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Original Communications.

ADDRESS IN MEDICINE.*

BY L. C. PREVOST, M.D., OTTAWA.

I hardly know truly, how to thank our worthy President and the members of the Council, for the distinguished honor they conferred upon me in intrusting to my hands the task of presenting the address in medicine before the highest medical society of the Dominion. In selecting me, in spite or rather, perhaps, on account of the nationality to which I belong, when so many others were certainly better qualified to fulfil this duty, they yielded more to courtesy than to the appreciation of my own merits.

This is the way that we, physicians, understand true and genuine equal-rightism, and surely we are right to be proud of it. Politics may divide, but science unites nationalities. As I eagerly wish not to be in debt of delicate manners with those who bestowed such an honor upon me; being aware, besides, of the deep feelings of loyalty so universally contained in the hearts of all true Englishmen, I am satisfied that I shall be agreeable to you all in availing myself of this occasion to highly confess the sentiments of respect with which I am animated towards our most gracious Queen, whose humble and most devoted subject I am proud to be.

Gentlemen, when we look back to the few years which have just expired, we are amazed at the immensity and importance of the advancement realized in medical sciences. I would have liked to lay before you, in this paper, all the acquirements recently obtained in medicine, but I would have had to deal with a gigantic task, rather impossible to overcome, when such a work had to be contained in the narrow limits of a small number of pages. Never, in fact, has such an amount of work been done, as now-a-days. There are few sciences in which so much has been accomplished as in medicine; observers have never been so numerous and never have they offered with such liberality to the medical world the precious results of their investigations.

I regret, for example, that the limits of this address do not allow my presenting with details, the admirable discoveries realized by neurologists. What marvels revealed by the thorough study of hysteria, mental diseases and heredity in these affections! What precious revelations attained with regard to the pathology of the brain and the spinal cord!

Every corner of neurology has been perused; usual symptoms have been studied over, and more closely examined, their value in semeiology has been more precisely indicated; new ones have been discovered, new morbid entities created.

The influence of these researches will daily more and more be felt in therapeutics. What cannot be hoped, indeed, when the study of nervous diseases has arrived at such a degree of precision that the surgeon can, to-day, almost harmlessly open the skull with the trephine, remove neoplasms from the cerebral substance, guided in his researches by the nature itself of the troubles he wants to combat! But amongst the discoveries which recently have most contributed to the advancement of medical science, there is one newly born, the effect of which has been to cause the healing art to enter a new era and which has transformed in medicine even up to the sense of the word, malady; I want to speak of bacteriology.

The medical science of to-day, gentlemen, has not been renovated, as is generally said, but its object has changed. During several years the study of symptoms, pathological physiology, the researches of anatomical lesions have been the object of scientists' attention; but to-day, pathogeny is the subject towards which they particularly direct their investigations. The study of the origin of new diseases is what characterizes our medical epoch.

Among the processes through which morbid causes succeed in producing diseases in our organism, there is one, the notion of which can be retraced far in the past, but which appeared in its true light only within the last twenty-five years:

*Read before the Canadian Med. Association, Aug., 1890.

I mean infection. At present the living nature of the contagious matter is beyond any doubt.

Ever since man has had the notion of contagion, all sorts of conjectures have been formed concerning its nature. But of all hypotheses, no one could be verified until the day it was demonstrated that, in the body of an individual afflicted with a contagious disease, there exists inferior organisms capable of fixing themselves and multiplying in the tissues of another individual and liable to determine in the latter a disease similar to the first.

In general, great discoveries are not the deeds of a single man; they appear as the realization of of an ideal aspiration which, during a more or less extensive preliminary period, is marked by isolated endeavors, the importance and signification of which we generally fail to recognize.

It is true that, in the seventeenth century, Robert Boyle, and later on, Tyndall, Haneau and Villemin have had as a glimpse of what was going to be later the resounding discovery of bacteriology; but it is not less true that to Pasteur is due the origin of the new doctrine and it is a duty for whomever speaks of bacteriology, to mention at first the name of the illustrious scientist whom France, nay, the whole humanity, is so rightly proud to possess.

It is to Pasteur that we owe this wonderful discovery of the rôle played, on our planet, by a whole world of infinitely small beings which, everywhere, invisible and present, contsitute, by the manifestation of their incessant activity, one of the greatest forces which govern matter and determine its transformations.

In applying all the faculties of his deeply investigating mind to the study of these infinitely small beings, much more powerful than the antediluvian monsters, and often much more dangerous, M. Pasteur has succeeded in watching them at work, in catching the play of their functions and in establishing their relations with the phenomena of fermentation of which they are necessary agents.

All fermentable substance can be preserved indefinitely in a vessel, if we take care to keep it constantly impervious to the air, which is the vehicle of microbes. It will remain in that unchanged state for months, years and even centuries. But let us allow the atmosphere, full of its microbes, to come into contact with these substances, the molecules of which had so long remained intimately connected with each other, and a few hours will not elapse ere we see them being agitated; heat is developed, gas produced by new combinations is set free and a change of state takes place.

The great discovery of the rôle played in fermentations by these minute beings of the invisible world, naturally led M. Pasteur to wonder whether it could not furnish some explanation to certain pathological phenomena characterized also by a great development of heat and during which takes formation a humor different by its characters and properties from physiological humors. He accordingly went to work and very soon light was thrown on the domain of pathology upon phenomena quite as mysterious, as obscure and until then as impenetrable as had been fermentations.

He then clearly demonstrated that the contagion of a certain number of diseases at least, is but the function of the infinitely small beings of the invisible world, each special malady depending on a special kind of microbe which is particular to it and of which it expresses the active manifestations.

The agent of transmission of each of these maladies, is the microbe itself, which, after infinitely multiplying in the organism it has infected, is being carried to a sound organism and again multiplies in the latter, giving rise to the same trouble, the same disorders and the same fatal accidents.

Here is then, at last, the virus: That mysterious agent of ancient pathology and the unauspicious action of which they formerly tried to explain by catalysis; here it is! It has assumed a material body that we can see when we proportionate through an instrument the power of sight to its infinite smallness. We can cultivate it, outside of the organism, in liquids appropriate to the exigencies of its nutrition; we can even master it, tame it, as it were, in attenuating its energy until it has been transformed in its own vaccine, that is to say, until it has kept up but the power of conferring by inoculation the singular privilege of immunity owing to which the strong virus shall hereafter be altogether or for a long time, without any powerfulness on the organism.

Carbuncle or anthrax was the medium which connected the study of fermentation and that of diseases. After having demonstrated the existence of

the "bacillus anthracis," Pasteur also discovered the microbe of septicæmia and that of cholera of fowls. The micro-organism of the latter disease was cultivated in a special *bouillon* made with hen's muscles and Pasteur demonstrated that when these media of culture were old, instead of producing, by inoculation, the death of the animal, they would give him a transient affection only, but these fowls so inoculated were by the fact preserved from the disease and would resist inoculation made with a very virulent liquid. It was, we may say, the greatest discovery of this century: that of attenuation of virus, and it was in the midst of the applause of the whole world congregated in London at the International Congress of 1881, that Pasteur pronounced the following words: "I have lent to the expression of vaccination an extension which science, I hope, will sanction as an homage paid to the immense services rendered to humanity by one of the greatest savans of England, Jenner."

All these unexpected results produced a general emotion amongst scientists. It was like a revelation; they felt that we were on the eve of discoveries which would very soon teach us the nature of all virulent diseases as well as the vaccine to oppose to each of them. Several biologists, carried on the wings of those dreams of glory for them and of triumph for science, went to work in search of new organisms, studying in the same time new cultures. Laborious seekers directed their investigations towards diseases the causes of which had been so far unknown and succeeded in surprising amongst microscopical organisms more than one malefactor of which science had not, till then, even suspected the existence.

The vast importance attached to the knowledge of micro-organisms in science could not but attract the attention upon the origin of microbes in general. Whence came these microbes? This question, a problem as old as the world, aroused anew and divided scientific men.

Can a being be born without parents? Does spontaneous generation exist?

These minute organisms which are found under the microscope in a drop of infected blood, where were they before they showed themselves there? Have they spontaneously originated in Robin's blastema, or do they come from Bechamps' eternal microzimas? Or again, according to Helmholtz' theory of cosmical organic germs, have they fallen from some planets, being carried away by one of the innumerable meteors which detach from them to travel across the space?

Eternal hypothesis of the origin of life! Mysterious problems, with their solutions apparently always at hand, and still for ever receding! Suffice it to say, that Pasteur, by his memorable experiments, has succeeded in thoroughly annulling the objections of the partisans of spontaneous generation. He successfully demonstrated that the germs of our diseases are profusely diffused in the air; *quærens quem devoret*, and waiting for favorable circumstances to develop themselves.

Our eyes cannot perceive these small organisms which swarm by millions in the atmosphere. We take our leisure by walking out in the country, fancying we breathe but pure air and sweet scent of flowers. Alas, what a delusion! According to Miquel, in the open fields, where the atmosphere seems so limpid, there are, mixed with pollen and the remains of plants, 30 to 40 micro-organisms by cubic meter of air. In our cities, in our houses, how much greater still is their number. They lie everywhere; our clothes, our furniture, our books, the walls, the hangings of our houses are covered with them. The water we use for our ablutions, the water which purifies, as we fancy, the things it washes, the water we drink, how many microbes does it not contain and nourish! Miguel has demonstrated that a single glass of Seine water contained 300,000 microbes.

Evidently, all these micro-organisms are not malefactors; many of them are, on the contrary, for us very useful auxiliaries. Others are quite harmless or indifferent. But mixed with these inoffensive germs there exists around us an immense quantity of them which are formidable. Such are the germs of infectious and contagious diseases, especially during epidemics.

If then we are surrounded by injurious microbes, if, moreover, as it has been demonstrated by several biologists, we conceal some of them within our body in the normal condition, as for instance, the pneumococcus of pneumonia, and the streptococcus of erysipelas, how is it that we so often and so generally escape their harm? Who, or what then protects us from maladies it is their mission to determine in living tissues? Ah! it is that the microbe, however powerful it may be,

the microbe is not the only element to be taken into consideration in pathology. The microbe does not alone constitute the disease, it requires a suitable soil and favorable circumstances for its development. It is the germ, the seed, but this germ will forever remain sterile should it fall on a soil unsuitable to its culture, and this is what explains the absolute or relative immunity we possess in the midst of the morbific causes which surround us. The teachings of bacteriology itself have placed us in a position to explain this immunity already revealed by clinical experience. This immunity consists in the integrity of our organism, the tissues of which possess in themselves their means of defence against the parasites which threaten to invade them. An impermeable barrier, for example, is set up to the entrance of bacteria by the epiderma and intact epithelia. But, even when the microbes have succeeded, owing to a rent in the cutaneous or mucous surfaces, in penetrating the subjacent tissues, a real defence is being organized by the reaction of our organism. Very soon a rush of fluids takes place to the spot in danger. White blood-corpuscles and wandering cells emigrate by diapedesis through the walls of the blood vessels; they surround the infectious agents. They, at first, encircle, imprison these invaders, but soon take them up within their cell-envelope there to be devoured and digested.

This is the phenomenon to which Metschnkoff has given the name of phagocytosis.

Leucocytes are especially endowed with this property of seizing and digesting the microbes, but they are not alone to enjoy this privilege. The connective tissue-cells, the cells of the spleen, bone, marrow, the vascular and lymphatic endothelia possess also in a greater or less degree the power of taking solid particles into their interior, virtually, as we say, of eating them. In short, there exists after the entrance into the blood of microbes, a period of collectedness, so to speak, during which they sustain an intra-cellular struggle. Human cells may remain victorious, but if the microbe is the most energetic, it will grow, develop, and infection continues.

The life of animal cells, the activity of their nutrition is a guarantee of the organism against the microbes. Wherever life is diminished or suspended in some part of the economy, the infectious agents that are there multiply and triumph over our cells.

Nervous perturbations, the impression of cold, physical and moral commotion, sorrows, night-labors in lessening the action of vaso-motors and rendering therefore diapedesis and consequently phagocytosis more difficult, become the occasional causes of the development or aggravation of infectious diseases. The above has been demonstrated by Charrin and Gley, whose experiments were recently cited by Bouchard at the Berlin International Congress.

(*To be continued.*)

BANFF AS A HEALTH RESORT.

BY J. MURRAY M'FARLANE, M.D., C.M., LETHBRIDGE.

As accessories to medicinal agencies, we are all well aware of the great therapeutic advantages to be derived in chronic affections of various kinds, from the application of such hygienic measures as may be obtained by a sojourn at some "Spa," or watering place, where, united to the efficacy, more or less pronounced, of the saline and gaseous ingredients of the waters, in promoting metabolism, we combine the undoubted benefit of environment, such as scenery, change of air or latitude, and the freedom from the cares and worries of business, or professional pursuits.

Having recently visited Banff, I was simply charmed by the combination of advantages which it possesses for the invalid, in its mountain climate and sulphur hot-springs. Therefore, I thought a paper to the Lancet might prove of utility in furnishing some of our medical men with information which may come in handy at any time, although the fact that the Canadian Medical Association held a most successful meeting last year at Banff, must, of a necessity, have rendered a great many practitioners thoroughly conversant with the health resort of the future. Banff is nestled among the crags of Canada's National Park, in the Territory of Alberta, on the eastern slope of the Rockies, surrounded on every side by the towering peaks of this famous mountain range, some of which, even at this time of year, are covered at their summits by a mantle of stainless snow; which lends a delicious coolness to the atmosphere, proving a most agreeable change to those arriving

from the sweltering and enervating warmth of the plains or Eastern Provinces. "The Springs" are situated at an altitude of 4000 feet above the sea, so that Banff combines the climatic advantages of the mountains, the therapeutical virtues of the ingredients of the water, with the social benefits of the palatial hotels, with which the place is amply supplied; although to the Canadian Pacific Railway must be awarded the palm, their magnificent structure being, *par excellence*, the finest in the mountains. It resembles a picturesque Swiss *chalet*, of very substantial appearance, and a closer inspection reveals its many excellent qualities, the rooms being large and airy, each lighted by the incandescent light; the sewerage system as perfect as money and expert skill could make it, in fact it fulfils to the letter the plan of its design, that is to say, a perfect home for the tourist or invalid. The table cannot be surpassed. Every delicacy of the season, being served in a manner equally pleasing to the vitiated palate of the gourmand, and the fastidious stomach of the valetudinarian. Nothing makes a prettier sight than is presented by a view of Banff just about dusk in the evening. The myriad electric lights of the C. P. R. Hotel, twinkling through the slender greenish-brown pine trees; the dim masses of the surrounding mountains beginning to vanish, gradually fading in color at their summits, which are tinged an orange red by the rays of the setting sun; finally, the last beam of light dying away, silence reigns supreme, broken only by the chirrup of the cricket or the purling of the river, as it makes its way down to its destination in the plains to the east.

Discussing the subject of the mountain climate, we find that as we rise above the level of the surrounding plains of Alberta, two facts are impressed upon us: 1st. The air becomes more and more rarified, and secondly, the heat diminishes. The higher we rise, the greater these meteorological peculiarities become marked, proving important factors in certain classes of disease, as we shall see.

The climate of mountains exerts a proverbially healthy action, owing to the purity of the air, and perhaps to the sparseness of population. As Quain remarks, they have been highly praised by many Continental authorities, in the treatment of phthisis, the freedom of the air from irritating germs, its coolness and rarity being of great benefit to sufferers from incipient lung trouble.

The atmosphere being, as we said, of a lower density than at the sea level, is also less humid, or damp, although owing to local winds, mist and cloud occasionally form. The temperature too is lower, especially at night, thus ensuring better sleep to the invalid, who awakes refreshed from a balmy slumber, to which he perhaps had long been a stranger. The general effect of this dry and rarified atmosphere, is to produce an increase of the cardiac action, with concomitant freedom of circulation; one curious effect of this is a buzzing in the ears, which affects some visitors for a day or so, but then passes away. The respirations become deeper, the lungs more vascular, and the air cells expand to a greater degree, thus increasing the vital capacity of the chest. Some are known to have had their chest measurement increased two inches, after a residence of one year in the Rockies, which fact speaks for itself. Bodily movement is more easily performed, thus ensuring a desire for exercise, while owing to the lowered temperature, more food is necessary, the appetite improves, and a gain in weight results as a sequence, the effect being tonic and stimulating in the extreme.

