stimulation of the xanthin oxidase of the liver. Incidentally I may remark that the body becomes capable of dealing with increased quantities of these materials—a point of some interest with regard to diet in gout.

Now, as to whether these points have any direct bearing on the classes of cases most likely to receive benefit at Harrogate, I must leave to the criticism and judgement of others, but I may bring to recollection some of the main points of recent research with regard to gout and arthritic troubles.

Brugsch and Schittenhelm have shown (1) that gouty patients kept on a non-purin diet and dosed with measured amounts of hypoxanthin excrete the hypoxanthin as uric acid both more slowly (five to six days) and in smaller percentages than is normal. (2) They assert that the administration of hypoxanthin in gouty patients may provoke an attack of acute gout.

Dr. Gowland Hopkins some years ago showed that the total uric acid output is lower in gout than is normal, and later Dr. Mallory³ has shown in a small series of cases that this is true whether the uric acid is of endogenous or exogenous origin. In Mallory's cases only 8 per cent. of hypoxanthin is recoverable as uric acid.

The results of my inquiries into the action of sulphur water in approximately normal subjects tend to show that in all these points sulphur water exerts a profound influence.

A very prominent characteristic in some cases of gout—the diminution in the amount of urine passed (it is often well under 20 oz. in the twenty-four hours)—is very rapidly relieved by treatment with this water, the diuresis amounting to well over 100 per cent. In such cases also the specific gravity of the urine does not vary inversely as the amount passed; on the contrary, the specific gravity is often highest at the height of the diuresis, the increase of the total solids being relatively enormous.

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BALNEOLOGICAL TREATMENT OF DISEASE.

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SPEAKING generally, there are two classes of cases that resort to spas for treatment—first, those that are not suffering from any definite disease, but from the results of living at high pressure, either in acquiring or expending wealth, who obtain, through the freedom from worry, regular hours, and plain food which form part of the regular régime of a spa, a restoration to their usual health. The other class are those that come for the relief of some definite disease.

We know that practically all disease is bacterial in origin, that inflammation may be defined as the tissue reaction to bacterial invasion, and that those chronic inflammatory diseases that form the majority of the cases that resort to spas for treatment are microbial; yet it has not been properly appreciated that the methods of treatment in use in the majority of spas are those most suited for the treatment of chronic bacterial disease, especially when it affects the digestive tract.

I will assume as a working hypothesis that such diseases as gout, rheumatism, rheumatoid arthritis, colitis, the various forms of neuritis, glycosuria, arterio-sclerosis, dyspepsias, and most skin diseases, have a toxic basis probably intestinal in origin.

The study of the varying pathogenicity of the intestinal bacteria shows that the bacteria which may be harmless inhabitants of the various secretions of the alimentary canal become at once pathogenic on a change in their environment—that is in this instance a change in the character of the secretion. The virulence of bacteria may depend upon the medium in which they grow. For example, a change in the nasal secretion due to the reflex effects of chill causes an increased growth of those bacteria normally present in the upper air passages, which at once become pathogenic, producing a common cold. A similar sequence of events takes place, I believe, in the upper digestive tract; owing to gastro-duodenal catarrh brought on by errors in diet, a change takes place in the normal gastro-intestinal secretions, and a bacterial growth takes

place in the upper intestinal tract which should in health be sterile, leading to the absorption of more virulent toxins. That this increased bacterial growth really does take place is known from the indol reaction in the urine.

The normal secretions of the body cavities inhibit the growth of those bacteria that are usually present in these situations, but if the character of the secretion is altered, this inhibitory power is lost, and a bacterial growth takes place, producing a catarrhal condition which leads to the production and absorption of bacterial toxins, and is the cause of most of the chronic diseases that come to spas for treatment.

Direct antiseptic treatment of this condition is useless; vaccines are occasionally useful, but the scientific treatment is to restore to the secretions that inhibitory power over the growth of bacteria which they have lost. This is what spa treatment really does. The most common form of spa treatment is the early morning drink; the most popular spas are those in which a fairly large quantity of water is drunk before breakfast when the stomach is empty. The most effective of these waters are not highly mineralized, and depend upon the quantity of fluid drunk for their therapeutical effects; at some of the spas, such as Contrexéville, six or eight pints may be consumed during the early morning walk.

