

ARRANGEMENT OF DIET.

In the case we are considering—namely, that of the patient who is passing out sugar but no diacetic acid—you may begin by allowing about as much carbohydrate as he is passing out in the urine. If the urine contains, for instance, 150 grammes of sugar you can easily devise from the list a diet containing that amount of carbohydrate. In making such a calculation you will require but few figures, even if the lists are not at hand. It is useful to remember the following data, which are in round figures :—

Bread contains 60 per cent. of starch.
Potatoes contain 20 per cent. of starch.
Milk contains 5 per cent. of milk sugar.
Thin gruel contains 6 per cent. of starch.
One ounce is (roughly) 30 grammes.
One gramme is 15 grains.

A diet containing about 150 grammes of carbohydrate may be constructed as follows :—

	Grammes of carbohydrates.
5 ounces (150 grammes) of milk... ..	equal 8
5 " " " of gruel	9
6 " (180 grammes) of bread	108
2 " (60 grammes) of boiled potatoes	12
Ordinary helpings of the foods in List 2 (estimate) ...	20
Total	157

The diet will then consist of the foods in Lists 1 and 2, with the quantities prescribed above of the foods in List 3. Sugar and jam and dishes or foods made with flour are, of course, not allowed. Saccharin may be used for sweetening tea or coffee, though it is better to form the habit of taking them unsweetened, as much saccharin may cause indigestion.

Such a diet may be arranged as follows :—

Breakfast.—A small basin of thin gruel with 5 ounces of milk; 3 ounces of bread; butter, bacon, eggs; a tomato; coffee with cream.
Lunch.—Meat or fish, pickles, 1 ounce of potatoes, butter, greens; green salad with salad oil; 1 ounce of bread with cheese and celery.
Tea.—2 ounces of bread with abundance of butter; a boiled egg; tea with cream.
Dinner.—Soup (containing no flour), fish, meats, 1 ounce of potatoes, spinach; custard made with cream and saccharin; cheese with some starchless bread, celery; a few Brazil nuts.

The diet will be varied from day to day, the quantity of carbohydrate being kept constant. After three days the urine will be analysed. If the quantity of sugar is much less, continue the diet for another week and make another analysis, and so on for as long as the sugar in the urine is falling.

If there is little or no reduction of the sugar, or if the quantity has ceased to fall or is rising again, the carbohydrate should be reduced by 50 grammes. This may be done by omitting the 2 ounces of potatoes and 2 ounces of bread, leaving the diet otherwise the same. The diet will then be :—

	Grammes of carbohydrate.
5 ounces of milk	equal 8
5 " of gruel	9
4 " of bread	72
Ordinary helpings of foods in List 2 (estimate) ...	20
Total	109

With this diet the patient would take freely of the foods in List 1 and moderate helpings from those in List 2.

If after five days on the above diet sugar is still present in quantity, you will omit the potatoes and milk, reduce the bread to 3 ounces, and allow from List 2 only well-boiled greens and a tomato. The carbohydrate in the diet will then be :—

	Grammes of carbohydrate.
5 ounces of gruel	equal 9
3 " of bread	54
Estimate of foods from List 2	10
Total	73

The rest of the food will be made up from List 1.

With such a diet in many cases sugar will no longer appear in the urine. If, however, there is still a quantity of 20 grammes or more passed out, the carbohydrate will be still more reduced by allowing only 2 ounces of bread in the day with greens and one tomato from List 2. These will contain about 46 grammes of carbohydrate. With such a

diet as this care should be taken to alkalise the urine by giving bicarbonate of soda while the restriction is in force.

Before this stage it will be necessary to provide some substitute for bread, such as the starchless breads made by Callard and the Protene Company and other manufacturers, of which the patient will be instructed to eat freely with abundance of butter. Puddings and other dishes may be made by the use of the starch-free flour.

In the milder cases we are considering the urine will now be free from sugar. The allowance of carbohydrate will then be increased, going back through the same stages. By this means it will be possible to ascertain easily how much carbohydrate the patient can take in the diet without any of it appearing in the urine. The chief aim is to keep this quantity—namely, the quantity of carbohydrate which can be assimilated—as high as possible.

