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President of the Ulster Medical Society

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Presidential Opening Address

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SOME ASPECTS OF METABOLISM— CHIEFLY CLINICAL.

Ladies and Gentlemen—I desire to thank you most sincerely for the honour you have done me, and to say that I shall spare no effort to carry out the duties of the office to the best of my ability. The inevitable difficulty presents itself of the selection of a subject on which to address you. The embarrassment of riches in matters to be handled is great. There are the University question, medical education, medical politics, and medical ethics, the hospital system of the day, when philanthropists look askance upon the iniquity of demoralising children in the street by giving them a penny, but with complacency devote thousands in supplying to their parents what they are in many cases well able to procure for themselves, or would, had they not squandered their wages in miserable and unrestrained drunkenness. No one will deny that care should be taken of the flotsam and jetsam of our urban population, and a helping hand given to the industrious but unfortunate, whether from accident or disease, in life's struggle; but we cannot hide from ourselves that indiscriminate charity emasculates the energy, self-respect, and independence of the recipient, and tends to breed a rank and overgrown vegetation sadly needing the impartial weeding of Nature.

The relations between the various professions offer a rich mine to furnish material for introductory addresses. Since the Beck case, the law will probably be somewhat less bumptious, and will curb its mild jokes on doctors differing and mistaken diagnoses. However, we of medicine live in glass houses; and our decisions are occasionally of the same trustworthiness as that of the Beck case, even those that are delivered in our final courts of appeal. The value of much of our more abstruse and specialised scientific work has lately been debated. As an educational procedure it is invaluable; as a means of



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examination of a patient it is also of the greatest service; but microscopic sections and bacterial growths, blood films and cryoscopy are all liable to mistakes and fallacies, just as auscultation and percussion are, and the interpretation of results is based upon experience. The laboratory is not a final court of appeal, but is simply a witness giving evidence, and that evidence may be most valuable, accurate, and decisive, or useless, faulty, and of no moment. The responsibility rests with the practitioner; it cannot be delegated to others; it may be shared, or refused altogether; but it is the inalienable duty of the medical man in charge of a case to collect all the evidence he can, and come to a conclusion himself; and it is a pernicious doctrine to preach that a man who has never seen the patient should diagnose the disease.

Leaving, however, these subjects, as they furnish matter of daily debate and of correspondence in our

¹ The original choice as president for this session was James Lorrain Smith but he moved to Manchester after he was elected.

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papers, and as I have little or no especial experience or taste in them, I turn to a more personal choice. In looking over my own small contributions, which I had the honour of making to this or other medical gatherings, or to journals, I find there are two classes of disease which engaged attention somewhat more, perhaps, than others. For ten years I was medical attendant at the Throne Consumptive Hospital, and I believe I was the first in Ireland to advocate and to adopt the present method of treatment. I visited some of the German sanatoria, and described my subsequent experiences on more than one occasion. But since this revolution of hyper-aeration and hyper-alimentation but little new in principle has been developed. It would be worse than useless to reiterate the old discussions; the trial has taken place, the advocates have aired their eloquence, the judge has summed up, and now the jury, composed of thousands of consumptives scattered over the realms of all civilised kingdoms, are debating in their own chests and tissues whether the hygienic treatment is a beneficent angel, or a quack, a base fraud and deception. The deliberations of the jury are not yet approaching an end, and for the next ten or fifteen years they should be left in peace. Some new series of statistics or some paper embodying the results of experience are added from time to time. No final verdict can be given yet. My own opinion is unchanged. One may not approve of all the details, but the method is an immense advance to a higher, more logical, brighter and happier life, not only among the consumptive, but in every path of life.

In 1899, two years before the publication of Mayo Robson's "Diseases of the Stomach and their Surgical Treatment," I read a short paper at Portsmouth on organic adhesions of the stomach as a cause for some forms of dyspepsia, and recommended mechanical interference. Since then, experience has grown and earlier opinions have been modified. But it is now a recognised principle that cases of chronic dyspepsia showing signs of ulceration, past or present, of cicatrisation and adhesions, should not be allowed to starve into a painful, miserable, and too-long-delayed death, but should take their courage in their hands and risk the great issue for the chance of formerly undreamt-of recovery. Here surgery has achieved one of its most signal victories. It is true that the description of the old English surgeon is not quite banished; some of the operations are still "terrible in the doing and melancholy in the event"; but when we consider the hopelessness of the case, and the large portion of success that attends interference, we must congratulate ourselves on the merits of the school of

surgery in our midst, not merely in abdominal work, but in the general principles, *technique*, of our surgery as a whole. As part of this second point on which I have laid stress, both before my fellow medical men and in teaching at the bedside, I may mention the constant connection of chlorosis and gastric ulcer, so that it has become a fad with me as all somewhat novel and strange convictions are politely termed by one's friends—that the so-called tea-dyspepsias of anaemic girls are really small, rapidly-forming, and, happily, often rapidly-healing gastric ulcers; and that such ulcers are a local manifestation of a constitutional affection. They are often overlooked, but at times prove their importance in an unmistakable manner and usurp the throne of the premier disease. I have, however, no new facts to put before you on either of these issues. Besides, like the consumptive problem, the principle has been affirmed; we require the experience of years to mould it, so that the finally developed procedure may pass into the accepted canons of our art.

In dealing with these two great departments of therapeutics—the open-air treatment, and surgical intervention in stomach disease—I discovered as year succeeded year that I was placidly sitting on the branch I was industriously sawing. The sanatorium physician swooped down upon my phthisical patient and carried him off to his fastness among the mountains. The operating surgeon fell upon my poor dyspeptic and imprisoned him in the safe retreat of the private hospital on the plains, and while they both fattened his body and carefully instructed him in all the laws of physiological righteousness, whether pulmonary or gastric, they picked clean and white, enough to satisfy the conscientious requirements of any respectable bird of prey, whether eagle or hawk, the financial bones of the patient; so that I was thus desirous in my next emigration of choosing a land where I should be free from the inroads of such disturbing neighbours.

I have been endeavouring to classify for my own edification diseases of the stomach other than cancer and ulcer, but have found the connections between pure gastric and gastro-intestinal-hepatic affection so close that it is nearly impossible to draw a line of demarcation. I thought, therefore, of abandoning a frontal attack, and approaching the stomach from the other or hepatic side before dealing further with gastric or intestinal derangements.

During both studies of phthisis and gastric trouble, if I may so dignify these very incomplete observations, the groundwork or constitution of a patient on which we, as professional artists, had to

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work, was forced upon my attention, not once or twice, but at every turn and move. However, of a man's inherited qualities the study is entrancing, but as regards practical therapeutics, somewhat wanting in hope. We cannot treat a patient's grandfather, although the Chinese may ennoble him, and nothing less than the unremitting treatment, preventive and curative, of four grandparents and two parents could remove the vice of blood and tissue from some patients. The effect by his environment, on the other hand, is all-important, and the effect of environment on the problems of metabolism constantly recur in dealing with disease in the province of the physician. It is one personally I have been drawn closely to latterly, and I propose to make a somewhat rapid survey of the subject from a clinical aspect.

Evolution does not give much help. Plants are able to form their protoplasm from the constituents of the atmosphere, or the inorganic matter of the earth. By the sun's rays and their own inherent vitality they build organic matter of high potential energy from CO₂, ammonia, nitrates, and mineral salts. The earliest appear to be sugar and starch, and, by synthesis, fats and proteids follow. One need have little doubt that could the evolutionary chemist of biology fathom the secrets of comparative physiology he would be able to trace the various stages of growth in lines radiating from the most elementary organic molecule in various directions of vegetable and animal life; and in that radius, at the end of which is man, ending in some molecule as complicated as that of a nucleo-albumin.

In mental disease, help is obtained by a study of comparative mental physiology, in which we may include not only the study of animal mind of various stages of evolution, but also the growth of the child's mind with various stages of development. I have no doubt also that most interesting facts, important in the light they would throw on the etiology and treatment, will be discovered in metabolism. At present, however, such few details as I have been able to glean are not of sufficient importance to warrant me in detaining you longer than simply throwing out the suggestion. Reversion to ancestral types may be present, but so far its study is not of practical importance. The same may be said of child development.

In order to refresh our minds on some points of elementary physiology, I shall very briefly run over the accepted dicta of the changes which food undergoes after the action of the digestive juices has been exercised upon them. Of proteid matter, the peptone formed in the alimentary canal is converted

by the agency of the columnar epithelial cells of the mucous membrane of the intestine, back again to some more ordinary form of serum and globulin albumen; for no trace of peptone is found in the portal vein, although serum and globulin albumen is found in excess during a proteid meal. Injection of small quantities of peptone into the portal vein gives rise to peptonuria.

In the liver, no doubt, this albumen undergoes some further change, possibly some of it is converted into glycogen, but physiologists are rather in a fog in this region, and the intricacy of the subject is such that the most careful investigations and experiments fail to allow more than probable surmises. It then circulates through the body in solution in the serum; some small portion is assimilated by the fixed and floating cells and tissues, but the great mass of absorbed albumen remains in solution, and seems to act as a source of energy without being taken up into the tissues and organised. The exact subsequent changes form a subject of conjecture, or perhaps of logical inference, and are as mysterious as the movements of the Japanese army in Manchuria. It were too great a prerogative even for the presidential chair to inflict upon you a tithe of the names assigned to analogous changes in the test tube; finally, however, we meet with urea at the end of these long subcuticular wanderings, most probably formed in the liver and excreted by the kidneys.

