be contained either in the nuclear matter or in the cytoplasm, and as we have shown that the higher vegetative powers of the cell are intimately associated with nuclear matter, it is in the nucleus that we must locate these biophores, and we must therefore regard the cytoplasm as composed of subordinate matter, and as having what must be termed subvital functions.

Now, the simplest conception that we can form of these biophores—and even in the very lowest forms of life they must be singularly complex—is that they are rings or rings of rings, carbon and nitrogen containing, and of the benzol type. The only satisfactory conception of growth, of multiplication of these molecules, is that the pre-existing rings possess unsatisfied affinities, and attract side-chains of various ions, simple and compound, from the surrounding media, and that these become grouped in a manner identical with the grouping present in the pre-existing biophore. In other words, we must regard the building of the new biophoric molecules as obeying laws of the same order as those which determine the building of ions out of a solution to form crystals of a particular form of salt, but with this difference, that so far we have no evidence of biophores becoming formed anew save under the influence of pre-existing biophores—we know no case of spontaneous generation. Thus, growth demands affini-

ties and side-chain formation on the part of the biophores. As with evolution the biophoric molecules have become more complex, we would suppose that ions and radicals have become attracted and attached not in ring arrangement but in loose series and loose connection with the biophores. As in growth new biophoric molecules are formed in association with the pre-existing, the result is an inevitable tendency towards the grouping of the biophores in a central mass surrounded by a zone of other attracted matter. With the development of such a complex system the biophoric molecules proper are no longer in direct and immediate relationship with the outer medium: there is interposed between the two an intermediate mass. The direct attraction of new matter is, in the main, accomplished by the intermediation of this outer cytoplasmic zone. So that eventually we reach the stage in which with increasing complexity of organization the biophoric molecules proper, deprived of the outer cytoplasmic zone, are unable to attract ions to themselves in the proper order—these must first have been built up into particular orders of radicals within the cytoplasm. In other words, the presence of performed cytoplasm becomes essential for the continued existence and growth of the nucleus—of the nuclear-biophoric matter. Each becomes essential for the continued existence of the cell as a whole.

This, frankly, is all hypothetical, but it is the hypothesis which seems best to throw light upon and to harmonize the data we possess regarding the function and the relative importance of nucleus and cytoplasm respectively. Nay more, it is in harmony with what we know concerning the very lowest forms of life, and their imperfect nuclear development.

To-day I feel I shall have done some service if I have demonstrated the dominance of the nucleus and impressed you with the conviction that the future will see not merely a cellular but a nuclear pathology and physiology. From the *omne vivum ex vivo* to the *omne ovum ex ovo* and the *omnis cellula e cellula* of our predecessors we now reach the *omne chromosoma e chromosomate* of the modern student of development and see before us surely the conclusion *omne biophorum ex biophoro ejusdum generis.*

If this be the ultimate conclusion of the investigator, it is at the same time the point from which chemist and physicist, anatomist and physiologist, pathologist and physician must start to develop harmoniously, each along his respective line, their various conceptions of vital processes, and, as the indications are that these biophores exist in the nucleus, so it is that to the nucleus and its alterations each of us, whatever his particular branch of biological science, must apply himself for the fullest, intimate grasp of the succession of changes that take place in health as also in disease.

DISCUSSION.

Professor A. B. Macallum (Toronto) said: The problems of the nucleus which appear to be most important are: (1) How the nucleus arose in the primeval cell; (2) how and why mitosis originated; (3) whether the nucleus elaborates out of the materials diffusing into it its own chromatin or derives the chromatin already prepared from the cytoplasm; (4) the part played by the nuclear membrane. The origin of the nucleus has not yet been studied as a definite problem, and will be attacked only when a comprehensive survey of the cytology of the protozoa and of certain non-nucleated vegetable forms is accomplished. As to the origin of mitosis nothing has been really done, for though we know much of the phenomena of mitosis, this has been obtained from studies and observations on forms in which after millions of years the processes have been definitely fixed. These forms, therefore, would not reveal the stages by which mitosis originated, and until we do find these stages in some cells, it is idle to speculate whether mitosis is due to electrostatic or osmotic forces. It would seem to be of more promise to study the nuclear division in forms which are in their metabolism typically neither animal nor vegetable, for these must, in some cases at least, be representative of forms which existed before the differentiation of organisms into animal and vegetable began, and in which the process of nuclear division should also show a mitosis of a primitive type, thus giving a clue to the origin of this mode of division. The value of work in this line has been shown by the studies of Keuten on *Euglena* and of Lauterborn on *Ceratium hirundinella,* in the former of which, the mitosis, if the process indicated can be so called, is very atypical, and in the latter the nuclear division is such as to suggest that it represents a very early stage in the evolution of mitosis. That division can obtain and does obtain which is certainly not mitotic has been proved by the results of Schaudinn's studies on *Calcituba polymorpha,* a foraminifer in which there is no nuclear membrane in the resting condition, but one develops during the division. According to Schaudinn, a number of other foraminifer forms show a similar mode of division. The nucleus is free from inorganic salts even when these are abundant in the cytoplasm. Chlorides, and notably chloride of sodium, which is so common a constituent of tissues, are not even in infinitesimal quantities found in the nucleus. This indicates that the nuclear membrane has the function of preventing the entrance to the nuclear cavity of inorganic compounds. It must permit the diffusion from the nuclear cavity of colloids, for otherwise the zymogens could not form. This would indicate that the membrane has properties very different from those of a typical semipermeable membrane (parchment) used in osmotic experiments. Such a nuclear mem-

brane, on the other hand, finds its parallel in the observations of Kahlenburg in the *Amer. Journ. of Phys. Chem.*, vol. x., page 141, on rubber membrane separating solutions of sugar and either camphor or copper oleate in pyridine, in which the membrane permits the colloids (oleate or camphor) to pass through, but not the sugar or other crystalloids. Kalflenburg holds that the dialyzed substance is transmitted because the rubber combines with it first. Accepting this explanation and applying it, we can suppose that the substance of the nuclear membrane unites with the colloids and thereby passes them outwards or inwards, while it will not absorb and combine with the salts. This property of the nuclear membrane also explains why the nuclei of the male and female cells are not affected by the constitution of the parent organism.

Dr. Gustav Mann (Oxford) drew attention to the fact that ordinary somatic cells during active metabolism resembled male cells in their large increase of nuclear chromatin, while resting cells resembled the ovum in possessing a large amount of nuclear matter. During normal metabolic processes in Drosera there is a nuclear change resembling karyokinesis, but only one half the number of segments occurring in normal karyokinesis is found. By the administration of antipyretics it is possible to greatly retard nuclear oxidative processes, and thereby to postpone the increase of nuclear chromatin which occurs after feeding with peptone from five minutes to thirty hours. It was suggested that researches along these lines ought to be undertaken with the view of an ultimate chemical means of treating cancer. In addition to the absence of the ordinary halogen salts to which Professor Macallum drew attention, he pointed out the absence of sulphur in the nucleoproteids, and such nucleoproteid derivatives as hemoglobin.

Professor E. Wace Carlier (Birmingham) said: The nature, origin, and function, if any, of the nucleolus is much disputed. The term "nucleolus" has unfortunately been applied by different authors to different bodies, and here only true nucleoli (pyrenin) are considered. When the trophochromatin decreases during nuclear activity, the nucleolus increases in amount, to be then cast out from the nucleus at the first opportunity, that is, as soon as the nucleus takes up a food supply from the lymph. As chromatin is reproduced in the nucleus, the nucleolus also increases in size, and finally is expelled either bodily or after fragmentation. The same thing occurs in the ova of the hedgehog after the growth period and before reduction mitosis. Therefore with Hacker I believe pyrenin to be effete material, unavailable for nuclear activity directly, as maintained by some, though after resolution in the cytoplasm it may become useful.

Farther, zymogen is not derived from nucleolar material, but directly from chromatin with pyrenin as a by-product.

Dr. Herbert E. Roaf (Liverpool) said that the eggs of the sea-urchin when grown in sea water to which minute traces of alkali have been added exhibit increased rapidity of growth with a tendency to irregularity in size and shape of cells. The nuclear divisions accompanying this irregular growth show a typical mitosis (multipolar mitosis, irregular distribution of the chromosomes, etc.). Similar experiments, in which acid was used instead of alkali, show that acid does not cause any increase of growth but from the beginning inhibits the growth.

Dr. Bashford (London) said: From the outset of investigations of the Cancer Research Fund the work has proceeded on the basis that cancer was a cell problem requiring to be approached from the experimental aspect. This problem required to be attacked under conditions more favorable than those obtaining in man. Since we have found the disease pervading the entire vertebrate phylene we have studied the processes of cell division under the favorable—the classical—conditions obtaining in the amphibia. We have found that the so-called heterotypical mitoses have no existence in fact. In the case of tumors which can be propagated there is nothing to indicate the inter-relation of this form of cell division, nor of anything of the nature of nuclear fusion or fertilization. The irregular forms of cell division are apparently subsidiary phenomena. What requires explanation is the apparently ceaseless proliferation by normal bipolar mitoses, in which the normal number of chromosomes is retained. The cell division is, however, only the terminal phase in the growth of the cell itself, and merely the most evident expression of the more complex problem of cell nutrition which lies at its basis. Thus stated it is not so much the power of ceaseless proliferation as the ceaseless power the cells possess of nourishing themselves.

Veronal in the Vomiting of Pregnancy.—F. M. Rowland, of Lichfield, Eng., reports the following case of interest, both from the gravity which it at one time assumed, and from the markedly beneficial effect produced by large doses of veronal administered rectally at a time when the question of procuring abortion was seriously under consideration: A healthy primipara, aged twenty-nine, developed serious symptoms of vomiting at the end of the second month of pregnancy. Nothing was retained by the stomach, and the retching and vomiting prevented her obtaining any sleep for more than a few minutes at a time. No improvement resulted from treatment by any of the following measures,

namely: Iced champagne, effervescing saline mixtures, vinum ipecac, m. j. every hour; cerium oxalate, gr. v. four-hourly; complete rest, careful constant nursing, entire rectal feeding, everything by the mouth being stopped. Hypodermic injections of strychnine were given to improve the pulse, which became rapid and feeble. Potassium bromide, gr. xxx., was given in one of the nutrient injections, and repeated in two hours, without any appreciable effect, and no relief followed morphine, gr. 1-4, hypodermically. At the end of three days veronal, gr. xxxii., in powder, was administered in a nutrient injection. The patient fell asleep within half an hour, and slept well for eleven and a half hours, and at intervals afterwards for the next six hours, merely rousing up while the nutrient injections were given. No vomiting occurred for twenty-five hours after the administration of the veronal, but after that time it gradually returned, though not to the same distressing extent as formerly, and during the following ten days small quantities of Brand's essence, kreochyle, dram doses of pepsin wine, peptonized milk, lime-water and barley-water were occasionally retained for a few hours. At the end of that time, as sleep was chiefly being obtained in snatches of one to one and a half hours, and as the patient was not getting on, another dose of veronal, gr. xxxii., was administered by the rectum. This was followed by ten and a half hours' sleep, with no ill effect other than a purpuric rash on the arms, which passed off in twenty-four hours. Vomiting recurred at intervals, but the patient gradually began to take more varied nourishment by the mouth, the nutrient injections being continued as well for a time. Sleep was obtained naturally in longer periods each day, and a week after the veronal she was getting from five to nine hours daily without the aid of drugs. The intervals between the attacks of vomiting became longer, and by one month from the commencement of the illness she was convalescent, taking ordinary food, and geting out each day. Since that time, four months ago, she has remained quite well, and quickening took place normally. The sleep obtained by the veronal was apparently sound and peaceful, and the patient awoke refreshed and feeling better in every way. Apart from some amount of dysmenorrhea and an attack of ovaritis (?) two years previously, the history was good, and there was no evidence of any co-existing renal or cardiac mischief, and the position of the uterus was normal.—*British Medical Journal,* Nov. 24, 1906.