That water drunk when the stomach is empty passes directly into the intestine has been well shown in recent x-ray work; consequently, any water then drunk acts as a gastro-intestinal douche, and by its purely mechanical action limits bacterial growth in the upper intestinal tract and helps to restore a catarrhal mucous membrane to a normal condition. A normal saline douch is the best way of restoring an infected mucous membrane to a normal condition, and this spa treatment is a long continued saline douche to the upper intestinal canal, for patients at these spas spend one or two hours sipping what is practically a normal saline solution.

It is the length of time required that makes this form of treatment difficult in private practice; it is very easy to spend an hour sipping hot water, walking about with genial companions who are all doing the same thing; quite a different matter in the seclusion of one's own home to spend an hour drinking and wait another half-hour for breakfast.

Intestinal catarrh with increased bacterial growth of the upper intestinal tract, which should in health be sterile, is quickly relieved by this saline douche; the contents of the intestine are mechanically washed downward, general peristalsis of the intestine is started by the direct stimulation of the salt in solution, which induces a more healthy secretion from the intestinal glands and removes the catarrhal condition that exists, as the same method of normal saline douching does in the case of other catarrhal mucous membranes. That this is the actual process can be proved by the indol test. The presence of indol in the urine is evidence of abnormal putrefactive changes in the upper intestinal canal associated with intestinal catarrh.

The effect of an intestinal douche on a case of intestinal catarrh showing the indican reaction is almost immediate. The indican is at once reduced in amount and gradually disappears, showing that the catarrhal condition has been cured and that the jejunum has again become sterile.

The study of the intestinal bacteria is still in a backward state, and, while we theoretically ascribe many diseases to increased or altered growth of this group of microbes, we are not yet able to place each disease. Gout, rheumatism, rheumatoid arthritis, colitis, glycosuria, some cases of eczema, different forms of neuritis, arterio-sclerosis, are a group of diseases which have a certain ill-defined connexion with each other, perhaps best shown in their hereditary relationships. They are, it is now generally believed, toxæmias of bacterial origin, they all have some digestive abnormality, they are all relieved by gastro-duodenal lavage.

The other effect of spa treatment is the protection of the body cell from the effect of toxic substances circulating in the blood by their dilution and by increasing the rapidity of their elimination; the water drunk is rapidly absorbed as it passes through the intestines and is eliminated through various secreting organs, increasing their activity, and especially causing a greatly increased action of the kidneys.

Thus spa treatment produces two definite effects upon the bacterial growth that is the cause of most of our diseases: it prevents the growth of a large class of bacteria in the intestinal canal, and it causes the elimination of those toxins already circulating in the blood. All the accessory modes of treatment, the various baths and forms of massage, are designed to the same end; they all in some way help the circulation through the cell spaces and increase elimination through the various organs of the body when applied generally; locally applied they cause an increased flow of serum through the tissues treated, which is again a factor in antibacterial treatment, though the increased resisting power given to the tissues by a flooding out of serum should also be taken into account.

COTTAGE NURSES FOR RURAL DISTRICTS.*

BY

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We have heard a good deal lately of the trouble there is with district nurses thrust on the profession and the community by what I would call the "Lady of Improvidence," who pays the piper and wants to call the tune.

The subject of cottage nursing is one which must be of deep interest to any one practising in rural districts. I should be inclined to say among the poor anywhere, but it is so long since I was engaged in town practice that I prefer to speak only of those conditions of which I have had recent experience.

Nursing of the poor, as of the better classes, is a necessity, but in considering the subject, several matters must be borne in mind. While the nursing is the main need, there are other things little less important.

When the wife and mother is in bed, it is little use having even a first-class nurse to attend to her if she is worrying all the time as to what is happening to her husband and children. What is wanted is a nurse who, in addition to attending the patient, will see to these matters. A cottager cannot afford, out of a wage of some 15s. to 18s. a week, to pay for a nurse and a housekeeper too.

The nurse must be competent within her limit; she must be able to do without waiting on; she must be able to keep house, see to the comfort of the husband and children, get them their food, send the children properly dressed to school, and generally take the mother's place, and so relieve her of all anxiety.

Her attendance must be so constant as to prevent friends and neighbours interfering with the treatment, removing dressings to see how a wound is getting on, or to show it to any interested visitor. Above all, she must be cheap, or she will not be available for the class of persons I have in mind.