Of the carbohydrates, the starches or poly-saccharides, and the cane-sugars or di-saccharides, are reduced by the saliva and pancreatic secretions to a mono-saccharide such as dextrose. In the columnar epithelial cells of the villi, some change comes over this dextrose, as the carbohydrate found in the portal vein has a lower cupric oxide reducing power than dextrose. In the liver a return to the poly-saccharides is found in glycogen. What happens next is a matter of dispute. Pavy says sugar does not and should not reach the general circulation; others say that glycogen is slowly given off as some form of sugar, which is used up in the fixed cells and in the lymph circulation, and disappears as water and carbonic di-oxide.

Fats are split in the intestine into fatty acids and glycerine. The former are reconverted into neutral fats by the columnar epithelial cells of the intestinal mucosa; and these fats are oxidised in the circulation into CO₂ and H₂O.

The principles of the complicated chemical changes are not difficult to understand. On the one hand, by the agency of ferment, the larger molecules of both proteid and carbohydrate are split up into

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smaller; this process is accompanied by hydration; there is a conversion of a high potential energy into a lower; but the molecule can now be absorbed. The process is exemplified in albumen and peptone, starch and dextrose, perhaps glycogen and dextrose, where the ferment is an internal secretion of the liver. On the other hand, by the agency of living protoplasmic matter, dehydration takes place, there is a combination of molecules, a formation of a molecule of a higher potential energy, a synthesis of living matter, an absorption into the living protoplasm of a cell. As examples of this synthesis, we may adduce the formation of fat from a carbohydrate, or of the complex, conjugated proteid as nuclein from simple proteid, fat, and carbohydrate. In the exercise of functions these complex compounds are broken, and this disintegration is mostly a question of oxidation. It is impossible to assign many of these substances to their exact place in the circuit of metabolism. Pavy assigns a great importance to the protoplasmic agency of the intestinal villi in the conversion of a dextrose into a high carbohydrate, so that no sugar should reach the blood circulation. In these cells he says there is a transformation of the sugar into fat, a synthesis into proteid, and a transmutation into glycogen. We can easily understand how these delicate and complicated processes may be thrown out of gear.

The mysterious influences of the internal secretion of various organs now come into play. They add a new wonder to life, and are potent for good and evil. This play of action and interaction form the symptom-complex of nutrition and malnutrition. There may be error in food or error in the preparation, or some defect, initial or acquired, in living matter, or perversion of internal secretion, or some mal-excretion.

The living protoplasm of the cells can apparently most easily assimilate the proteid in the serum, next the carbohydrate, and the fat with the greatest difficulty. The proteid molecule is the most complicated, but also most accommodating, too accommodating at times; not only does it give rise to the simpler molecules of ammonium carbonate and carbamate, but glycogen and a mono-saccharide can be split off, and fat finds a ready origin. This great huge lumbering mass of a molecule has, like the Empire of China, enough to give and to spare. Of all proteid molecules, the nucleo-albumens and cerebrals probably furnish the most complicated.

All the chemical processes of cells may be in time reduced to fermentation, the function of the living protoplasm being confined to the determination of

the direction of the process at any moment. These ferments are innumerable; there are eight known unorganised ferments in the alimentary canal and a whole array in the body fluids. They bring about composition with an evolution of kinetic energy without themselves being used up in the process. If products of action are removed, the process can go on like the reversible action in chemistry. Those of you who practise the quantitative estimation of sugar by boiling an ammoniacal solution of cupric hydrate are often puzzled how to decide when all the copper is exhausted. You boil and the blue colour disappears; but then, as you watch the solution on exposure to air, it regains some of its blueness. You repeat the process, and yet again repeat it. Apparently an indefinitely large quantity of the dextrose can be oxidised by the same solution of copper; this is one of the fallacies of this test; it is called the "reversible action," and in the inorganic world is analogous to the fermentation so richly found in physiological chemistry; the fallacy in practical work is of course avoided by noting the results at the instant that the blue colour first disappears. Another instance is the fact that spongy platinum will affect a rapid reunion between oxygen and hydrogen to form water. Ferment, then, is a factor which adds nothing to the total energy of the reaction, yet materially alters its velocity.

Of the vital action of the protoplasm itself we know little; it is the deepest physical secret of life, next to the material origin of consciousness; it is an ultimate fact.

This, then, is about as compressed a synopsis of the metabolism in our bodies as it is possible to make. From the evolutionary point of view, it is the result of millions of millions of experiments in plant and animal life during the last 50,000,000 years. Each living being has been a test tube wherein Nature has been experimenting; we but touch the fringe in the most advanced vital chemistry.

Can we propose now to examine into the question of disease arising—

1. From some perversion of the ferment action, by which albumen is converted into peptone and starch into dextrose;
2. From some perversion of the protoplasmic or synthetic action, by which peptone is reconverted into serum albumen and dextrose into glycogen;
3. From some perversion of the anabolic process of the most highly complicated molecules of living protoplasm throughout the whole body;
4. From some perversion of the katabolic or disintegrative processes?

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This would be the theoretical course, but for practical purposes a different and more clinical course will be adopted.

I.—The natural variations in metabolism are infinite—age, sex, temperament, occupation, hereditary influence, and a hundred other minor causes all combine to form permutations and combinations of the force of which we can only make a sort of intuitive guess, but the exact value of which in an individual case under special circumstances baffles us completely when we endeavour to establish a careful estimate. You know of Professor Kraepelin's (of Heidelberg) experiments on certain fundamental properties of mind, as capacity for work, susceptibility to mental fatigue, the power of recovery from much fatigue, the power of concentration, the relation of bodily and mental fatigue, depth of sleep, and so on. Many of these experiments and results might be applied by analogy to metabolism if we changed some of the terms. The forces of metabolism vary in individuals as much as the manifestations of nervous energy. They deserve to be more closely studied at the bedside. It is impossible to go into all the variations; two types will illustrate my meaning. We all know the big-boned child with a huge appetite, that is never fat; this type in adult life performs a vast amount of work at a spurt, but is rather deficient in staying power, and takes alcohol badly. The opposite type, the phlegmatic, rather cold child, with poor appetite, eats little, but still is fat; and in adult life often endures prolonged work, and even privation, and shows the strain but little; as an adult he can also take for years an unusual amount of alcohol, with at first, at anyrate, apparently no further result than being a little too stout.

It is a pity that our old friends, choleric, melancholic, sanguine, and phlegmatic, have completely disappeared from our note taking; they point to the power and changeability of emotions and metabolism, which students now completely ignore, but which they subsequently learn from pure experience with no science to guide them. We should, however, remember the natural variations, and just as there is a slow burning coal and a quick burning coal, even to an explosive petroleum; and just as there is a coal with little ash, and a coal that soon puts itself out by its own accumulation, so we find endless variations in the firing of the human body.

It has occurred to me that we should have some clinical method of examining a patient's metabolism, as we examine his lungs, and heart, and brain. The methods that we find exemplified in experimental investigation in the *Journal of Physiology* are out of

place by the bedside; in exceptional instances in hospital the chemical examination of food, urine, and faeces might be undertaken, but the possibility and advantage of any general practice would be more than dubious; as far as we can see, it would not be compensatory for the trouble. I am inclined to think that some descriptions of the metabolism should be added to notes of our students in hospital.

II.—Next, of the changes that take place in acute starvation one does learn but little. I have seen one case of gastric ulcer where a return to feeding by the mouth was delayed so long on account of previous haemorrhage that the patient died from actual starvation supervening on excessive haemorrhage at an earlier date. But although such an occurrence is rare, the gradual starvation that ensues in malignant disease of the cardiac end of the stomach, and the yet more complicated starvation that follows extensive and chronic gastric ulceration, is not uncommon. There was nothing in any of the cases that I have seen that struck me as very exceptional; the natural conservation of energy, the want of mental initiative, the small amount of urine and constipation form a familiar picture. No special examination of the excreta was made. But such cases form opportunities ready to hand for examination into metabolism. As an instance of changed metabolism due to insufficiency of one kind of food and an excess of another, rickets suggests itself, and then scurvy; their study is valuable not only for the sake of the disease itself, but as types of disease that arise from some small deficiency in food, of little importance for one day, but when repeated daily, week in week out, giving rise to an affection which may be fatal in its severity.

III.—Excessive feeding has been well studied of late in our consumptive sanatoria, and an interesting problem faces us. In Vol. XXVIII. of the *Journal of Physiology*, details are given by Goodbody, Bardwell, and Clapman of an investigation into the metabolism of three ordinary healthy men, first on ordinary diet, secondly on excessive diet; the results are important, and are summed up as follows:—

The latter in all cases had to be stopped within a few weeks; loss of appetite, haemorrhoids, dyspnoea on walking, mucous colitis; at first a rapid increase of weight, a subsequent rapid loss, and marked deterioration of health occurred in one or all. This result is interesting with regard to feeding of consumptives. Dr. Howard Sinclair and Dr. Burton Fanning have both written to me to the effect that the limit of diet is probably the same as in health; my own view is that it is more a question of deficiency before, than excess after entrance to a sanatorium.

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The question of an excess of carbohydrates in food is interesting. No excess of such simple articles of diet as rice appears to disagree in the ordinary individual. Excess of any forms of sugar, di-saccharides, or mono-saccharides soon disagrees, and the symptoms are too well known to need mention. If, however, we inject sub-cutaneously large quantities of dextrose, 5 to 7 grammes per kilo of body weight, so that it is acted on by the general tissues of the body, not by the liver, it is at once secreted by the kidney, and at the same time causes a marked increase of proteid metabolism. In fact, dextrose, or more probably an acid derivative of dextrose, under such circumstances acts like such toxic agents as phosphorus, poisoning the protoplasm.