FURTHER OBSERVATIONS.

Do not, however, form the idea that there is a fixed quantity of carbohydrate which the patient can assimilate. That is not the case. The quantity varies from time to time, and under proper treatment may become larger and larger. Some kinds of carbohydrate are also assimilated better than others. You will give in the course of treatment various kinds to your patient in order to find out whether he can, for instance, assimilate the starch of oatmeal better than that of bread, or whether levulose is better borne than dextrose. You will see that to obtain a correct picture of the patient whom you are treating it is necessary to take a good deal of trouble and to give the patient a good deal of trouble, for the collection of the 24 hours' total urine is, in ordinary life, an inconvenient business. It is sometimes impossible to have it collected on consecutive days. In that case samples are taken at the week-end, when the patient has leisure. The ideal plan would be for every patient to be carefully observed for at least a month with different diets and different kinds of carbohydrate. After such an investigation we should be in a much better position to advise than after one or two examinations of the urine. But this is seldom possible in mild cases, and you will often have to extend your observations over a longer period with considerable intervals between each. When you have found out how much carbohydrate can be assimilated you will order a diet containing rather less than this quantity.

The success of dietetic treatment depends very largely upon the skill in cooking which is at the disposal of the patient, and particularly upon the varieties of appetising dishes which can be made from the foods in List 1 with the help of the starchless flour and the various sugar-free jams and cakes which are provided by the manufacturers. If the patient is on a fixed allowance of carbohydrate it is a good plan to supply him with a list of the various ways with which he can supply that amount. With the aid of the analyses which I have given above this is quite easy to do.

In my next lecture I shall speak of the treatment of cases in which diacetic acid is present in the urine.

ON POST-NASAL CATARRH IN CHILDREN AND SOME OF ITS CONSEQUENCES.

By EUSTACE SMITH, M.D. LOND., F.R.C.P. LOND.,
SENIOR PHYSICIAN TO THE EAST LONDON HOSPITAL FOR CHILDREN.

OF late years I have been in the habit of examining the fauces of all children who have been brought to me suffering from loss of appetite, gastric derangements, spasmodic conditions of the air-tubes, and obstinate coughs. In a very large number of these cases I have found the patient to be suffering from a more or less intense post-nasal catarrh. This catarrh is often confined strictly to the naso-pharynx, and does not pass into the nasal passages. While thus limited it may give rise to none of the usual signs of "a cold" in the nose, such as snuffling, sneezing, and external discharge, or even to a throaty quality in the voice. It may therefore remain latent and escape notice for weeks, or even months, together unless the throat be inspected in a good light. I have often been surprised at the intensity of the catarrh which an examination has shown can be fixed in the naso-pharynx without giving rise to a single local symptom to make its presence known. But whether or not it be associated with the ordinary symptoms of coryza, post-nasal

catarrh may be the source of widespread disturbances. These at first sight may not be of such a nature as to suggest a relationship with the state of the pharynx; but that the connexion, however obscure, is a very real one is seen in the successful results of treatment founded upon that assumption. When the catarrh goes on for months together it is, no doubt, being continually renewed; and the symptoms may be noticed to wax and wane according to the varying severity of the pharyngeal derangement. This rarely ceases completely, but if in a fairly long spell of genial dry weather the catarrh for a time comes to an end, it often returns at once when the weather again becomes changeable and damp. Some of these children suffer from a certain amount of adenoid overgrowth in the naso-pharynx, but in many the adenoids have been already removed. In the latter it is common for a return of the vegetations to be suspected on account of signs of obstruction to the posterior nasal openings arising from the thickened and swollen mucous membrane. But adenoids rarely return if their extirpation has been complete, and most of the cases of suspected renewal are of this kind.