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Editorials.

THE WARM INFUSION OF MALT IN THE THERAPY OF GASTRIC DISORDERS.

EVERYDAY experience reveals the beneficial effects of warm drinks in gastric therapeutics. Used at meals they are valuable, owing to the fact that they act simultaneously on the sensory, motor and secretory functions of the stomach. Warm drinks relieve pain of the stomach by diminishing its hypersensitiveness. They act on

its motor power by stimulating its unstriped muscular fibres, making them contract just in the same way as an injection of hot water brings about contraction of the womb in a case of uterine hemorrhage.

They promote the working of the active agents of gastric digestion; for, as pepsin acts most powerfully at temperatures ranging from 104 deg. to 122 deg. F., the digestion of albumen takes place under favorable conditions of temperature when warm drinks are taken at meals.

Plain warm water, chamomile tea, weak tea, etc., are commonly used to obtain the desired effects.

Dr. Leon Meunier (*La Presse Medicale,* January 16, 1907), recommends the use of an infusion made by pouring hot water over powdered barley malt, and he claims that in addition to its general properties as a warm drink, this warm infusion also exercises a special action in gastric digestion. As is well known, when barley is steeped in water and dried in a kiln, germination of the grain is forced; under this influence, diastase, the digestive ferment of starch, is formed around the developing embryo. The diastase, penetrating into the starch reserve of the barley grain, transforms the starch into hydration products, soluble starch, dextrine, soluble grape sugar. The barley thus changed forms malt, which is used in brewing and in the distillation of whiskey. In brewing, the malt is exhausted by boiling water, which dissolves the soluble substances derived from the starch, and it then yields a sweet fluid, known in brewing as sweet wort, which, after special manipulation, is changed by fermentation into beer.

In the treatment of barley malt with boiling water, as in brewing, the ferments of the starch totally disappear, diastase being in fact destroyed at a temperature of about 212 deg. F.

But if, instead of pouring boiling water over the malt, as is done in brewing, we use water having a temperature of 158 deg F., we get not only a sweet wort but also an active solution of diastase. The reason of this is that the diastase, which is in solution in the water, attains its maximum of saccharifying action at temperatures ranging between 140 deg. and 176 deg. F.

The sugar-producing properties of an infusion of malt prepared in this fashion can be demonstrated by placing the malt infusion in contact with a solution of starch in a stove, at a tem-

perature of 104 deg. F. Under the influence of the diastase present in the malt the starch is changed into sugar, the presence of which may be shown qualitatively or quantitatively by the employment of Fehling's solution. In man, the changes of starch into sugar in the stomach, that is to say, the digestion of all vegetable foods, is produced in a similar way by the action of the diastase contained in the saliva (ptyalin). But the diastasic action, which begins during mastication and continues in the stomach, is often seriously interfered with. It is well known that, owing to different influences—too rapid mastication of food, exaggerated secretion of hydrochloric acid in the stomach, which destroys the salivary ferment in the stomach, the digestion of starch is seriously impeded in the majority of cases of gastric dyspepsia.

It is reasonable to suppose, therefore, that in severe cases of gastric dyspepsia the use of a warm infusion of malt would assist in overcoming the insufficient conversion of starch into sugar in the stomach, and would thus improve the digestion of starch. Dr. Meunier says that this fact can be shown after administering a test meal. If on two successive days you give the same patient an Ewald test meal consisting on the first day of bread and tea and on the second day of bread and a warm infusion of malt, the soluble sugar will be found more abundantly in the gastric juice secreted during the second meal than that secreted during the first one.

To get the maximum of saccharifying action in an infusion of malt Dr. Meunier recommends that it should be prepared like a cup of French coffee; grind a tablespoonful of malt in a coffee mill and exhaust it in a coffee filter having a flannel bottom, with a teacupful of water, which is almost boiling. On principle, water of a temperature over 176 deg. F. should not be poured over malt, as the diastase is destroyed at a temperature of 212 deg. F. As a matter of fact, however, water which is almost boiling may be employed for this purpose, because the hot water used in making the infusion of malt loses some of its heat when it is in contact with the flannel strainer of the coffee filter, and thus comes into contact with the ground malt at a temperature of about 176 deg. F., as Dr. Meunier has proved.

This warm infusion of malt may be drunk during or after meals. Speaking generally, Dr. Meunier contends that in addi-

tion to its general qualities as a warm drink malt tea has special therapeutic properties. Taken at meals, it favors the conversion of starch into soluble sugar and thus improves the often enfeebled digestion of all foods of vegetable origin. J. J. C.

THE MARIA LOUISA ROBERTSON RESIDENCE FOR NURSES.

Only a dream realized, perhaps, to the man who plans and then carries his ideas to a perfect culmination; but a gift so great in reality, and an example in giving so generous that words other than a simple "Thank you" addressed to the donor, Mr. John Ross Robertson, would be fulsome.

To give in detail all the comforts, luxuries and necessities that lie within the four walls of the new Residence for Nurses would fill a journal. In the February number of *The Canadian Nurse*, the editress, Dr. Helen MacMurchy, has splendidly filled this need, by description and illustration, and we heartily commend this number of the *Nurse* to physicians whom distance prevented enjoying "a look in" on the opening day.

The corner-stone of the building was laid October 7th, 1905, and the Residence formally opened February 5th, 1907, by Mr. Goldwin Smith in the presence of the Lieutenant-Governor and many physicians and other friends of the donor of the institution. The nurses call it "The Nurses' Paradise," and paradise it is. Its general arrangement, equipment, coloring and furnishing are complete, pleasure-giving and luxuriously comfortable. The gymnasium, the baths, the swimming tank, writing and reception rooms, sewing rooms, pantries, broom cupboards, and big refrigerators ice-filled from without,—in short, every modern invention and improvement is there to enjoy and conjure with.

The young women who receive their probationary training amid such surroundings are doubly equipped for their chosen life-work. They emerge with sound bodies, steady nerves, and with that touch of delicacy and brightness that the environments of beauty and refinement always impart. True, they may often suffer, and stifle a sigh of regret as they undertake work later on among patients whose homes lack even the comforts to which their student years have accustomed them; and then, should

Cupid plead a poor man's cause successfully, will discontent creep in? Well, the answer to that question we leave to the Man in the Moon. W. A. Y.

A HYGIENIC INSTITUTE AT LONDON, ONTARIO.

The Ontario Government has decided to make a grant of $50,000 towards the erection of a hygienic institute in the city of London, and to give $5,000 per annum for five years towards its maintenance. This step is in accordance with the policy of the Government to encourage medical education in sections of Ontario other than those adjacent to the facilities afforded at the University of Toronto.

It is understood that the city of London will give a free site for the institute and also vote a sum, perhaps equalling that given by the Government, towards the cost of the building. In addition, the city of London will build a contagious diseases hospital, separate from the institute, but with which the staff of the institute will co-operate whenever occasion may require. It is also expected that there will be a certain amount of revenue from fees paid by students, and from the fees charged for the examination of water, milk, food products, etc.

Dr. W. M. English, Chairman of the Local Board of Health of London, Ontario, has kindly written us on this subject, and we refer our readers to his letter, which appears at p. 183 of this issue. J. J. C.

WHAT IS MEDICAL EXPERT EVIDENCE WORTH?

In connection with the recent telephone operators' strike, counsel on both sides summoned their quota of medical practitioners to give testimony on such points as whether or not eight hours' work was too much for the average operator, etc. We understand that the counsel for the girls, when certain discussion took place in court as to whether the physicians summoned were entitled to collect expert fees, or only the usual four dollars per day as provided by law for the payment of a medical witness, made the statement that any physician who was served with the usual subpœna had to come, if necessary, without being paid at all for his

services. This is, of course, all nonsense, but it brings up the point so often discussed, and referred to in this JOURNAL several times during the past ten years, *viz.*, what a physician is entitled to for attendance in court. This all depends upon the character of the evidence he is called upon to give. We do not agree with those who claim that four dollars a day is a sufficiently large fee for a medical man who gives evidence in a court room. No professional man should be expected to sacrifice his time at this rate, especially when it is remembered that to be summoned to any court means, as a rule, a waste of time to the extent of at least a couple of hours. What lawyer of any standing is there who is willing to devote two continuous hours of his time to a client's case for any such paltry sum? We venture to think that his fee would be considerably more. The same applies to other professions and callings. Taking it for granted, however, that four dollars is a fair fee for a medical witness' attendance in court, it is entirely different when a man has to give what is ordinarily termed expert testimony. An ordinary witness must only state facts; but when he is called upon to give an opinion as to matter depending upon special knowledge, he has every right to be paid accordingly. The medical gentlemen who appeared in the Telephone case were giving evidence as to their opinion on certain points depending upon their professional knowledge, an opinion which could not be passed upon by a layman, and a fee of four dollars a day for such evidence is entirely inadequate. The matter of the payment of an expert witness' fees is looked upon in different lights by different judges. One High Court judge, we understand, not long ago decided that, not only was an expert witness a compellable witness, but that he could not demand for his services in court more than the usual four dollars *per diem*. Judge Morson, on the other hand, not long ago, in the Division Court, gave judgment in favor of two Toronto practitioners who had sued for fees as experts what amounted to about $50 per day, giving it as his opinion that an expert, if an expert, was entitled to collect a reasonable sum for his services. However, the only way to settle this mooted point is for some professional brother, who has a little more courage than others, to fight it out and enter action for reasonable remuneration (say $5.00 an hour as a minimum). A College Street physician not long ago sued the Toronto

Railway Co. in the Division Court for his fee in connection with an accident, and, unfairly, we consider, had judgment entered against him. He said that all he desired to get was the ruling of the court for the sake of his professional brethren. Let the Medical Council take this up and get a ruling as to this by securing such legislation as will for ever set this matter to rights. Alfred Swayne Taylor once said that no man has any right to enter the witness box to give expert evidence unless he knows *all* about the subject under discussion. That, of course, is too sweeping a definition, and, if literally followed, would mean that no such personage as an expert existed. As to whether some of our *confrères* who figured in the case to which we refer, could, even in the ordinary acceptation of the word "expert" be considered as such, we leave to the Philadelphia lawyer whose specialty was the reading of illegible chirography. W. A. Y.

IMPORTANT QUESTIONS TO BE DISCUSSED AT THE NEXT MEETING OF THE ONTARIO MEDICAL ASSOCIATION.

From a letter sent by Dr. D. J. Gibb Wishart, Chairman of the Committee on Papers and Business of the Ontario Medical Association, (*vide* p. 184), we learn that arrangements are being made to hold general discussions on several important questions at the next annual meeting of that association. These discussions will refer to the relations of the medical profession to the public, and are to be taken up under four heads: (*a*) Medico-legal Aspects, embracing the subjects of coroners, post-mortem examinations, medical evidence, court fees; (*b*) Public Health Aspects, embracing county medical health officers, attendance upon the poor, fees for registration of births, deaths and infectious diseases, compulsory vaccination, etc.; (*c*) The Ideals for Ontario in Asylum Work; (*d*) The Water Supplies of the Province, and the methods for the prevention of their infection. We learn that the opening of these discussions has been placed in the hands of competent men and that authorities upon the various matters referred to have been invited to discuss the papers, many of which have already been received.