These results (which I have taken from an article by James Scott, M.D., in *Journal of Physiology*, vol. XXIII.) have a bearing on the boils and phthisis of diabetes, and also on the acne spots, the carious teeth of ordinary sweet eating; and this again leads to the variations in susceptibility to the evil effect of sweet-eating. To take our lesson from every-day life, one young lady can scarcely touch sugar without disfiguring her face; her companion in the parterre seems to think nothing of a box of chocolates, and retains the peachlike bloom unspotted. The "protective substance" in the latter must be well developed and able to overcome all the stray staphylococci lodging in her sebaceous glands; or the sieve-like action of her liver must be peculiarly delicate and efficient. People vary enormously in the power of dealing with not only alcohol, but carbohydrates and proteids, and we do not understand the secret.

IV.—I pointed out to you that in the alimentary canal there was a conversion of albumen into peptone, and starch or polysaccharides into dextrose, and that actually in the mucosae of the intestine there was a reconversion back into an albumen, and that there was probably some change in the dextrose. That in the liver some further change occurs, certainly resulting into glycogen in the case of the carbohydrates, but unknown in the case of the proteid. Now is there any disease known arising from a perversion of these functions? I shall relate very briefly notes of a few cases, each of them types, the main symptoms of which are at anyrate due to some disturbance in these parts.

A gentleman came to me one afternoon preparatory to presenting himself for life assurance. I found him perfectly healthy, but with a marked quantity of sugar in the urine. On investigation it

came out that he had been in a small country town that morning; that about two p.m. he got hungry, he could not find any place to get tea, and bought a ¼ lb. of figs and some biscuits which he ate in the train home. No trace of the sugar was found in 30 hours. This was plainly too great a strain for the mucosa-hepatic functions.

A man eats and drinks somewhat to excess; he overloads his stomach with food, food which is good in itself, or a part of which he could deal with perfectly; gastrointestinal catarrh soon sets in; nausea, vomiting, depression, a soft pulse, headache, a dirty tongue, perhaps diarrhoea, a copious deposit of urates, with a rather haggard face, loss of about 1–3 lbs. in weight in 24 hours, forms the not unfamiliar picture. However the toxin is formed, the fermentation and the assimilative function of mucosa and liver are sadly out of gear and suffer most. In the adult and gouty in such cases, sugar comes and goes mysteriously, and in one case when sugar was present the urates were less, and *vice versa*.

Let us advance a step further. Some few years ago I related the facts of the following case to the Members of the Ulster Branch of the British Medical Association. A gentleman leading a steady, hard-working life, and discharging very responsible and trying business duties, every now and then turned a complete intemperance somersault, and for a few weeks gave way to excessive alcoholism. I had an opportunity of examining him in half-a-dozen of these bouts, and in the lucid intervals; during the latter the urine is always free from sugar, although he takes a plate of porridge each night, and potatoes and rice for dinner; during the bout sugar always appears and takes about a week or a fortnight after the last glass to disappear. There is a furred tongue and some catarrh of the stomach. The phenomenon is perhaps best explained by the supposition that the mucosa-hepatic functions in the carbohydrate metabolism is disturbed by the alcohol.

A fourth case: Lady now approaching 60 has been troubled all her life with attacks that are familiar enough, but not understood; she is somewhat indiscreet in her diet, and wanting in care in preventing chill; a little too much exercise exposes her to a sudden change of an east wind, and these two when combined with something appetising for a mild supper, are followed by gastric catarrh, vomiting, desperate headache, and a pulse as hard as wire; urates are present only to a slight degree; one kidney is floating; these attacks last from three days to three weeks; the urine is always of a low specific gravity; never any trace of albumen or sugar; she is always

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cured in a few days by rest in bed and a milk diet, but is very liable to relapse. I had made the diagnosis somewhere about ten years ago of incipient cirrhotic kidney, but there is no more evidence of it now than then. I explain the case by disturbance of metabolism in intestine and liver, due to indiscretion in diet, and chill—chill on the liver—and that her kidneys are inefficient without being diseased. The case approaches the type of Sir Andrew Clark's "Renal Inadequacy."

Yet another case: A gentleman, aged 70, accustomed to take rather much alcohol, indulged somewhat freely one spring, while exposed to the treacherous wind of the season, and exhausted himself by too much walking; this was on the 13th of the month; he was ill and confused in mind on the 14th and 15th; worse the next day, and took convulsions the ensuing early morning of the 16th; several of these occurred, part consciousness returned, but unfortunately congestion of the lungs set in and he died. There was no albumen, but copious urates, and the pulse was very hard before the convulsions, and no other cause for the convulsions except some toxic material produced by chill, fatigue, and whisky in an oldish man.

I bring these cases forward as examples of a well known class of disease; when more chronic the condition approaches the lithaemia of Murchison; lithates and urates are synonymous terms, but lithaemia and uraemia are widely distinct. There are protean forms of this class—biliousness, torpid liver, acidity, and flatulence; common symptoms are often elevated to the rank of distinct affections. The type of the disease is the effects of the administration of tolyuyendiamin; with the absorption of a poison there are metabolic changes. How far the constitutional symptoms are due to the initial toxin, and how far to the products of the perverted metabolism is unknown.

These alimentary forms shade off gradually, even in different stages of the one attack, into a more hepatic type, and these again into gout in the gouty, or into a migrainous type in the neurotic. Their initial treatment is the same—the cleansing and purifying of the alimentary canal, as being the prime source of the mischief. Experience is gradually impressing upon me the value of mercury, of salines, of a pure diet, with very little meat, and of salicylate of soda; of mercury as an antiseptic purgative; of salines to reverse the current of absorption; of a pure or sterile diet to lessen the number of bacteria and of toxins; of absence of flesh meat, as the toxin seems to be of nitrogenous origin; and of salicylate of soda, from its

obscure action in elimination. The effect of this last drug is marked, and cannot but have some relation to the results of experiment, which show that it increases the amount of uric acid and purin bodies by 20 to 60 per cent.

I make the statement, however, as in practice the exhibition of blue pill and of salicylate are too much restricted in this class of affections. As regards the cleansing of the blood from the secondary poisons of perverted metabolism, potash and salicylates are the most efficacious, although Walker Hall says that probably salicylate simply hinders the normal oxidation of uric acid to urea. Other authorities say that uric acid is not oxidised into urea.

There are many most interesting subjects of debate and of conjecture in this region. The depression of spirits is most noteworthy; it is often associated with catarrh of the colon; and the suggestion has more than once occurred to me that the poison that so acts on the nervous system is, if not identical, at anyrate closely allied with that which produces melancholia.

Another point scientific medical men, especially of the younger and more robust type, are apt to despise, is the effect of chill. In nearly every case in my notes do I find chill mentioned. Are we right in attributing the effect to reflex nervous action? May there not be an internal secretion from the skin which when perverted is the primary toxin? This affects the excretory functions of the liver, next, the alimentary canal; a vicious circle is set up, and the metabolism suffers.

The pathology of diabetes is obscure, but considerable advance has lately been made; in that of gout less progress is acknowledged. In a recent number of *The Practitioner* several authorities expressed their views; but, as a result, Clifford Allbutt in a preliminary review, lamented the fact that so little had been done since the time of Sydenham. The discussion at Oxford this autumn was more helpful, but finality is as near as in the Irish education question. Putting the pathology as briefly as possible, the following factors have much evidence in their favour: First, there is an element of initial defective tissue, as shown in its hereditary nature. Secondly, we have clearly some mucosa-hepatic disturbance. Thirdly, there is defective elimination. The diathesis or constitutional tendency is a matter of common professional knowledge. The defective elimination is shown as the results of the examination of the urine. The mucosa-hepatic disturbance, we see in the coated tongue, the dyspepsia, the constipation, the excess of fat and proteid in the stools. We see, then,

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that gout constitutes a half-way house between the more purely mucosa-hepatic gout and the true primary disorders of metabolism. In this country it is not with typical gout that we have most to do, but with the acidity, the flatulence, Murchison's lithaemia, megrim, biliousness, that are not gout, but allied to gout, and for which I have ventured to coin the name "para-podagra"; they are palpably to be classed under the mucosa hepatic type, but are inextricably mixed up with hereditary tendency, nervous influence, and defective elimination. In one person a chill and fatigue give rise to shivering and gastritis; in another to constipation with headache; in this connection I may mention a peculiar type of constipation, where the bowels just simply refuse to act without some aperient for several days, and then suddenly begin to act of themselves, and the patient feels better. From somewhat close observation, I do not think that the constipation here is the cause of the other symptoms, but is a symptom itself, of a para-podagrous condition. Constipation is associated with an increase of uric acid in the urine, but which is the cause and which the effect? I imagine that in all we have a pretty constant mucosa-hepatic disturbance; that in most cases the effect passes off in a few days; that in some we have bad bilious attacks; in others megrim; in others distressing constipation, perhaps mucous colitis; that in those with renal inefficiency the attacks may be severe; one may even suspect that here may be found the origin of Bright's disease; in those of a bias of tissue, true attacks of gout, regular or irregular, may supervene.

As to the origin of uric acid, and as to the part it plays in gout, there is so much dispute it were idle to rehearse the numerous theories. How far the exogenous uric acid derived from food is a factor in gout is unknown; how far the endogenous is a result of reversion to birds and serpents, to deficient oxidation, to mal-synthesis, to excessive production, to diminished destruction, is unknown; how far it is due to the disintegration of nucleins is unknown. As Osler says:— "The nature of gout is unknown; that there is a faulty metabolism, associated in some very special way with the chemistry of uric acid we know, but nothing more. The remainder is theory, awaiting refutation or confirmation."

As a final example of these mucosa-hepatic disturbances I may mention one theory of pernicious anaemia, where evidence points to some toxin probably formed in the intestinal canal, destroying the blood to the portal vein.

V.—Coming to the next class of cases—that by changes in metabolism due to affection of other

organs—I must be content merely to mention the diabetes mellitus that accompanies atrophy or removal of the pancreas; the causal relation is not known; the wasting without diabetes that follows cirrhosis of the pancreas, and has so often misled operators into the opinion of malignancy, is also recognised since Mayo Robson's publication.