The appearance of the fauces varies according to the intensity and duration of the catarrh. In cases of long standing the mucous membrane at the back of the pharynx is thickened and red like red velvet, and is bathed in secretion. In less severe cases the posterior wall is thickened and reddened and often uneven from shallow projections of the surface. These are redder than the mucous membrane around them. The surface is moist and is often covered with thick yellowish mucus, which may be seen flowing down from above. In bad cases enormous quantities of this mucus may be secreted, and as it is all swallowed and passed down into the stomach the gastric irritation set up by this continual inflow of acrid and often highly septic matter is not difficult to understand. A bacteriological examination of the mucous discharge taken from the pharynx was made for me in several cases by my house physician, Dr. G. Walker. The secretion contained, as might be expected, a great excess of the micrococcus catarrhalis, but mixed with these in the various specimens were Friedländer's bacillus, the bacillus septus, and more or less numerous staphylococci. In one case Dr. Walker found three Klebs-Loeffler bacilli of involution forms and a few pneumococci. Sometimes the uvula and soft palate are thick-looking and congested, but the tonsils are not necessarily enlarged. This state of derangement, I may again repeat, may remain unsuspected for months together if it be not associated with signs of coryza, for while it remains limited strictly to the fauces there is no pain in swallowing or other symptom pointing to the naso-pharynx. It is only by actual inspection of the throat that the existence of any morbid condition can be ascertained. Even after the inflammation proper is at an end its ill consequences remain as long as the free secretion of mucus persists. Therefore, if the posterior wall of the pharynx be found to look pale, thick, flabby, and moist, active treatment with astringent applications should be adopted without unnecessary delay.

One of the commonest consequences of this persistent post-nasal catarrh is complete loss of appetite. This is shown, not by a mere indifference to food, but by an active dislike to it, which is very striking and difficult to overcome. The children are generally pale, but show little sign of illness, and are cheerful and active in their games. As the mother remarks, "there does not seem to be much the matter with the child, but he will not eat." At every meal the same difficulty occurs, and much strategy may have to be employed to get him to swallow even a small quantity of food. It has often surprised me to notice that the subjects of so much perplexity and concern are not necessarily thin or obviously ill-nourished. This is probably owing to the fact that a child who will not eat can often be made to drink, and, indeed, may be ready enough to do so without any persuasion. He consequently takes large quantities of milk in the course of the day, and the deficiency in his regular meals may be thus more or less completely repaired. This absolute loss of appetite is a very common symptom in children between the ages of 4 or 5 and 9 or 10 years, although in other respects they may seem to be healthy enough. If the fauces of these children be examined there are very few in whom the pharynx will not be found to be in a state of active catarrh, or to have been left flabby, relaxed, and freely secreting after the acute stage has passed away,

although no symptom pointing to the throat may have been noticed; and appropriate treatment of the derangement will rarely fail to restore the child's inclination for food and relieve the anxiety of his friends.

In some of these cases, in addition to the loss of appetite, which is a persistent fault, there may be signs from time to time of active disturbance of the stomach. Not a few examples of the so-called "cyclical vomiting" are of this nature. The child every month or six weeks is taken more or less suddenly with an attack of vomiting in which for 24 hours or more he returns at once everything, even water, which he takes into his stomach. His temperature is high, rising often to 104° or 105° F. at night. In the beginning the vomited matters are sour; later, when he is drinking nothing but water, the fluid is returned as it was taken; but, as a rule, vomiting quickly ceases when food is withheld. When these attacks are associated, as they so often are, with post-nasal catarrh I attribute them to an acute exacerbation of the catarrh in which a fresh secretion of peculiarly acrid mucus, teeming with more or less noxious organisms, is poured out and swallowed. This tainted secretion excites a septic fermentation in the alimentary canal, and the products are immediately absorbed into the circulation. It is possible that there may be a neurotic element in the illness, but that it is not a pure neurosis, as is usually assumed, is proved, I submit, by the fact that the temperature is excessively high, that the vomited matters are sour and offensive and show every sign of digestive derangement, and that the course of the complaint may be shortened, and a further recurrence prevented, by careful diet and early attention to the condition of the throat. At the same time it is, of course, advisable to take steps to put an end to periodical chills, so that the effect of the remedies may not be weakened or annulled by future repetitions of the original disturbance.