And what classs of diseases may be benefited by a climate such as Banff affords? According to practical experience, they are as follows:

1st. In the early stage of phthisis, before much structural damage has been done.

2nd. In hereditary tendency to chronic pulmonary mischief, especially in young people, with badly developed chests, and a history of struma, the coolness of the air being of great benefit to consumptives, who suffer severely from the heat.

3rd. As a restorative, in the neurasthenia or nervous prostration, in overworked professional or business men, who frequently find here the relief, long sought for, by the aids of bromide, strychnine and the hundred and one alleged cures, for this, too prevalent affection.

4th. In cases of hay fever, which is unknown here. (The "Hay Fever Association" should make a note of this fact.)

5th. In Dyspepsia, and convalesence from acute illness, in persons not much over middle life.

A mountain climate is, however, contra indicated in chronic Bright's, heart disease, and emphysema,

the rarity of the air being particularly dangerous in these affections, especially if well marked.

It is a well established fact, that in persons suffering from chronic disease, environment has a great deal to do with the curative action of purely medicinal remedies. Therefore at Banff Springs the sublime scenery of the surrounding country, with its wealth of rugged beauty, its pine covered ridges, the majestic peaks towering in every direction, its mountain lakes, and romantic rivulets, which tear down icy cold from the melted snows of the summits, to join the rapid greenish-blue waters of the Bow River, which trails its serpentine length through our National Park. All these most potently assist the recovery of the invalid, who is taking a course of the sulphur waters. Every possible inducement exists for the enjoyment of physical exercise. For those fond of walking, there are pleasant paths, which wander in all directions, sometimes through balsamic scented pineries, others along the bank of the river, which wanders through the valley at the foot of the Titanic Range, which towers in rugged masses in every direction, as far as the eye can reach, disclosing new beauties of nature to the delighted pedestrian at every step.

For the sportsman, the speckled beauties, dear to all disciples of Izaak Walton, abound in nearly every roadside brook. While at a greater distance may be had the famous mountain sheep, which are becoming rarer every year, and like the buffalo seem doomed to extinction. Riding and driving may be had by those who desire it, good livery stables being quite near the hotel. So we see that Banff holds out inducements, of a very superior quality, to the ennuied health seeker.

Having told of the climate and scenery we will now discuss the "Hot Springs," which are becoming ustly famous throughout America and even Europe as well. The waters bubble up from the bowels of the earth, laden with medicinal virtue, heated to a temperature of 100° to 108° in nature's cauldron; and belonging to the class of alkaline sulphur waters.

The following are said to be the ingredients, according to the Government analysis of 1887, but I cannot vouch for its correctness, the analysis not having been made on the spot, and during transportation to Ottawa some of the gases must have escaped or changed their chemical composition; nevertheless the curative effect of the water is beyond cavil in certain diseases, which I will hereafter enumerate. In 100,000 parts of water there are the following saline and gaseous constituents :

Sulphuric anhydride	51.26
Calcium salts	24.48
Carbon dioxide	16.47
Magnesium oxide	4.14
Sodium oxide (calculated)	27.53
Silica	traces
Organic matter	traces
Total solids,	parts 123.88

And who may use these springs with benefit? It seems that their predestined function is for chronic invalids, and it may be encouragingly added for all, except the unfortunate victims suffering from such incurable maladies as advanced Bright's and malignant affections, which of course are not amenable to successful treatment.

The large quantity of water taken at the hot springs acts most beneficially, especially in the long category of affections belonging to what is now termed the uric acid diatheses. Upon this subject Fothergill speaks in the following terms :

"The good effects of watering places are largely due to the increase in the bulk of the fluid taken there, irrespective of any special property of the water. Especially is this the case of ladies who, as a rule, habitually take too small quantities of fluid."

Further, there is an impression abroad that it is dangerous to dilute the gastric juice too freely, and this has a tendency to cause many who should know better to use less fluid than is necessary for the proper maintenance of the bodily functions. This idea it is needless to say has been exploded by recent researches by noted physiologists. Then there can be no doubt as to the efficacy of fluids in the treatment of uriasis, or defective metabolism of the heterogenous portions of the ingesta, by the liver, where instead of the highly soluable urea being formed, the insoluble uric acid is the product manufactured. This being the case, large quantities of water should be taken so as to render as far as possible the circulation of uric acid in the blood, where it becomes a powerful irritant, as inert as possible thereby avoiding the long train of ills which gradually lead up to that medical bugbear

arterio capiliary fibrosis with the various pathological changes so ably written of by Fothergill and others.

Gouty people drink as a rule too little water and more is essential to their well being, and if the water be alkaline, as at Banff, so much the better, for taken before meals it stimulates the secretion of the acid gastric juice as Ringer has demonstrated, thus materially aiding digestion, relieving the drowsiness, despondency and mental apathy, common to disorders of the alimentary canal. Banff combining as it does the climatic benefits of the mountains with the therapeutical activity of the hot springs, in a most agreeable form, seems to be the best health resort in America in the treatment of the diseases of which we have spoken.

The waters are to be taken in combined drinking and bathing courses, and we find their best effects in the following disorders: Hepatic congestion, hæmorrhoids, laryngeal, pharyngeal, and bronchial catarrh, in early lung mischief, in rheumatism and gout, cutaneous disorders and constitutional syphilis, the latter especially being benefited as many of the cow boys and other residents of this western country can testify. Mercury of course is given as usual. Space will not permit of my telling how the baths are taken, but all is done under competent medical advice. Dr. Brett, the resident physician at the "Sanitarium," having charge of this department, any further information will be given by him to those writing for it. I cannot, even at the risk of being considered prosy, omit telling of the many persons met with, who, after patronizing in vain the "Spas" of Europe, at length found relief in Canada for their chronic pains and aches. Persons were seen who had come to Banff confirmed cripples with rheumatic disorders, and, after a due trial of the thermal baths were able to throw away there now useless crutches, and depart to their homes enjoying a peace of body and mind to which they had been strangers for years. In concluding I can only state that if any of my medical confrères send patients to the mountains they may rest assured that every attention possible will be paid to them by the C.P.R. people, whose courtesy is proverbial, and that they will be benefited physically, I am most positive; if the universal satisfaction which I saw evinced on every side be any criterion.

Reports of Societies.

CANADIAN MEDICAL ASSOCIATION.

The 23rd annual meeting of the Canadian Medical Association was held in the Theatre of the Normal School, Toronto, Sept. 9th, 10th, and 11th. The programme was a full one, but the attendance, especially at the opening, was small. The President, Dr. James Ross, of Toronto, delivered a very interesting address, in which he fully explained the aims of the Association and its purpose. In the afternoon Dr. Prevost, of Ottawa, gave the address in medicine—an excellent one which appears in this issue of THE CANADA LANCET. The programme, which we gave in our last Number was pretty faithfully carried out.

The officers for next year are as follows :—

President—Dr. T. G. Roddick, Montreal.

General Secretary—Dr. Birkett, Montreal.

Treasurer—Dr. W. H. B. Aikins, Toronto.

Vice-Presidents—Ontario, Dr. A. H. Wright, Toronto; Quebec, Dr. S. P. Lachapelle, Montreal; New Brunswick, Dr. S. H. Coburn, Fredericton; Nova Scotia, Dr. John Stewart, Picton; Manitoba, Dr. D. Young, Selkirk; British Columbia, Dr. E. A. Prager, Nanaimo; Prince Edward Island, Dr. Taylor, Charlottetown; North-West Territories, Dr. E. A. Kennedy, of McLeod.

Local Secretaries—Ontario, Dr. Prevost, Ottawa; Quebec, Dr. P. Robertson, St. Andrew's; New Brunswick, Dr. Bruce, St. John; Nova Scotia, Dr. A. Morrow, Halifax; Manitoba, Dr. Milroy, Portage la Priarie; British Columbia, Dr. Fagan, New Westminster; Prince Edward Island, Dr. McKay, Summerside; North-West Territories, Dr. Oliver, Medicine Hat.

Committees—Necrology—Drs. J. L. Davison, Stewart, Montreal; and Daniel, St. John.

Publication—Drs. Sheard and A. H. Wright, Toronto; George Ross, Campbell, Desrosiers. Fortier, Montreal; A. Morrow, Halifax; Pennefather, Winnipeg.

Ethics—The President, Secretary, and eight vice-presidents.

Arrangements—Drs. Bell, Roger, Lachapelle, Desjardins, Lamarche, and Shepherd, with power to add to their number.

Climatology—Drs. Oldright, Toronto; McGuiness, Edmonton; D. A. Campbell, Halifax.

Auditors—Drs. T. A. Rogers, Montreal, and A. A. Macdonald, Toronto.

Education and Literature—Drs. I. H. Cameron, Toronto; Chown, Winnipeg; Shepherd, Montreal.

Selected Articles.

ANÆSTHESIA.

An Address delivered before the International Medical Congress, Berlin, August 6, 1890.

BY H. C. WOOD, M.D., LL.D.,

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The most brilliant modern achievements, in the direct saving of life, of the science and art of medicine are connected with surgery. These great achievements have been rendered possible by two epoch-making discoveries, antisepsis and anæsthesia. The long array of fatal cases of poisoning by carbolic acid, by iodoform, by corrosive sublimate, and by other antiseptic agents; the hundreds of deaths from chloroform, ether, and other anæsthetics, all bear witness to the verity of that strange law, in obedience to which the progress of the human race is so often at the sacrifice of the individual. Antisepsis has outgrown the dangers of its youth, and to-day the measures that are meant to save, very rarely kill. On the other hand, the death-roll of anæsthesia is daily added to; added to, according to my belief, at a rate that has not changed in forty years. Though this be true, from far-off Australia comes the news that jury and judge have condemned to heavy penalty a chloroformist who had lost his patient; and in old England itself, the leading medical journal lends support to such a verdict by affirming that "deaths from chloroform are preventable, that with due care they may be avoided," and that, therefore, when they occur, they are the result of ignorance or carelessness. Five hundred deaths and more—the result of ignorance or carelessness! Five hundred surgeons, including such names as Billroth, Jaeger, Simpson, McLeod, Agnew, Hunter, McGuire, and others of equal rank, guilty of manslaughter! And still the carnage goes on. Surely under such circumstances the subject of anæsthesia is worthy of the attention of even this, the most learned medical gathering of the nations that the world can furnish. Antisepsis, the gift of the Old World to humanity: anæsthesia, the gift of the New World, which made the fruits of antisepsis possible: surely it is fitting that I, standing here to-day before you all, as the representative of the newer civilization, should be the chosen mouthpiece for the renewed discussion of this old but pressing theme.

In attempting a fresh study of a well-threshed-out subject, I propose to take advantage of the modern physiological methods, and to endeavor to discover by experiments upon the lower animals how anæsthetics kill, and what drugs or measures are most powerful in putting aside their lethal effects. This brings us face to face with the question—How far is it possible to adapt experiments to the needs of practical medicine, and to reason from the dog to the man? A full discussion of this subject would not be opportune, but it does seem necessary for our purpose to devote a few minutes to the pointing out of certain general guiding principles.

It ought to be acknowledged as a fundamental axiom, that no amount of experiments can overthrow a clinical fact; although when a contradiction between experimental and bedside observation seems to arise, such contradiction challenges the correctness of the alleged clinical and experimental facts alike, and should lead to a careful re-examination. No amount of failure to purge a dog by eleatrium proves that eleatrium does not purge man; whilst, on the other hand, the discovery that digitalis increased the blood-pressure in the lower animal very properly led to doubt as to the correctness of the, at the time, general belief that digitalis acts upon man as a cardiac sedative, and finally to the recognition of the falsity of the clinical observation upon which such belief rested.

Whatever difficulties may beset the path of the experimental therapeutist, it is certain that law is throughout the universe supreme: that man, at least in his physical nature, is only an especially developed animal: and if drugs act differently upon different animals, such action must be in obedience to certain laws, to us known or unknown.

Any attempt to discuss fairly these laws would lead us too far afield for the present. One law, however, treads so closely upon the matter at hand this morning, that it requires statement. This law is, that when an apparatus or system is of similar function and of similar functional activity in different animals, the difference in the action of remedies is very rarely, if ever, in kind, though it may be in degree. Throughout mammalia the heart has one general structure, and one general function; the heart of the dog responds to the touch of digitalis precisely as does the heart of the man. The human brain is so much more highly developed than the brain of the lower mammal, that it is, in fact, a new organ or apparatus, and its relation to drugs changes with the change of structure and of function. The scope of this law in regard to anæsthesia is not far to seek. The functions especially compromitted in lethal anæsthesia are respiration and circulation. Surely these functions are similar throughout mammalia, and surely we ought to be able to reason safely concerning them, from the dog to the man.

Recently, however, alleged clinical facts have been challenged by high authority, upon the strength of experimental results. Under these circumstances, nothing must be at once aban-

doned, everything must be re-examined. These re-examinations I have made, and I may be pardoned, perhaps, if I affirm that a complete study of the clinical and experimental evidence brings out, not a discord, but a most beautiful concord—that concord between experimental and practical medicine which so often fails to appear simply because we cannot fit together the fragments of truth in our possession.

Although numerous substances have been tried, there are to-day in use, practically, only three anæsthetics—nitrous oxide, ether, and chloroform. Of these, nitrous oxide stands apart, because it produces loss of consciousness not by virtue of any inherent properties, but simply by shutting off from the nerve-centres the supply of oxygen.

It has been asserted that the changes of circulation produced by the inhalation of nitrous oxide are essentially different from those of mechanical asphyxia, and that therefore nitrous oxide does not act as an asphyxiant. It must, however, be borne in mind that the phenomena of mechanical asphyxia are largely due to the presence of an excess of carbonic acid in the blood, whilst in the asphyxia produced by nitrous oxide there is no excess of carbonic acid, so that the phenomena present are simply the outcome of a lack of oxygen. It is, therefore, *a priori*, to be expected that the phenomena of mechanical and of nitrous oxide asphyxia should differ to a certain extent. To determine the way in which nitrous oxide inhalation affects the circulation, I have, during the past winter, in connection with my assistant and friend, Dr. David Cerna, made a long series of experiments. The result has been to show that usually the inhalation is followed by a rise of the arterial pressure, accompanied by a great disturbance of the pulse; the pulse at first becoming irregular and tumultuous, but by and by settling, so that when anæsthesia is complete the pulse-wave is remarkably large and full, and the rate very slow. The rise and fall of the arterial pressure in nitrous oxide anæsthesia was found to vary remarkably, not only in different inhalations, but in different periods of the same inhalation. Sometimes the rise was sudden, sometimes it was slow and gradual: sometimes it was maintained until near death, sometimes it was interrupted very early: sometimes it was not very well marked, sometimes it was enormous. As illustrating it, I have the accompanying diagrams, accurately showing the curve of the blood-pressure obtained in four inhalations practised cn three different dogs. (Fig. 1.)

In all our experiments respiration ceased while the heart was still in full activity. Indeed, instead of the gas acting as a cardiac depressant, it appeared to act as a cardiac stimulant, although it paralyzed the vaso-motor apparatus. Thus, during complete anæsthesia, faradic irritation of the sciatic nerve always failed to register itself in an increase of the blood-pressure, although the heart was beating very powerfully, and although the pneumogastrics had been previously severed: whilst late in the poisoning—at a time when the respiration had absolutely ceased, and the animal was in this respect dead, and without the power of self-recovery, and when the arterial pressure also had fallen almost to zero—the pulse-waves were frequently still nearly three times the norm. In evidence of this I append a reproduction of a tracing. (Fig. 2.)