Of the kidneys as influencing metabolism we meet not infrequently with the following type of case: A man over 60 complains of loss of weight, but most of loss of strength and energy; there is a sub-normal temperature, large quantities of urine are passed with low specific gravity, this condition deepens, and after a lapse of a few months he finally dies, being conscious up to his death, perhaps a little delirious; his pupils are small, and there is muscular trembling and restlessness. Most probably an enlarged prostate is discovered during life, but on examination after death there is found hydronephrosis of both kidneys, with but little kidney substance left. This is Roberts' "latent uraemia," and its symptoms coincide very closely with Rose Bradford's results in removing portions of the healthy kidney. He found that when a fraction, say one-fourth, of the total kidney substance was removed, the urine increased in quantity, its specific gravity fell, but there was an increased excretion of urea, greater than in health, and as high as when the animal was on a full diet, although now starving. When three-fourths of the total kidney substance was removed, the wasting, the sub-normal temperature, and great accumulation of urea were observed. There was no coma, convulsion, dyspnoea, vomiting, nor appreciable rise of arterial pressure. The symptoms are not those of Bright's, they point to a peculiar effect of the kidney—perhaps an internal secretion—on proteid metabolism generally. As the pancreas has some peculiar relation to carbohydrate metabolism, so the kidney has some relation with proteid metabolism.

With regard to the effects of the suprarenal bodies on metabolism, it must suffice simply to mention Addison's disease; similarly, with the pituitary body, acromegaly; with the thyroid, exophthalmic goitre, myxoedema, and cretinism; with the testes, the great change that ensues concomitantly with their growth during adolescence, their inhibitory influence on fat formation, their general stimulation of metabolism, and the quite as remarkable a change after their removal; the alteration in the female at puberty, at the menopause, and on artificial removal of the ovaries. The very strong effect of the cerebrum on metabolism is well known; an angry altercation, deep woe, any strong

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passion for a few hours, make one haggard, and bring down the weight by a few pounds. Literature is full of illustrations. Alienists tell us of the changes that come over the insane in this respect, the wasting to excess in acute cases, the overgrowth of fat in the dement, and the necessity for terrific doses of purgatives.

VI. and VII.—Time is left only to mention the effect of such toxins as the fevers on metabolism; and also the effect of such articles of diet or of luxury as alcohol, tea, tobacco, and of such drugs as phosphorus, arsenic, iron, mercury, and salicylate of soda, and last, but most interesting, of phloridzin. Pavy mentions 38 artificial conditions which have been reported as leading to the production of sugar in the blood, which is tantamount to saying glycosuria, as the amount of sugar in the urine is always an index of the sugar in the blood.

VIII.—In treating of the primary or idiopathic forms of diseases of metabolism, one enters upon the most difficult problems of pathology; as our knowledge becomes more exact and extensive, the group becomes smaller. For instance, many forms of glycosuria are secondary; secondary to the food, to functional disturbance of intestine and liver, to disease of the pancreas or of the brain. It is curious that diabetes or glycosuria is not associated with any organic disease of the liver. There still remains, however, an apparently primary diabetes mellitus, where sugar appears in the urine, although carbohydrates are disallowed, and liver, pancreas, and brain show no evidence of disease; where apparently a dextrose escapes into the blood stream from the huge molecule of living protoplasm, from its own intrinsic weakness of combination. This is the “composite” diabetes of Pavy; whether the excess of urea that accompanies the sugar is also due to the primary disintegration of proteid, or is secondary to the sugar, as in the case of the subcutaneous injection of dextrose is unknown. The questions of pentosuria, of levulosuria, of glycolytic action of the blood are yet too *sub judice* to allow any practical deductions to be made.

The opposite type of a primary disease of metabolism is obesity; the tendency is often hereditary; it seems to be a faulty tissue, not a simple failure to effect oxidation. Whether at all, or how far it is connected with the thyroid gland is uncertain, but cases have been reported of the gland having been found changed. As an instance of the want of proper testing of methods of treatment, Von Noorden relates the case of a stout lady, who submitted to massage of one arm; massage was a vaunted remedy for obesity, and warranted to remove an overplus of adipose

tissue; however, at the end of a suitable time, the circumferences were again measured—the arm which had not undergone treatment remained as before, the other had increased one and a half centimetre.

I now come to some other, rather rarer forms of apparently primary disorders of metabolism. One has received the name azoturia; it is a rare condition; we commonly enough see milder forms of it, or perhaps, more truly, we see mild acute attacks of it; there is an excess of urea and urates; this causes a certain amount of polyuria, a feeling of languor, weariness in loins and thighs, a disordered stomach, dirty tongue, and disturbed appetite, with loss of weight. I have seen several mild instances of it, and the patients were all more or less under the influence of some pretty powerful emotion. As a pure proteid diet does not stop a primary diabetes, so a pure carbohydrate does not stop this azoturia. Some cases are reported as running into diabetes. An analogous condition called baruria, where there is a general pathological increase of the solid constituents of the urine, is also reported; the symptoms are much the same as in azoturia. Whether under this head we should include diabetes insipidus or not is debatable. However, we must include “phosphaturia,” or “phosphatic diabetes,” of which most of us have come across at anyrate mild types of, although a rare affection. By this term is not meant phosphates deposited in alkaline urine, or the triple phosphates due to decomposition, but a pathological constant increase of earthy phosphates. We find phosphates somewhat excessive in gout, where it may alternate with uric acid, and also in the opposite kind of disease, namely, phthisis; phosphates are said to be increased by administration of ovarian substance; and although excess of these salts is not found in mollities ossium, yet removal of the ovaries is said to arrest this disease. Like uric acid, phosphates are derived chiefly from the food, but some come from tissue disintegration; the urine removes the alkaline phosphates, but the mucous membrane of the intestine removes the phosphates of calcium; and, lastly, phosphates are diminished in Bright’s disease, and are in excess where uric acid is in excess—namely, where there is a breaking up of nuclein into its proteid and purin radical. It is said there may be a renal inadequacy for phosphates, as there is for urea, and as we shall see for chlorides. Von Noorden lays considerable stress upon these phosphates, and advises in Bright’s disease the administration of carbonate of calcium several times daily in milk, as he says by this means half of the phosphoric acid remains in the intestine, or, after circulating in the body is poured into the intestinal

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secretion and appears in the faeces, and so the kidneys are spared. We thus see that there is more than empirical reason for adding lime water to milk.

The symptoms of phosphaturia are much the same as in azoturia—namely, emaciation, nervous irritability, dyspepsia, with pain in back and loins; and the ill-health may deepen into phthisis or diabetes.

Under the same heading and with much the same symptoms comes oxaluria, which need not delay us.

While on this subject of what has been called the “demineralisation” of the tissues, one must not omit the theory lately advanced by some French clinicians, that if sodium chloride is not eliminated by the kidneys at a rate proportional to its absorption, the salt accumulates in the tissues, causing a hydration which leads to oedema. The excretory power of the kidneys for common salt in some cases of Bright’s disease is less than in health; the opinion was advanced that chloride retention was a sign of renal inadequacy. The figures given are as follows. A man eats about 15 grammes of salt every day; healthy kidneys can excrete more than 30 grammes, but diseased kidneys perhaps not more than 2 or 3 grammes; urea, phosphates, and other urinary constituents may remain normal. In some cases of tubular nephritis with oedema there is a renal inadequacy for sodium chloride; the opposite condition is said to exist in some cases of chronic interstitial nephritis, in which a state of hyperchloriduria is present, by which the tissues are dechlorinated. We thus seem to have a disassimilation for nitrogen, for phosphates, and now for chlorides. On the other hand, in one case, more chloride was excreted than had been absorbed; the tissue, instead of fixing some of the salt, had lost part of what it had already held; the symptoms were polyuria, thirst, absence of oedema, and hyperchloruria. On *post-mortem* examination both kidneys were very small. (*Practitioner*, November, 1904.)

The result of these statements is that in future we must pay more attention to the quantitative analysis of urine for such salt, and endeavour to find out in how far they are primary diseases or merely signs of a disease. The treatment of all these conditions of which pathology is obscure, but in which the nervous element in my experience is the most important, is much the same—rest, quietness, removal from all sources of emotion, cold salt bathing or sponging, and acids, cool rooms, and light clothing and purified food. Of drugs, I think opium should be tried in cases that do not yield to hygienic measures.

And now, ladies and gentlemen, your wearisome vigil, if vigil it has been, is over. I have endeavoured to

fit in some of the serrations of clinical knowledge on the one hand, and of scientific on the other. Our severe critic, the most junior Fellow, whose *obiter dicta* on papers and addresses are so often lost to the Society by being retailed in the interval of cigarette puffs to a few choice and kindred friends before the hall fire below, is no doubt bristling and straining at the leash to course the timid hare which I have let loose. French, German, Russian, and Japanese authorities will be quoted to expose the antiqueness of my physiology, and the inadequacy of my pathology; weird and awful theories will be propounded as the latest; and scathing denunciation will scintillate like tropical lightning, exposing the weakness and shallowness. But I would ask our most junior Fellow to remember that the creed of to-day, becomes the dogma of to-morrow, and vanishes in the tradition of the day after; and that years, although they dull the appetite for new facts, yet sharpen the assimilative powers of judgment. My object has been, not to attempt to unravel the mysteries of any one disease, but by a rapid survey to take stock of our knowledge and our ignorance of a very common but a most important function of our tissue, and to stimulate our most junior Fellow to undertake missionary work, and to carry the light of physiological chemistry among the slums and alleys of home diseases, such as diabetes and migraine.

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Presidential Opening Address

Ulster Medical Society

9th November 1905

SOME OBSERVATIONS ON THE TREATMENT OF ULCER AND DILATATION OF THE STOMACH.