But these attacks of vomiting and general depression may not be the only evidence of intestinal intoxication. Such septic infections are capable of giving rise to local as well as general distress, and may be the cause of serious inflammatory mischief in distant tissues and organs. It is not now disputed that to toxæmic conditions many inflammatory diseases which arise without obvious cause may be directly attributed. Meningitis, appendicitis, otitis, iritis, and it has been lately suggested poliomyelitis, may all owe their origin to toxins generated in the bowel by such an incursion of virulent organisms; and cases have come under my own observation in which repeated attacks of retinitis and other obscure inflammatory or semi-inflammatory states of the eye, with threatened failure of sight, have been associated with, and I believe were the direct consequence of, persistent or very frequently recurring naso-pharyngeal catarrh.

To return to the everyday consequences of this functional disturbance of the naso-pharynx, it may be stated that loss of appetite and indigestion arising from this cause are not confined to children. In young adults of both sexes a peculiar susceptibility of the fauces may be left as a consequence of an attack of diphtheria or scarlet fever. These patients are liable to periods of indisposition in which they complain of a loaded tongue, unpleasant breath, and want of all relish for their food. There is seldom mention of sore-throat, but the voice has a nasal quality, and examination shows that there is much post-nasal catarrh with copious secretion, and that the tonsils, although not acutely enlarged, look red and may perhaps show retained yellowish matter in the follicular recesses.

Between post-nasal catarrh and spasm of the air-passages (stridulous laryngitis and laryngismus stridulus) in young children there is a close relationship to which I have drawn attention on many previous occasions. The more I see of these complaints the more convinced I become that post-nasal irritation is the common exciting cause of these attacks when the reflex spasm occurs in children whose glottis is of normal construction and development. But it is not only local spasm which may be excited by post-nasal irritation in early life; general convulsions may be induced by it. The apparently causeless convulsive attacks which sometimes occur in young children of rickety tendencies are often the consequence of this condition of the naso-pharynx—at least, a severe post-nasal catarrh may be the only deviation from a normal state of health which the closest examination can discover.

In young children up to the age of two years, and in children of neurotic tendencies who have passed that age,

the presence of acute and subacute post-nasal catarrh is often sufficient to induce a rise of temperature. This may be curiously erratic and unsettled. In a brief space of time the mercury may shoot up from the level of health to 102° or 103° F., and after an hour or two fall again to its normal point. This rise is especially likely to happen towards the end of digestion, or a couple of hours or so after food, and I am disposed to attribute it to the absorption from the stomach of mildly irritating products of decomposition. The pyrexia thus induced may be a cause of some perplexity for no symptoms may be present to point to the throat, and unless the fauces be examined the origin of the febrile movement must remain a mystery.

A very common consequence of post-nasal catarrh is acute enlargement of the cervical glands. The connexion between the state of the glands and the condition of the throat is, I find, often—indeed commonly—overlooked, although for successful treatment its recognition is a matter of the utmost importance. Whether there be symptoms suggestive of this condition or not, a glandular swelling at the border of the sterno-mastoid should suggest at once a careful inspection of the pharynx; and if the enlargement be recent, prompt treatment of the throat will in a short time cause the swelling to disappear. If the state of the fauces be overlooked or neglected, the enlargement of the glands may persist for months together, the swelling being more or less evident according to the degree of intensity of the pharyngeal disturbance. In such a state the glands have little power of resisting tuberculous infection; and as by their absorbent radicles they are in close connexion with the adenoid tissue in the naso-pharynx they are peculiarly open to invasion by the organism, and defend themselves feebly or not at all. Consequently if the state of the throat be disregarded, the glands may become the seat of tubercle, or possibly suppurate so that surgical measures may have to be resorted to; but the assistance of the surgeon is rarely required if the nature of the complaint be recognised in time. So long as the tumid glands retain their elasticity to the touch, and vary in size from day to day as the catarrh waxes and wanes, we may say positively that they are as yet unaffected by the tubercle organism and are still capable of returning to their original state. In such a case we may confidently expect that judicious treatment of the retro-pharyngeal catarrh will cause them to resume their natural size in the course of a few weeks.