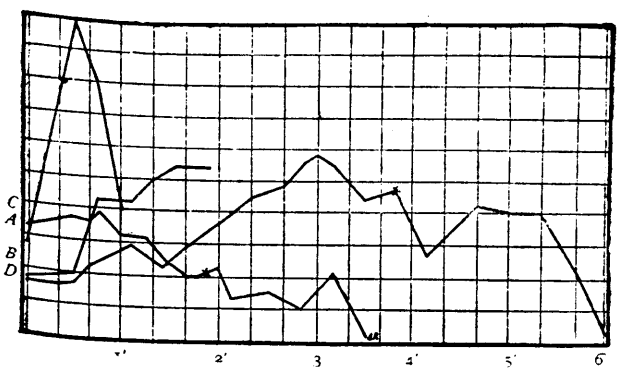


Fig. 1.

Plot showing effects of inhalation of nitrous oxide upon blood-pressure. *A*, first inhalation. *B*, second inhalation. *C* and *D*, inhalations in different dogs.

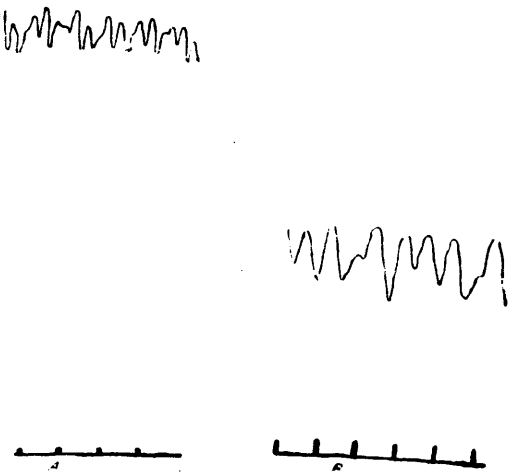


Fig. 2.

Figure showing the relative size of the pulse-waves in nitrous oxide anæsthesia. Tracing *A*, before inhalation. Tracing *B*, after breathing had stopped.

We made but few experiments as to the action of artificial respiration upon the animal dying from nitrous oxide, but these experiments proved that even after complete paralysis of the respiratory function, artificial respiration is capable of rapildy bringing the animal back to life. The heart lives on through nitrous oxide anæsthesia long after the respiratory function has been abolished, and even when the strong, full pulse fails, and the heart has almost ceased to quiver, recovery is still hopeful, because the loss of function has been caused, not by the presence of a poison, but by the absence of oxygen; and although the paralysis may be complete, the life-power sleeps before it dies, and is ready to awake at the touch of fresh oxygen.

These experimental results are in strict accord with clinical observations. The S. S. White Dental Manufacturing Company supply a very large, if not the largest, portion of the apparatus and material used for the administration of nitrous oxide in the United States; and, in answer to my inquiry, Dr. J. W. White, their President, writes me that a computation based upon their own sales, and a knowledge of those of their rivals, has reached "the somewhat appalling result, that anæsthesia by nitrous oxide gas is probably effected in three-quarters of a million of cases annually in the United States." Most of these inhalations have been given, not by trained physicians, but by comparatively untrained, and often very ignorant dentists; have been given to patients in a sitting or semi-sitting posture; have been given apparently without thought or care to the general community, as the units present themselves, to the healthy and to the diseased alike; and the result is, out of many millions of inhalations only three deaths recorded as directly due to nitrous oxide! Could anything be safer?

A suggestive and very practical fact which came out in our experiments, is that sometimes during an inhalation of nitrous oxide the rise of the arterial pressure is extraordinary and abrupt. Not long since, in the city of Philadelphia, a gentleman arose from the dentist's chair after an inhalation of nitrous oxide, staggered, and fell in an apoplexy. Is it not easy to perceive that when the arterial system is diseased, the great strain of a sudden rise of blood-pressure may produce rupture?

Some years since, Dr. Kenderdine, a Philadelphia surgeon of local note, died of diabetes, which he insisted was produced in him by the inhalation of nitrous oxide. This is in accord with the researches of the French physician Dr. Lafont, who reported a case in which sugar appeared in the urine twice in a patient, after inhalation of the gas; and who also caused in himself, and in dogs, temporary glycosuria by such inhalations. Further, Dr. Lafont noticed in a case of mitral insufficiency temporary albuminuria.

I am not aware that these very suggestive statements of the French physician have given rise to any research, except five experiments made recently upon healthy men, with negative results, by two medical students of the University of Pennsylvania, Messrs. George S. Woodward and Alfred Hand, Jr. I do not believe that ordinarily the inhalation of nitrous oxide is followed by sufficient disturbance of the circulation to register itself in the urine, but the negative evidence of Messrs. Woodward and Hand is not sufficient to render it improbable that in exceptional cases the inhalation of nitrous oxide may produce albuminuria or glycoscuria. Such phenomena, if they occur, are in all probability not directly produced by the nitrous oxide, but are due to the disturbances of capilliary circulation caused by it.

However these facts may be, it seems to me that great caution should be used in the administration of nitrous oxide to persons the coating of whose arteries is diseased, and it is probable that when widespread atheroma exists, ether is a safer anæsthetic then nitrous oxide.

When respiration has been suspended in nitrous oxide anæsthesia the overwhelming indication is certainly for the employment of artificial respiration.

Notwithstanding the great safety and the many advantages which attend the anæsthetic employment of nitrous oxide, the gas can never be used for the general purposes of the surgeon, on account of the excessive fugaciousness of its influence.

The perfect anæsthetic will be a substance which has the power of paralyzing the sensory nerve-trunks without affecting other functions of the body. If such drug exist, it yet awaits the coming of its discoverer. Probably until such a sensory nerve paralyzant is found, choloform and ether will maintain the complete supremacy which they now have; and in the further discussion of my subject I shall confine my remarks to them. Lack of time limits the discussion to:

First. The method in which these two drugs kill, both in man and in the lower animal; that is, whether they destroy life through the circulation or the respiration.

Second. The comparative fatality attending the use of these two agents, and the reason for the difference.

Third. The comparative disadvantages between the two agents, and the best method of securing the desired result.

Fourth. The treatment of accidents occuring during ether or chloroform aæsthesia.

In regard to the method in which anæsthetics kill, my own teaching hitherto has been: first, that although ether in moderate doses acts as a stimulant to the circulation, yet in overwhelming amount it is capable of depressing the heart, but that such depression of the heart is always less

than the depression of the respiration, and therefore, ether kills always through the respiration; second, that chloroform may produce death by paralysis of the respiratory centre, or by a simultaneous arrest of respiration and circulation, but that primary paralysis of the heart may occur, and is especially prone to do so when the chloroform vapor has been given in concentrated form.

I think that these views are in accord with general professional belief, but it has recently been alleged that they are at variance with experimental evidences, so that a re-examination is necessary. What then are the clinical facts?

If any credence is to be attached to the statements of competent witnesses, who have recorded human deaths during anæsthesia, it is certain that in some cases, under the influence of chloroform, the pulse and respiration have ceased, simultaneously; whilst in other instances the respiration has failed before the pulse; and in still other cases the pulse has ceased its beat before the respiratory movements were arrested.

Usually ether arrests respiration in man before it paralyzes the heart, but the collection of records made by Dr. J. C. Reeves certainly shows that the fatal result may be produced by syncope. Thus Dr. Ernest H. Jacobs, in a report of a fatal case, asserts positively "the pulse ceased, the breathing continued." It would seem that we must admit that ether in the human subject may cause death in the same methods as does chloroform.

Such then are the clinical facts; or in other words, such are the results of observations made upon the human subject. What are the results of observations made upon animals?

The general teaching in regard to chloroform has been recently challenged by Dr. Lauder Brunton, who, of the result of 450 experiments made by himself upon the pariah dogs of India, has reached the conclusion, published in the London *Lancet*, that however concentrated the chloroform may be it never causes death from sudden stoppage of the heart. In the physiological laboratories of the University of Pennsylvania, for some years, several hundred dogs have been annually used, and a very large proportion of these dogs have been, at the end of an experiment, killed by chloroform. The observations of Dr. Reichert, Professor of Physiology in the University, Dr. H. A. Hare, Demonstrator of Therapeutics, and myself, have been concordant in showing that chloroform is a cardiac paralyzant, and often does kill dogs by a direct action upon the heart or its contained ganglia. The statements made concerning the Hyderabad Commission, however, led Dr. Hare and myself to a thorough and careful restudy of the subject. Some of our experiments were made by injecting chloroform into the jugular vein; others by administering it by inhalation in the usual way.

The action of the chloroform seems to be not seriously modified by the method of administration. We definitely proved that in the dog, chloroform has a distinct, direct, paralyzing influence on both respiration and circulation; that the respiration may cease before the heart-beat, or the two functions be simultaneously abolished; but that in some cases the heart is arrested before respiration.

We have several times seen the respiration continue as long as one, and even two minutes after the blood-pressure has fallen to zero, and the pulse has completely disappeared from the carotid artery.

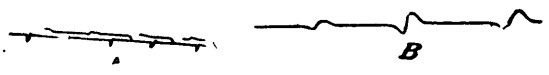
The correctness of our experiments, we claim, must be acknowledged. The experiments have not only been witnessed by a number of persons, but I have with me to-day tracings which I will gladly show anyone especially interested in the subject. I do not desire to express any doubt whatever as to the correctness of the experimental data of Dr. Brunton; I simply claim that both sets of experiments, although they have yielded different results, have been correctly and properly performed. It may be that the high heat or other climatic conditions surrounding the pariah dog make his heart less sensitive to the action of chloroform than is the heart of the dog bred in Northern climates. That the thought of the different constitutions of animals in different climates is not absurd, is shown by the fact that some years ago, after I had affirmed before the Physiological Section of the International Medical Congress at London, that if certain asserted results were obtained upon European dogs, said dogs must differ from those of America, and had been met with a smile of incredulity, Dr. Brown-Séquard rose and stated that he had experimented upon hundreds of dogs on both continents, and that there was a distinct difference between the animals, the vascular system of the European dogs being much more developed, and operations upon them being, therefore, much more bloody than was the case with the American dog.

A very curious parallel might be traced at this point between the experimental and clinical evidence in regard to the effect of climate upon the action of chloroform. In the Southern United States chloroform is used with great freedom, and with great alleged safety; and as long ago as 1878, Dr. Landon B. Edwards, editor of the *Virginia Medical Monthly*, wrote: "It is one of the most peculiar facts I have ever known in medical practice—the difference of experience in Europe and the North, with chloroform and ether, as compared with that of the South—the high rate of mortality in the North, and the low rate in the South.

In a series of experiments which I have recently made to determine the changes in the circulation produced when ether anæsthesia is carried on to

death, I have found that in the first periods of anæsthesia the blood-pressure is usually elevated, and that it is usually quite high at a time when the respirations are very shallow and imperfect, and the dark color of the blood shows that it is heavily charged with carbonic acid. It is not, however, very rare for the blood-pressure to remain near the norm, and I have seen the blood-pressure begin to fall in the very first stages of ether anæsthesia; moreover, in at least two experiments death occurred from syncope, the respiration continuing for one or two minutes after the complete cessation of the circulation. In an experiment in which the fall of the blood-pressure was most pronounced, and the arrest of heart most complete, the dog was sick from the mange, and it is possible that the weakened heart was more susceptible than is the normal heart to the depressing influence of ether.

Fig. 3.



Tracing showing respiratory movements, *B*, registered one and a quarter minutes after circulation had fallen as shown in *A* during death from ether in the dog.

So far, then, as concerns the method in which ether and chloroform kill, I claim most urgently that there is no contradiction between the results as obtained by the bedside and in the physiological laboratories, and that a complete, broad study of the clinical and experimental evidence leads to one conclusion, namely, that chloroform and ether are capable of paralyzing the respiration and the circulation; that in some cases one function, in other cases the other function, is primarily arrested; but that ether is less prone to produce a primary arrest of the heart than is chloroform.

In the discussion of the second point which I have raised, namely, the comparative fatality attending the use of ether and chloroform, I shall not occupy time with any elaborate setting-forth of the clinical evidence. In regard to the number of recorded deaths, I shall content myself with accepting the latest statistics at hand, namely, those collected by Dr. Laurence Turnbull, who has found 375 deaths reported from chloroform, and 52 from ether. I do not believe that these figures nearly represent the total mortality; I doubt very much whether one-third of the deaths from anæsthesia are reported; certainly not one-third of the cases I have had personal knowledge of have been publicly recorded. Moreover, the pressure to conceal deaths from chloroform is greater than when the lethal result is due to ether. The surgeon who uses ether feels that he has employed the safest anæsthetic, and that he will receive no blame if a death occurs from it, and feels also that he has a rare case to put on record, which will give his own name a permanent place in anæsthetic literature; whereas the surgeon who uses chloroform knows that if death occurs from the anæsthetic, a very large proportion of the profession, at least in the United States, will condemn him either in public or secret, for the use of this drug, and that he will be fortunate if he escape being publicly condemned by a coroner's jury. Moreover, deaths from chloroform are only too common, so that the surgeon has nothing to gain and much to lose by publication of a chloroform death, and if possessed of the average human nature, holds his peace. The Coroner's Physician of Philadelphia, Dr. Formad, informs me that he has made autopsies in 15 cases of ether death, only 3 of which have been reported in medical journals; how many chloroform deaths have been lost in eternal quiet?

It seems to me impossible to get at the exact number of anæsthetic deaths, or the proportionate fatality of ether and chloroform. Lyman considers that in regard to chloroform, the ratio of deaths to inhalations is 1 in 5860; Richardson, that it is 1 in 2500 to 3000. Andrews puts it for ether, at 1 in 23,204; and Lyman, at 1 in 16,542.

Without claiming strict accuracy for any of these figures, I think it can be asserted that the ratio of deaths from chloroform is probably at least four or five times that of deaths from ether.

When we come to study the effects of chloroform upon the lower animals, we find that it varies very distinctly in its action on the different species. The cat seems to withstand the fatal influences of chloroform with a power worthy of its reputed "nine lives." Many years ago, Professor Schiff called attention to the fact that the use of chloroform as an anæsthetic in the dog is usually attended with the loss of many animals. Professor Martin, of the Johns Hopkins University, writes me that the margin between complete chloroform anæsthesia in the dog, and chloroform death, is a very narrow one. This certainly is our experience in the University of Pennsylvania; we have never been able to use chloroform as an anæsthetic without losing a very large proportion of our dogs.

Clinical and experimental results—*i. e.*, the results of experiments made in the physiological laboratory upon the lower animal, and the results of experiments made in the amphitheatre upon the higher animal, Man—are again concordant. Chloroform is much more inimical than ether to animal life. The cause of this singular fatality is not, however, chiefly the cardiac action of chloroform. Chloroform is more apt to cause cardiac arrest than is ether, but it is also much more prone than is ether to cause death by failure of the respiration. Almost invariably, when ether is withdrawn before the dog is absolutely in the grasp of death, recovery occurs; but over and over again I have noticed that although the chloro-

form was taken away whilst the respirations were still being mantained with regularity, the arterial pressure much above zero, and the pulse very apparent, yet the symptoms of cardiac and respiratory failure continued to increase until the fatal issue was reached.

It seems to me that certain general facts or principles in regard to anæsthesia must be considered as established:

First, that the use of any anæsthetic is attended with an appreciable risk, and that no care will prevent an occasional loss of life.

Second, that chloroform acts much more promptly and much more powerfully than ether, both upon the respiratory centres and the heart.

Third, that the action of chloroform is much more persistent and permanent than is that of ether.

Fourth, that chloroform is capable of causing death either by primarily arresting the respiration, or by primarily stopping the heart, but that commonly both respiratory and cardiac functions are abolished at or about the same time.

Fifth, that ether usually acts very much more powerfully upon the respiration than upon the circulation, but that occasionally, and especially when the heart is feeble, ether is capable of acting as a cardiac paralyzant, and may produce death by cardiac arrest at a time when the respirations are fully maintained.

