five to ten minutes daily. It has some effect in causing shrinkage of the swollen fibrous tissue.

Injection of Chromic Acid.

This method is only possible where the nodule is sharply defined and can be penetrated accurately by the hypodermic needle. Superficial nodules should never be treated in this way, as the solution is apt to damage the skin and cause a phlegmon. Ten minims or less of a 1 per cent. solution in water may be given. It may cause some aching, but if the nodule has been accurately injected, shrinking, with great relief to the rheumatic pain, follows.

Drugs.

Where intestinal indigestion is present, and especially in lumbago, a course of mild purging (grey powder, compound rhubarb powder, salines) is advisable. As regards specific remedies, it cannot be said that any are known which cause absorption of the fibrous indurations. In quite recent cases I have seen potassium iodide give relief, but in regularly chronic cases any benefit is not very apparent. Salicylic compounds lessen pain during the exacerbations. Their action is not curative, however, as they cannot be expected to remove hard fibrous tissue. The same is true of phenacetin, phenazone, quinine, and all similar compounds. Alkalies, ammonium chloride, colchicum, guaiacum, actaea racemosa do no good. Iodine and local blistering are helpful, especially over joints or nerves.

Spa Treatment.

Recent cases, where the fibrous thickenings are in the early stage and still plastic, may be cured by a course of hydrotherapy, but inveterate cases only obtain temporary relief from their sufferings. The drinking, bathing, and general massage promote absorption of the serous exudation in the fibrous tissue, and possibly some shrinking. This usually gives for a time complete relief to the pain, aching, and stiffness of chronic cases, so that the patient feels much more happy and energetic. The indurations still remain, however, and are apt to swell and give trouble under the influence of exciting causes. The regular purgation obtained at Harrogate by the sulphur water improves intestinal digestion and does much good in certain cases.

Diet.

The broad rule is to avoid gastro-intestinal fermentation and the consequent absorption of irritant products from the bowel. Indigestion certainly causes aching in many rheumatic subjects, and the best way to avoid it is to eat plainly but sufficiently of an ordinary mixed diet. Any articles which are well and easily digested by the individual may be allowed.

Climate.

Residence in a dry stimulating climate often brings about spontaneous cure. A damp atmosphere and a seaside climate increase the symptoms, and seem to favour the conditions which give rise to chronic rheumatism.

Surgical Treatment.

Certain nodules after prolonged massage remain very hard, and refuse to be dispersed. If they cause pain and aching, they can be removed surgically. Removal gives complete relief. It is sometimes not an easy operation, as the small mass of fibrous tissue often lies deep, and may be difficult to find.

PROGNOSIS.

In recent cases the prognosis is good, and even in cases of some years' standing complete, or almost complete, recovery is assured, if the treatment be persevered with. It requires considerable resolution and determination on the part of the patient, as it takes time and trouble, relapses are common, and he is apt to get discouraged. In severe cases, where there is marked and widespread induration, and the patient is very stiff and crippled, recovery is hopeless; but by stretching, massage, and manipulations, more freedom of movement may be obtained. When the subcutaneous tissue is thickened and brawny, treatment is very tedious, and recovery usually only partial. The same is true of joints which have been long affected.

PROPHYLAXIS.

After rheumatic fever, influenza, muscular chills, violent exertion, sprains, dislocations, and other conditions which bring on indurations of the fibrous tissue, the patient should be treated, and preferably perhaps at a spa, by massage, elec-

tricity, and bathing. After being cured of chronic rheumatism, a somewhat "hardening" mode of life should be adopted, with plenty of outdoor exercise. Any relapse should be at once treated.

A CASE OF SCURVY IN AN INFANT FED ON MUNICIPAL "HUMANIZED" STERILIZED MILK.

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In a leading article in the *BRITISH MEDICAL JOURNAL* of September 26th, 1903, p. 746, reference was made to municipal milk supplies for infants, and a note of warning sounded as to their limitations and dangers: and at the annual meeting of the Association both Dr. T. D. Lister and Dr. E. Cautley called attention to the risks attending the haphazard distribution of municipal "humanized" sterilized milk.¹

As illustrating these remarks I am tempted to publish a case which came under my observation a short time ago. The parents were a strong and healthy couple who brought me their first infant, 10 months old. The father belonged to the higher artisan class, being an overlooker in a mill and earning good wages. The history was that the infant had been born healthy, and was nursed by its mother till it was six weeks old, but as at this time she was not satisfied with its progress, she weaned it, substituting "humanized" sterilized milk obtained from a municipal milk dépôt. The parents appear to have obtained two days' supply at a time, the milk being supplied in eight bottles in a crate: The milk was stated to be white and sweet, but there often was butter oil floating on the top after the milk was warmed. They had used this milk exclusively till the present time, apparently of the original strength, but had increased the amount, and had added some baked flour. The infant did fairly well till he was about 8 months old. He then began to cry when handled, and kept his legs still as if paralysed, instead of kicking about as he used to do. When I saw him at the age of 10 months the gums were swollen and purplish around four incisor teeth which had been cut, the roots of the finger nails were injected, both legs beneath the knees were much swollen, immobile, tender and shiny; there was tenderness of the bones of the arms. The infant was poorly nourished; there was some enlargement of the epiphyses of the forearms.

The case did not differ in any way from the cases of scurvy so often seen from the prolonged use of preserved foods, but the fact that the milk which had given rise to the scurvy had been obtained from a municipal dépôt supplies food for reflection in several ways.