The influence of post-nasal catarrh in promoting otitis by extension upwards of the derangement through the Eustachian tube into the middle ear is so much a matter of common knowledge and observation that this branch of the subject need not be referred to. I may, however, draw attention to the less recognised consequence of a downward spread of the catarrh and the irritation this further development is able to set up in the larynx and upper part of the trachea. The child becomes subject to attacks of violent cough which may come on at any time, but are especially liable to occur at night. He is not free from them during the day, but at night when he is put to bed and later while asleep he will often be roused by an attack of coughing which the domestic remedies employed have little power to restrain. The attack may last for 20 minutes or half an hour, and end in vomiting efforts in which a quantity of mucus is brought up. I have known such attacks to be mistaken for whooping-cough, especially as there may be some slight spasm of the larynx which produces an attempt at a crow, but the complaint is quite different in its symptoms from pertussis and may go on for months at a stretch in wintry weather unless the cause be recognised and appropriate treatment employed. Vomiting is only an occasional incident in the attack, but when it occurs the quantity of mucus which may be brought up by the retching efforts is sometimes surprisingly large. All this mucus has trickled down from the back of the nares and has been swallowed. When secretion is free the child may be noticed at intervals during the day to make swallowing efforts as the thick, tenacious mucus comes within reach of his muscles of deglutition. In most of these cases the patient's appetite is poor or almost completely lost, and this further symptom, itself a cause of disquietude, adds greatly to the concern of his friends. A further cause for alarm may sometimes be discovered in a staining of the mucus with blood or even a discharge of pure blood with or apart from the vomited matters. But there is no real cause for anxiety: the blood, like the mucus, comes from the back of

the nose, and is no doubt a consequence of the increased strain upon the vessels set up by the retching efforts themselves. It is important to note that in spite of the urgency of the symptoms examination of the chest shows no sign of pulmonary catarrh or other indication of mischief in the lungs; and it was this absence of physical signs, conflicting as it does so curiously with the prominence of the cough, which first led me to look to the fauces for an explanation of the symptom. In cases where the cough is more than usually violent, especially if it be accompanied by any sign of spasm of the larynx, whooping-cough has to be excluded; but this is done by ascertaining the absence of an epidemic and noting the fact that other children of the family have remained unaffected although living all the time in intimate association with the sufferer.

In the treatment of these various disturbances the condition of the throat to which they all owe their origin must be remedied with as little delay as possible. In addition, the particular symptoms of each individual derangement must be the subject of special treatment.

For the throat affection local applications should be at once employed. These may take the form of drops instilled into the nostrils and allowed to trickle down into the naso-pharynx, or remedies applied directly to the fauces with a throat-brush. If the catarrh be very acute, with great irritability of the mucous membrane, we must be careful not to aggravate this condition by the use of too stimulating remedies. In such a case the throat should be painted several times a day with the glycerine of boric acid; or, if the child be old enough to follow directions, may be sprayed with a weak solution of tartrated antimony in water (gr. $\frac{1}{2}$ to the ounce) while the patient inspires deeply. By this means the first acuteness of the inflammation is quickly relieved, and the paint may then be made more astringent by combining the glycerine of boric acid with an equal proportion of glycerine of tannin. In cases where the painting cannot be carried out owing to the resistance of the patient and (especially) the want of determination on the part of the operator, some drops of a mild antiseptic solution may be instilled into the nostrils several times a day as the child lies on his back with his head supported by a pillow. Any weak antiseptic drug will do for this purpose, such as a solution of resorcin in normal saline (gr. v.-x. to the ounce) or of boric acid (gr. x. to the ounce of water), or of sodium bicarbonate (gr. xv. to the ounce). But any other remedy of this class may be used so long as it is not injurious to the stomach, for it is impossible to prevent a young child from swallowing the fluid when it reaches the fauces. In every case, however, where it can be done the throat-brush should be used, for the instillation of antiseptic drops is a far less efficient remedy than the other. As the redness of the pharynx fades stronger and stronger applications may be employed, for if the case be of long standing the mucous membrane is left flabby and relaxed and freely secreting. For such a condition pure glycerine of tannin may be used, or a paint made of gr. xii. of iodine and gr. xv. of iodide of potassium to the ounce of glycerine. This application may be flavoured by five drops of the oil of cinnamon or peppermint. A good astringent iron paint is made by adding one drachm of the stronger perchloride of iron solution to the ounce of glycerine, but this application should only be used after all trace of redness has disappeared; it is then a very efficient remedy. In cases where the anorexia has been complete the appetite usually returns when the flow of mucus into the stomach has been brought to an end. If, however, this result do not follow the symptoms rarely resists a good iron tonic, especially if this treatment be combined with bracing country air or a stay at the seaside, but change of air alone without special treatment of the throat is powerless to effect an improvement.