Chloroform kills, as near as can be made out, proportionately four or five times as frequently as does ether; partly, no doubt, because it is more powerful in depressing the heart, but largely because it lets go its hold much less rapidly than does ether when inhalation ceases. Is it not possible that this "holding on" is because it is less volatile than ether, and can we not here get a hint why chloroform is less deadly in the South than in the North? The diffusibility of vapors or gases is in inverse proportion to the square of their densities, and the vapor of chloroform would certainly diffuse itself with far greater rapidity at 90° F. than at 70° F.

The comparative advantages and disadvantages of the two anæsthetics in practical medicine, are so well known, that only one or two points seems to force themselves upon our present attention. I cannot see that the surgeon is justified in putting the life of the patient to the unnecessary risks of chloroformization, except under special circumstances. I believe, moreover, that much of the unpopularity of ether is due to its improper administration. It is so easy to embarrass the respiration seriously by the folded towel, as commonly used, that not only are the struggles of mechanical asphyxia almost invariably produced, but probably death itself is sometimes caused. Especially is there danger of death being thus caused mechanically in the advanced stages of etherization, when the patient is too thoroughly etherized to struggle, and when the attention of the etherizer is, it may be, attracted by some novel and difficult operation. I myself confess to having once nearly killed a patient in this way.

A proper apparatus is certainly preferable to the folded towel. Various apparatus have been invented, but as the time is short I shall only mention one—one which seems to me a practically perfect mechanism, although it is probably little known this side of the Atlantic.

The inhaler invented by Dr. O. H. Allis, is based upon the theory that the patient to be etherised should be supplied with a full abundance of air, saturated with the vapor of ether. It consists essentially of a series of foldings of muslin on a wire framework, arranged almost like the gills of a fish, so as to allow the air to pass freely through, but everywhere to come in contact with ether. It should be placed upon the face of the patient dry, and the ether gradually poured on from a bottle with an especially prepared cork, known in Philadelphia as the "polyclinic" bottle. When properly used the Allis inhaler practically does away with the sense of suffocation, and the consequent struggles which have made etherization alike so repulsive to patient and surgeon.

In order to determine the rapidity with which etherization can be produced by this inhaler, Dr. M. H. Williams kept for me notes of thirteen consecutive cases in the clinic of the Jefferson Medical College Hospital in Philadelphia. The average time required for the production of complete unconsciousness was eight minutes. The average time during which anæsthesia was fully maintained, was thirty two minutes; and the average amount of ether used during this time was $7\frac{1}{2}$ ounces. In twenty-one surgical cases occurring this spring in the clinical service of Professor J. William White, of the University of Pennsylvania, the average time for the production of complete anæsthesia with ether, used through Allis's inhaler, was seven and nine-tenths minutes. The results arrived at in these two clinics are so close that eight minutes must be considered the average time required for full etherization by this apparatus.

In discussing the treatment of the accidents of anæsthesia, the results obtained at the bedside naturally press forward for careful consideration, but in going over the subject from this point of view, I have found so little that was novel, and so little that was satisfactory to myself, that I shall not occupy the time of this Congress with any conclusions drawn from reported cases, or personal experience in chloroform accidents. I do not think myself that the problem can be solved by any such study of cases. Death is so near and so terrible, time is so absolute, moments so important, that no surgeon would be willing or justified in waiting for the effect of any one remedy; and

when a man is dosed with alcohol, nitrite of amyl, hypodermic injections of ether, digitalis, atropine, and other powerful agents; faradized, slapped, douched, stood on his head, subjected to chest movements for artificial respiration, and to various other measures too numerous to mention; who can tell, if by chance he recover, why he has done so? or who can point out, if by chance he die, what is the remedy whose omission or commission has led to the fatal result?

The problem is a very complex one, not to be worked out amidst the excitement and responsibilities of the amphitheatre. Only in the physiological laboratory can its various elements be separated and studied each by itself, without regard to the individual life which is at stake.

In the physiological laboratory two distinct paths open, each promising to lead to some positive knowledge. We may, on one hand, enter upon the study of the minimum fatal dose of the anæsthetic, and of the results by the concurrent or subsequent administration of its supposed physiological antagonist; or we may investigate the effect of remedies upon functions that are failing under the influences of the anæsthetic.

The objections to the first of these methods have been, in the present instance, overwhelming. The accidents seem to be independent of the amount of anæsthetic inhaled; and such a method of investigation would have required far more time than was available after I had had the honor of being asked to address this body. Death is produced by chloroform and ether through paralysis of the respiration and the heart, and the method of experimental study which I have employed consisted in a study of the action of powerful agents upon these functions when oppressed by chloroform. I have selected chloroform chiefly because it is the more powerful agent of the two anæsthetics, and the more certain in its lethal results.—*Med. News.*

(To be Continued.)

ON THE PRINCIPLES OF THE TREATMENT OF DIABETES MELLITUS.

The first point to be considered in discussing the treatment of diabetes is the rationale upon which it should be conducted. A certain deviation from health resulting in the escape of sugar with the urine constitutes the condition that has to be combated, and something requires to be said regarding the nature of the deviation before we are in a position to approach the question of how it should be treated.

The observable phenomena are that, whilst in the healthy subject the food ingested is disposed of in such a manner within the system as not to lead to the exit of sugar from it, in the diabetic subject the food fails to be similarly disposed of, but in part passes out as unconsumed and wasted material with the urinary excretion. It is with the carbohydrate principles that the faulty action lies. These, instead of passing in the direction that results in their consumption and utilisation, and thus disappearance within the system, as occurs in health, do not follow such a course, but remain in the state of carbohydrate, and are eliminated as such. The chemistry of the body with regard to these principles is at fault. The proper changes do not take place to lead to their being employed as they ought to be, and thereby lost sight of. Represented in other words, through defective assimilative action these principles do not pass on, it may be said, to their proper destination.

Thus much is learnt by simply looking at the matter through the light of ingress and egress.

There is no theoretical consideration involved in stating that the carbohydrates in the system of the diabetic fail to undergo those right chemical changes which, in health, lead to their disappearance, and that consequently, whether ingested from without, or formed from the splitting up of nitrogenous matter within, they become disposed of by egress with the urine.

It may further, I consider, be stated that, as a result of the faulty action, the carbohydrate, in the form of sugar, reaches the general circulation in a manner it ought not. No one with any ground of support can contend that the sugar eliminated is formed by the kidney. Whatever appears in the urine has previously existed in the blood flowing to the organ, and osmosis suffices to account for the escape that takes place. I am of opinion it has satisfactorily been made out that healthy urine contains a certain small amount of sugar, and this stands in accord with what is observed as regards the condition of the blood under natural circumstances.

With regard to the presence of sugar in ordinary urine, I conducted a series of observations some years ago, in which I precipitated the sugar by means of lead acetate and ammonia, after previous separation of the uric acid by lead acetate alone. The compound of sugar and lead oxide was then decomposed by sulphuretted hydrogen, and the sugar estimated gravimetrically by boiling with the copper test liquid, collecting the precipitated cuprous oxide, and subsequently, by the aid of a galvanic current, depositing the copper upon a weighed platinum cylinder. The amount found varied from 0.96 to 0.533 parts of sugar per 1,000 parts of urine.

The condition of the blood, as regards sugar, can be with precision defined by the application of a satisfactory analytical procedure which exists at our command. There is no difficulty, with the exercise of proper attention, in securing the full extraction of whatever sugar is present in a given

specimen of blood, and afterwards expressing its amount. From a large number of observations, I may state that the quantity of sugar in blood taken under natural conditions does not amount to more than from about 0.5 to about 0.8 per 1,000. Under deviations from the natural state the quantity may be quickly made to rise higher, and this, it may be said, should be borne in mind in looking at results where larger quantities are mentioned by investigators as having been found. I have made analyses of the blood obtained from persons suffering from diabetes, and have a record of seven instances. A general agreement is distinctly recognizable between the amount of sugar escaping with the urine and that found in the blood. Taking one instance, where 750 grammes of sugar were eliminated with the urine in the twenty-four hours, the blood contained 5.763 per 1,000; whilst in another, with 27 grammes in the urine for the twenty-four hours, the amount in the blood was 1.543 per 1,000. These are the examples giving respectively the highest and lowest figures of the series, both for urine and blood. It is correct to state that the condition of the urine as regards sugar affords an index of that of the blood. This is only what might be expected, seeing that sugar is a diffusible substance, and that therefore in proportion to its presence in the blood so may it be looked for in the urine. As its presence to more than an exceedingly minute extent is abnormal to the urine, so the same may be said of the blood, and its presence in the blood to the extent occurring in diabetes means the existence of an unnatural state of this fluid, which induces a deviation from healthy action throughout the system. In proportion to the extent of this deviation from the healthy state—that is, in proportion to the amount of sugar reaching the general circulation and thence passing out through the kidney—so will stand the measure of severity of the symptoms of diabetes. Looked at broadly, it may certainly be stated that the larger the amount of sugar eliminated with the urine the worse, in every direction, is the condition of the patient suffering from diabetes.

We thus trace the symptomatic phenomena of the disease to the abnormal condition occasioned by the presence to an undue extent of sugar in the general circulation.

Whence, it may be next asked, arises this abnormality? I must not enter too far into the discussion of this matter, but the question has a distinct bearing upon the basis of treatment, and therefore requires to be touched upon to a certain extent.

I doubt not it will be conceded by all that the object to be attained by treatment is to diminish the deviation from health as far as practicable. It is only a rational procedure to endeavor to establish and maintain as close an approximation to the healthy standard as our knowledge enables us to effect. Observation shows that the amount of error as regards sugar in the blood, and, following upon this, sugar to be discharged with the urine, is in proportion to the amount of carbohydrate principles, of what ever kind, ingested. It may be said in general terms without, as I have already stated, asserting anything outside the region of fact, that the nature of the error to be dealt with consists in a failure of the power in the system to dispose of the carbohydrates in a manner to lead to their utilization and disappearance. But now arises the question, to what kind of faulty action is this failure to be attributed? Two points of view present themselves for consideration. We start with the fact that sugar is present in the blood to an extent that is unnatural. Is this due to sugar reaching the general circulation in a manner that it ought not? Or is it to be regarded as natural that all the sugar eliminated in diabetes should reach the general circulation, the error consisting of its not undergoing subsequent destruction, thus leading to accumulation?

It would be out of place to discuss these propositions here. The view to be taken rests on physiological considerations. It is known that I have over a long space of time given close attention to the matter, and my experimental inquiries lead me decidedly to affirm that I consider the source of the sugar encountered in the blood and eliminated in diabetes to be attributed to its being permitted to enter the general circulation in a manner that it ought not. This view harmonizes fully with the phenomena observed in diabetes. In health, I should say, the opportunity is not afforded for the ingested carbohydrates to appear in the urine, for the reason that they are not permitted to pass through the liver and reach the general circulation. In diabetes, on the other hand, we know that they do reach the general circulation in the form of sugar, and from the amount of this principle to be found in the urine it can be stated that they must do so in proportion to the amount ingested. I would, therefore, say that we have here to deal with a failure of power —assimilative, or whatever else it may be called —to arrest the passage of carbohydrates through the liver. Being thus permitted to reach the general circulation, they are placed in a position to be discharged with the urine, and hence, according to the amount of carbohydrate principles ingested, so is the amount of sugar eliminated. With such a state of things existing, elimination necessarily follows upon, and is proportionate to, ingestion, and leads to the production of a result which is found to stand in harmony with observation.

I have spoken of ingested carbohydrate being checked by the liver from entering the general circulation as constituting what occurs under

conditions of health, and I do not make this statement unsupported by the information afforded by experiment. I have conducted a large number of experiments upon the point, and can say from them that when the requisite precautions are observed, to obtain a representation of the natural condition of the blood of the systemic, or general, and of the portal circulation, a large preponderance of sugar is encountered in the blood of the portal vein, if the observation be made at a period of digestion and after the ingestion of food freely containing carbohydrate matter. But it is necessary to bear in mind, if the estimation of the sugar be effected, as is the common practice, with the copper test, that a fallacy may arise from the following circumstance, unless measures are taken to guard against it. With the transformation of starch in the alimentary canal, preparatory to absorption, it is not, certainly to any noteworthy extent, carried higher than maltose, which, as is known, has a cupric oxide reducing capacity of 61, as compared with glucose at 100, and much of it is only carried into a dextrin with a lower cupric oxide reducing power still. Hence the form of carbohydrate, derived from starch, which reaches the portal system, does not possess the cupric oxide reducing capacity of glucose, but something more or less considerably below it. As an actual fact I have a recorded instance in which the product contained in the portal blood after the ingestion of starchy food possessed a cupric oxide reducing power standing as low as 21, as compared with glucose at 100. In this instance, if reliance had been placed upon the ordinarily conducted method of estimation, the amount of carbohydrate present would have been expressed at only about one-fifth of what it really was. With a form of carbohydrate other than glucose existing, it is necessary to bring it into glucose by boiling with dilute sulphuric acid, to permit of the true amount being determined, and this has been the plan of procedure of late years adopted in the researches I have conducted.

I have considered it necessary to enter into these preliminary details. They display the nature of the faulty condition that has to be dealt with by treatment. Sugar reaches the general circulation in a manner that it ought not, and to its presence in the system are due the various symptoms belonging to diabetes. Through reaching the general circulation it becomes eliminated by the kidney and is lost. The disease thus involves a sacrifice of material which ought by rights to be turned to account, but this is a point that has but little bearing on the production of the phenomena that are observed in connection with the disease. If it were only a question of waste of the carbohydrate principles of food there would be no reason against their being taken and allowed to run off. Provided a sufficient amount of other alimentary principles were consumed to meet the requirements of life, no particular harm need arise from the sacrifice of the material occurring. What, it may be said, in reality inflicts the harm is the altered constitution of the blood, occasioned by the presence in it of the sugar which passes through the system to the urine. In proportion to the largeness of the amount of sugar thus traversing the system in the blood so will be the extent of deviation from the natural state, and so in correspondence the impairment of health that will be found to exist.

The class of case to which these remarks apply is that in which the discharge of sugar is susceptible of control by treatment, and the class embraces the majority of the cases in which the disease sets in after the middle period of life.

In such instances, starting with the ingestion of carbohydrate, there follows, briefly summarized, as a consequence of the want of proper transformative, or assimilative power within the system, an accumulation of sugar in the blood attended with its discharge by the urine. Accumulation of sugar in the blood leads to the production of symptoms proportionate in severity to the deviation from the natural state. The plain object before us is to reduce this deviation as far as is found to be possible.

We cannot be wrong in endeavoring to attain as close an approach to natural conditions as circumstances permit If the chemistry could be set right, and sugar be prevented reaching the general circulation, the disease would be removed; but it may not be possible to restore the transformative, or assimilative power which has become impaired or lost, and then the only way of arriving at what is wanted is to withhold from introduction into the system the alimentary principles, which, owing to failure of power to properly dispose of them, cannot be of service, and which, by leading to the passage of sugar through the system, establish an unnatural condition, and thereby inflict positive harm.

As long as the passage of sugar through the system is prevented no harm takes place. In the course of all my experience in diabetes, I have never known anything serious to arise as a part of the disease so long as the urine has been kept free from sugar. There is nothing, in fact, to form the source of trouble, seeing that there is not the abnormal presence of sugar in the circulation to occasion deviation from the healthy state. On the other hand, when sugar is passing through the system, and the remark applies in proportion to the amount passing through, not only are there to be observed the symptoms ordinarily consequent thereon, but a constant state of insecurity exists, from the danger of the supervention of the serious issues known to follow upon disease. Moreover, with the unnatural state occasioned by the pres-

ence of sugar, nutritive action is not carried on in such a manner as to properly maintain the general strength. As a consequence, the general power becomes sapped, or prematurely exhausted, and the system weakened and rendered less able to resist the effect of pernicious influences. Such is not the position when sugar is not similarly traversing the system. Indeed, there is nothing to render the state essentially different from that ordinarily existing.