It is also stated that the programme of papers on medical and surgical subjects is already well advanced.

There is, therefore, good reason to believe that an excellent programme will be provided at the next annual meeting of the Provincial Medical Association. It is earnestly to be hoped that many physicians will be present to give to the subjects discussed the weight which their importance deserves. The physicians of Ontario, who number nearly 3,000, should evince towards their Provincial Medical Association a little of that enthusiastic loyalty which helped to make a success of the meeting of the British Medical Association last August. J. J. C.

A REMARK OVER THE TELEPHONE.

AGAIN a labor problem forces itself upon the public, and its weary droning of pros and cons is a subject for newspaper, pulpit and fireside discussion. We refer, of course, to the strike of the "Telephone girls," and the investigation or inquiry now going on. The subject only concerns medical journalism inasmuch as it has to do with the health of a portion of the community. A delicate woman has not any business in the jostling highways of city work-a-day life. There are so many truly womanly occupations now open to her. Honest wages must be honestly earned. It is dishonest for incompetents to seek places and crowd the labor market with fainting foolishness. Consequently a person applying for such a nerve-wracking work as a telephone operator, or a kindred occupation, should be submitted to examination by a physician on application for the position, and, if appointed, be re-examined twice annually. We deem this expedient would be just to both employer and employee. It certainly is conducive to neither the health nor morals of women "to strike," and such scenes as we witnessed of striving to keep one another "out" were more disturbing to the nerves of the striking operators than days of listening to the urgent "hello's" of persons in a hurry to transmit a business message. All work has more or less strain, and all the world's workers are aweary at times; but it has to be done, and there are plenty willing, and from a "health" standpoint, quite able. 'Tis marvellous how health often improves when wages go up. Surely the disease most prevalent in this day and generation is discontent. We cannot discuss work in its

relation to wages and hours here; it is not the province of a medical journal, and, if the subject were thrust upon us, we could only stagger at the thought. There is but one Upton Sinclair in this generation, and on his shoulders he carries the burden of discussing the great labor problem. Would he had the power to solve the problem, and that harmony might come into the lives of the Classes and the Masses alike, and silence forever the discordant slogan of the world's wage-earners:

> "Our blood splashes upward, O our tyrants,
> And your purple shows your path;
> But the child's sob curseth deeper in the silence
> Than the strong man in his wrath."

February 17th. W. A. Y.

PYORRHEA ALVEOLARIS AND THE DUTY OF THE PHYSICIAN.

At the Fifteenth International Congress of Medicine, in the section of Laryngology, Rhinology, Otology and Stomatology, Dr. Jaime de Losada read a paper on the treatment of pyorrhea alveolaris, an abstract of which appears in *The Lancet* (London), May 5th, 1906, p. 1272. He said that the first class of case was characterized by the inflammation of the edge of the gum, produced by the mechanical irritation of tartar. The second class was distinguished by the complete absence of mechanical irritation, and the malady was largely confined to the periosteum. In the first class the affection originated in the region of the root, the remainder of the fang being normal. The prognosis was favorable, and the treatment consisted in the removal of the cause of irritation, curettage, and the cleaning away of every particle of foreign matter, proceeding as far down the fang as was necessary and cleaning out all pockets with a jet of hot water, containing some germicidal and astringent agent in solution, such as trichloracetic acid.

In the second class the prognosis was usually unfavorable, but treatment should be commenced at the earliest possible date. It should consist chiefly of general hygiene of the mouth and constitutional remedies for arthritis should be administered; curettage and germicidal and astringent irrigations should also be employed in these cases. Perchloride of mercury was especially recom-

mended as an antiseptic. A third class of cases was distinguished by degeneration and increase of periosteum of the fang, frequently accompanied by the formation of calculi, together with the presence of urates and calcareous plaques. The prognosis here depended largely on the intensity of the gouty diathesis, and the treatment should be principally constitutional. The local treatment was much the same as that recommended in other cases.

Professor Osler, in *Practice of Medicine*, p. 439, says: "Pyorrhea alveolaris is the most common cause of foul breath in adults and is almost constantly present after middle life, causing a perfectly distinctive odor, only too well known to most of us. To test for its presence draw a bit of stout thread or the edge of a piece of paper high up between the teeth and the gums and then smell it. Scrupulous treatment of the gums by a dentist is needed and daily scouring, etc."

In "A System of Clinical Medicine," by Dr. Savill, London, 1903, the author, after describing pyorrhea alveolaris, says: "The discharge from the mouth not only imparts an offensive odor to the breath, but, being continually swallowed, is absorbed and sets up a chronic toxemic condition which, it is now recognized, may produce a large number of troublesome symptoms. Dyspepsia, even apart from difficulties of mastication, invariably ensues, sooner or later. But, even before the dyspepsia becomes established, the patient is listless, languid and unfit for work, and complains of a great variety of functional nerve symptoms. Among the symptoms due to this cause I may mention headache, neuralgia, pain or tingling in the limbs and prostration, attacks of flushing, shivering or giddiness, a feeling of heaviness and swelling of the limbs, which is sometimes attended by actual odema of the ankles, wrists and other parts, which differs from ordinary anasarca in requiring longer pressure to produce the pit. Great depression is usual, and even melancholia may result—one of my patients committed suicide."

In reference to treatment Dr. Savill recommends the removal of the tartar and the careful dressing of the suppurating pockets with sulphate of copper or some other mild escharotic at intervals of a week or two, later on a few months. He thinks that the only radical cure is the removal of the teeth or stumps. Cases also occur in which symptoms of pyorrhea alveolaris arise from stumps which are left beneath an artificial plate. If pyorrhea is

not recognized as the cause and removed, no treatment is of much use.

These and other pertinent remarks, which could be multiplied if necessary, go to prove that the diagnosis of pyorrhea is of the first importance if we would benefit our neurotic patients, many of whom suffer from a disease which has not been sought for, or which, if recognized, has not been treated.

First recognize the disease and then treat it.

The treatment of pyorrhea alveolaris should be carried out by a dental surgeon; but there are degrees of competence in dental surgeons, and some of them are more conscientious and painstaking in caring for the unfortunate sufferers from pyorrhea alveolaris than others. Study, practice, a good set of tools and the patience and skill to use them adroitly and gently, are necessary if teeth which are beginning to show signs of parting company with the gums are to be retained. We know of a patient who, after having received thorough treatment for pyorrhea alveolaris from a dental surgeon, derived benefit, not only in the improved condition of his teeth and gums, but also in freedom from dyspepsia and absence of neurotic symptoms. The cure in this case was effected by the methodical treatment of nearly all the teeth left in this patient's mouth, and nothing more, except a well-regulated diet.

Perhaps a doctor may think that he would be better employed than in finding cases for a dental specialist; but, after all has been said, the diagnosis of disease or diseased conditions and the restoration to health of a patient are the primal objects of medical science and surgical art. Should a medical practitioner discover, by making Dr. Osler's simple test, that a patient has pyorrhea alveolaris, the honest course to pursue is to send the patient to a competent dental surgeon for treatment. J. J. C.

MEETING OF THE AMERICAN ANTI-TUBERCULOSIS LEAGUE AT ATLANTIC CITY, N.J., JUNE 1-4, 1907.

Dr. George Brown, President and executive officer of the American Anti-Tuberculosis League, issues "A Plea for Humanity."

The next meeting of this association will be held at Atlantic

City, New Jersey, June 1-4, 1907, under the auspices of the following Reception and Entertainment Committee: Dr. Edward Guion, Vice-President and Chairman, Atlantic City, N.J.; Dr. Theodore Senseman, Vice-President, Atlantic City, N.J.; Dr. D. Edgar Darnall, Vice-President, Atlantic City, N.J.; Dr. J. A. Joy, Vice-President, Atlantic City, N.J.; Dr. A. B. Shimer, Vice-President, Atlantic City, N.J.

Physicians and sanitarians desirous of attending this meeting should write to Dr. Edward Guion, Chairman Reception and Entertainment Committee, Atlantic City, N.J., for hotel rates and reservations.

The American Medical Association meets at Atlantic City, June 4-7, 1907. Members and delegates can attend the meetings of both bodies, as the dates do not conflict. J. J. C.

EDITORIAL NOTES

Multiple (Insular: Disseminated) Sclerosis (Sclerose en Plaques.)—This chronic affection of the brain and cord, characterized by localized areas in which the nerve elements are more or less replaced by neuroglia, has been studied by Guinio Catola (Florence). A paper giving the results of his recent observations appears in *Nouvelle iconographie de la Salpetrière,* 19e Année, No. 4, Juillet, Août, 1906, p. 337-361, 4 pl., hors texte). The author makes a critical study of the syphilitic origin of insular sclerosis. From the numerous bibliographical papers which he mentions and from researches made by himself in Dr. P. Marie's laboratory, he concludes that the foci of syphilitic sclerosis may possess all the histological characters of common insulated sclerosis. Consequently, he admits that syphilis may be a causative factor in the etiology of insulated sclerosis, and that there is a syphilitic insulated sclerosis, which compares closely with forms of that disease originating in some other infection. This notion is not new and has evidently, ere now, influenced practitioners in the treatment of insulated sclerosis. Dr. Osler says in *Practice of Medicine,* p. 931: "No known treatment has any influence on the progress of sclerosis of the brain. Neither the iodides nor mercury have the slightest effect, but a prolonged

course of nitrate of silver may be tried and arsenic is recommended."

The Weight of the Brain and its Relations to Physical and Mental Labor.—A contribution to this question which weakens the notions formerly prevalent on it, appears in *Revue v neurologii, psychiatrii, fysikalnia diaeteticke therapie,* Prague, 3e Année, Septembre, 1906. No. 9, p. 415-418. The author's conclusions are as follows: "It can be shown by the aid of figures that there are certain relations between the weight of the brain and its functions. These relations may be due to two causes: On the one part, cerebral aptitude for any work is due to the physical and psychical properties of the brain; on the other hand, work of the brain exercises, in turn, an influence on its own physical and psychical properties. Remarkable differences in brain weight have been noted in individuals of different sex, age and stature, and these differences have been influenced by the development of the muscular system, by alimentation, by the degree of health or illness, or by the form of death. Finally, intellectual work is not the sole factor in producing the weight of the brain, but it has some influence therein."

The Mortality of Paris During the Nineteenth Century.—M. Bertillon, at a meeting of the Academy of Medicine of Paris, Jan. 2, 1907, showed that a considerable reduction in the mortality of Paris had taken place in the course of the last century. During the Restoration it ranged from 32 to 33 deaths per 1,000 inhabitants; in 1860 it fell to 26 per 1,000; to-day it is 19 per 1,000. The principal factor in the reduction of the mortality is the diminution in the infantile deaths. The principal causes of death which have most contributed to the lessening of mortality in Paris are infectious fevers (notably typhoid fever and diphtheria), diseases of the respiratory organs and infantile diarrhea. The mortality from tuberculosis is high. Slightly diminished since 1886, it is still, however, 456 per 100,000 inhabitants, or 4.56 per cent., a much higher figure than that of London, Berlin or Vienna, where the diminution has been greater. In many diseases (heart diseases, liver diseases), the mortality remains stationary. In two, however, nephritis and cancer, the mortality has increased.