LADIES AND GENTLEMAN, On entering a second session my first duty is to thank you for your kind indulgence to my many failings during last year, and for the loyal and steady support you gave to the Chair in its present unworthy occupancy. I may be allowed to hope that while my zeal and earnest desire to comply with your wishes is unaltered, the experience of a year may have some little power in enabling me to do so in a more suitable and becoming manner.

Few events of great medical importance have occurred since the opening meeting of 1904. No great discovery has been announced; no startling series of operations have told us of some new conquest of surgery; the hopes of the cancer-stricken victim are still but the cry from the depths; the tropics have not furnished any new fairy tale of the conveyance of disease by unexpected and fanciful channels, more suited, one would think, to a gruesome and diabolical *Midsummer Night's Dream*, than to a staid and exact scientific treatise. Locally, in our own medical world, we must offer our congratulations to Sir William Whitla on the honour bestowed upon him by the Glasgow University; to Dr. James Graham, a former President of this Society, on his being called upon to fill the office of His Majesty's Coroner for the city; and to Dr. Henry O'Neill, another former President, on his election to the dignified position of High Sheriff; to all three we wish long life and happiness, and offer them our hearty thanks for so upholding the dignity of the profession. One event has indeed occurred, which is deeply interesting, not only to medical men, but to all associated with learning in all its branches: A generous merchant prince, who spent a few years of his boyhood in the town, in his old age has not forgotten his early days, nor turned a deaf ear to the pressing claims of teaching in our midst. Sir Donald Currie's generous offer has elicited praise from all quarters, and the beneficent toxin of his liberality has successfully infected old and young, rich and poor in our midst. We must congratulate the Profession on the handsome manner of their response, and trust that the answer from the pockets of the public to the coffer of the College may be rapid and full in its action.

We have to record the deaths of one Fellow and two Members of the Society during the year.

There were but few of us who did not feel an awkward lump in our throat and hesitation in our speech when we heard of the tragic death of Owen Maurice Praeger, M.B., R.U.I.; he had excellent abilities, and was of a kindly, sympathetic, and sensitive nature; he seemed unable to bear the strain of modern life, and the depressing surroundings in which he was placed. Dr. Praeger was most popular as a student, and an active member of their organisations, and had held the responsible post of Resident Medical Officer in the Forster Green Hospital for Consumption, and in various departments of the Union Infirmary and Hospital. We cannot but think with deep regret of the potentialities that lay in his future years, and of the unhappy state of his mind during the final stage of life, "like sweet bells jangled out of tune, and harsh."

A marked contrast in mental attitude, but allied in their early death, is given by Dr. John M'Clatchey. It was with very keen regret that the news of the untimely death of Dr. John M'Clatchey was received. Dr. M'Clatchey studied in the Queen's College, Belfast, and for several years was a distinguished teacher in mathematics and natural philosophy; he was a Sullivan Scholar of the College and an Honourman of the Royal University in Ireland. Turning to medicine, he attended the Royal Victoria Hospital at Belfast, and took the degrees of M.B., B.Ch., and B.A.O. in the Royal University in 1903. Subsequently he gained experience as an assistant in asylum work in England. He started practice last October in Dunmurry, became Honorary Anaesthetist to the Queen Street Hospital, and was already rapidly gaining ground, when most unfortunately he contracted influenza. Pneumonia supervened on February 27th, and he passed away on March 5th. Dr. M'Clatchey was a man of the finest and most lovable character; optimistic, ever ready to help another, cheery, strictly honourable, never heard to say an ill word about another, with common sense and high ability; he was more than liked by his contemporaries, and most highly thought of by his seniors. His was a personality that it was good to know, and a large circle of junior medical men feel deeply the loss. Much sympathy is felt with his mother and family.

In further contrast was the death of Geo. Fred. Wales, M.B., of Aberdeen ('57), M.D. ('67), and F.R.C.S., Edin. ('77), a former President of this Society, well-known for many years in Belfast as a successful, skilled, conscientious, and able physician; although never on the teaching staff of the Belfast School,

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many felt that his abilities and culture entitled him to a high position, and regretted the loss for the School.

He retired some years ago from active practice to his residence in Holywood, where he ended his days in peace, surrounded by a large and well-respected family.

In making a choice of the subject of an address my thoughts naturally wandered back to last year. The subject of metabolism is so vast, that it would easily have afforded material for another inaugural, but I emerged from my former plunge with somewhat the feelings of the foolhardy diver, who, when he gains the shore, recognises with alarm and trembling the shallows, the depths, the pointed rocks, the swift undercurrents, the entangling sea weeds that his rash ignorance had, if you will forgive the confusion of metaphor, landed him in. And so with wisdom born of fright, I shall betake myself to the less romantic and less speculative, if better known and safer regions of stomach affections. Here also, however, disturbing spirits of incongruity of book statements and of actual experience, of the impossibility of honest acceptance of the common teachings and traditions, vex one's soul, and this all the more, when pen, ink, and paper force one to become, as Bacon said, an exact man. Respect for one's own reputation would lead to consultation of the latest authorities, and quotation of their copious statistics, which might produce a respectable, reasonable, and orthodox address that few could find fault with, but perhaps still fewer could find good in. It is said that boldness belongs to youth, but with some, boldness comes with age, and audacity of opinion and of speech is symbiotic with grey hairs. The knowledge that this latter class exists encourage me to speak what I think. Although I do not deny that I have consulted authorities, and gratefully purloined, or borrowed several valuable suggestions, the matter that I shall lay before you to-night is mostly what is not found in books, or not generally acknowledged and accepted. To make a connected whole I shall have to include much that is common, but I feel I shall have to apologise for statements that many will hesitate to accept. You are not asked to believe, but to observe, and if any stray remarks may aid your observations, no matter in how slight a degree, the object of the address will have been accomplished.

After a few preliminary observations on catarrh of the stomach, I shall deal at greater length with the treatment of ulcer, both acute and chronic, and of dilatation of the stomach.

Catarrhal Gastritis.—Regarding treatment in diseases of the stomach, the first point I would make

is the confusion, both in diagnosis and in treatment, that arises from the onset of catarrhal gastritis as a complication of other affections. One sees a perfectly clean tongue, absence of sickness or nausea, and a good appetite in ulcer of the stomach. On the other hand patients are often seen for the first time with signs of an ulcer, but with a dirty tongue, nausea, vomiting of much stringy mucus, and anorexia. This syndrome clears off in a few days, leaving but pain and localized tenderness. After visiting day in hospital the condition may return. What effect these easily summoned attacks of gastric catarrh have on the ulcer is not known, but they are assuredly not for good. Luckily, the starvation treatment of the ulcer is the best treatment of the catarrh. But I feel more disposed to give fairly large quantities of warm—not hot—alkaline draughts, as it cleanses the stomach, gives relief to flatulence and acidity, and stops the vomiting. This procedure is all the more necessary, if there be a perverted peristaltic action of the duodenum and regurgitation of bile into the stomach. The risk of injury from a few ounces, or, indeed, from a pint of warm water, with a little magnesia, soda, and menthol, slowly sipped, even though it be followed by vomiting, is much less than the continual straining and retching of unrelieved nausea, due to mucus and bile in the stomach.

The same experience holds in cancer, where catarrhal gastritis is very apt to intervene; one case of cancer presents a clean tongue, clear conjunctiva, and absence of vomiting; the next has a foul tongue, muddy conjunctive, and the trouble increased by frequent vomiting containing more or less mucus.

The only other question I would submit to you in the treatment of chronic catarrhal gastritis is that of a gastro-jejunostomy, where the walls of the stomach have become either atrophic, or thickened and cirrlosed; this procedure would appeal to us as reasonable, but in actual practice we are met by the difficulty of accurate diagnosis; and even if this were got over, the cause of the chronicity of the stomach trouble is apt to affect the general constitution of the patient, and the condition of the other organs as well as the stomach, so unfavourably that an operation is not to be thought of.

GASTRIC ULCER.

I.—**Acute.** This affection is characterised by the formation of a small punched out ulcer in the walls of the stomach, accompanied mostly by dyspeptic symptoms, of which slight pain after food may be the only one present; haematemesis may be absent, may

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be slight, may be severe, and even fatal. The formation and the healing of the ulcer are undoubtedly at times much more rapid than is generally conceived, a few hours being sufficient for the former process, and perhaps for the latter, if the ulcer be small as it not unfrequently is. It is also enormously more common in the female sex between the ages of 14 and 24, and there is very commonly, if not constantly, some chlorosis and menstrual disturbances present.

Any chlorotic female between the ages of 14 and 24, and perhaps older, who suffers from dyspeptic symptoms coming on rather suddenly, should be promptly put to bed and treated as if she were suffering from gastric ulcer; statistics and experience are combining to shew that there is a strong probability that she is; and by this treatment we avoid the very galling reproach of having made a mistaken diagnosis, when perhaps a quart of blood is brought up in twenty-four hours, and the unfortunate girl unexpectedly brought to the very edge of the grave. The second advantage is that cure of the symptoms is rapid and facile; in three days to a week the patient is quite free from pain or tenderness, and can soon eat anything. It is better to make the mistake of confining unnecessarily to bed some slight case of gastric catarrh, or of dyspepsia from overwork and nervous strain, than to permit an acute gastric ulcer, not perhaps larger than a large-sized pea, to perforate or open a blood-vessel without hint or warning.

A patient suspected of an acute gastric ulcer should be kept in bed and at rest till all trace of pain and tenderness have completely disappeared; as a rule, it is well to keep them longer, and to let the change of diet precede change of position; there is less liability to relapse, and a better test of healing is furnished. Definite periods should not be fixed, such as three weeks, six weeks, and so on; no two cases are alike; and if a girl is eating a lightly-boiled egg, toast, and chicken at the end of a fortnight without pain or trouble, she might be let up anytime. As emphasized above, definite proof has been furnished to put beyond doubt that a small, acute ulcer of the stomach may heal, if not actually in a few hours, certainly in a few days; union in such a vascular structure as the gastric mucous membrane, when the edges are pressed together by collapse of the stomach, not separated by its distension with gas or peristaltic movement, cannot be a long affair, provided no other factor be present to prevent its healing.