The contrast between the two conditions—that is, where sugar is allowed to abnormally exist in the system, and where it is prevented from doing so—is well shown in cases where the disease has run on for some time without being recognized, and is subsequently controlled by dietetic treatment. What will be observed in such instances will be a gradually advancing impairment of health and increasing severity of the symptoms of the disease; and it is right to assume that progress in the same direction would run on, and the patient grow worse and worse, if the condition continued to be left to itself. Whilst matters are thus proceeding, it happens, say, that the existence of the disease becomes recognized, and, if the case be such that the sugar is susceptible of being removed from the urine by the exclusion of the carbohydrate principles from the food, and this exclusion be carried out, this alone will suffice, not only to check the downward progress occurring, but to bring back health and strength to the patient.

The first consideration, therefore, in the treatment is to control by dietetic measures the passage of sugar through the system. The real point, however, to be aimed at is to restore the assimilative power over the carbohydrate elements of food; and until this has been accomplished it cannot be said that a cure has been effected, but only that the disease is held in subjection, and prevented, as long as the condition can be maintained, from leading on to an unfavorable issue. What most conduces to this desired restoration of assimilative power is the maintenance of a normal state of the system by keeping it free from the passage of sugar through it, and in this way bringing a healthy condition of body to bear in helping to promote a removal of the faulty state.

According to my own experience, opium and its derivatives, codeine and morphine, are the medicinal agents which, more than any others that I know of, assist in the actual cure of the disease, by which I mean a restoration of the assimilative power which has been impaired.

The influence of these agents may be witnessed in cases where the sugar has been brought down by diet to a certain point, but is insusceptible of entire removal from the system by dietetic treatment alone. The complete removal may then be sometimes observed to follow the subsequent administration of the drug, showing that the medicinal agent has acted in the direction of exerting a restraining influence over the abnormal production and elimination of sugar.

When cases of a favorable nature, that is, cases occurring above the middle period of life, are treated by these combined measures, and the treatment is steadily carried on for some time, it is a matter of common observation that the system of the patient becomes able to tolerate a certain amount of carbohydrate food, without it leading to the elimination of sugar. Often, with strict observance of the required treatment, the assimilative power is found to become so far re-established, that a fair amount of the carbohydrate principles, or even an ordinary diet, may be taken without leading to the elimination of sugar. When this is the case, carbohydrate principles, according to the extent found to be tolerated, may be taken without occasioning harm; but the object is to keep below the point at which the escape of sugar takes place, and when this is done actual benefit, instead of injury, is derived therefrom.

Here I may refer to the aid afforded by the quantitative testing of the urine. It is absolutely essential, I consider, in the management of a case, to possess the knowledge thus supplied, not only for the purpose of regulating the treatment according to the progress made, but also for keeping a check upon the manner in which the directions given are being carried out. When in a case it is found to happen that the assimilative power has been restored, it is permissible to consider that an actual cure has been effected; but it is always requisite to bear in mind that a weak point has existed, and that it is advisable to avoid unduly taxing a power which has previously given evidence of being at fault.—Dr. Pavy in *Br. Med. Jour.*

CARDIAC DYSPNŒA: ITS PATHOLOGY AND TREATMENT.

The dyspnœa of cardiac affections is either mechanical or toxic, or both. In the toxic forms it may exist independently of any appreciable affection of the respiratory passages by the simple fact of spasm of the arterioles; in the mechanical forms its essential condition is blood-stasis in the lungs; in all cases it may co-exist with bronchitis and emphysema.

In stenosis or insufficiency of the mitral the dyspnœa is largely, if not altogether, mechanical, being due to pulmonary engorgement. In the earlier stages the dyspnœa may be but slight, and only felt on active exercise (the dyspnœa of exertion); the heart may be quite competent to clear its cavities, except when an extra task is put upon

it ; in the later stages engorgement is constant and the dyspnœa permanent.

In the incipiency of aortic regurgitant disease, dyspnœa of a mechanical character is a frequent symptom ; any sudden violent exertion may put the patient in agony for breath ; the left ventricle is only able to clear itself during rest or moderate exercise. When the disease is advanced and compensation is broken, the dyspnœa may be constant, as in mitral disease ; in fact, the cardiopathy is likely to be complicated with mitral lesion ; it more often happens, however, that the dyspnœa is paroxysmal, coming on at night, thus resembling true asthma. The dyspnœa of fatty degeneration, of chronic myocarditis (fibroid heart), or dilatation from whatever cause, ordinarily assumes this paroxysmal character, though always produced or aggravated by exertion. The same remark is applicable to the dyspnœa of aortitis and arterio-sclerosis, pathological states to which attention has been much called of late, since the publication of Huchard's able work. Various factors concur in the production of this paraoxysmal dyspnœa. The dyspnœa may be purely mechanical, being provoked by any exertion that fatigues the heart, any condition or position of the patient that embarrasses the heart's action. The paroxysmal dyspnœa of aortic disease, of myocardial degenerations, etc., which is so prone to come on in the night-time, waking the patient out of his first sleep, compelling him to sit up and tug for breath, has been attributed to the recumbent posture, the stomach and viscera, especially after a full meal, being forced upward with the diaphragm and encumbering the heart's area. Moreover, any concomitant bronchitis and emphysema is likely to be aggravated in the night-time and when the heart is fatigued.

The above explanation of the pathogeny of the paroxysmal dyspnœa does not quite satisfy Huchard, who sees in this dyspnœa a phenomenon of arterial hypertension : " *Selon moi le pseudo-astheme aortique est du à la hypertension arterielle; or, celle-ci est augmentée par la station horizontal et sous l'influence du sommeil, comme elle s'élève aussi ar l'effort de la marche et du mouvement.*"*

This hypertension greatly augments the peripheral resistances against which the heart has to contend, producing a spasmodic condition of the arterioles, which is more or less constant. Now aortic disease, according to Huchard, is very generally associated with a peculiar diathesis called *arterio-sclerosis*, which manifests it self by more or less general atheroma or sclerosis of the blood-vessels. The kidneys sooner or later, participate, undergoing slow degeneration, and becoming incompetent for their function ; the blood poisoned by retained waste products, irritates the lining membrane of the arterioles, still further augmenting the hypertension. Hence, the dyspnœa of aortic degenerative disease is not only mechanical, it is also toxic, owing to the impermeability of the renal emunctory.

The same explanation is applicable to degenerative diseases of the myocardium dependent on arterio-sclerosis.

In the treatment of cardiac dyspnœa the reading indications are, 1, to make the heart competent for its work ; 2, to calm nervous perturbation ; 3, to eliminate toxic elements which may be the cause of the dyspnœa.

The first indication is likely to be very difficult of fulfilment. The dyspnœa is generally a symptom of failing compensation, and digitalis, strophanthus, and other heart tonics confer only temporary, and more or less uncertain, benefit. The heart cannot by any medication be made sufficient for great tasks, and the best that can be done is to adapt the work to the capacity of the heart. In the early stages of mitral disease the dyspnœa is only felt on exertion ; the patient should be enjoined to work moderately and tax the heart as little as possible. Persistence in labor of an arduous kind is sure to overcome the heart and precipitate all the evils of uncompensated dilatation ; while it is possible that rest and a judicious antirheumatic medication ; (iodide of potassium and the alkalies) may stay any further progress of the endocardial lesion which spoils the valves, and favor the supervention of a compensatory hypertrophy. The same may be said of the endocardial lesions, and consequent dilatation and dyspnœa, attending aortic regurgitant disease, which is often a rheumatic affection, though it may accompany or follow any of the iufectious fevers.

The diet should be of a nutritious and digestible character, consisting of nitrogenous aliments rather than of carbohydrates. A diet largely of meat or fiish is more easily digested than a strictly vegetable diet, one is more likely to overload the stomach, and this distention cannot fail to embarrass the heart.

Regular daily action of the bowels is desirable, and to procure this result gentle laxatives (hunyadi, rubinat, cascara, etc.) may be demanded.

When the dyspnœa attends asystolism and broken compensation, the flagging heart may be for a time sustained by the so-called cardiac tonics,—digitalis, caffeine, strophanthus, etc.

To calm nervous perturbation, a judicious selection may be made from various analgesics, antispasmodics, and narcotics of the materia medica. Hayden combines the calmative with the tonic treatment ; his favorite prescription is ten minims

* " In my opinion this aortic pseudo-asthma is due to arterial hypertension ; now, this is augmented by the horizontal position and under the influence of sleep, as it is also increased by the effort of walking and of movement" (Huchard, " Maladies du Cœur et des Vaisseaux," 1889, p. 132).

of the spirits of chloroform with fifteen minims each of the tincture of digitalis and the tincture of perchloride of iron in an ounce of water every three hours.

Among the "respiratory medicaments," Professor Germain Sée speaks highly of "erythrophleum, in 20-drop doses of the alcoholic tincture; in simple or cardiac asthma the respiratory movements become slower and more ample under the influence of this remedy."* The same writer recommends iodide of ethyl and iodide of potassium as medicaments which directly favor the respiratory movements by a specific effect on the medulla oblongata. The iodide of ethyl is given in the dose of 6 to 8 drops five or six times a day; the iodide of potassium in 10 to 15-grain doses three times a day. But, after all, in grave cases, and sooner or later in all, resort must be had to hypodermic morphine, in doses sufficient to quiet disturbed nervous action, allay spasm, and facilitate respiration.

Since the attention of the profession has been particularily called to arterial hypertension as a principal factor in the dyspnœa of aortic disease and of arterio-sclerosis, it has been maintained that this dyspnœa is of toxic origin, and weighty considerations have been advanced by Hurchard and others to establish this view of the case. Huchard points to the beneficial results attending the use of remedies that lower arterial tension —bleeding, purgatives, nitrite of amyl, and nitroglycerin,—and especially to the utility of an exclusive milk diet in combating these paroxysms of aortic dyspnœa, causing them often to disappear in the space of a few days. Now, this medication, he says, acts in two ways and fulfils two indications,—first, by the abundant diuresis which it provokes, the milk diminishes the arterial tension, and promptly eliminates the toxic principles contained in blood; secondly, it acts because it is bland, harmless, and does not launch into the current of circulation, as do other aliments, and meat in particular, materials which, being incompletely eliminated, become rapidly toxic to the economy.—*Ed. Therap. Gaz.*

THE CHEMISTRY OF GOUT.

At the last meeting of the Medical and Chirurgical Society an important contribution to our knowledge of the chemical changes occurring in the tissues of gouty persons was brought before the Society by Sir William Roberts, in the form of a very elaborate paper on the subject. In bringing forward the subject Sir William Roberts referred to a recent paper of his, in which he had shown that in the physiological state uric acid existed in the blood and urine exclusively as quadrurates, and that when it appeared in any other form this was due to abnormal changes in the quadrurates. In that paper he had traced the changes which the quadrurate underwent in urine—changes leading up to the separation of free uric acid in gravel. In the present paper he proceeded to consider the changes which the quadrurates undergo in the blood—changes leading up to the deposition of free uric acid in gout. These latter changes were intimately connected with the property possessed by the quadrurates of taking up in alkaline solutions an additional atom of base—thereby becoming converted into biurates. A knowledge of this reaction enabled us to present a coherent view of the succession of events which culminated in a gouty paroxysm. Normally, the uric acid, which circulated in the blood as quadrurate, was at once removed unchanged by the kidneys. But in the gouty state—either from defective kidney action or from some other cause—the quadrurate lingered unduly in the blood; circulating then in a medium rich in sodium carbonate, it was gradually transformed into sodium biurate, which was almost insoluble in blood-serum and probably, for this reason, was difficult of removal by the kidneys. Under these new conditions sodium biurate accumulated more and more in the blood and, when the accumulation reached a certain point, was precipitated in the crystalline form in the joints and elsewhere, thereby determining the occurrence of a fit of the gout. Sir William Roberts said he based this view upon a study of the reactions of blood-serum and synovia with uric acid and the urates In the case of blood-serum these depended essentially on the saline ingredients; the sodium salts exceeded all the other salts put together in the ratio of 7 to 1, and a solution of 0.5 per cent. of sodium chloride and 0.2 per cent. of sodium carbonate was a fairly exact imitation of blood-serum so far as concerned its saline ingredients. Experimentally, it was found that such a solution behaved with uric acid and the urates in the same manner as blood-serum itself, and in the same manner as a solution composed of all the salines of the serum in their due proportion. The behavior of uric acid and the urates with this "standard solution" was then studied in detail and the results checked, by comparing them with those obtained with blood-serum under similar circumstances. The author found that sodium biurate dissolved in water at 100° F. in the proportion of 1 in 1,100, but that it was almost insoluble in the standard solution and in blood-serum, and no addition of potassium, lithium, or magnesium salts—whether alkaline or neutral—made the slightest difference. The solvent power of the standard solution was found to depend exclusively on the sum of sodium salts contained in it, and the degree of alkalescence had not the least influence; the nearer the standard solution ap-

* "Maladies du Cœur," 1883, p. 511.

proached to pure water, the higher became its power of dissolving sodium biurate, and *vice versa*. The solubility of gouty deposits was tested by suspending gouty articulations, encrusted with uratic deposits, in a large volume of blood-serum ; the deposits remained unchanged even after immersion for many months. Uric acid, itself dissolved freely (as a quadrurate) in the standard solution—and also both in blood-serum and synovia—but after an interval of a few hours or a few days it was again precipitated, often somewhat suddenly, in the form of crystalline needles of sodium biurate exactly resembling those found in gouty deposits. The author held that this reaction was analogous to the phenomena of the gouty paroxysm. In gout. he considered that the blood became increasingly charged with uric acid, until, after a certain period of incubation, sudden precipitation of sodium biurate occurred and the "fit" of gout took place; then followed a process of recovery with restoration of the blood to a purer state. In the experimental process a similar succession of events was observed : solution of uric acid in the medium as quadrurate; gradual conversion of quadrurate into biurate (stage of maturation) ; deposit of the biurate in the crystalline form (stage of precipitation); restoration of the medium to comparitive purity.

With regard to the conditions which hastened or retarded the processes which culminated in the precipitation of sodium biurate, the following results were arrived at: 1. Precipitation occurred earlier in synovia than in blood-serum. 2. Increased alkalescence of the media favored the stage of solution, but did not retard the stages of maturation and precipitation. 3 The addition of sodium salts hastened maturation and precipitation. 4. The addition of potassium, lithium, or magnesium salts had no effect either way—except potassium chloride, which retarded maturation. 5. Maturation was hastened and precipitation occurred earlier at 100° F. than at the temperature of the room. 6. The proportion of uric acid in solution was the circumstance which exercised the most decisive influence on the speed of maturation, and on the time of advent and copiousness of precipitation. If the proportion of uric acid in solution were 1 in 2,500 or over, there was observed in the middle period of maturation, on the second or third day, a copious critical precipitation ; but if the proportion were 1 in 4,000 or under, the precipitation was throughout scanty and gradual, and postponed to the twelfth or fourteenth day. Dr. George Harley remarked that when Sir Alfred Garrod proved that gout was due to the existence of uric acid in the system, a distinct advance in our knowledge was made. A further advance was made when it was shown that an acute attack of gout was due to the deposition of uric acid in the articular cartilages. Later on, it was shown that the deposits were not due to inflammation of the joints, but that the deposits caused the inflammation around the joints which was known as gout. Sir William Roberts' present paper was a contribution to the chemistry of gout, and Dr. Harley urged that, through chemistry, a new pathology would be founded in which all morbid changes would be proved to be due to chemical action. Dr. Haig observed that Sir William Roberts's paper afforded a chemical explanation which he had long wanted. He had found that alkalies increased the excretion of uric acid, and Sir William Roberts had shown that increased alkalescence favored the state of solution of uric acid. Similarly, acids lessened the amount of uric acid excreted. Sir William Roberts then replied, and remarked that he had confined himself to certain chemical results, and had drawn no conclusion as to the profounder theories of gout. There was something in gout beyond the chemistry of the urates ; it was, in essence, a mode of nutrition associated with an error, which was uric acid. There was a colloidal form of uric acid, as well as the crystalline form, and the action of the two forms also differed. He believed that if an attack were imminent, a patient ought not to take mineral waters containing soda and lime, except very sparingly at first. Dr. Herman Weber had, for many years, warned his patients on this point. Sir William Roberts said he thought it possible that most of the good done at mineral springs was due to the water taken, and not to the salts it contained.—*Correspondence, Med. Rec.*

THE THERAPEUTIC VALUE OF ELECTRICITY.