Pernicious Anemia and Typhoid Fever.—In a paper read at the Society of Internal Medicine of the Hospitals of Paris (December 27, 1906), Drs. Vaques and Esmein stated that if the causes of pernicious anemia escape discovery in the greater number of cases, it appears certain, nowadays, that this disease may be provoked by acute infectious diseases. Destruction of the blood is effected by such agents, owing to the presence in the blood of microbes which have a hemolytic property. These authors observed a case of typhoid fever complicated with grave anemia. Red blood cells, 180,000, leucopenia, a total myeloid reaction; serious hemorrhages in different parts of the patient's body were also noted. The Widal reaction and the diazo-reaction were positive, and a culture of the patient's blood enabled the observers to isolate a streptococcus and a real Eberth bacillus, which became agglutinated when acted on by the blood serum of other typhoid patients. The patient (a female), who was treated, according to custom, with baths and an abundant diet, recovered without any other complication. A similar case has been recently reported by Drs. Mouisset, Mouriquand and Thevenot. The authors of the paper thought that the progress of hematology and its more common practice will enable practitioners to show more frequently the agency of similar disorders in the production of pernicious anemia and, by such means, will reduce the number of anemias of obscure or doubtful origin.

Acute Pleurisy.—In the International Clinics (Vol. 4, 16th. Series), A. A. Stevens states, in reference to the treatment of acute pleurisy, that the patient should be confined to bed until the exudate begins to recede. Temporary relief of pain may be given by a hypodermic injection of morphia, but the application of leeches or of a few wet cups is preferable. Thin poultices may be applied to the chest after the local bleeding. He has found that strapping the affected side with adhesive plaster does not relieve the severe pain in the side. In sthenic cases he has found salicylate of sodium useful, in doses of a dram or a dram and a half in 24 hours. In the great majority of cases, however, this remedy is useless. Medical treatment can do little to promote the removal of the exudate. He has given up the use of iodide of potassium as an absorbent of the exudate. Counter-

irritation by means of flying blisters appears to exercise a favorable influence in promoting absorption of the exudate and, in vigorous subjects, the use of saline purgatives is sometimes serviceable for the same purpose. Irrespective of the period of the disease, paracentesis is urgently required: (1) When the fluid in the pleural sac excites cough, dyspnea, cyanosis or failing pulse; and (2) when the fluid reaches to the level of the third rib, and there is displacement of the neighboring organs. The immediate prognosis is favorable, the remote one unfavorable. The after treatment should be that laid down for incipient tuberculosis—a life in the open air, full diet, tonics, such as iron and arsenic.

A Good Way to give Cod-Liver Oil to Tubercular Children.—A good way of giving cod-liver oil to tubercular children, says Dr. Savill, is to pour away the oil from a box of sardines and replace it by cod-liver oil. After standing for 24 hours the oil becomes flavored by the sardines, and both can be given together to the child. A suitable dietary should accompany this treatment. An important consideration in the feeding of children under two years of age is that great care should be exercised in the cleanliness and asepsis of the milk given them. If this were done effectively, tabes mesenterica would become less frequent. This wasting disorder occurs for the most part in children of two years and upwards, and is due to tuberculosis of the mesenteric glands.

The Blister and Leucocytosis.—Drs. Carriere and La Griffoul (Montpellier, France) reported favorably on the action of blisters at a meeting of the Society of Biology (Paris), December 22, 1906. In addition to the analgesic and diuretic effects of the blister there is another effect which, in their opinion, deserves special mention—the stimulation, the spur, which a blister gives to phagocytosis. The increase in the white blood cells reaches many thousands and may last for several days. It produces a polynucleosis, with eosinophilia. The blister is particularly indicated when leucocytosis is weak or moderate. The blister may also throw some light on the prognosis of a case. Absence of a leucocytic reaction indicates, in general, a grave attack; a marked and persistent leucocytic reaction is, on the contrary, an excellent prognostic.

Influence of Local Anesthesia on the Pain Consecutive to Injections of Soluble Salts of Mercury.—Dr. P. Salmon stated at a meeting of the Society of Biology (Paris, December 29, 1906) that, as was well known, pain was a formidable objection to the employment of mercurial treatment, by subcutaneous or intra-muscular injections. The advent of pain may be retarded, or sometimes even prevented, if cocaine or stovaine is injected first. These alkaloids are precipitated and rendered inert by mercurial salts. To get a favorable result, therefore, it is necessary to make the two injections, anesthetic and specific, separately. The two injections should be made at different depths.

A Quebec By-law Against Spitting.—The following by-law against spitting in public places came into force in Quebec, October 28th, 1906: "Whosoever shall spit upon the sidewalks of streets, roads and public places, or on the floor of any public building or vehicle, or on the deck of any public boat, shall be liable to a fine not exceeding five dollars for the first offence, and to a fine not exceeding ten dollars for every subsequent offence." We notice that there is no provision in this by-law against anyone expectorating into the street gutters. Total inhibition of spitting in public places is excellent in theory, but difficult in practice.

Toxic Neuritis Caused by Phosphite of Creosote.—Toxic neuritis, caused by poisoning, has been traced to alcohol, arsenic, lead and mercury, some of the most useful drugs mentioned in the Pharmacopeia. Dr. Osler says he has seen a case of neuritis "which followed the use of two grains of the sulphocarbolate of zinc taken daily for three years. Tea, coffee and tobacco are mentioned as rare causes." Judging from the extensive use of the agents referred to in the last remark by Dr. Osler, one would surmise that billions of the present generation of the human race are subject to, or likely to be sufferers from, neuritis. The toxic materials absorbed into the blood are said to produce the inflammation of nerve tissues, known as neuritis. How the toxins do it is not clear; but neither, for that matter, is it clear how toxins produce uremic convulsions. If the eliminating power of the kindeys is intact, uremia will not appear, even though a vast amount of toxic material be

circulating in the blood. May it not be also true that if the eliminating functions of the skin, kidneys and intestines be active, neuritis will not appear in a patient who may have some medicinal or alimentary toxins circulating in his blood? In a learned paper read before the International Society of Tuberculosis, November 6, 1906, Dr. Bertheim, Editor of the International Review of Tuberculosis, states that in his opinion phosphate of creosote, which usually yields excellent therapeutic results in tuberculosis, is often followed by lengthy and painful attacks of polyneuritis of toxic origin. This result has not been observed after the use of the phosphite of creosote.

Elimination in the Treatment of Tuberculosis.—In a paper entitled "The Common Sense Treatment of Tuberculosis," by Dr. T. W. Williams, published in Merck's Archives, January, 1907, the following appears: "When we give our malefern to kill a tapeworm, we follow it with purgatives to expel the worm from the body and tonics and restoratives to build up. Before giving the vermifuge we restrict the patient's diet and thus reduce the amount of pabulum accessible to the parasite and increase the proportion of the toxin in its food. In tuberculosis we aim to do the same thing. By restricting the diet, the blood becomes highly charged, proportionately, with the germicide (creosote). After killing whole colonies of microbes we must get rid of their remains. The white blood corpuscles are increased in number and appropriate as food the bacilli tuberculosis, as they do other less vindictive bacteria. Still those processes leave some residuum and 'physiological ash,' which we must eliminate. Enemas are preferable to purgatives." Dr. Williams enlarges on the good effects of the enema, which cleanses, empties and disinfects the colon, making room for the descent of the contents of the small intestines, thus preventing fermentation and autoinfection, while promoting the digestion and assimilation of food. The enema, at a temperature of 105 deg. F. should be administered on first rising in the morning, or after breakfast. In view of the enfeebled circulation and digestion of tubercular patients, and the added fact that medicaments, such as arsenic and creosote, are given them for long periods of time, elimination is certainly requisite in cases of tuberculosis. Daily elimination for evacuative purposes might, if deemed proper, be followed by an enema

of an emulsion of phosphite of creosote, given in tepid milk. This method of administering creosote to a tubercular patient is favored by Dr. Bertheim and certainly appears to have much to recommend it. J. J. C.

PERSONAL.

Dr. Lowry begs to announce to the profession that he has opened up consultation rooms at No. 2 College Street, and will make a specialty of ophthalmology.

Obituary

DEATH OF SIR WILLIAM HINGSTON.

Sir William Hingston, one of Canada's most distinguished physicians and philanthropists, died suddenly on Feb. 19th, at his home on Sherbrooke Street, Montreal.

The news of the passing away of this familiar figure spread rapidly, and on all sides could be heard expressions of grief. Despite Sir William's advanced age, his erect bearing, his active walk, his continual freshness, led those who knew him to think of him ever as younger than he was. Although taken slightly ill after dinner on the previous Sunday, death was by no means considered near.

The day before his death Sir William was up and about as usual, and lunched with a party of friends at the Mount Royal Club in the middle of the day. It was noticed that, although he endeavored to retain his usual pleasant demeanor during the meal, there was something amiss. He did not complain of any illness or pain, but seemed to find it hard to keep awake. After luncheon, in the smoking room, he dozed off, and it was not until some time had passed that his friends realized that his breathing was heavy and abnormal. Efforts were made to arouse him, but without avail. He seemed to have dropped off in a quiet trance.

Medical aid was at once summoned, and he was conveyed to his home, where his son, Dr. Donald Hingston, and several other physicians did all in their power to revive consciousness. Sir William still continued to sleep peacefully, however, and it was not until early next morning that any fears were entertained as to what the ultimate outcome would be. Acute indigestion is ascribed as the cause of his death.

Sir William Hingston was the son of the late Lieut.-Colonel Hingston, formerly in her Majesty's 100th Regiment. He was born near Huntingdon, January 29th, 1829, and was educated at the Montreal College, entering McGill University and taking course in arts and medicine. He completed his university career at Edinburgh, where he received his diploma as surgeon. He returned to Montreal, and in 1853 began the practice of his profession, a practice which extended so rapidly that in a few years the name of Dr. Hingston was a household word throughout the city. In March, 1875, he married a daughter of the late Hon.

D. A. Macdonald, formerly Postmaster-General and Lieut.-Governor of Ontario.

He was formerly President of the City Passenger Railway Company, and had long been a director, and at the time of his death was President of the Montreal City and District Savings Bank. He was an unsuccessful candidate for Montreal Centre in the bye-election of 1895, for the Commons, being defeated by Hon. James McShane. In the following year he was called to the Senate of Canada, and was appointed a member of the Ottawa Improvement Commission in 1902. In politics he was a Conservative, and in religion a Roman Catholic.

Sir William Hingston is survived by his wife, Lady Hingston, one daughter, Miss Eileen, and four sons. The eldest son is at present studying for the priesthood; the second is Dr. Donald Hingston of the Hotel Dieu, while the third, Mr. Basil, is with the firm of W. P. O'Brien & Company, stock brokers. The youngest is a student at Laval.

Correspondence.

The Editor cannot hold himself responsible for any views expressed in this Department.

To the Editor of the CANADIAN JOURNAL OF MEDICINE AND SURGERY:

My Dear Sir,—I regret that I have been unable to answer yours of the 25th January ere this, but will now try to give you a fair idea of what we have outlined as the work of the proposed Hygienic Institute.

First, I might say that it is only along the line of advanced medical instruction or education that the Government would in any way consider our request.