If the patient has had a haemorrhage, or if the pain be very acute, or if milk food has been tried

without relief, an attempt to administer nourishment by nutrient enemata should be made for from one to five days, and nothing given by the mouth but teaspoonfuls of warm water, with which also the mouth should be rinsed out frequently. During this time the patient should be sponged with warm water; this is both refreshing, and probably some of the water is absorbed; the nutrition of the skin seems to be improved. If thirst be marked, a large enema of plain warm water should be administered about an hour after the usual washout.

Nutrient enemata are best administered as follows: Once daily a pint of soap and water should be given to clear out the bowel; if it does not disturb the patient much it may be immediately succeeded by a pint of perfectly plain water at blood heat, to remove any further traces of faeces and any soap deposit lying among the folds of the bowel; if the patient is weak and exhausted this second enema should be omitted. The morning is probably the best time for this aperient. The patient is now kept perfectly quiet for an hour, when the first nutrient is to be given. The best method is to fasten a large male india-rubber catheter to a glass funnel, warm and oil the catheter, and with the patient lying comfortably on the left side, or on the back if requisite, the catheter is inserted about two inches; no attempt need be made to pass it high up through the folds of Houston; above the pelvis it invariably bends, and causes annoyance. About ten ounces of peptonised milk, at blood heat, of which the peptonisation process has been stopped, is now very slowly poured into the funnel; one or two stoppages for a few seconds should be made, and when the whole amount is given the patient should be turned on her back, the buttocks brought close together, and the legs straightened out. Suggestion is valuable with some patients, and they should be told that it won't come away, and their thoughts turned to some other matter; some patients unconsciously tend to press if they feel a little peristaltic action. The quantity given varies; generally four to six ounces every four hours. It seems much better, and has been my practice for some years to give ten ounces thrice daily, which involves less manipulation of the anus and less annoyance and exhaustion to the patient. The quantity should vary with the age, and also with the size of the patient; many women with large pelves and tolerant recta can retain a pint without trouble, and in those who have lost much blood, it is marvellous how quickly and thoroughly it is absorbed. On the other hand, the quantity may have to be reduced to a few ounces. The funnel and catheter constitute a much better method than the

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old-fashioned ball syringe, from which one seldom ejected the whole contents, and which was very liable to suck back some of the contents, owing to the nurse inadvertently relaxing her grip the moment she has expelled its contents; there is also the fear of the syringe being emptied too quickly, and bringing on an expulsive act by the patient. As to the material given, a great variety has been from time to time recommended; some urge the necessity of pre-digestion; others say it is useless; beaten-up eggs, sometimes the yolk, sometimes the white; beef tea, meat juice, various prepared carbohydrates, whiskey, laudanum have all been advocated. The best results seem to follow fresh milk, freshly peptonised, and given in the above manner; the reports as to its retention are more favourable, and it leaves less residuum behind than any other material.

Reports of patients kept alive for a fortnight on nutrient enemata are not uncommon. It is however very unwise to persevere longer than five days; latterly, the period is getting shorter; patients are apt to fall into a condition of starvation, and their tissue vitality is seriously impaired; this is especially the case, if they have just previously lost a large quantity of blood; and more than one patient has died from the treatment unduly prolonged, not from the disease. On the first sign of the patient getting apathetic, of the pulse rising, or of exhaustion becoming marked, from 3i to ʒss peptonised milk should be given by the mouth every half-hour; if it agree, the quantity should be doubled the next day; when the patient is getting two pints in the twenty-four hours, the nutrient enemata should be promptly stopped; some are inclined to go on with the enemata, as giving more nourishment, but such a mode of feeding is only an emergency means, and should always be kept in reserve; few recta bear this handling for more than a week or so, and if both rectum and stomach give up together, no other channel is left; besides these enemata in some seem to bring on vomiting and a kind of colic, no matter how carefully they are given. More than once the experience has occurred of distressing vomiting of bile and mucus continuing as long as the nutrient enemata were being given, which promptly ceased under the administration by the mouth of one or two pints of milk per day; the peristaltic action seemed to have been upset by the abnormal procedures, and to have recovered at once on resumption of ordinary feeding. When the patient is brought up to three pints of peptonised milk, by adding half a pint daily, one pint should now be given fresh with a little aerated or lime water; if this agree, the whole should, pint by pint, be changed to fresh

milk; here again unnecessary delay should be avoided in changing; and unless the patient definitely shews he can take peptonised milk, one ought not to persist for weeks on the artificial preparation. By degrees a very well beaten up egg can be added. Burney Yeo suggests "an egg well beaten up with two tablespoonfuls of boiling water, strained through muslin and added to two ounces of milk and water; also an ounce of crumb of stale roll well soaked in hot water, rubbed through a sieve and mixed with three ounces of milk and water; a little very well boiled rice in milk, or some other farinaceous food, some pounded breast of chicken, or white fish, and so gradually back to ordinary convalescent diet."

"As alternatives, may be given in the earlier stages, whey, l'eau albumineuse, raw meat juice, beef tea, peptonised gruel, Benger's Food, and a little later on scraped raw meat, and the lean of meat twice passed through an American mincer and cooked for twelve minutes in a bain marie with a little water (Burney Yeo); lightly poached or boiled eggs."

Medicinally, little can or should be done for a case of uncomplicated acute gastric ulcer. The majority of drugs as probably delay healing as promote it; but whether from correction of the hyperacidity or from washing away the mucus, and as it were cleaning the stomach, which is only receiving small quantities of food, relief and comfort is increased by small doses of soda, magnesia and menthol in a wine glass of blood heat water thrice daily.

The complications of acute gastric ulcer are (1) gastric catarrh, (2) pain, (3) vomiting, (4) starvation, (5) haemorrhage, and (6) perforation.

1. For the first three the rest and abstinence from food, or the milk diet will probably be sufficient; a little of the magnesia, soda and menthol powder in warm water will help. Leeching, the local application of ice, or if haemorrhage be not suspected, warm poulticing; all four have given marked relief in cases, and all four have disappointingly failed. For excessive pain a mixture of bismuth and morphia with some counter-irritation over the epigastrium is generally sufficient; both bismuth and morphia, unfortunately, tend to produce constipation, and so neither should be used if it can be avoided, and their use should be discontinued at the earliest period. French authorities advocate huge doses of bismuth for the treatment of both acute and chronic ulcer, but their logic is unconvincing. A little plain opium powder (gr. ½) is also of service, its effect, perhaps, is a little more local and a little more delayed; also 5 to 15 *m* of the liquor opii sedativus. An ⅛ to ¼ gr. of cocain hydrochloride

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may be used as an alternative; it can be prescribed with twenty minims or so of cherry laurel water, or a little hydrocyanic acid. $\mathit{m} i$ of creosote in $\mathfrak{z}ii$ of water should next be tried every three hours. For vomiting the same medicaments should be used, more especially the form just mentioned of cocaine and aqua laurocerasi; the milk or whey may be iced; and a little iced champagne with three parts of seltzer at times acts like magic, although at other times it is refused or rejected. As has been already mentioned, stopping the nutrient enemata and giving a pint of milk, $\mathfrak{z}ii$ at a time, occasionally stops the vomiting of mucus and bile, which is so distressing and exhausting.

4. STARVATION as a complication is commoner than is generally thought; some medical men are apt to put too much faith in nutrient enemata, or to be too timid in resuming food by the mouth after severe haemorrhage; the treatment is obvious.

5. HAEMATEMESIS. Sudden severe haematemesis is one of the most alarming accidents that happen in medical practice, and ranks next to the bursting of an aneurysm or a severed artery in its unexpectedness, its fulminant danger, and its panic-striking power; a young woman in the very bloom of early womanhood, with no warning but a little scarcely noticed dyspepsia, may be reduced in a few hours to a condition of restlessness and pallor; it may not often happen, but once seen it is not forgotten. Haematemesis may conveniently be divided for practical purposes by the degree of severity. One or two small haemorrhages may occur within an hour or so of each other, and the patient may see no more; the danger here lies in the difficulty of persuading the patient to submit to radical treatment; on the other hand, the accident may prove a blessing in disguise, if it frighten the patient into submitting to real treatment for the dyspepsia. For such a case, absolute rest in bed, stoppage of all food by the mouth for twenty-four hours, with the exception of teaspoonfuls of warm water every half-hour, is necessary; if the stomach be at all flatulent, a tiny pinch of the magnesia, soda and menthol powder in say every alternate teaspoonful is to be given. Swallowing small lumps of ice cannot but be deleterious, and on more than one occasion has been followed by vomiting up blood and water mixed in large quantities; the cold ice will cause rapid anaemia of the part of the stomach it lies in, with contraction of the stomach, which is to be desired; but it also increases peristaltic action, and its melting will be followed by a flushed reaction; there is no statistical evidence, nor even the evidence of reliable medical

men's impression that its use has lessened the recurrence of haemorrhage, and *à priori* reasoning is against it. The benefit of the external application of an ice bag to the epigastrium, is very doubtful, but it has more to say in its favour. If no further haemorrhage occur, half-an-ounce of weak milk and water should be substituted next day for the teaspoonful of water; it also should be blood-heat, as less liable to cause reflex flushing and peristaltic action; the next day $\mathfrak{z}ii$ every hour can be given with milk a little stronger, amounting to Oiss—ii. in the twenty-four hours, the next day three pints, and the further treatment is that of simple acute gastric ulcer.