The school of electro-therapeutics, which may be said to have been founded by Duchenne, has not made satisfactory progress during the last quarter of a century. The studies of this observer upon electricity in the clinic, founded upon some accurate anatomical and physiological knowledge of the muscular system, gave the subject an impetus which still survives to keep this agent before the profession, and to insure its recognition in spite of the abuses to which charlatanry or ignorant credulity have too often subjected it. Duchenne's work was chiefly upon an anatomical basis ; his great aim was clinical results. The legacy which he left was a great mass of empirical observations on the action of electric currents upon the muscles and nerve-tissues in health and disease. His studies were almost entirely confined to the neuro-muscular apparatus. His method was one of simple clinical observation, without experimentation or very exact pathological findings. It is not too much to say that his followers have adhered to his method, and have not made much advance beyond him in the direction of what could be called accurate scientific work.

The defects of this method are numerous. The class of diseases to which electricity has been mostly applied by the followers of Duchenne, includes the degenerative diseases of the spinal cord, nerve-trunks, and peripheral nerve-endings. The patients especially who are subjected to the current are those who suffer from acute or chronic anterior poliomyelitis, neuritis of traumatic or toxic origin, and sometimes the victims of ataxia and other systemic lesions of the cord. The morbid anatomy of these diseases is now fairly well understood. The clinical history and termination of many of them can be predicted with accuracy. It is, for instance, well within the bounds of probability that a facial paralysis due to neuritis will recover entirely, and that an infantile paralysis due to acute inflammation of the anterior horns will leave a residuum of palsy and wasting which may be permanent. The lesion in all these diseases is destructive. The repair is by a progressive building up of new tissue—a strictly nutritive process, which requires time and favorable conditions, and cannot be done or assisted artificially, except in the most indirect way, as by the supply of food, hygiene, etc. Here is the gist of the whole matter. The question which forces itself upon the mind is whether galvanism or faradism can influence this process at all. Clinicians have answered this question almost unanimously in the affirmative, but there are dissenting voices of authority. It is hard to conceive how an electric current, applied hap-hazard on the skin of an arm or leg, can influence cell-growth in a nerve-trunk, or particularly in the spinal cord. Empirical methods and results are not to be altogether ignored, but it is, nevertheless, unfortunate that any therapeutic agent has to rely entirely upon an empirical record. This we think is the position of electricity to-day as applied to diseases of the motor apparatus, and justifies us in saying that the science has not advanced beyond where Duchenne left it.

The use of electricity in diagnosis by the reactions of degeneration has been thus far its most exact scientific result; and while we believe this test is not as widely applicable as some have claimed, it is, nevertheless, now reduced to accepted formulæ which seem trustworthy, and promise to be permanent.

In spite of what we have said, we think electricity, as a therapeutic agent, has a bright future in some departments of practice. We refer now to its dissolvent action by electrolysis. We wish to indicate here briefly a few cardinal principles upon which some of its advocates do not sufficiently rely, and of which some of its determined foes appear to be completely ignorant.

The power of a galvanic current to break up into its constituents a fluid medium, such as water, through which it may be passed, is one of the elementary facts of electro-physics. This power is exerted equally upon more complex fluids, such as solutions of chemical substances, and also upon organic fluids, such as blood, serum, milk, etc. Finally, it is exerted upon organized tissue. Thus water is resolved into hydrogen and oxygen, as may be readily observed upon passing a mild current through a tvmbler of this fluid. In compound fluids or salts the acids seek the positive, while the alkaline bases go to the negative pole. The subsequent chemical actions of these acids and alkalies are just the same as would be the case if they were introduced from without, and constitute the secondary action of electrolysis. Now, the important point which therapeutists have too much neglected is this, that these changes are in exact quantitative relation to the strength and duration of the current,—that is to say, with so much current strength continued a certain time (or, technically, with so many *coulombs* of electricity), just so much hydrogen, oxygen, or what ever the simple atom or compound radicle may be, will be liberated. In such a simple fluid as water the figures of this problem are exactly known, but in such a complex series of organized tissues and fluids as exist in the human body (while doubtless, the changes are just as constant and according to law) the figures are not known. It thus appears very evident that the power of electricity to break down organized tissue is not only indisputable, but that it may even yet be reduced to an exact dosage, and that it thus fulfils the first requirement of exact science,—conformity to law.

We are perfectly aware that electrolysis in surgery becomes a practical question,—*i. e.*, whether it can compete with the knife? Into this rather vexed question we do not propose here to enter. Several most important issues are involved. Can it be always controlled with perfect safety to surrounding parts? Is it expeditious, clean, and attended with little pain? Can it be rendered antiseptic, or is it already so? Several indications are imperative. The dose must be adequate and must be applied direct, and not allowed to diffuse widely through the skin and mucous membrane; hence puncture is probably always preferable. Finally, the dosage must be studied with care to supply data for reference. That certain fibroid tumors, bronchoceles, nævoid growths in vascular regions have been successfully treated in this strictly scientific way is without doubt.—*Ed. Therp. Gaz.*

RECENT REMEDIES EMPLOYED IN PERTUSSIS.—Dr. Stepp has published a second article on the treatment of whooping-cough with bromoform. In one hundred cases treated there was not a single failure. He gives the bromoform pure in one-drop doses in a teaspoonful of water. On account of its

high specific gravity the bromoform sinks to the bottom of the spoon, and forms an isolated drop. The teaspoon should then be carried well back into the mouth, and its contents rapidly swallowed. The dose, given three or four times daily, varies as follows: For children of three to four weeks, one drop; in older, nursing children, three drops, according to the intensity of the attack; in children of two to four years of age, four or five drops; up to seven years of age, six to seven drops. Dr. Stepp claims diminution of vomiting, shortening of attacks, and increased appetite, with a perfect cure in from two to three weeks. But a small quantity of bromoform should be ordered at a time, as it is volatile. Protect it from the light to prevent decomposition. Red bromoform should be rejected, as it is decomposed and contains free bromine, and is consequently unsuited for administration. Dr. Rothe warmly recommends, for children of from one to two years of age, iodophenol in whooping-cough, administered after the following method: Phenic acid, 1 gramme; alcohol, 1 gramme; tincture of iodine, 10 drops; tincture of belladonna, 2 grammes; peppermint water, 50 grammes; syrup of white poppies, 10 grammes. Mix. One teaspoonful for a dose. Older children in proportion. Hydrate of turpentine is also favorably mentioned. It forms large, colorless, odorless, rhombic crystals with a weak aromatic taste, and easily soluble in hot water. Lepine first recommended it in 1885 as having a similar action to oil of turpentine, without the unpleasant effects. In small doses (three to nine grains) it acted on the bronchial mucous membrane, and was found useful in chronic catarrh. In large doses, it diminished secretion, and was given with excellent results in bronchorrhœa. When the kidneys were healthy, no evil result followed; but when those organs were diseased, large doses produced hæmaturia and albuminuria. Later, Germain See, who gave large doses to animals without harm, and to man as much as thirty grains daily in alcoholic solution as pill, praised the good effects of the hydrate in the initial catarrh of phthisis, where it lessened secretion; and he recommended it as a hæmostatic in bleeding from the lungs. In this opinion he has been confirmed by Lazarus. Recently Manasse has made careful trials of it in forty-one cases of pertussis. To children under a year, daily doses of over twenty grains were given without ill effects upon the renal or digestive organs. In none of the urines of older children examined, after amounts of thirty-five to forty-five grains daily, was albumin or blood found. The ages of patients ranged from nine months to twelve years. The general result was, that after four to five days' use of turpentine hydrate (twenty to forty-five grains, according to the age of the child), there was lessening of the attacks—at all events they became much mitigated. In all the cases there was bronchial catarrh, which improved more rapidly than usual and soon entirely disappeared. —*Med Rec.*

The Silver Lines of Pregnancy.—Langdon thus summarizes a short paper in the *Cincinnati Lancet-Clinic*:

1. The abdominal lesions known as "*striæ albicantes*," or "silver lines" of pregnancy (and other abdominal distentions), are a true deformity, due to over-stretching of an abnormally nourished skin.

2. Their prevention may be accomplished by daily inunctions of olive oil, followed by gentle hand friction for about ten minutes; the treatment should begin at, or before the fourth month, bearing in mind that prevention, not cure, is the object sought.

3. Corsets, constrictions and suspension of clothing from waist bands are to be avoided entirely—at least, after the third month of pregnancy.

To paraphrase the old adage—the lines are "silver," their absence golden. Another desirable object attained by the treatment is relief from the aches and shooting pains often complained of, which are largely due to the irregular stretching and compression of the nerves of the abdominal parietes.—*Times and Reg.*

How to Use Sulphonal.—Dr. J. Madison Taylor, in the *University Med. Magazine*, protests against the growing distrust of sulphonal, believing that when judiciously used it shows rare and admirable qualities. But he thinks it has been improperly administered, and gives his opinions based upon an extensive use. He gives from five to seven grains, rarely more than ten grains, beginning in the afternoon, and repeating about every three hours. Three or four doses will usually be followed by excellent results in securing a normal night's sleep. It seems best administered in a little soup or milk. In those who are wakeful towards morning, it is best to give the drug towards bedtime to secure its tardy effect. Thus used sulphonal gives excellent results, and seems free from danger or unpleasant effects.—*Indiana Med. Journal.*

The Cause and Treatment of Chlorosis.—According to the Paris correspondent of the *British Medical Journal*, M. Duclos believes with Sir Andrew Clark, that chlorosis is a fæcal auto-intoxication, which should be treated by purging, prolonged until the intestine is completely freed from all the hardened and decomposed fæcal matters. He recommends a vegetable rather than meat-diet. When constipation is not very marked the affection results from the great activity of putrid decomposition, and should be treated with

carbonate of soda combined with carbonate of lime, magnesia, and charcoal. Iron is beneficial because it forms an iron sulphide with the hydrosulphuric acid in the intestine. Hyposulphite of sodium has been of use in checking fæcal fermentation; naphthol might serve the same purpose.—*Med. News.*

INEBRIETY AND MARRIAGE.—Dr. T. D. Crothers, in an editorial in the *Quarterly Journal of Inebriety*, says: Public sentiment is shocked at the marriage of lunatics, and yet every day the lunatic inebriate is permitted to marry, and persons are ready to join themselves in such a contract for the purpose of curing them. In a recent murder case it appeared from the evidence that the murderer's father was married when intoxicated, and died a few years after by suicide. The murderer was the first child, and was a low, paroxysmal drunkard, who had spent years in prison for crimes of drunken violence, and finally killed a passing stranger. In another case the courts refused to grant a woman a divorce who had recently married and found her husband an inebriate; a few months later this husband killed her in a drunken frenzy. In a certain family of entailed wealth there are living to-day, in the third generation, ten direct descendants who are feeble-minded, idiotic, and insane; all clearly traceable to the marriage of an inebriate ancestor. The failure of the law to prevent and regulate such marriages, and the delusion that inebriety is a *vice* that is under the control of the victim, is one of the great obstacles toward social and legal reform. The efforts to raise the poor and degenerate inebriate and his family are practically of no value as long as marriage with inebriates is permitted. Recently the legislature of the State of Victoria in Australia has passed a law which gives a wife the right of divorce if the husband is found to be an habitual drunkard. If after marriage she discovers that he is an inebriate she can also get a divorce. The husband can do the same with a wife if she is proven to be an inebriate. This is a clear anticipation of the higher sentiment which demands relief from the barbarous law which would hold marriage with an inebriate as fixed and permanent. —*Am. Pract. and News.*

TREATMENT OF TUBERCULOSIS WITH BORACIC ACID.—For the past five years, Dr. Gaucher has been studying the action of boracic acid on pulmonary tuberculosis. He has recently made public the results which so far have accrued from his researches. He first of all determined by means of experiments on animals the toxic limits of the acid when administered internally, and he found that this stood at the ratio of about a gramme to a kilogramme of the animal's weight. As to its subsequent elimination from the system, he found that this took place very readily and even rapidly by way of the renal secretion; there was therefore little fear of any accumulation or tardy cumulative action. But, what was an equally important and desirable result, he found that the boracic acid was also eliminated appreciably through the expectoration; the sputum of tubercular patients whom he had subjected to this treatment was found to be very freely charged with the acid. Some of his experiments are not only interesting, but certainly encouraging in their ascertained results. For example, he took two or three rabbits and injected into their lungs through a needle syringe a few drops of a solution of pure tubercular culture. In this way he set up a local tuberculosis which became caseous but not generalized. Some of the animals soon succumbed to pulmonary tuberculosis, and the surviving ones were shortly after destroyed. Well-marked phthisis was found in all post mortem. He next repeated his inoculations on healthy rabbits in precisely the same manner, but he now fed the animals on bran mixed with boracic acid. After a time these also were sacrificed, but, contrary to what he found in his initial experiments, their lungs were quite free from any tubercular lesion, neither was any found elsewhere. It is submitted that, although these experiments on rabbits may not be altogether conclusive as to a like action of boracic acid on human tubercular subjects, they are at least—in the face of the enormous mortality from phthisis and hopelessness of therapeutic methods in general in this disease—worthy of serious attention and more extended trial. As to clinical results, so far as it has been tried, the boracic acid treatment has been found to bring about a notable diminution in the expectoration, which became more fluid and less purulent. Considerable time is, of course, necessary before speaking of remote or final results, but in the cases in which the treatment has been tried, and which have been under observation for a considerable period, it may be said that in general they improved in every way, while the tubercular trouble in the lung appeared to be at a standstill. The dose administered in these cases was one gramme in divided doses in the twenty-four hours. This, on the weight theory, must be considered insufficient. Taking the average weight of a patient to be sixty kilogrammes, and putting the limit of dose at twenty centigrammes for every three kilos, four grammes of the acid should be given per day, the dose being, of course, graduated up to this amount. Boracic acid will be found as a rule to agree well with the stomach, and is easily taken; it is not caustic, has no diagreeable taste, and in some cases was found even to check the diarrhœa when this existed.—Paris Correspondent, in *Lancet.*

OINTMENT FOR SYPHILITIC ERUPTIONS.—The *Medical Free Press* says that there was in use in

the Lock Hospital an ointment for erythematous, papular and scanty syphilitic eruptions, which on account of its rapidly curative effects used to be called by the patients the "magic cream." The composition was as follows: One part of ammoniate of mercury and three parts of oxide of zinc, mixed and rubbed into a fine powder, with sufficient glycerine and lard to make a stiff cream. A few drops of olive oil facilitates the mixture of all these. It is really astonishing how a few applications of this will make a very perceptible rash disappear in a few days. A very ready method of preparing the above is by mixing one part of the ammoniated mercury ointment with three parts of zinc ointment, each being fresh, and adding a little glycerine.—*N. W. Lancet.*

Perchloride of Iron for Leucorrhœa.—Of all remedies for simple leucorrhœa, the old tincture of perchloride of iron is the best, combined with hyoscyamus, opium, hop, or Indian hemp, when the mucous membrane is in a state of irritation. Tepid or cold water injections, cold hip-baths, etc., are useful local applications, with rest; and avoidance of occupations involving prolonged standing or pedal exercise.