When there is active disturbance of the stomach with incessant vomiting no attempt should be made to administer food. All efforts to do so only aggravate the vomiting, however simple the food may be; milk especially in such a condition is an irritant poison whose use, by supplying more material for fermentation, can only prevent the disturbance from subsiding. The patient should be allowed nothing but water swallowed as hot as he can be induced to take it. Even this, however, will probably be returned immediately, especially at first; but this result is to be welcomed as it helps to clear the stomach of objectionable matters and may obviate the necessity of using the stomach tube. If, as may happen,

An odour of acetone can be detected in the breath, a hot solution of sodium bicarbonate may be used instead of the plain water, and six or eight ounces of the same solution may be injected under the loose skin of the back. This is the orthodox treatment and has the advantage, especially the hypodermic injection, of appearing to be an energetic proceeding, but I cannot say that it has seemed to me to be of much practical value. The severe forms of acetonæmia generally end badly and the milder cases usually recover whatever be the treatment adopted.

Other consequences of the catarrh quickly disappear when treatment of the throat is taken briskly in hand. Cough, however violent, soon subsides; spasm of the larynx rarely persists after the acuteness of the pharyngeal catarrh has been reduced; and subacute glandular enlargements in the neck are not slow to decline when the naso-pharyngeal irritation has been detected and subdued.

It is important to remember in the treatment of these complaints that we must not be satisfied by a mere temporary improvement, even if the symptoms completely disappear for the time, for in no case can this be accepted as a sign that the patient is definitely free from his troubles. In the treatment of catarrh affecting any tract of mucous membrane, in order to arrive at a permanent cure it is necessary for the medical attendant to bear in mind during convalescence the special sensitiveness to chills which still remains in the part lately affected. Catarrhs invariably tend to repeat themselves, and therefore relapses may be confidently expected unless special measures are taken to put a stop to this tendency to return. This can only be done by recognising the patient's susceptibility and taking steps to increase his resisting power and provide him with sufficient protection against sudden changes of temperature.

There is a tendency in the present day to make light of chills as a cause of disease, and to attribute all the disturbances which were formerly ascribed to this source not to the exposure but purely and simply to microbial agency. That noxious organisms may take a part in the process I am not prepared to deny, but at the same time I must protest against the doctrine that the influence of damp and cold and abrupt changes of temperature can altogether be left out of account. I have learned as a matter of clinical experience that relapses in these cases will continue to recur as long as a patient is neglected and exposed. If we allow such a child to go about with bare legs and cold feet, as is done so often, he remains weakly and suffers continually from catarrhal disturbances. If his legs are covered up with woollen stockings, if his feet are kept warm and such other precautions are taken as his known susceptibility may suggest, he will cease to suffer from these ailments and get well and strong. It is possible that exposure to cold may be hurtful by rendering the mucous surface a congenial soil for the action of organisms which, without this necessary preparation, would be incapable of harm; but whatever the explanation may be, of the fact I am convinced—viz., that to get and keep such children well we must keep them warm. The necessity of recognising this susceptibility in order to effect a permanent cure is a point upon which I have often insisted, but it is one which is too often overlooked even by the medical attendant. By the public it is invariably ignored; and in consequence when relapse follows relapse in any case of catarrhal derangement the relatives rarely fail to attribute the repeated and disappointing recurrence, not to their own ignorance or neglect, but to an assumed failure of their family adviser to supply a satisfactory remedy. But it is not the treatment which is usually at fault. This may have been judicious enough and successful again and again. The failure lies in the medical attendant's omission to insist upon proper precautions being taken in the matter of dress and general management to protect the patient against unnecessary exposure and the risk of further chills. Until this has been done the cure cannot be regarded as complete.