If the degree be more severe, either in the form of a larger initial haemorrhage, or of repetition every twenty-four hours or so, so that anxiety as to the issue from the haemorrhage is increasing, nutrient enemata should be given for from three to five days and no food by the mouth, with the exception of the teaspoonful of water at blood-heat every half-hour in which $\mathit{m}v$ of adrenalin (1-1000) should be given every two hours, and $5i$ of chloride of calcium for first dose and $\mathfrak{z}ss$ thrice daily for two days by the rectum; it may be added to the nutrient enemata: this course with perfect quietness in a darkened room seems to answer best; three doses of chloride of calcium, by the mouth, of twenty grains each, every half-hour in an ounce of water, has been tried to obtain more rapidly the effect of the drug in the coagulative power of the blood; but on one or two occasions it seemed to have induced vomiting, so perhaps it is better to introduce it by the bowel. If there be much restlessness, the question of morphia arises; considerable caution must be exercised, as those suffering from severe loss of blood occasionally seem to be easily affected by the drug; from $\frac{1}{4}$ to $\frac{1}{8}$ of a grain may be injected subcutaneously, if it be necessary, but it is better avoided, especially as with some it causes subsequent sickness.

Most other drugs seem to do more harm than good, especially when introduced by the stomach; gallic and tannic acid, Ferric salts, alum, acetate of lead, nitrate of silver are very liable to cause sickness; ice or iced water becomes in a few minutes water at 90° ; hot water cannot be swallowed, and during its passage, in the thin stream down the oesophagus would lose its heat. The stomach will not remain at rest, and so will not permit the coagulative effect of such a drug as tannic acid; on the other hand, preparations of the supra renal gland undoubtedly cause local anaemia where it touches, and this effect lasts for an hour or so; and it is for this object, and not for the general vasomotor constriction that it is given,

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the latter may be brought about by the hypodermic use of ergotin (*M* 3-10).

Three questions now arise, both in connection with this degree of haemorrhage and with the still more severe, or fulminant form, namely (1) the question of the distension of the stomach with flatulence as the cause of the continuance of the bleeding, (2) the question of saline infusion, and lastly (3) of operation.

Moynihan (Leeds) says: "That in one of his cases, the stomach was so tightly distended with gas, that he had first to introduce a canula to let off more of the gas before proceeding with the operation; and his course is to neglect the bleeding point absolutely, and perform a gastro-enterostomy as soon as possible; the bleeding," he says, "does not return." This would agree with the peculiar way in which a quantity of blood is brought up, which empties the stomach and allows its collapse, and the patient then has relief for some hours, when renewed bleeding occurs; the act of vomiting empties the stomach and allows the mucus membrane to shrink into folds again; patients not unfrequently complain of distension, and a considerable tympanitic area is common; the use of half-hourly teaspoonfuls of an alkaline carminative—the act of swallowing being useful in allowing the escape of gas—of supra renal substance and of ergot which contract involuntary muscular tissue, even blanching the mucous membrane, and of the passage of the stomach pump, which before now has been followed by cessation of the haemorrhage, are thus seen to be all based on scientific grounds; and although one must be timid in the enterprise, in a case of a large tympanitic area, the uvula and pharynx should be cocaineised and a soft tube gently and quickly run an inch into the stomach, let stay there for fifteen seconds, and rapidly withdrawn again; on one occasion the resumption of milk feeding by the mouth, due to the extreme bloodlessness and weakness of the patient, was coincident with the cessation of the haemorrhage.

The question of saline infusion should not be delayed too long; it is also better to be injected under the breast, or into some plane of areolar tissue, from whence the replenishment of the blood vessels is more gradual, than into a vein which has been suspected of inducing bleeding; for immediate effect in one supposed to be dying, the vein is quicker.

Operation in cases of bleeding from an acute recently formed ulcer is a most difficult point; the question is are you giving a chance to a patient bleeding to death, or are you taking away the last chance by an operation in a person who is on the

threshold of death, but may recover yet if left alone, as so many have done before. If operation is performed in a comparatively early stage, it will be performed on many, in a very large majority, who will perfectly recover without it; if delay is urged till the patient is utterly exhausted, death will occur in some who would have recovered if operated on earlier. The balance of survivals, however, seems to be in non-operative measure; if operative measure be decided as the correct treatment of haemorrhage, it should be done early, and in a large number of cases, with the full cognisance of the position that many cases are operated on which would have perfectly recovered without it, to save a few that would not; the other course may be stated that a few are sacrificed to save many from the risks, dangers, and trouble of a major operation. This raises the question do all ulcers eventually become chronic, and would all be benefited by a gastro-jejunostomy. Nothing is farther from the truth, and the number that will require operation in the future will be much fewer than at present, as the recognition and correct treatment of gastric ulcer becomes more widely known.

II.—**Chronic.** Acute ulcer is fairly well known; chronic ulcers are also known; but the intermediate stages, although becoming daily more known, are still less familiar than either of the other forms. This is due to the fact that they more seldom require operative treatment, or are the cause of death. They constitute a form, however, which from a physician's point of view is the more important. An acute ulcer will heal in 90 per cent, of cases: a large chronic indurated ulcer, causing pyloric stenosis, an hour-glass stomach, adhesions to pancreas or elsewhere, requires surgical interference; medicinal and dietetic remedies may make life tolerable, but that is all. If we let our scientific imagination, however, have a little play under the control of common sense, we can frequently diagnose with accuracy, an acute ulcer passing gradually into a chronic indurated condition under ill regulated conditions. It is the type of ulcer of months' standing, in patients who attend to their business, who consult many doctors, and take intermittently much medicine, who feel ever so much better with a day's rest in bed, who are better and worse, but never quite well for more than a week. If we allow valuable time to be lost and the patient to drift, the symptoms become more and more intensified, till in one to five years, the patient is a confirmed invalid.

The treatment of such a condition, and this treatment should be tried nearly on every case of chronic ulcer before operation, is prolonged rest and

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a fluid diet, preferably milk. Unless there be some urgent symptom such as haemorrhage, exacerbations of pain and tenderness, continuous vomiting, it is not advisable to give nothing by the mouth and feed per rectum. For the first few days rectal feeding may be necessary, but it should be to remedy some complication at the beginning, and be followed by peptonised milk by the mouth. The patient should then be put on two or three pints of milk per day, that is about ℥iii every hour for fifteen hours in the twenty-four; the milk should be blood-heat, and diluted with a little aerated water, lime water, or have a pinch of salt and of bicarbonate of soda (gr. 5 of each). He or she should remain perfectly quiet in bed, and at first should not be allowed to read, write or work, and but little talking; he must remain horizontal, not sit up. During the second week the milk should be increased to three to four pints, that is four to five ounces per hour, slowly sipped. This may have to be maintained for two or more weeks; or some relaxation of the diet allowed in the third week, of which the following are the safest: strained chicken soup, "l'eau albumineuse," beef tea, fresh meat juice, the yolk of an egg in hot water, a beaten up egg and milk, Benger's food.

When no pain or tenderness has been experienced for a week, the diet should be increased, some bread crumbs, scraped fresh meat in a thin sandwich between thinly buttered layers of stale white bread, pounded breast of chicken, or steamed whiting, rennetted milk.

If pain occurs, a return to the milk diet should immediately be made for another week, if no pain return another advance may be made in a week, but the patient must be kept in bed altogether, except for twenty minutes or so in the afternoon or evening, and for natural purposes, till he is on full diet including potatoes and beef. There is also a natural tendency in most patients towards self-deception, and in their eagerness they say there is no pain, or "only a little;" any pain, however, beyond that due to abdominal flatulence, and any tenderness should cause a return to a fluid diet. Patients often do very well and get fat on this diet, when brought up to the second or third stage, although any further advance cannot be borne; in such cases, a complete return of their old condition is brought about by getting up; however, if nothing else, they are prepared and strengthened for an operation, if such eventually be considered necessary. In severe cases it may be necessary to persevere for the full three months on a milk diet, but the peptonised milk should not be continued for more than a fortnight without some fresh food; it is better

to substitute gradually fresh milk for the peptonised. Diet then should be increased in both quantity, quality and variety, whilst the patient remains in bed, and when a full diet has been satisfactorily taken, the patient may get up, and after a holiday or change of air, resume his occupation. For the healing of the ulcer itself medicines are of no avail. For some of the complications, considerable help is obtained.

Chronic gastric catarrh, with exacerbations supervening in a mild form, is a common complication, and apt to confuse diagnosis and treatment; in addition there is likely to be reversed peristaltic action of the duodenum and regurgitation of bile; the magnesia, soda and menthol in hot water is the best for this condition, and a pill of a little plain aloes seems to aid in sweeping the bile downward. Rectal feeding, peptonised milk, and mustard over the epigastrium will in a few days bring about subsidence of the catarrh. If there be much pain, a little morphia and bismuth mixture gives relief, but it causes constipation, and may induce sickness, so should not be used unless really called for. For sickness, the magnesia, soda and menthol often acts admirably; as alternative, a mixture of soda and hydrocyanic acid, or aqua laurocerasi, or minim dose of creosote, or an effervescing mixture of ten to fifteen grains of Pot. Bicart, given in a little lemon juice in half a wine-glass of cold water. A blister at times stops the vomiting; and as has already been mentioned, a large alkaline warm draught of half-a-pint, or a return to larger quantities of milk from half-spoonfuls. For haemorrhage and perforation the same procedure should be adopted as in acute ulcer.

The chief error in modern treatment of ulcer of the stomach is in not insisting on early rest in bed, on prolonged rest, and in too great haste to get up; and in trust to medicines, which as often do harm as good, perhaps oftener.

DILATATION OF STOMACH.