Our aim in establishing the Hygienic Institute here is to provide three fully-equipped laboratories in Chemistry, Physics and Bacteriology, with several small research rooms in connection with each. In the building there would, of course, be a lecture-room, capable of accommodating 100 or 150 people, hygienic and other museums, library, etc.

The Government grant towards the erection and maintenance of the institution is given in response to signed requisitions—in number four hundred or more—from nearly every medical practitioner in and west of Guelph, and the majority of the Boards of Health in this western district, and more especially due to the energetic and persistent pleading with the Premier and Cabinet of the Hon. A. Beck, our local member.

Our endeavor will be to have our Professor of Bacteriology, etc., appointed the examiner for the Provincial Board of Health in the west, as Dr. Connell of Kingston is for the eastern part of Ontario.

The work of the institute will be the examination of water, milk, food products, patent medicines, bacteriological and pathological specimens and general research work as to the diseases of men and animals.

The Western University at present has not the power to confer the degree of D.P.H., but if the institute is a success in the training of health officers, inspectors, etc., and there is a demand for the degree, I have no doubt that our senate will so amend its charter, with the consent of the Legislature, that the desired degree may be given.

Thanking you for your intended kindness in referring to the matter in your already very full columns, I am,

Sincerely yours.

W. M. ENGLISH.

688 Dundas Street, London, February 6, 1907.

News of the Month.

CANADIAN MEDICAL ASSOCIATION, MONTREAL, SEPTEMBER 11th, 12th, 13th, 1907.

WORKING COMMITTEES.

Medicine.—Drs. H. B. Cushing, F. G. Finley, Gordon, H. A. Lefleur, Martin, Morrow, Nicholl, Peters, Richer.

Surgery.—Drs. Armstrong, Archibald, Bell, Barlow, Bazin, Elder, England, Garrow, Monod, Forbes, von Eberts.

Dermatology.—Drs. Jack, Shepherd.

State Medicine.—Drs. McTaggart, Louis Laberge, Starkey.

Laboratory Workers.—Drs. Keenan, Yates, Duval, Adami, Klotz, Bruere.

Pediatrics.—Drs. Blackador, Gordon Campbell, Fry, F. P. Shaw, Francis.

Gynecology.—Drs. Chipman, Gardner, Lockhart, Lapthorn, Smith.

Museum.—Drs. Adami, Maud Abbott.

Eye.—Drs. Byers, J. J. Gardner, Stirling, McKee, Tooke.

Laryngological.—Drs. H. S. Birkett, R. Craig, Jamieson, H. D. Hamilton.

Neurological.—Drs. Shirres, Colin Russell.

Obstetrics.—Drs. Cameron, Evans, Reddy, Little.

THE ONTARIO MEDICAL ASSOCIATION.

THE Committee on Papers announces that the series of papers to be read at the next meeting, dealing with the Relation of the Profession and the Public, will be read under the following titles:

1. "The Medico-Legal Aspects," by Dr. G. Silverthorn. This paper will take up the question of the appointment and remuneration of coroners; the selection of expert pathologists for autopsy work and proper remuneration; the present undesirable method of retaining experts in legal cases; a discussion of the present irresponsibility for the payment of fees in legal cases and a comparison of all fees with those of other countries.

2. "The Public Health Aspects," by Dr. J. W. S. McCullough. The need of the appointment of county health officers; compulsory vaccination; remuneration for the registration of births, deaths and infectious diseases, and that attendance upon the poor should be remunerated by the municipality; the organization of the profession, and how to deal with the peripatetic dead-beat.

3. "The Ideals of Asylum Work for Ontario," by Dr. C. K. Clarke.

4. "The Infection of Drinking Water," by Dr. J. A. Amyot. The following have promised with some reservation at this early date to discuss these papers: Drs. C. A. Hodgetts, R. Raikes, W. R. Hall will take up certain portions of Dr. McCullough's paper; Drs. Beemer, Burgess, of Montreal, J. Russell and W. N. Barnhart, Dr. C. K. Clarke's, and Drs. Starkey, of Montreal, and W. T. Connell, Dr. Amyot's paper.

The Committee on Arrangements wishes to announce that there will be a smoking concert on the first evening and on the second a dinner at one of the large hotels, at which a distinguished guest will speak, whose name will be announced later.

SOCIETE INTERNATIONALE DE LA TUBERCULOSE.

MEETING of the 6th of November, under the Presidency of Professor Lancereaux.

THE COMPULSORY NOTIFICATION OF TUBERCULOSIS.

Dr. Samuel Bernheim and Louis Dieupart. The authors, after having referred to the conclusions of the recent International Conference on Tuberculosis (at The Hague in October, 1906), and the favorable report of the committee of the Academy of Medicine (June, 1906), declare: That prophylaxy can become real and efficacious unless the compulsory notification of tuberculosis is legally enforced. In a struggle with such a formidable enemy no half measures will avail.

The compulsory notification of tuberculosis could be made without any shock to humanity. Certain countries have adopted it and find the advantage of it. We must await the day when the public in all countries will be sufficiently educated to accept this excellent measure of protection unhesitatingly.

Compulsory notification, of course, involves, *ipso facto*, compulsory disinfection.

According to Messrs. Bernheim and Dieupart compulsory notification during the lifetime of the patients should only apply to

manifest tuberculosis in which the patient expectorates the bacilli. It appears to them needless to complicate the matter by including all forms of osseous, ganglionary, cutaneous and other forms, which rarely present any danger.

THE PHOSPHO-CREOSOTE TREATMENT OF TUBERCULOSIS.

Dr. Samuel Bernheim. Demineralization is a characteristic of the tuberculous subject. The soil is poor in phosphates and chlorides. This tuberculous soil is a hypo-acid and a hyper-comburant. The best treatment consists in transforming this soil and in assimilating it, as far as possible, to the arthritic formula. The hygieno-dietetic treatment does this admirably.

But this treatment is peculiarly facilitated, and its duration may even be abbreviated, if accompanied by certain medical treatment, especially phospho-creosote therapeutics. There is a poly-ether of creosote which facilitates this transformation of the tuberculous hypo-acid soil into arthritic hypetacid soil, and this is phosphite of creosote or "phosphotal."

This salt acts both by its phosphorous acid in removing the humoral acidity, by its phosphorous element in combating the dephosphorization of the tuberculous soil and in replacing it by an arthritic soil, and finally, by its creosote, an acidifying medicament which liquefies the expectoration and especially influences the bacteria associated with the bacillus, and which will decrease and often disappear.

The author has treated a large number of tuberculous subjects with phosphotal, and he particularly notes 97 cases, most of which have derived benefit from this treatment. Phosphotal, which is easily tolerated, is administered *per os*, by subcutaneous injections or by the rectum, in daily doses of 0.50 centigrammes to 2 grammes. This treatment may be continued for a very long period without the slightest inconvenience. An interval of eight days should be allowed after administering phosphotal for three weeks.

Army Medical Corps.—The Department of Militia and Defence of Canada is authorized to grant commissions to twenty-five Nursing Sisters in the A. M. C., to be employed when necessary. There are at present seventeen. Two of the most recent appointments are to the Halifax Garrison Hospital—Miss Georgina Pope, Royal Red Cross, appointed in August, 1906, and Miss Margaret McDonald, appointed in November, 1906. These two sisters both served in South Africa with distinction, and are entitled to the rank, pay and allowances of a lieutenant.

ABSTRACTS.

Cancer-Infected Cages for Rats and Mice.—H. R. Gaylord and G. H. A. Clowes, Buffalo, N.Y. (*Journal A. M. A.*, January 5), give the history of the endemic occurrence of sarcoma in rats in an infected cage in the New York State Cancer Laboratory. Three years previously the cage had been used for the keeping of rats inoculated with sarcoma. They also give an account of another infected cage in which, in the course of three years, over sixty cases of carcinomatous tumors have occurred in white mice. The frequent changes of location of the cage and of its occupants in at least one instance without interrupting the occurrence of tumors, seem to leave no doubt that the infection is in the cage. The authors consider it the most striking example of cage infection that has yet been recorded. These observations, they remark, indicate that both sarcoma in rats and carcinoma of the breast in mice (all the cases in the mice seemed to occur in females), must be looked on as contagious, and, taken in conjunction with other like observations on record, should, they think, lead us to give more consideration of the possibility of the contagion or local infection of malignant growths in the human species. The article is fully illustrated.

The Treatment of Pleurisy with Effusion.—F. Forchheimmer Cincinnati (*Journal A. M. A.*, January 5), finds that the chief causes of the prevention of the absorption of pleuritic effusions are the results of inflammatory processes deposited on the endothelial layer, and, still more effective, the compression of the lung by the pleuritic effusion, and the greater this becomes, the less the chance of spontaneous absorption. For the first condition, we must attempt to reduce the inflammation of the pleura itself, and whether this can be done with any amount of certainty is a question. Ice-bags, local hydrotherapy, rest in bed, strappings and counter-irritation, salicylates, etc., may be used, but at best the methods are imperfect, though he would not like to be without them. For removing the effused fluid, the general treatment is based on the modification of the blood structure so as to favor its absorption, and the means usually recommended are: The use of cathartics, diuretics, diaphoretics, diet, superalimentation (in reduced subjects) or withholding of liquids and the milk cure. Except superalimentation, diuretics and the milk cure, these are depressing measures, and Forchheimer holds that save in a very few exceptional cases, general methods are unnecessary in acute cases, as local treatment is much more effective. He condemns counter-irritation as inaccurate, inefficient and harmful. He sees no contraindications to paracentesis, and thinks that every one will agree that when a

large effusion develops rapidly it should be withdrawn. He has always used the aspirator, and, in addition to complete asepsis, considers the following precautions necessary. The negative pressure within the aspirator should not be too great, otherwise the lung will be too suddenly expanded, with the well-known unpleasant consequences. It is rarely necessary to increase the pressure within the aspirator; not much suction is required. The second precaution is not to withdraw too much fluid at one time, but no fixed rule can be given as to the amount to be taken. Enough to relieve the symptoms is all that is required. It is usually easy enough to tell when another aspiration is needed. Another precaution to be taken is to keep the patient in as nearly a recumbent position as possible at the time, so as to avoid the bad effect of too sudden change in the circulation, which would be less in the recumbent position than in any other. The patient should be carefully watched during the operation, and if he coughs violently or spasmodically, suffers great pain or is faint, the aspiration should be interrupted, to be tried again when the symptoms have disappeared. If they then reappear, the needle should be withdrawn and the patient put to bed. After removal of the fluid it is well to keep the patient in bed and under observation for a short time. In all cases respiratory gymnastics should be advised. In chronic serous effusion the conditions are different, and there are a few cases in which repeated removal of the fluid does not bring recovery. The future therapeutic development of this subject, Forchheimer says, lies in the direction of surgery. With empyema the principles of treatment are still different; very few cases can be cured by aspiration. The condition is practically one of abscess, and the one essential indication is its opening and drainage —the earlier the better. While rib resection is the rule, with an early diagnosis, he would make an exception in cases in which the thorax is sufficiently elastic, as in children under two years of age, to warrant the risk of its contracting sufficiently to collapse the abscess.

Adrenalin Catheterization in Prostatic Cases.—A. E. Prince Springfield, Ill. (*Journal A. M. A.*, January 5), reports three cases in which he relieved the difficulty of catheterization, otherwise insuperable, by inserting the contents of an ordinary pipette filled with equal parts of an 0.1 per cent. solution of adrenalin and a 4 per cent. solution of cocaine into the catheter and allowing it to gravitate to the tip. Then he inserted the end of the pipette into the upper end of the catheter, closing it and preventing the escape of the fluid, and introduced the catheter as far as it could be done without discomfort. The solution was then injected from the catheter by squeezing the bulb of the pipette. After waiting a short time the instrument passed painlessly into the bladder.