Queen Anne-street, W.

A FURTHER CONTRIBUTION TO THE STUDY OF RHEUMATISM:

THE EXPERIMENTAL PRODUCTION OF APPENDICITIS BY THE INTRAVENOUS INOCULATION OF THE DIPLOCOCCUS.¹

BY F. J. POYNTON, M.D. LOND., F.R.C.P. LOND.,

PHYSICIAN TO OUT-PATIENTS AT UNIVERSITY COLLEGE HOSPITAL AND THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET;

AND

ALEXANDER PAINE, M.D., B.S. LOND.,

DIRECTOR OF THE CANCER HOSPITAL RESEARCH INSTITUTE.

(From the Research Laboratories of University College Hospital and the Cancer Hospital Research Institute.)

The Source of the Infection.

THE first step in this communication is to indicate accurately the source of the infective agent with which our results were obtained.

A boy, aged 14 years, previously healthy and with a good family history, came to University College Hospital in August, 1911, suffering from a first attack of acute rheumatism of five days' duration. It commenced with pain in both knees and ankles and later in the left shoulder. The temperature was 100.5° F. and the pulse-rate 100 to the minute. Both knee-joints were tender and full of fluid, and the other joints named above were painful. For 24 hours an apical systolic murmur was faintly audible, but this disappeared and the boy made a rapid and complete recovery. He was treated with salicylate of soda. The only point at all unusual in this case was the excess of fluid in both knee-joints, the right one being distended. Mr. C. E. Shattock, acting house physician, tapped the joint for us, and a greenish fluid, which coagulated and contained some fibrinous shreds, was obtained. From this a diplococcus was isolated and grown in pure culture and is the infective agent which we have used for the following experiments.

The Investigation.

The animals used for experimentation were rabbits, and we would lay special stress upon the point that we used consistently for the first time young ones of some six to seven weeks of age. All the injections were made from bouillon cultures into the auricular veins. The first animal injected with a large dose died from general pericarditis. The second was six weeks old and received $\frac{1}{2}$ c.c. of a bouillon culture. Multiple arthritis followed and mucous diarrhoea, the animal dying from an intussusception of some days' duration. In passing, we would comment upon this occurrence of acute intussusception in two animals as a sequel and possibly a result of the infection. A pure culture of the diplococcus taken from the joint of this animal was used for the third rabbit. This was seven weeks old and was inoculated on Sept. 2nd with 1 c.c. of a bouillon culture. Monarthritides of the left knee-joint developed with general illness and diarrhoea, and death occurred on the third day. The post-mortem examination showed that for $1\frac{1}{2}$ inches in the middle two-fourths of the appendix there was acute inflammation. The left knee-joint showed the usual early synovitis. The liver showed fatty areas. The spleen was slightly enlarged and firm. The kidneys were not remarkable. There were no petechiæ and no post-mortem staining; the heart was not opened, but there was excess of fluid in the pericardial cavity. The diplococcus was recovered in pure culture from the left knee-joint and the heart's blood. The appendix was clearly inflamed and the mucous membrane was swollen and red. A small piece was excised for histological investigations.

[The rabbit was shown, with histological sections illustrating the diseased condition of the appendix and the presence of the infective agent in the blood-vessels in the submucosa and in the mucosa.]

The details of the histological examination were as follows. The muscular and serous coats of the bowel were healthy, but the mucous and submucous layers showed extensive necrosis. There was destruction of Lieberkühn's follicles and of the lymphoid tissue. The basal vessels of the submucosa were engorged with blood, and numerous diplococci could be seen

¹ A communication read before the Pathological Section of the Royal Society of Medicine on Oct. 17th, 1911.

WINSLEY SANATORIUM FOR CONSUMPTION.—

The proposed extensions at the Winsley Sanatorium will, if carried out, greatly improve the administrative block of buildings and provide better accommodation for the staff. It will also increase the beds for the accommodation of patients from 68 to 100.