There are two essentially different classes of causes of this affection (1) Where there is a definite organic stenosis in the pyloric region of stomach or duodenum; and (2) Where no such organic stenosis exists, but from a variety of other causes, a certain combination of gastro-ptosis, very often with viscerop-tosis, and dilatation exists, which is at times extremely difficult, if not impossible, to distinguish from dilatation pure and simple arising from organic stenosis. There is an intermediate class, where a large chronic ulceration in the neighbourhood of the pylorus with dense adhesions, generally to the

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pancreas, seems to bring on dilatation from interference with the peristaltic movements, although the actual orifice of the pylorus is patent.

The chief causes of the first class with organic stenosis are contracting scar following chronic ulceration with peritoneal adhesions; malignant disease; adhesions following inflammation of the gall bladder; adhesions forming between pyloric region, gall bladder and liver.

The causes of the second class are multiple; excessive quantities of food and fluids is not a common one; it is mentioned more frequently in books than met with in reality; the same remark may be made with regard to chronic gastric catarrh, and weakness of muscle wall; there is generally some tertium quid, although, perhaps, not necessarily so. The commonest and most important form is that which is associated with a certain amount of viscerop-tosis, and especially of right nephrop-tosis; with this condition we find a more or less neurotic element; and the whole syndrome becomes characteristic, but one of the most difficult to deal with. In all forms of dilatation, rest in bed nearly always, except in a very advanced stage, produces considerable amelioration, and when combined with occasional lavage and a regulated easily digested diet, may appear to cure, and sometimes does so; this is due to the fact that in dilatation, kinking of the pyloric end of the duodenum occurs in the upright position, which is removed or lessened on the patient lying down.

In the treatment of class (1) our object is to ascertain as soon as possible whether the stenosis is such as to permit the patient to live and follow his occupation, under a restricted diet and careful mode of life generally; or whether the disease has so far advanced that further existence is impossible, except as a patient confined to bed with a fluid diet, allowing but a vegetative existence, not that of an active human being; if the latter, presumptive at first, is confirmed each week of careful treatment, the sooner the patient is relieved by a gastro-jejunosomy the better; delay but prolongs his sufferings and diminishes his chances of recovery. Many cases also will require operation from the effects of chronic ulceration generally, although the stenosis is not in itself sufficiently marked to require a by-path; this is the case in many chronic ulcerations adherent to the pancreas; ulcers near the pylorus probably cause spasm of that sphincter.

I. Partial Organic Stenosis causing a certain amount of dilatation. It is very advisable to begin the treatment of these cases, and indeed all forms of

dilatation, by a fortnight's rest in bed; the kinking at the pyloric end of the duodenum, due to the sagging down of the dilated stomach in the erect position, is much relieved, and the myasthenic element is helped by the easier escape of the contents; the stomach is not kept stretched with double the amount of its normal contents for sixteen hours at a time. To further this object still more, and at the same time to remove all fermenting material, the stomach should be washed out (*v. Stomach, Lavage*); this operation may not be required again; but it is better to perform it again in four to seven days, and examine the contents; one of these occasions may be used to give a test breakfast to ascertain the free hydrochloric acid and other facts. The diet at first should be milk; if there be much fermentation, which is found to be still present at the second wash out, it is advisable to repeat the washing every second or third day, and to sterilize or pasteurize the milk, or give condensed peptonised milk; but it is in most cases a counsel of perfection. In many of these cases, great improvement is experienced with these simple methods; the milk is given every two hours, and later on an egg, well beaten up, and some strained chicken or other soup, some Benger's food, very thin arrowroot, a weak cup of tea or coffee with plenty of milk or cream; but the food should be fluid for a fortnight at least. In hospital and in private, when possible, the stomach should be washed out at night, and left empty till the next morning; it gives the strained muscle the best chance of recovering its tone, especially in those cases where the stomach does not retract when empty, but lies as a dilated and flabby bag, quite different from the enlarged and dilated stomach with hypertrophied muscle. It is called by the Americans "Myasthenia," and in some cases this has been done every night for a week, about two hours after the last milk at 7 p.m., *i.e.* 9 p.m. No medicine is required; but a little magnesia, soda and menthol corrects acidity, and gives relief; carminative oils as peppermint, cloves, cajuput, about 1-3 minim, creosote *m* i-ii in milk, carbolic acid *m* 1-2 in water, resorcin, gr. ii-v in water, and other antiseptics and antifermentatives may be required, but seldom seem to do as much good as theoretically they might be supposed to do.

At the end of a fortnight, the usual convalescent diet of bread crumbs, pounded breast of chicken, very well boiled rice in milk, rusks should be tried, and although it is not so important, it is better to get the patient on to a fairly full diet, before letting him up. In a month the diet should be the ordinary food taken in rather smaller quantities five times in

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the day, breakfast, luncheon and tea—late dinner should be avoided—with a glass of diluted milk and a rusk between breakfast and lunch and between lunch and light dinner; supper should not be taken; the diet should be ordinary, but many articles must not be attempted, *e.g.*, coarse vegetables, pastries, rich, heavy puddings, lemonades and such like; one mealy potato is sufficient, and bread should be stale and freshly toasted; the patient now walks about, always resting for an hour after each meal; and in another two weeks—six altogether—resumes his occupation. Some of these patients do well, especially if care be taken; but many relapse; and each attack is more severe than the previous one. If it is found that a patient can get as far as convalescent diet, but that any attempt at solid food causes a return of the symptoms, he must decide between an invalid existence with the probability of an operation later on, or a gastro-enterostomy at once. How long the treatment by diet and lavage, and rest, should continue depends upon the individual case; six months has been tried with ultimate success; but two months nearly always distinguishes between the hopeless, those which require, and those which do not require an operation, at any rate, at the time.

II.—Operative Cases. If a case, although benefited by the rest in bed and the lavage, show but little increase of power in gastric digestion, if the stomach still retain its large dimensions, and vomiting return every few days, and if all the symptoms are immediately intensified by any return to a more liberal diet, or by getting up, there is not only no advantage in delaying operation, but a positive evil; much valuable time may be lost, and the patient may rather suddenly become so weak that operation is hopeless, or may develop tetanie, or perforation may occur. There is no absolute rule to guide; it is here the experience and the judgment of the physician in attendance is the deciding factor. If visible peristalsis be present, there is little use for delay; it always indicates considerable organic stenosis.

III.—Dilatation, in which organic stenosis is not found—

(a) The first class to be considered are those in which a large chronic ulcer adherent to the pancreas, or neighbouring parts, or, indeed, an ulcer in the pyloric region, presumably causes a pyloric spasm, which leads to dilatation, although on operation or post mortem examination no actual pyloric or duodenal stricture is discovered. The symptoms here are practically indistinguishable from ulcer causing stenosis; and if rest and a fluid diet do not relieve, a gastro-jejunosotomy had better be performed at a

comparatively early date to avoid the combined risks of ulceration and of dilatation.

On the other hand, if there be visceropotosis in general, and the sign of ulcer be indefinite, it is one of the most difficult problems to advise a decided course of treatment; of three of such cases, two of whom were neurotic, no vomiting was present, and the third encouraged vomiting daily to get relief. Medicines and dietetic regulation are useless; the peculiar gnawing trouble generally about the pylorus or right kidney, with little or no tenderness, is uninfluenced by anything short of morphia, which of course leaves the patient worse than it found him, and should on no account be used, as there is always the fear in such cases of its habitual use. The best line of treatment is as before, to try the effect of prolonged rest and a fluid diet, with a weekly wash out, if there be much acidity. Few patients are willing to persevere for the necessary three months; they can be told with confidence that improvements will take place, but not the slightest guarantee can be given that it will not be followed by relapse. Many variations in symptoms are found; one patient says he is always better on a solid diet; another, that he is better up; the neurotic element, and the wilfulness of many of these patients form a strong bar to an exact diagnosis and to satisfactory treatment.

Supposing a sufficient trial has been made of rest, diet and lavage, will a gastro-jejunosotomy furnish a more hopeful outlook? This is very doubtful; many results have been more than unsatisfactory; and it is a matter on which my judgment is wavering, whether in such a case, when the surgeon discovers that no thickening, no adhesions, no mechanical cause for dilatation exist; if the dilatation be not marked, whether he should not close up the abdomen at once, and content himself with an exploratory operation, and trust to the moral effect upon the patient. The nervous depression, the hysteria, the hypochondriasis that are found associated with such cases are an all important element; and form a series of symptomatic hieroglyphics, of which we do not as yet possess the key. We do not know whether the nervous condition causes the dilatation, or the dilatation causes the nervous condition. We are as yet so blind as not to be able to distinguish which is the cart and which is the horse. We are further confused by the fact that while we are able to prove demonstratively the existence of dilatation during clinical examination, yet on operation after the stomach has been cleaned out it is found, healthy and muscular, snugly retracted under the protective covering of the left ribs.

The following measures have been

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recommended in these cases, and should receive a fair trial before operation be decided upon:—

(1) A dry diet consisting of dryish ordinary foods, with a minimum of fluid, *i.e.*, half allowance of tea, water, etc.; soup is prohibited.

(2) A meat diet (Salisbury treatment), where the food consists of about two pounds of freshly grilled steak, and the fluid is warm water.

(3) Meat meals and carbohydrate meals alternately; it is said that carbohydrate digestion delays proteid digestion, and *vice versa*.

(4) Massage; general exercise; abdominal exercise, a course of Swedish gymnastics, the abdominal douche should certainly be tried; a regular course under a good reliable instructor is often of service.

(5) Drugs to no end have been urged; Broadbent recommends:—

Sodii Sulpho. Carbolat gr. v. x.

Spt. Ammon. Aromat. ℥ x.

Inf. Gent. Co. aa. ℥ss. ℥.

Ft. dosis. to be taken after meals.

Taka-diastrase is also recommended, and has been found of decided benefit where there is a suspicion of amylaceous dyspepsia.