The Physician's Library.

BOOK REVIEWS.

The Bacteriological Examination of Water Supplies. By WILLIAM G. SAVAGE, B.Sc., M.D. (Lond.), D.P.H. Medical Officer of Health and Public Analyst, Colchester; late Lecturer on Bacteriology, University College, Cardiff; Bacteriologist to the Cardiff and County Public Health Laboratory; Assistant to the Professor of Pathology, with charge of the Bacteriological Department, University College, London. London: H. K. Lewis, 136 Gower Street, W.C. 1906.

This is a very timely treatise upon a subject with which many practitioners are but slightly acquainted. The author has been a diligent student of water analyses by bacteriological methods, and the book he has written on that subject enables the reader, whether a bacteriologist or not, to gain a good grasp of the subject.

Physicians or hygienists desirous of acquiring authoritative data on the examination of water for the typhoid bacillus should read the seventeenth chapter of the book. Some idea of the labor involved in the preparation of this work may be gathered from the fact that the recent bibliography, printed at the back of the book, covers thirteen pages. J. J. C.

Atlas and Text-book of Human Anatomy. By DR. JOHANNES SOBATTA, Professor of Anatomy in the University of Würzburg. Edited, with additions by J. Playfair McMurrich, A.M., Ph.D., Professor of Anatomy in the University of Michigan. Vol. II.—The Viscera, including the Heart, with 214 illustrations, mostly in colors. Philadelphia and London: W. B. Saunders Company. 1906. Canadian Agents, J. A. Carveth & Co.

This is a quarto volume of 194 pages, containing 214 illustrations, mostly in colors; published in cloth at $6.00 and half morocco at $7.00. This is the second volume; the entire work when completed will consist of three volumes. The first volume dealt with the bones, ligaments, joints and muscles. The contents of this second volume are enumerated above.

A large number of atlases and text-books on human anatomy have appeared recently, but it is safe to say that none of them sur-

pass the standard of excellence which is maintained thus far in the work at present under review. The illustrations are excellent both as works of art and in accuracy of detail. The descriptive letterpress is full and clear and constitutes a reliable and useful guide to a knowledge of human anatomy. One has no hesitation in recommending this work to students and practitioners, as we believe it to be in many respects the best work of its kind that has appeared in the English language.

A Manual of Normal Histology and Organography. By CHARLES HILL, Ph.D., M.D., Assistant Professor of Histology and Embryology, Northwestern University Medical School, Chicago. 12mo volume of 463 pages, with 312 illustrations. Philadelphia and London: W. B. Saunders Company. 1906. Flexible leather, $2.00 net. Canadian Agents, J. A. Carveth & Co., Toronto, Ont.

This work is designed for students' use under the guidance of a demonstrator. The book is well arranged, the descriptions are easy to follow and the illustrations are all one could desire. The closing chapter is devoted to stains and laboratory methods. This will prove a first-class work for either the student or practitioner who requires a review of the subject. W. J. W.

Syllabus of Lectures on Embryology. An Introduction to the Study of Obstetrics and Gynecology. By WALTER PORTER MANTON, M.D. Pages, 136. Philadelphia: F. A. Davis Co., publishers.

This little volume is a dandy. It contains not a useless word, no long, unnecessary explanations or theories, and yet it does not read like a quiz-compend. Each organ is taken up in turn, its anatomy, physiology, embryology are briefly stated. A small section on technique is appended. The work would be especially valuable for physicians contemplating a post-graduate course.

E. A. M.

A Text-book upon the Pathogenic Bacteria, for Students of Medicine and Physicians. By JOSEPH MCFARLAND, M.D., Professor of Pathology and Bacteriology in the Medico-Chirurgical College, Philadelphia; Pathologist to the Philadelphia Hospital and to the Medico-Chirurgical Hospital, Philadelphia; Fellow of the College of Physicians of Philadelphia, etc. Fifth edition. Philadelphia and London: W. B. Saunders Company, Publishers.

The new edition of this excellent work will no doubt retain the high position of the former ones.

The pathogenic bacteria are considered in such a thorough manner that all who read the work will be greatly benefited. Bacteriology is such a progressive subject that it seems almost impossible for physicians to keep abreast with the continual advances made, yet this work deals so fully with the very latest ideas that it well deserves a place in the doctor's library.

The system of study of each organism is taken up in a routine way that not only simplifies the description, but impresses thoroughly the main points upon the reader.

The chapter on syphilis lays stress on the recent observations on the finding of the spiro-chaeta pallida (Schaudinn), thus illustrating well the up-to-date character of the work.

There are many beautiful illustrations throughout the book, which are of much assistance to all students of bacteriolgy.

D. K. S.

A Text-book of Pathology. By ALFRED STENGEL, M.D., Professor of Clinical Medicine, University of Pennsylvania; Physician to the Pennsylvania University and the Philadelphia hospitals. With 399 illustrations in the text, many of them in colors, and 7 full-page chromo lithographic plates. Fifth edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company. 1906.

There is evidently a great demand for this popular text-book, as the editions rapidly succeed each other, thus keeping it well abreast of the times. We find this edition to be somewhat larger than the previous ones, but still retaining the characteristics of a text-book. The three important chapters, "Inflammation," "Immunity" and "Animal Parasites," have been extensively revised and augmented. Under the heading of "Immunity" such theories as the alexin, opsonin, aggressin and bacteriolytic are fully explained.

The work as a text-book for students and practitioners should continue to hold the enviable reputation it has already won.

W. H. P.

Studies in the Psychology of Sex. Erotic Symbolism, the Mechanism of Detumescence, the Psychic State of Pregnancy. By HAVELOCK ELLIS. Pages, 285. Extra cloth, $2.00, net. Sold only by subscription to physicians, lawyers and scientists. Philadelphia: F. A. Davis Co., publishers, 191-16 Cherry Street.

This volume has already met with much harsh criticism. It is only fair to say, however, that the author has gone to a good deal of trouble collecting and arranging material, and presents a distasteful subject unobscured by technical terms and unfettered by scientific experiments. If one is interested in a study of these

phenomena or wishes to investigate the subject for its own sake, the book will yield an abundance of illustration. Its practical value to the practicing physician is nil. The psychologist might find ample field for investigation in some of the extraordinary sexual histories cited, but it would never be safe to trust him with the book, as his morals would be forever ruined.

E. A. M.

Minor Maladies and Their Treatment. By LEONARD WILLIAMS, M.D., M.R.C.P., Physician to the French Hospital; Assistant Physician to the Metropolitan Hospital; late Assistant Physician to the German Hospital, and Hon. Medical Officer to the Sidmouth Cottage Hospital. Paris, London and Madrid. London: Bailliere, Tindall & Cox., 8 Henrietta Street, Covent Garden. 1906. Toronto: J. A. Carveth & Co., Limited, 34 Yonge Street, Toronto.

Much of the matter contained in this volume was embodied in some lectures delivered at the Medical Graduates College and Polyclinic, and has already appeared in the *Clinical Journal* and elsewhere. It is hardly to be found in the average text-book.

The book takes the place of our old preceptor. It describes the management and treatment of a lot of ailments that are overlooked by the medical student until after he is qualified, when he suddenly finds to his cost that the more serious conditions do not occur every day, but that the conditions that he has to treat have, in many cases, merely been mentioned, but never fully considered, in his text-books. It is full of the most valuable information, and should be on the shelves of every medical man, and will be read with much interest by old and young. The treatment laid down is scientific, and is accompanied by a number of very valuable common-sense suggestions.

A. J. J.

The Harvey Lectures, delivered under the auspices of the Harvey Society of New York. 1905-06. Philadelphia and London: J. P. Lippincott Company. 1906.

The book contains 337 pages, and reproduces the following essays: "The Theory of Narcosis," by Prof. Hans Meyer, University of Vienna; "Modern Problems or Metabolism," by Prof. Carl von Noorden, University of Vienna; "On Trypanosomes," by Prof. Frederick G. Novy, University of Michigan; "Autolysis," by Dr. P. A. Levene, Rockefeller Institute for Medical Research; "A Critical Study of Serum Therapy," by Prof. W. H. Park, University and Bellevue Hospital Medical College; "The Neurons," by Prof. Lewellys F. Barker, Johns Hopkins University; "Fatigue," by Prof. Frederick S. Lee, Columbia University; "The Formation of Uric Acid," by Prof. Lafayette

B. Mendel, Yale University; "The Extent and Limitations of the Power to Regenerate in Man and other Vertebrates," by Prof. T. H. Morgan, Columbia University; "On the Nature and Causes of Old Age," by Prof. Charles S. Minot, Harvard University; "Modern Views Regarding Placentation," by Prof. J. Clarence Webster, University of Chicago; "Some Phases of Tuberculosis," by Prof. Theobald Smith, Harvard University; "The Cause of the Heart Beat," by Prof. W. H. Howell, Johns Hopkins University.

This collection contains a series of interesting monographs by well-known authors and authorities on most important subjects. It is not necessary to do more than enumerate the subjects dealt with and the names of the different contributors. It is undoubtedly a volume replete with valuable and instructive information on the various subjects presented by the individual writers.

Progressive Medicine, Vol. IV., December, 1906. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D. Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Octavo, 349 pages, with 29 engravings. Per annum, in four cloth-bound volumes, $9.00; in paper binding, $6.00, carriage paid to any address. Philadelphia and New York: Lea Brothers & Co., publishers.

In the first section Dr. J. Dutton Steele deals with diseases of the digestive tract and allied organs. He reviews the literature on such interesting topics as occult blood in the diagnosis of gastric ulcer and in the diagnosis of cancer, and radiography in the diagnosis of intestinal disease. He also writes an interesting discussion on the etiology and treatment of chronic constipation. Dr. Wm. T. Belfield, in the second section, deals with tuberculosis of the urinary organs, and other genito-urinary diseases. Under "Gonorrhea" he says that "Torrey has prepared a serum containing agglutins and precipitins for the gonococcus. His clinical observations indicate that this has no appreciable effect upon the urethral discharge, but causes marked improvement in the various metastases of the gonococcus comprised under the term gonorrheal rheumatism. Under "Diseases of the Kidneys" there is a valuable article on the treatment of nephritis. Dr. Joseph C. Bloodgood contributes, in the fourth section, one hundred pages on anesthetics, fractures, dislocations, amputations, surgery of the extremities, and orthopedics. Dr. H. R. M. Landis contributes over sixty pages to the last section, which deals with therapeutics. This is possibly the most interesting section

in the whole number. In regard to adrenalin, he says that the important questions of dosage and the after-effects on man are still unsettled. He cites a case where one drachm of the 1 to 1,000 adrenalin chloride solution was given every hour for four or five doses in a case of obstinate hemoptysis. Suggestions are also made regarding the use of alcohol, mercury, opium, urotropin, ergot and many other drugs. The December number is full of practical, useful articles, and is interesting from start to finish.

A. E.

Food and the Principles of Dietetics. By ROBERT HUTCHINSON, M.D. (Edin.), F.R.C.P., Assistant Physician to the London Hospital, and to the Hospital for Sick Children, Great Ormond Street; author of "Lectures on Diseases of Children," "Patent Foods and Patent Medicines," joint author of "Clinical Methods." Revised edition, with plates and diagrams. Pp. xx.-582. Cloth, $3 net. New York: William Wood & Company. 1906.