Sometimes tannin, zinc, or alum are valuable additions to the injections. When the discharge emanates from the glands of the os uteri, local applications of belladonna and bicarbonate of potash are serviceable, two ounces of tincture and a teaspoonful of the alkali to about a pint of water.—*Archives fur Gyn.*

Injections of Blood for Chlorosis.—Dr. Antiq, of Lyons, in a recent thesis, recommends injections of defibrinated beef-blood as a remedy for chlorosis. The fluid should be taken from animals known to be healthy. After being whipped once, it is put up in bottles holding half a litre each, a quantity sufficient for four injections, 125 grammes being administered night and morning. The bottles must be kept in a cool place, and heated on a bain-marie before using. The patient should be directed to retain the injections as long as possible. Sometimes they produce slight colic, in which case they must be preceded by a purgative enema, or if this is ineffectual, three or four drops of laudanum may be added to the blood.—*New York Med. Times.*

Treatment of Tabes Dorsalis — Professor Leyden, whose monograph on *Tabes* is well known, has, after the lapse of twenty-five years, given us a further statement on the same subject. On the question of treatment we find that Dr. Leyden lays great stress on the use of warm baths (temperature 95°-96° F.), the duration of which should be 5,10,20 minutes. Three kinds of baths are employed—1, the simple warm bath; 2, brine baths containing CO_2; 3, sweating baths and vapour baths. The first and third kinds are suitable in the early stages of tabes, the second in the more advanced stage. Dr. Leyden considers that nerve stretching has once for all received its condemnation. He has not the least faith in suspension, and is in hopes it may soon disappear from the therapeutic stage. Of massage he speaks with indifference; of the electric treatment he says it must not be overrated.—*Br. Med. Jour.*

Turpentine in Typhoid Fever.—Dr. H. C. Wood advises a return of the turpentine treatment of typhoid fever as practised by Dr. G. B. Wood. He begins its use about the twelfth to the fifteenth day, thinks it lessens the tendency to hæmorrhage, and ameliorates other symptoms due to the local lesions.

His formula is:

℞.—Oil of cloves - - gtt. vj.
Oil of turpentine - f ℥ jss.
Glycerine, Mucil. of acacia āā f ℥ ss
Syrup, Water - - āā q. s. ad f ℥ iij.—M

Sig.—Dessertspoonful every three hours during the day.—*Med. News.*

Diuretic Effects of Grapes.—Dr. Pecholier, of Montpellier, has published a note on the diuretic effects of grapes, which would appear to confirm the diuretic action of glucose recently brought to notice. In two cases, one a patient with cardiac disease, and the other the subject of hepatic cirrhosis with ascites, a "grape cure" was undertaken with the best results. In the former patient, notably, five pounds of grapes were daily ingested, in three parts, and the diuresis produced was much more considerable than with milk, digitalis, or iodide of potassium. This effect can only be attributed to the sugar of the juice of the grape, the other parts of the fruit having been rejected.—*Lancet.*

Virgin Modesty.—A Sister of Charity had a tape worm. "When we have what we cannot love," says the proverb, "we must love what we have." But the nun and the proverb differed in opinion. The expulsion of the anchorite was decided on. A physician was called in and prescribed kousso, that Fourth of July for tape worms, but alas! the kousso failed. "Ah, Sister!" said the physician to the *religieuse*, "when kousso fails we must use the *male fern* on you." The nun blushed scarlet, and timidly made answer: "The *male fern*. Heavens! In that case, doctor, I must have a special dispensation from our Bishop!"—*Lancet-Clinic.*

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HYDRONAPHTHOL IN THE TREATMENT OF TYPHOID AND OF DIARRHŒAS.

Mr. K. Mitchell Clarke (in the *Practitioner*), gives us a most interesting and instructive paper on the above subject. He starts out with the idea that antisepsis of the alimentary canal should shorten both the duration of the disease, and lessen the severity of the symptoms, in all intestinal catarrhs. It is now generally believed, that the fever accompanying many of the diseases of the intestinal tract, is due to the absorption into the blood of the toxic products of fermentation—the ptomaines—or life products of bacteria—specific or otherwise, which have a habitat in the intestinal contents. At the same time, they by this local action irritate the intestine and cause the continuance of the malady—originated perhaps by some simple cause, such as undigested ingesta, etc.

By producing intestinal antisepsis these fermentations are checked and the evil results arising from them are obviated to a degree commensurate with the completeness or otherwise of the antisepsis. Theoretically a perfect antiseptic would be one which would not influence harmfully the digestive process, could not be absorbed into the blood, or if so, should be innocuous to the general economy, and at the same time exert its antiseptic influence upon every part of the intestinal tract. While a perfect drug can hardly be looked for, inasmuch as any remedy which will check fermentations will also to a greater or lesser extent interfere with the digestive process, that also being a kind of fermentative change, yet Mr. Clarke thinks he has found in hydronaphthol a substance which comes nearer to the idea of a perfect antiseptic than any yet experimented with. It is absolutely harmless, even if absorbed in large quantities. Its taste is somewhat pungent and burning, and it has a faint odor of carbolic acid. A number of experiments were undertaken to show to what extent it effects digestion, the result of which go to prove that hydronaphthol has a distinctly retarding influence upon the digestion of egg albumen by peptic fluids, that it has a very slight effect on the digestion of milk by these same agents, and that it has no effect at all on the digestion of either milk or albumen by the pancreatic ferments, nor on the conversion of starch into sugar. Now, as in most cases of intestinal troubles milk is the diet, hydronaphthol may be given without danger of interfering with stomach digestion to anything more than a very slight extent, and if any fear were entertained that even the slight check might prove prejudicial to the patient's safety, the drug might be administered in pill form, coated with keratin, so that it would not be active till it had passed the pyloric orifice, when as Mr. Clarke has shown, its influence over digestion ceases. Mr. Clarke usually administered it either in pills coated with gelatin, or suspended in milk, in doses of two or three grains every two hours. For children under one year the dose is half a grain, for older children, half to one grain every hour or two as required. Five cases of enteric fever were treated by this method, and all did well, although two of them were severe and prolonged. The effect of the drug upon the diarrhœa was very marked, that distressing symptom being at once controlled by it, and the offensive odor of the stools being lost. The dose in typhoid should be a little larger than those mentioned above—say three or four grains every two hours until the diarrhœa is checked, and then every three hours during the whole course of the fever. The author of the paper believes it is a valuable remedy in the diarrhœa of children with green colored stools, several cases which he treated with it, yielding readily, only one case proving obstinate. In two cases of dysenteric diarrhœa it acted well, as also in a case of the diarrhœa of tuberculosis.

THE BLOOD.

The importance of a very complete knowledge of the blood is evident to all who are engaged in the practice of medicine. True it is, that for the every day rank and file doctor, the knowledge that the blood consists of water, red and white corpuscles, together with albumins, fibrine, salts, extractives, etc., has seemed sufficient. But the physiologist and pathologist are not satisfied with what is already common property in regard to the constituents of the blood, and they are, with very laudable ambition, endeavoring to discover new things in connection with this all-important fluid, and to identify their names with such discoveries. Students have been not a little puzzled by the numerous terms found in text-books, to express the ideas conceived by those experiments, their discoveries having, in many cases, proved mares' nests, and their terms ephemeral. While much that was illusive has been written, the progress of material knowledge in this department, as in all others connected with physiology, has been steady, and, thanks to the patient care of these laboratory workers, our conception of many physiological and pathological processes is much clearer than it was even one decade ago, all the blunders, ephemeral terms, and mares' nests notwithstanding.

The latest discovery is that of a new blood cell, by Dr. Alexander Edington, of Edinburgh, a surgeon and bacteriologist of considerable repute, who has devoted much time to the study of the morphology of the blood. This new cell, Dr. Edington calls an "albocyte." It is a spherical, colorless cell, of about one-third the diameter of the ordinary red blood corpuscle, of which it is an early form.

The whole of Dr. Edington's views regarding the blood cells may be summed up as follows:

Starting with white blood corpuscles, he finds that in their earlier life, they contain one, or at most two nuclei, which number, after a certain period of development, is increased to four. The discharge of these nuclei from the cell results in the formation of "free," or "daughter" nuclei, of which some go in to the development of fresh white blood corpuscles, while others become multinucleated cells, also allied to white blood corpuscles, but having distinct functions to perform. To this cell the discoverer gives the name of matricyte, and it, after increasing in size, discharges its numerous nuclei, and then forms, what he calls, the new cell—the "albocyte." This gradually enlarges, takes up hæmoglobin, and eventually is transformed into the perfect red blood corpuscle. The arrangement, then, according to Dr. Edington, is: (*a*) The white blood corpuscle; (*b*) The daughter nuclei; (*c*) The matricyte; (*d*) The albocyte; (*e*) The red blood cell; (*f*) The granular bodies called hæmatoblasts.

These latter bodies were named by Hayem, and consist, according to him, of granular matter originating in the white cell. They are concerned, together with the white cell, in the formation of fibrin.

THE CANADIAN MEDICAL ASSOCIATION.

It is to be regretted that the attendance at the recent meeting of the Dominion Medical Association was not larger. The physician who allows the fear of losing the receipts from his practice for the few days requiring his attendance at such meetings, to influence him in not attending, acts upon a mistaken idea of economy. It is in, and by such meetings that the general good of the medical profession is advanced and every physician should consider it his duty to attend. No organization has done more than the Dominion Medical Association to maintain the unity of feeling and purpose, which exist among the members of the profession to-day, and apart from its social and scientific benefits, it has conferred benefits upon all which should keep alive its claims. When we state that of the three hundred and eighty medical men in the City of Toronto, not more than twenty-five attended this meeting, and also that at a meeting held over twenty years ago the attendance was much larg r and more representative, we may be excused if we question the progress of the medical profession as being upon as high a plane as some would lead us to imagine.

Puerperal Eclampsia.—Mr. Alban says (*The Med Jour.*) that he has seen six cases, four whilst acting as assistant and two in his own practice.

All the mothers recovered, and two or three children were saved. The first case was treated by administering chloroform, bringing on labour, delivery by forceps, placing 5 grains of calomel and 2 drops of croton oil on the tongue ; which brought away an enormous scybalous mass, but no arrest of the fit until nearly a pint of blood was taken from the arm. Chloral was afterwards given. In a few hours the fits returned, but on addition of morphine to the chloral it acted like a charm, and they were completely controlled by the latter drug. In this case convalscence was very long. The other five cases, which were not bled, recovered very much more quickly.

The treatment consisted in emptying the uterus early, some with and some without chloroform, dilating the os with Barnes' bag when necessary, and applying forceps or version when more convenient, clearing the bowels, and quieting the fits by giving morphine combined with chloral to give quicker effect. I look upon morphine almost as a specific in these cases, after the uterus and the bowels have been emptied. Ordinary doses of brombide of potassium were disappointing in my hands. I consider venesection useful if there is no other remedy at hand.

A $200,000 Libel Suit.—Suit has been entered by William Radam, manufacturer of Radam's Microbe Killer, against the *Druggists Circular*, of New York, for $200,000 damages, the largest amount so far as heard from that was ever asked for in a libel suit of this kind.

The pleadings show that the action is brought to recover damages claimed to have been done the business of the plaintiff by an article published in the *Druggists Circular* for September, 1889. This article gave the result of an analysis of the Microbe Killer made by Dr. R. G. Eccles, a prominent chemist of Brooklyn, who stated that an identical preparation could be made by the following formula.

Oil of vitriol (impure)....4 drams.
Muriatic acid (impure)...1 dram.
Red wine, about .....1 ounce.
Well or spring water.....1 gallon.

This mixture, it was alleged, could be made at a cost of less than five cents per gallon for which Radam charged three dollars.

It was further alleged that while when properly used sulphuric acid, the principal constituent of the Microbe Killer, was a valuable medicine, it was, when taken without due caution or advice, a slow but certain cumulative poison ; and the theories advanced by Radam, as to the causes of diseases and the proper method of treatment, were alleged to be totally erroneous. Col. Robert G. Ingersoll. the famous lecturer, is the counsel for the plaintiff.

The *Druggists Circular* which is published at 73 William street, New York, expresses a desire to hear of any case in which unfavorable results have followed the adminstration of the Microbe Killer or of any other fact that would be interesting under the circumstances. They claim to have published this analysis, without malice and with the sole intention of protecting the public from the loss of their health and money by the use of a dangerous nostrum.

Rotterham House.—"Nothing succeeds like success," is an old maxim, and an instance of it is found in the extraordinary success that has attended the Private Hospital opened by Dr. Holford Walker, a little over a year ago, on Isabella street, for the treatment of surgical and nervous diseases of women. The Doctor having procured a handsome pair of semi-detached houses, the hospital was opened with a staff of four nurses, two for the surgical cases, and two for the nervous cases requiring massage. The demand for rooms became so great that it was necessary to procure more accommodation, and a handsome house adjoining was purchased this spring, and the three joined by a covered bridge, the whole forming one of the most complete private hospitals on the continent. The staff of nurses has been increased to eight. As the Doctor does no outside work except in consultation, he is enabled to devote his attention to the minor details so essential to the comfort and welfare of his patients.

An engraving of the establishment will be found in this month's issue.

Therapeutic Uses of Peroxide of Hydrogen.—Dr. Mikhail P. Manassein, of St. Petersburg, (*Novosti Serapii*) draws attention to the following points in connection with the subject :—

1st. Peroxide of hydrogen is an excellent antiseptic and disinfectant agent which deserves the most extensive use.

2nd. It proves especially valuable in cases of herpes progenitalis, soft chancres and gonorrhœa. The latter may be cured by injections of peroxide in eight to twenty-one days; soft chancres in from five to fourteen, by using the drug in the form of lotions.

3rd. It is entirely free from any odor, does not soil the linen, or give rise to any local pain or irritation or any unpleasant general effects.

4th. It affords a most reliable means for preventing any venereal infection by using it as an injection and wash for men after each suspicious coition, and women should use it both before and after each sexual intercourse.

5th. It is very stable when kept in some dark and cool place.

Compound chrysarobin ointment, says the *Brit. Jour. of Dermat.* used chiefly in psoriasis, is, according to Unna's formula, composed of chrysarobin 5 parts, salicylic acid 2 parts, ichthyol 5 parts, and vaseline 88 parts. Aristol ointment is recommended by Eichoff: aristol 3 to 10 parts, vaseline 30 parts. It is said to be not less efficacious than chrysarobin in psoriasis, and to have the advantage over the latter that it does not stain the skin or irritate.

Bourgard's paste, a powerful escharotic, useful in epithelial cancer, is composed of wheat flour 60, starch 60, arsenic 1, cinnabar 5, sal ammoniac 5, corrosive sublimate 0.50, solution of chloride of zinc 2.45. The first six ingredients are to be separately ground and pulverized, and then mixed together in a glass mortar. The zinc solution is then to be slowly added, while the contents of the mortar are kept rapidly moving by means of a pestle.

Resorcin for Rodent Ulcer, etc.—Dr. Chas. Szadek, in the *Satellite*, recommends resorcin for various forms of skin diseases, particularly condyloma and verrucæ, in the form of ointment and powder. He reports a case of cure of rodent ulcer by using an ointment of resorcin and vaseline (25 per cent.). Dr. Seblond uses it in treating simple chancre, by sprinkling the ulcer each day with the powder, and gently cleaning it the following morning, as long as the base of the sore is of a greyish color. It becomes of a rosy hue, and shows healthy granulations in five or six days. Then a five per cent. solution of resorcin is applied, and cicatrization speedily follows. It will cure a recent chancroid in a couple of weeks.

Treatment of Sycosis.—Rosenthal, of Berlin, claims that the following treatment is followed by the best results. The patient must be shaved daily, and an application of the following paste made:

℞.—Acidi tannici	. . . . .	10 pp.
Lac. sulphuris	. . . . .	20 "
Zinci oxidi alb.	. . . . .	
Amyli. āā..	. . . . .	35 "
Vaselini flavæ	. . . . .	100 "

℥.—Et. ft. ung.

The healing is rapid, the method is convenient, the pain insignificant, and renders it epilation unnecessary.