The nurse must not be provided by charity, or the poor will be pauperized, to their own and every one's disadvantage. The ordinary trained nurse is quite beyond the means of these people, and the district nurse does not meet other requirements in the case. She will not cook for the family, nor get the children ready for school. A district nurse could not work in a sparsely populated district—the distances are too great for her to attend more than one or two patients a day.

The cottager should be able to pay for the services of the nurse when well, for when ill he has more to do to meet the extra cost of living than he can well manage.

The nurse should be provided by the community, not by any "Lady of Improvidence," under whose guidance she would work—an arrangement which generally appears to lead to trouble with the medical men. In my opinion, it is essential that any nursing association which is to be a success, and work smoothly, should be on provident lines, apart from the unquestionable benefit to the people from this method of working. As soon as charity is introduced the door is opened for the interference of the larger subscribers, who, sooner or later, will want to run the scheme on their own lines, without any regard to the interests of the patients or the doctors.

* Read at a meeting of the Ashford Division.

These needs are met by the Holt Ockley system, which was founded at Ockley by Miss Broadwood in 1883. It is a provident system, each member paying his share of the estimated cost of the nurse. In my experience, the figure at which the subscriptions are fixed will, I am sorry to say, hardly cover this cost. Miss Broadwood says she had at Ockley great difficulty in fighting the idea that the poor should have everything found for them, instead of being encouraged to provide for themselves. We have found that, with encouragement, they are quite willing and able to do this.

The central office told us, in the first instance, that one nurse would nurse the sick of a population of 1,100, but when the maternity nursing is added, we find that the number of nurses needed is much larger. Acting on the figures supplied by the central office, we fixed our subscription at 4s. a year as a minimum for the labouring class, rising gradually to 21s. for gentry; and the hire of the nurse rises proportionally, the labourer paying 2s. a week and the gentry 15s. when the nurse is employed. These fees are doubled after the nurse has been at a case for three weeks, unless a certificate from the doctor saying that a longer attendance is necessary, is shown.

The nurses are taught to make a bed, cook, wash and dress a patient, do ordinary dressings, take temperatures, pass a female catheter, and note symptoms; to nurse a midwifery case, and, most important of all, to do as they are told. Some of them have a midwifery certificate, but most of them hold certificates for monthly nursing. No nurse is allowed to attend without a medical man, and we have not had any trouble with nurses wanting to practise medicine or midwifery.

All the medical men in the district were invited to join the committee, and I and my colleague did. The central office suggested that in some districts at least one of the nurses should be a certified midwife, but we pointed out that there was no demand in the district for midwives, and, further, that if the association employed midwives, we should expect it to make provision of payment of any medical man called to her assistance by a midwife, and that the Poor Law allowance of two guineas would be the smallest fee we should be prepared to accept. (The model rules now provide for the payment of the doctor by the association.) The committee decided not to employ midwives as such.

The nurses are women of the cottager class, and generally are well content with their position and do good work; the trouble is that the younger ones get married, and the elder ones get ambitious and want to train further.

Each nurse receives four to six months' training at a cost to the association of from £14 to £21. This amount is repaid by the nurse by the acceptance of a smaller salary for the first three years. A small sum is also retained by the association to form a bonus, which is given to the nurse at the end of three and a half or four years' service. As showing somewhat the progress of our association, I may say that the first year's subscriptions amounted to £31 12s. 5d., and the fees for actual nursing done, £6 10s. 6d. Last year the subscriptions were £58 9s., and the fees £71 5s. To put it in another way—in the first year 9 cases were nursed out of 105 subscribers; in the second year 26 cases out of 110, the nurses being engaged for seventy-two weeks' nursing. In the third year 28 cases were nursed for ninety-two weeks out of 124 subscribers; the fourth year 48 for 127 weeks out of 127 subscribers, and last year 57 for 156 weeks out of 221 subscribers. These figures will serve to show how the nurses increase in favour as they are known.

Each association covers a number of parishes, and supports one or more nurses, who are not allotted to separate parishes, or districts. Any nurse may be sent to any part of the district where she is required, so that if there is no work in one part of the district, the nurse is not wasting her time, but is working where she is needed. The work of the association is controlled by a committee consisting of president, secretary, treasurer, and one or more committee ladies from each parish. The duties of the committee ladies are to collect subscriptions and fees in their parishes, to forward applications for nurses to the secretary, and to pay occasional visits to the house where a nurse is employed, in order to see that both patient and nurse receive fair treatment. All fees are paid through