The chief changes to be found in the present edition are in the chapter dealing with the amount of food required in health and in the sections devoted to the dietetics of disease, but in every respect this standard work has been fully brought up to date. The various plates, tables and diagrams are a very prominent and valuable feature, and tell their stories most graphically. C. R. D.

A System of Clinical Medicine. Dealing with the Diagnosis, Prognosis and Treatment of Disease, for Students and Practitioners. By THOMAS D. SAVILL, M.D. Lond. Vol. 2. "Certain General Disorders; Diseases of the Skin and the Nervous System." London: J. A. Churchill, 7 Great Marlborough Street. 1905.

In a book review, which appeared in the January, 1907, number of this journal, the first volume of Dr. Savill's work was noticed. In the second volume are chapters on General Debility, Pallor, and Emaciation; Symptoms referable to the Extremities; Symptoms referable to the Skin; Symptoms referable to the Nervous System; and finally, an epitome of clinical bacteriology and the examination of pathological fluids. The second volume is separately indexed.

Frequent reference to both volumes reveals new features corroborative of one's own observation in clinical medicine and of observations made by others. Some observers might object to the presence in Vol. 2 of the chapters devoted to diseases of the skin, but there is no good reason why the etiology, diagnosis and treatment of these diseases should not be given in a work devoted to clinical medicine. Dr. Savill's experience in the treatment of

skin diseases appears in minute things, as when he recommends 20-grain doses of calcium chloride for urticaria. The chapters on diseases of the nervous system, including diseases of the mind, are excellent. In fact, Dr. Savill's work is an encyclopedia medica. From a rather frequent reference to it, and some familiarity with works on the practice of medicine, we would say that Dr. Savill's book ought to be the most used and the most useful book in a physician's library. We cordially recommend it to physicians and senior students of medicine. J. J. C.

Abdominal Operations. By B. G. A. MOYNIHAN, M.S. (London), F.R.C.S., Senior Assistant Surgeon at Leeds General Infirmary, England. Second revised edition, greatly enlarged. Octavo of 815 pages, with 305 original illustrations. Philadelphia and London: W. B. Saunders Company. 1906. Cloth, $7.00, net; half morocco, $8.00, net. Canadian agents: J. A. Carveth & Co., Toronto, Ont.

It seems but yesterday that the first edition of this work was before us, and yet one has but to glance through its pages to find much additional matter in both the text and the illustrations.

The whole chapter on "Preparations Adopted by Surgeons and Assistants," should be carefully read and digested by all modern surgeons, as well as by nurses responsible for operating-room technique.

The work does not include the surgery of such organs as the kidney and bladder, nor does it include any gynecological operations. It does include operations upon the stomach, the intestines, the liver, the gall-bladder and ducts, and the spleen and pancreas. As these were fully covered in a former review it is not necessary to go into them here, except to say that the whole work is thoroughly up-to-date. F. N. G. S.

The Technic of Operations upon the Intestines and Stomach. By ALFRED H. GOULD, M.D., Boston. Philadelphia: W. B. Saunders Company. Toronto: J. A. Carveth & Co.

If books for review were oftener of the type of the one before us the task of the reviewer would be a pleasant one.

Good original work, modestly presented and splendidly illustrated, with a generous recognition of what others have done and are doing along similar lines, are leading characteristics of Dr. Gould's volume.

The work starts out with a study of the pathology of repair in intestinal wounds, then suture materials, aids and methods are taken up and then, in proper sequence, all the operative procedure; now most in favor in dealing with the stomach and intestines receive full and satisfactory consideration. No other work known

to the writer of this review goes quite so fully into the thousand and one details which make or mar success in intestinal surgery. In a general way it can perhaps be best compared with that admirable section on the surgery of the organs connected with the peritoneum to be found in Bryant's operative surgery, while in wealth, in beauty and in accuracy of illustration it is in a class with Kelly's operative gynecology.

Having come to the conclusion that to any surgeon doing abdominal work its value will be many times its published price, the purchase of Dr. Gould's book is unreservedly advised.

N. A. P.

Operative Gynecology. By HOWARD KELLY, A.B., M.D., LL.D., F.R.C.S. Edin.; Professor of Gynecology at Johns Hopkins University, etc. New York and London: D. Appleton & Co.

It is now ten years since the first edition of this work was presented to the medical profession. At that time great praise was showered on the talented author for the workmanlike manner in which the book was compiled. The second edition is of much greater value—enlarged, containing many more illustrations, and much more subject-matter, while the increased experience gained through an enormous practice, hospital and private, and aided by skilled laboratory and clinical assistants, has enabled Dr. Kelly to present a work as near perfect as human hands and brain can produce. The additions of greatest interest deal with the anatomy of the peritoneum, with complete laceration and relaxed vaginal outlet; a very much improved and perfected article on the urethra, bladder and ureters and kidneys. He also has taken into consideration the general practitioner, and for his benefit has added an entirely new chapter on local and palliative treatments, as well as chapters on displacements and pessaries and menstruation and its anomalies. Cancer of the uterus is also entirely rewritten and embellished with fifty-six new illustrations on this subject. Gynecological diseases in early childhood is also a new chapter of extreme interest.

Nearly the entire work on bacteriology has been rewritten and greatly altered, for much has been added to this subject in the past ten years. From the first chapters on "Instruments," "How to Examine a Patient," "Postures," "History-taking," etc., to the last one on "Intestinal Complications," there is no let up or slackness in one single sentence or line. Work, and hard work, laborious care to make everything clear and concise, backed up by finely magnificent plates, mostly photographs taken immediately from the subject, makes this work unique.

The publisher should also be congratulated on the production of so splendidly finished a work. It is divided into two volumes, each six hundred and fifty pages, and contains no less than eleven

beautifully colored plates, and over seven hundred original illustrations. No practitioner who does any work in the field of gynecology can afford to be without this book. It is certainly *par excellence* the best work of reference published, and, moreover, it is more than that, it is a work that any student having time at his disposal will find the easiest and simplest exposition of the subject yet published. A. B.

A Text-Book of Elementary Analytical Chemistry, Qualitative and Volumetric. By JOHN H. LONG, M.S., Sc.D., Professor of Chemistry in the Northwestern University Medical School. Third edition, revised and enlarged. Illustrated. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1906. Price, $1.25.

As in former editions, the first part is devoted to qualitative analysis, and the second part to volumetric analysis. The principal changes in this edition consist in the addition of a chapter on reactions in solutions, and a number of simplifications in qualitative processes. In the second part several paragraphs have been added on the use of indicators, and a number of new processes have been added. This is a handy and convenient text-book. A. E.

A Text-Book of Diseases of Women. By J. CLARENCE WEBSTER, M.D. (Edin.), F.R.C.P.E., F.R.S.E., Professor of Obstetrics and Gynecology in Rush Medical College, in affiliation with the University of Chicago. Large octavo of 712 pages, with 372 text-illustrations and 10 colored plates. Philadelphia and London: W. B. Saunders Company. 1907. Canadian agents: J. A. Carveth & Co., Ltd., Toronto. Cloth, $7.00, net; half morocco, $8.00, net.

Dr. J. Clarence Webster has for a period of some years been looked upon as an authority on diseases of women. For this reason, if for no other, his text-book will be welcomed by many as a book of reference and no doubt a source of enlightenment on a subject which to a great many practitioners frequently proves a stumbling block. There is little doubt that, during the past decade or more, the tendency in the treatment of many diseases of women has been narrowed down too much to a surgical procedure, so that, for this reason, the practice of gynecology has almost become ultra specialized. As the author of this book himself says: "Too strong a protest cannot be urged against the concentration of attention on the local pelvic condition without regard to wider physical and psychical relationships." Dr. Webster's book consists of twenty-four chapters, covering in all about 700

pages. After discussing in a somewhat stereotyped manner the anatomy of the female pelvis, puberty and menstruation, he takes up such subjects as: "The Genital Tract in Relation to Micro-organisms," "Surgical Technic," "Affections of Peritoneum and Cellular Tissue," "Injuries and Displacements of the Pelvic Floor," "Affections of the Vulva," "Affections of the Vagina and Hymen," "Affections of the Ovaries and Fallopian Tubes," "Malformations of the Uterus," "Displacements," "Ectopic Gestation," and "Sterility in the Female."

One of the most interesting chapters is the one entitled, "Neuroses in Relation to Pelvic Diseases in Women." In this the author discusses hysteria and neurasthenia in women. In referring to the relation of pelvic disease to insanity, Dr. Webster says: "This relation is not definitely established. Insane women undoubtedly have pelvic disease just as sane women have; but whether there is any connection between them of the nature of cause and effect it is impossible to say. It has been proposed by some to remove the appendages in cases where abnormal sexual aberrations are part of the insane manifestations, but there is no rational ground for such a procedure." W. A. Y.

Surgical Suggestions. Practical Brevities in Diagnosis and Treatment. By WALTER M. BRICKNER, M.D., Chief of Surgical Department Mount Sinai Hospital Dispensary; Editor-in-Chief *American Journal of Surgery*, New York; and ELI MOSCHCOWITZ, M.D., Assistant Physician Mount Sinai Hospital Dispensary; Editorial Associate *American Journal of Surgery*, New York. New York: Surgery Publishing Company, 92 William Street. 1906.

"Surgical Suggestions," as the authors state, is a collection of the valuable hints and bits of wisdom published during the past year, in successive issues of the *American Journal of Surgery*.

The "Suggestions" are arranged in convenient form and well indexed, so that one may easily refer to them. This is a little work of 58 pages, full of surgical hints gained by experience and calculated to save one from many pitfalls. It will well repay a careful reading. W. J. W.

The Western Canada Medical Journal. We have recently received the first two issues of *The Western Canada Medical Journal*, published by Dr. George O. Hughes, of Winnipeg. We don't hesitate to congratulate our confrere upon his initial numbers. They are clean, crisp, readable, and, from a mechanical standpoint, excellent. There is no reason why the new journal should not be a success, and, though its successful establishment means a whole lot of work on the part of a few, yet we earnestly trust that, editorially and financially, it will be a winner.

American Practice of Surgery. A Complete System of the Science and Art of Surgery, by representative surgeons of the United States and Canada. Editors, JOSEPH D. BRYANT, M.D., and ALBERT H. BUCK, M.D., of New York City. Complete in eight volumes; profusely illustrated. Volume II. New York: Wm. Wood & Co. 1907.

We think that we are not far wrong when we say that seldom has any publishing house in America undertaken so great a task or gone to such expense as have Messrs. Wm. Wood & Co. of New York in getting out such an extensive and comprehensive system as "The American Practice of Surgery." On a par with this work we would place, for instance, "Twentieth Century Practice," which the same house published but ten years ago. Vol. II. of "American Practice of Surgery" has just come to hand, and it is even better than its predecessor.

From a mechanical standpoint, the book is a worthy example of the highest in the printer's art. The paper could not be excelled and the half-tone illustrations are among the best we have ever seen. It takes but a moment for the reader to realize what a large sum of money any firm must needs invest in publishing such a work, but, judging from the real scientific worth of Drs. Bryant and Buck's System, there is no question as to those who have invested their money getting it back, we trust, fourfold.