Abortive Treatment of Herpes.—M. Seloir employs the following solutions (*Med. News*) in the abortive treatment of herpes:

℞.—Resorcine,	. .	ʒ ss.
Cocaine mur.,	. .	gr. viij—xxx.
Ac. Tannici.	. .	ʒ jss.
Alcohol (90%)	. .	℥ iij.—M.

Or,

℞.—Cocaine Mur.,	. .	gr. xv.
Ext. cannabis indicæ,	. .	ʒ ijss.
Spt. menth. pep.	. .	ʒ ijss.
Alcohol (90%),	. .	℥ iij.—M.

Secrecy in Lying-in Hospitals.—Last week we expressed the hope of seeing institutions established here for enabling women pregnant out of wedlock to be assured of decent support and secrecy until they were relieved of their embarrassment by the birth of a full-time child, and recover from the disabilities of the lying in period. This we said in the interest of the restriction of criminal abortion. In the course of an essay on the proper measures for remedying the depopulation of France, an abstract of which appears in a recent number of the *Union Médicale*, M. Lagneau advocates the establishment of such institutions, and alludes to their existence in Vienna. The officers and employees are sworn to secrecy, and there a woman may be delivered and leave her child behind her when she is ready to be discharged, without her identity being made known.—*N. Y. Med. Jour.*

DROPSY OF CARDIAC ORIGIN.—The following has been (*Med. Press and Circ.*) found useful in the dropsy of cardiac origin :—

Digitalis leaves.	30 grs.
Water.	6 fl. ozs.

Infuse and add to it :

Citrate of caffeine. . . .	30 grs.
Tinct. strophanthus. . . .	10 drops.
Acetate of potash.	2 drachms.
Syrup of orange.	1 fl. oz.

Mix. Dose, one tablespoonful during twenty-four hours.

ECZEMA OF DENTITION.—The following is recommended (*Med. Mirror*) for eczema of dentition :

Treatment is to be directed to three indications.

I. To calm pruritis of the gums, frequent rubbing with the finger dipped in a solution of the following :—

℞—Cocaine mur.	gr. i.
Pot. brom.	gr. x
Glycerini.	
Aqua destil. āā.	fl. ʒ ss.—M.

II. For insomnia a teaspoonful of the following hourly :—

℞—Sodii. bromidi.	gr. xii.
Syr. aurantii flor.	fl. ʒ iij.—M.

III. For the local eczema the following :—

℞—Zinci oxidi.	gr. xx
Vaselini.	ʒ i.—M.

TREATMENT OF GALL STONES.—The usefulness of pilocarpine seems to be increasing. According to the *Bulletin Gen. de Therap.*, Lekarckie makes the assertion that pilocarpine is almost a specific in the treatment of gall stones. It relieves at once the pruritus of jaundice. The dose hypodermically is one-eighth of a grain twice a day. Thirty cases have been treated successfully.

PERSISTENT DANDRUFF.—Mr. Stephen, writing to the *Lancet*, says the following is very useful in persistent dandruff. ℞ Resorcini, ol. olivarum, ætheris sulph., āā ℥iii. ; spt. vini. rect., ʒviss. To be well shaken, and applied to the scalp by a bristle brush about twice as large as the ordinary mucilage brush, by insinuating it between the locks of hair. The head to be well washed with soap and warm water twice a week.

FOREIGN BODIES IN THE NOSE.—It is a common occurrence (says *Med. Classics*) for children to get beans, grains of corn, and other foreign substances up their nose. This simple remedy is worth remembering : Get the child to open its mouth, apply your mouth over it, and blow hard. The offending substance will be expelled from its nose.

KELOID.—In the treatment of small keloid growths, Dr. Browning (*London Med. Recorder*), has obtained satisfactory results from the application of perchloride of mercury in collodion (1 in 30). The tumor is thickly coated with this application, which is allowed to remain on until it peels off, usually five or six days. Another coating is then applied, and so on, until, by successive coatings, the growth is reduced to a level with the surrounding surface.

JAUNDICE.—Dr. Withkowski (the *Satellite*), administers pilocarpine hypodermically in $\frac{1}{6}$ grain doses once or twice daily, for jaundice. He considers it almost a specific for the disease, and if it continues after ten to fifteen days' treatment, a malignant growth may be suspected. He has succeeded in over thirty cases, and only failed in those cases which subsequently proved to be malignant.

INJECTION FOR HÆMORRHOIDS.—Dr. Shuford (*St. Louis Med. and Surg. Jour.*) stated at the last meeting of the Texas State Medical Association, that he obtained good results by injecting the following in hæmorrhoids :

R.—Glycerole of salicylic acid, . .	ʒ iv.
Glycerole of boracic acid, .	ʒ iv.
Carbolic acid, ...	ʒ iij.—M.

Sig.—Inject five to ten minims into each tumor.

BILIOUS ATTACKS.—Outis writes as follows in the *Lancet* : In a case of migraine similar to that detailed by " A Ten Years' Subscriber, " the following prescription gave prompt relief, and might, I think, be tried with advantage :—℞.—Pot. brom. ʒ ii. ; antipyrin, ʒ iss. ; liq. bismuth. et am. cit., ℥ i.; tr. card. co., ℥ ss. ; aq. ad. ʒ viii. Two tablespoonfuls when the attack comes on, to be repeated every two hours till relief is obtained.

PERSONAL.—Dr. Laughlin McFarlane of Toronto, when returning from England, met with a very

painful accident on leaving the steamer at New York, sustaining a compound fracture of the leg. The bone protruded through the skin, and a portion of it had to be removed. He is in an hospital at New York, and is progressing as favorably as can be expected.

Is Diabetes Mellitus Communicable?—Now that the bacillus is abroad, certain diseases hitherto considered as hereditary, or at least not communicable have come to be regarded as such. The latest addition to their number is diabetes mellitus. Dr. Richard Schmitz (*Berlin Klin. Woch.; Pract.*) has noticed that in some instances husband and wife become diabetic, without being able to trace, in the one becoming last affected, any hereditary predisposition, or ingestion of too much saccharine matter, or any other cause. In the course of some years, he found it 26 times in 2320 cases, and the circumstances were very similar in all. They were persons hitherto considered quite healthy, with few exceptions married people, and chiefly women; and they had become suddenly diabetic after having nursed a patient suffering from diabetes for some time, slept continuously in the same room, or otherwise had intimate relations with him. Hereditary predisposition did not exist in a single case, nor was the second patient a blood relation of the first. No apparent cause could be discovered: too much sugar had not been taken, and there was no history of arthritis. These cases formed more than 1 per cent. of the whole, and occured under similar circumstances, so that mere concidence may be excluded. In the absence of any obvious cause, the question may be asked whether a transmission of the diabetes did not take place in these cases—a possibility which is strengthened and favoured by the long and intimate connexion between the individuals. Schmitz gives the clinical history of seven of these cases, where persons intimately related—chiefly man and wife—were attacked by glycosuria during or shortly after the illness of their friends.

Precautions against Tuberculosis. — The State Board of Health of Pennsylvania has lately issued the following:

"The duster, and especially that potent distributor of germs, the feather-duster, should never be used in the room habitually occupied by a consumptive. The floor, woodwork, and furniture should be wiped with a damp cloth. The patient's clothing should be kept by itself, and thoroughly boiled when washed. It need hardly be said that the room should be ventilated as thoroughly as is consistent with the maintenance of a proper temperature."

The Cathartic Treatment of Peritonitis.—Dr. Lamphear, of Kansas City (*Med. Rev.*) says:

1. The saline treatment should be adopted early in simple, acute peritonitis.

2. Small doses of calomel may be given to mild purgation in cases seen after the disease is fully developed.

3 Cases which fail to be relieved by cathartic measures should receive early operation interference.

4. Whenever peritonitis has gone to the stage where the formation of pus is known, or even suspected, to have taken place, abdominal section and drainage are imperatively indicated.

5. When the existence of tubercular peritonitis is diagnosticated, or strongly suspected, operation (exploratory incision) is justifiable.

6. Opium is only indicated in the second stage of peritonitis, and then not because it "forms a splint," but because it relieves pain, sustains the heart and prevents shock—thus combating the tendency to death.

For Psoriasis.—Mr. Jonathan Hutchinson's favorite prescription for psoriasis is (*Arch. of Surg.*):

℞.—Acid. chrysophanic., . . . gr. x.
Liquor. carbonis detergent., . ♏ x.
Hydrargyri ammon. chlorid., gr. x.
Adipis benzoat., ... ʒ j.—M.
Fiat unguentum.

At night the patient should wash the diseased surfaces free from all scales; then, standing before a fire, rub on the ointment, devoting, if possible, half an hour to the operation.

Mr. Hutchinson somewhat doubtfully prescribes arsenic internally along with the above.

Chronic chorea is now being successfully treated by inducing upon the patient a condition of almost constant sleep for a period of some two weeks, from time to time allowing intervals of consciousness that nourishment may be taken.

The hypnotic most recommended is chloralamid in fifteen grain doses, and repeated sufficiently often to maintain a constant effect.

WHILE cross-examining Dr. Warren (says the *Montreal Weekly News*) a New York counsel declared that doctors ought to be able to give an opinion of a disease without making mistakes.

"They make fewer mistakes than lawyers," responded the physician.

"That's not so," said the counselor; "but doctors' mistakes are buried six feet under ground, and lawyers' are not."

"No," replied Warren, "but they are sometimes hung as many feet above ground."

TAPE WORM.—Says the *Times and Reg.*: Campi's treatment for tape worm is as follows: Give over night five or six fluid drachms of castor oil. Next morning give early two drachms of thymol divided into twelve doses, one to be taken every fifteen minutes. After taking it the worm will be expelled entire.

PILOCARPINE IN BELLADONNA POISONING.—Dr. McGowan (*Lancet*) relates an interesting case of belladonna poisoning, successfully treated by hypodermic injection of two doses of pilocarpine, $\frac{1}{3}$ grain each. He considers that the drug was undoubtedly the means of saving a valuable life.

Mr. GORY, of Bournemouth (*Lancet*), has improved the binaural stethoscope by an alteration in the chest-piece which permits of its direction being altered, so that it may be readily adapted to the chest wall in any position without inconvenience to the auscultator.

IT is said (*Times & Reg.*) that the natives of New Holland perform oöphorectomy upon girls to provide a class of prostitutes who will not increase the population, as also to prevent the transmission of any natural defect, such as mutism.

SCABIES.—The London *Med. Rec.* says the following is an efficient application for scabies:

Creolin, ...	1 parts.
Balsam of Peru	20 parts.

TO STOP THE FLOW OF MILK.—It is said that the application of a solution of half an ounce of camphor in twelve ounces of turpentine, is efficient in controlling the hypersecretion of milk.

CHAPPED HANDS.—The following prescription (*Med. Mirror*) will be found useful in the majority of cases of chapped hands:

℞.—Menthol, ...	gr. xij.
Salol, ...	gr. xxx.
Olive oil, ...	♏ xxx.
Lanolin, ...	ʒ ip.

Mix. To be applied twice daily.

TYMPANITIS.—The following is recommended (*Rev. Obstet. et Gynæcol.*,)

℞.—Naphthol,	
Mag. carb.,	
Carbonis, āā - - - - - -	ʒ iss.
Ess. Menth. Pip. - - - - -	♏. x
M. et div. in pulv x ij.	

Sig.—One every two hours till relief is obtained.

LINIMENT FOR GOUT.—In his small work on rheumatism and gout, Dr. F. Leroy Satterlee recommends the following local application in cases of gout:

℞—Ol. gaultheriæ,	
Ol. olivæ,	
Lin. saponis,	
Tr. aconite,	
Tr. opii, ...	āā ʒ ij.

M. Ft. liniment.

Sig.—Apply freely and cover with cotton batting.

NEURALGIC HEADACHE.—Dr. E. P. Hurd, in his monograph on neuralgia, advises the following prescription for headaches of all kinds:

℞—Caffeini citrat.,	
Ammonii carb., . . .	āā ℈ j.
Elixir guaranæ, ...	ʒ j.—M.

Sig.—ʒ j. every hour until the pain is relieved.

RIGID PERINEUM IN LABOR.—Dr. F. W. Southworth (*Jour. of Obs.*) uses the following solution in rigid perineum, which he considers indispensable and infallible:

℞—Chloroformi, ...	ʒ ij.
Ether sulph., ...	ʒ j.
Cologne, ...	O j.—M.

Sig.—Apply locally.

It acts quickly and well, large heads passing

the perineum without a tear, which seemed impossible without extensive rupture.

For Gonorrhœa.—Prof. Schrimmer (*Wein Med. Woch.*), speaks well of injections of salicylate of mercury in gonorrhœa. He gives:

℞.—Hydrarg. salicylat., . . . gr. ½.
Aq. destil., ... ℥ iij.—M.
Sig.—Use as injection three times a day.

By this means the discharge is checked in two or three days, and on leaving off the remedy it commences again in a mild form, consisting of mucus, and disappears of itself in a few days. In the chronic form a stronger solution is used, of say, ⅝ grain to two or three ounces of water,

Dysmenorrhœa.—A noted physician recommends the following:

℞ Pulv. camphore. . . . . gr. x
Pulv. Doveri. . . . . gr. xx
Ext. hyoscyami. . . . . gr. x
M. Ft., pil. x.
Sig.—Two pills every two hours till pain ceases.

Talmage says:—Established physicians, encourage young doctors by telling how you yourself once took measles for scarlatina. Don't walk around with a profundity and overwhelmingness of manner, as though you were one of the eternal degrees. And if you have nothing to say that is encouraging, compress your lips, put your hand over your mouth and keep still.

Vomiting of Pregnancy.—Menthol 1 part, spt. vin. rect. 20 parts, aq. dest. 150 parts, is the formula for the administration of this drug in the vomiting of pregnancy. The dose is ℥js every hour. Dr. Gottschalk and other experienced observers have been very successful in the treatment by this means of several intractable cases.

For Exophthalmic Goitre.—Dr. A. F. Watkins recommends (*Week. Med. Rev.*) the following prescription in the treatment of exophthalmic goitre:

℞.—Picrotoxin, ... ¹/₃₀ grain.
Aqueous extract of ergot, 2½ grains.
M.—Ft. pil.
Sig.—One pill three times a day.

For Pleurodynia.—For quick and lasting relief in pleurodynia, J. Adolphus, M.D. (*Medical Age*), praises gelsemium and ammonium muriate. He gives the first in the form of the tincture, ten drops every hour; or, if the latter medicine is employed, twenty to thirty grains are administered every four to six hours.

Eczema.—Shoemaker says that for the itching of the skin so commonly met with in eczema there is nothing that affords such prompt and effective relief as a mixture of equal parts of glycerine and lime water. This may be applied to the skin as often as necessary.

Take of powdered starch. . . ½ drachm.
Subnitrate of bishmuth. . . ½ "
Spermaceti ointment. . . . ½ ounce.
Mix. Valuable for irritation in the axilla, about the groins, and erythema of the female breasts.

Woodbury says that ten grains of the bicarbonate of soda in a half-ounce of an infusion of uva ursi every two hours will relieve acute inflammation of the bladder immediately.

Lumbago.—A valuable internal remedy:
℞.—Ext. Cimicifugæ fl., - - ℥ j.
Celerina (Rio) - - - - ℥ vij.—M.
Sig.—Teaspoonful every four hours.

Royal Medical College, Kingston.—Dr. W. G. Anglin has been made Professor of Pathology and Dr. E. Ryan Demonstrator of Anatomy in the above College.

Dr. Frank Lydston, Opera House Block, Chicago, will be pleased to send a copy of his lecture on Sexual Perversion to any one enclosing a stamp.

Calcium Sulphide in Croup.—The *Med. Reg.* (*Ed.*) recommends the use of the above drug in doses of one-tenth gr. hourly for the worst cases.

The *American Lancet* says that a five per cent. solution of chloral hydrate will clear the hair of dandruff and prevent alopecia from that cause.

Pilocarpin is said to be useful in the treatment of chronic articular rheumatism.

It is said that one-half the population of Edinburgh is treated gratuitously.