Among the contributors to Volume II. are: Dr. W. C. Borden, Dr. C. R. Darnall, both of Washington, D.C.; Dr. C. N. Dowd and Dr. V. P. Gibney, of New York City; Dr. A. F. Jonas, of Omaha; Dr. E. L. Keyes, of New York; Dr. J. F. Leys, of Norfolk, Va.; Dr. W. McDowell Masten, of Mobile; Dr. D. W. Montgomery, of San Francisco; Dr. P. M. Pilcher, of Brooklyn, N.Y.; Dr. J. Clark Stewart, of Minneapolis; Dr. B. T. Tilton, of New York; Dr. DeForest Willard and Dr. A. C. Wood, of Philadelphia.

Vol. II. consists of Parts VI. to X., inclusive, devoted to the following subjects: Part VI., Diseases which belong in varying degrees to the domain of surgery and which are observed in certain parts of the United States and its dependencies and in Canada; Part VII., General survey of tuberculosis and symptoms in their relations to surgical work; Part VIII., Surgical diseases of various widely distributed structures of the body; Part IX., Surgical diseases caused by intense heat and intense cold and by the electric current; and Part X., Simple and complicated wounds, including gunshot wounds. One of the best samples of color printing that we have seen for some time is Plate XVII., showing the potassium iodide eruption. Plate XIV., illustrating molluscum contagiosum, is very delicate and true to nature, as also that of biskra button (oriental boil, aleppo boil).

Perhaps the most interesting section is that by Dr. Benjamin T. Tilton, of New York City, on "Burns and the Effects of Electric Currents and Lightning." In discussing the treatment of burns, the author thinks well of the French method of treatment, with picric acid employed in the form of a solution, varying in strength from 1 in 100 to 1 in 50, applied through saturating sterilized gauze laid over the affected surface. He considers that by that method pain can be lessened more rapidly than by many other means. Where infection and inflammation have already occurred and the surrounding skin is red and painful, wet dressings are most efficient. In the case of extensive burns, the use of the continuous bath is often advisable.

Dr. Edward L. Keyes, of New York, contributes quite an elaborate section on "Syphilis from a Surgical Standpoint," which is well worth reading.

Dr. D. W. Montgomery, in writing on boils and the frequent attempt to abort them, says as follows: "All such attempts at aborting the furuncle are, however, quite likely to fail, and they are aside from the real aim of treatment, viz., materially to alter the physical condition of the patient."

In a word, we can honestly state that no medical man, be he a physician, surgeon or general practitioner, can invest the money to any better advantage or probably get better value than by ordering "American Practice of Surgery." W. A. Y.

International Clinics. A quarterly of illustrated clinical lectures and especially prepared original articles on Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynecology, Orthopedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and other topics of interest to students and practitioners, by leading members of the medical profession throughout the world. Edited by A. O. J. Kelly, A.M., M.D., Philadelphia, U.S.A., with the collaboration of Wm. Osler, M.D., Oxford; John H. Musser, M.D., Philadelphia; Jas. Stewart, M.D., Montreal; J. B. Murphy, Chicago; A. McPhedran, M.D., Toronto; Thos. M. Rotch, M.D., Boston; John G. Clark, M.D., Philadelphia; Jas. G. Walsh, M.D., New York; J. W. Ballantyne, M.D., Edinburgh; John Harold, M.D., London; Edmund Landolt, M.D., Paris; Richard Kretz, M.D., Vienna, with regular correspondents in Montreal, London, Paris, Berlin, Vienna, L[illegible]sic, Brussels and Carlsbad. Volume IV., sixteenth series, 1906. Philadelphia and London: J. B. Lippincott Co. 1906. Canadian agent: Charles Roberts, Montreal.

After a careful glance through, and even partial perusal of, Vol. IV. of this series of "Clinics," we feel that we are safe in saying that it is the best yet gotten out by the Lippincott firm. No

one can complain that they do not get good value in purchasing "Clinics" four times a year, as the matter *is all original.*

We find that among the contributors to Vol. IV. appear such names as Drs. Howard Lilienthal, of Mount Sinai Hospital; W. A. N. Dorland, of Philadelphia; J. B. DeLee, of Chicago; S. Roger Morris, of Johns Hopkins; J. G. Ross, of Philadelphia; J. Edward Squire, of London, Eng., and David Wallace, of Edinburgh.

Those who subscribe for "Clinics" undoubtedly receive for their money the *quid pro quo.*

Half a Rogue. By HAROLD MACGRATH, author of "The Man on the Box." Toronto: McLeod & Allen. Cloth, illustrated.

A breezy story of the life of a man as playwriter, journalist, politician, lover and friend; entertaining, every line of it, and just enough out of the "beaten paths" of story telling to have a charm all its own. W. A. Y.

Publishers' Department

Shredded Wheat, a Suitable Diet during Recovery.—Shredded Wheat does not pall on the appetite; on the contrary, it satisfies and leaves a desire for more. It is an article of diet suitable for all stages of sickness where food is permissible. Since the stomach does not become intolerant of shredded wheat even after a long period of subsisting on it, this product is well adapted as a staple article of diet in health. Its nourishing qualities put it in the front rank as a steady food agent, and it may be made a component part of each meal. The great tendency of modern white flour to constipate is constantly brought to the attention of the profession. The bowels need a stimulant to their walls. They need, in addition to this gentle stimulation, a food mass that can be grasped, as it were, by the bowels, and by its mechanical presence encourage peristalsis. In the manufacture of a finely ground flour the parts of the wheat berry that would form a stimulating mass and aid digestion and bowel motion are eliminated, and in consequence the bread-eating public suffers. This sacrifice of a health-giving property for the sake of a beautiful white flour is responsible, in a certain degree, for an impairment of the natural functions of the gastro-intestinal canal. This difficulty is entirely obviated by shredded wheat. It leaves a residue which is slightly irritating to the mucous coat of the bowel and by its presence encourages normal intestinal activity. Nothing in the food line is more palatable than shredded wheat or can be prepared in such a number of appetizing ways. (*Abstract.*)

GRAPENUTS—A PURE FOOD "ADJUVANT" OF WELL-KNOWN PRACTICAL VALUE TO THE DOCTOR.

FEEDING the body is, after all, a very simple matter when the results desired are fully understood, and the sources of supply are known.

The two principal objects to be attained by consumption of food are the repair of tissue and the production of heat or energy. The proteids are absolutely necessary to the first-named function; the carbohydrates, fats *and* proteids to the second.

In the normal, active individual, there is little difficulty in the way of elaborating food material into new tissues and storing up with them potential energy for future use. The normal physiological processes of metabolism, constructive and destructive, accretive and eliminative, accomplish these ends without perceptible effort or opposition.

In the case of abnormal or perverted nutritive processes, however, the skill and knowledge of the trained physician is of supreme importance in order to bring about a restoration of metabolic equilibrium. Weak digestive organs must be rested and at the same time the nutrition of the patient must not be neglected, or the life-processes will inevitably cease.

In consideration of the above, it is highly advantageous if a single food preparation can be obtained that has the following qualifications:

1. *Partially* predigested, but not *entirely* so, in order that the digestive organs may have *some* work to do and thus gradually encourage a return to normal function.

2. Containing a desirable proportion of the necessary proteids, carbohydrates and organic mineral matters to supply the various requirements of a true food.

3. Be of such form as to be easily prepared and agreeable to the taste.

4. If possible require some mastication, as it is now well known that *fully insalivated* food is much more perfectly acted upon by the gastric, pancreatic and intestinal enzymes.

In the preparation of Grape-Nuts the two most valuable of all cereals, *wheat* and *barley*, are used. The barley is partially malted and in the combination of this flour with the whole wheat flour in presence of heat and moisture, about 50 per cent. of their starch is converted into dextrose. By the long baking (16 to 20 hours) Grape-Nuts is subjected to, the remaining starch granules are so completely broken up that they are promptly converted by the saliva into soluble carbohydrates. Thus, it is practically *all available* as a food.

In a wide range of intestinal troubles, Grape-Nuts has been found by many eminent authorities to be an ideal aliment as a *therapeutic adjuvant* of the greatest possible value. The weakest patient can extract repair and energy material from it, and in various combinations with milk or cream, added proteid and fat may be secured.

Even children, the aged, the convalescent, can absorb, and gain strength from Grape-Nuts. On account of its composition and the fact that it is practically all assimilable, Grape-Nuts is of special value where it is necessary to prescribe a small bulk at a time and yet desirable to increase nutrition as rapidly as possible.

Its small proportion of fat is of special value since fats are difficult to digest, and when required can be added in the form of that most easily digested fat—cream.

The Postum people are sending out a liberal box of samples to physicians, and are desirous that the profession should keep in mind that Grape-Nuts is the pioneer among prepared foods now on the market, and contains absolutely no "coloring matter" or "preservative" not contained in clean, selected wheat and barley. "The Door Unbolted," for the waiting-room table and analysis of Grape-Nuts, in addition to the samples mentioned, will be sent on request to the Postum Cereal Co., Ltd., Battle Creek, Michigan, U.S.A.

POSTUM—A WHOLESOME BEVERAGE OF PECULIAR VALUE TO PATIENTS WHERE COFFEE DISAGREES

It is often necessary to interdict the use of coffee and tea during certain stages, if not throughout the course, of treatment, in many cases.

The reason for this is, coffee and tea contain an alkaloid—caffeine—which has a therapeutic or toxic action of its own, in proportion to the amount ingested and the susceptibility of the individual.

Like all drugs that create a delusive sense of stimulation or temporary freedom from physiologically normal fatigue, caffeine tends to induce a call for more and more of this "delusion." This in the end produces the "coffee-habit," which has to be reckoned with by the wise physician, if he expects to accomplish successful therapeutic results.

The world-wide indulgence in the use of these drug-containing beverages and the fact that they do not produce immediate alarming toxic effects, as in the case of alcohol, opiates, etc., has doubt-

less caused many otherwise astute and clever physicians to pass the matter by. On the other hand, this is being carefully considered by an increasing number of leading members of the profession as it should be.

That coffee and tea *do* cause many ailments frequently attributed to other causes and so treated, is doubtless true. That such a procedure is at wide variance with scientific diagnosis and efficient therapeutics, is also true. It is obviously impossible to secure definite therapeutic results from one remedy while the patient is under the influence of another—as is the case of the habitual consumer of *caffeine,* disguised in the form of a "harmless" beverage.

Realizing the desirability of removing the opposing element from the therapeutic field of operation, the conscientious doctor will be glad to turn to a wholesome, agreeable beverage made from clean, select wheat in such a manner as to make the discontinuance of coffee or tea an easy possibility for his patients.

Postum is made in this way: Clean, perfect wheat-berries are parched by skilful operatives and ground to the fineness of ordinary coffee. The outer, or bran-coat, with its stores of organic mineral salts, combined with 10 per cent. of New Orleans molasses, is parched in separate ovens, ground, and the two parts of the wheat blended by a special formula which long experimenting has shown to be just right for securing the aroma that (when boiled properly) makes Postum a delicious beverage.

Containing absolutely nothing not contained in fine wheat, it is obviously not only *safe* but *wholesome.*

The Postum people are sending out a liberal box of samples (including vials containing the various ingredients of Postum in the several stages of its manufacture) to physicians on request. Their handsome booklet, "*The Door Unbolted,*" for the waiting-room table, also analysis of Postum, will be sent on application to the Postum Cereal Co., Ltd., Battle Creek, Michigan, U.S.A.