In the first place I should like to say that for every typical case of scurvy met with in either private or hospital practice at least half-a-dozen will be seen who have been fed on preserved foods which exhibit indefinite symptoms of scurvy, which may be called "para-scorbutic." The tenderness of the bones may be entirely absent, but there is anaemia, loss of flesh, distaste for food, sometimes diarrhoea of a dysenteric type, more rarely haematuria, a fine zone of pinkness in the gums around the teeth and perhaps a similar zone of pinkness at the root of the finger nails. In some cases there are herpetic-like rashes. In such cases improvement at once follows a change of food such as a milk-whey mixture and orange juice. I mention this because I feel sure the amount of mischief done by preserved foods is not to be measured by an odd case of typical scurvy.

A municipal supply of "humanized" milk cannot be provided except at considerable loss to the ratepayers; it cannot possibly be made to pay its way, assuming that fresh milk and cream of good quality are obtained from suitably-foddered and clean cows, and bottles, tins, and crates are provided. There is also the rent of the dépôt, the sterilizing apparatus, and the labour to be reckoned with. A charge of 3d. a day, or 1s. 6d. a week, cannot cover the cost. There is certainly a risk that the class who use the dépôt belong to the better-circumstanced artisan class rather than the poorest class who get their milk by the pennyworth. It is difficult to know how this is to be prevented, but it is certain that it is among the latter class that the infant mortality is the highest, and that it is they who need the greatest looking after.

I wish all the municipal authorities would get rid of the word "humanized," and substitute "modified" or any other word in the dictionary they like. Municipal milk is sold with

all the stamp of authority upon it; and, although compounded of diluted milk, cream, cane-sugar, and a pinch of salt, it is apt to be looked upon as a "fetish" for all the sick and healthy babies in the town of whatever age, and, as it is "humanized," what need is there for human milk?

Some harm has been done to these well-intentioned efforts of the municipalities by enthusiastic friends who have made use of statistics in a way which I cannot think the facts warrant. Thus in one town it was reported that in the year 1900 the rate of mortality among the infants fed from the municipal dépôt was 102 per 1,000, while the infant mortality of the whole town was at the rate of 188 per 1,000; these figures have been published widely to show that municipal feeding saved the lives of children at the rate of 86 per 1,000 during that year. One would be inclined to believe that the infants who were not fed from the dépôt were veritably on the "broad road which leadeth to destruction."

But surely more facts are needed. Of those "fed from the dépôt," how long were they so fed, a week or twelve months? What was the financial position of the parents? Did this class contain any of the infants who only survived their birth a few hours or days, or are these all relegated to the total mortality class? How did the mortality of those fed at the dépôt compare with the infants fed at the breast?

What I think is wanted is a careful investigation of the results of municipal feeding by some skilled observers entirely independent of the officials, and conducted on the lines of the investigations made by a medical committee recently in New York on the work of the charities supplying sterilized milk to the poor in that city.

In writing as I have done I wish to add that it is the "haphazard" methods of administering municipal milk dépôts that I condemn; I most certainly commend the efforts made in Liverpool and Battersea to work in connexion with the medical charities and to keep a weekly record of all the infants being fed from the dépôt.

I am perfectly open to conviction as to the general merits of municipal feeding, but I think more investigations are necessary in order to judge results, and before it can be said that the important problem of how to bring pure, fresh, clean milk within the reach of the poorer classes, and teach them how to use it aright, has been finally solved.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, August 29th, 1903, p. 469.

SOME NOTES ON THE URINE IN BERI-BERI.

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THE following notes are not put forward as being in any way exhaustive, but rather to attract the attention of those who may have other cases of peripheral neuritis under their care (arsenic, alcohol, diphtheria, etc.) How far such different forms of "nerve disease" may be distinguishable by the degree to which the metabolism of the individual may be upset, is a point yet to be determined. It is possible that some aid in establishing diagnoses may be obtained by attention to such matters.

It has long been known, as from the work of Scheube¹ that the excretion of urea and phosphates is much diminished in beri-beri; the figures set out in the accompanying table serve to confirm this point. It will be observed that the figures for urea are extraordinarily low in certain of the cases, so low indeed that it was not until I had made control observations on the healthy, that I was satisfied that there might not have been some error of calculation or of observation. The possibility of some tampering on the part of the patients can be excluded by reference to the proportions of other constituents.

The patients were of three races—Chinese, Tamil (Madras Indians), and Sikh. It will be observed that the Chinese controls gave figures which were comparable to the ordinary physiological standard. Such, however, is far from the case with the control Tamil cases, and it may be doubted whether these men were really in a normal condition, apart from the trivial matters for which they were under hospital treatment. It should be stated² that in the Malay States, as Braddon and others have insisted, the Tamil escapes beri-beri in his home life so completely that cases are but rarely seen in the hospitals. The insusceptibility, or rather non-acquisition, of the disease is even more pronounced in the Sikh, and,

further, usually endures during confinement in gaol, so that beri-beri in a Sikh is most exceptional. In the case of the Tamil, it may be suggested as a possibility that for some reason their nerves are more sheltered from the action of the beri-beric poison, so that they only suffer from a disturbance of metabolism—a "beri-beri sine neuritide." Naturally the control cases are much too few in number to establish such a possibility as a fact, but if it leads to a more complete knowledge of the metabolism of the Tamil, the suggestion will be justified.

DIET.

In respect to diet these control Tamil cases were perhaps on a more liberally albuminous diet during their stay in hospital than in their life outside; for they had 4 oz. of salt fish four times, and 2 eggs three times a week, with vegetables, curry stuffs, and rice. The Chinese hospital patients have 4 oz. of dried fish or meat each day, with rice and vegetables. The diet of the prisoners contained 6 oz. of meat or fish a day in the case of the long-sentenced men, but none in the case of the short-sentenced men. Two cases with extraordinary low urea values (Table Nos. 6 and 17) had been on bread and water for the twenty-four hours during which the urine was collected. The question of malingering naturally has frequently to be taken into account in gaols, and in these two cases the signs of beri-beri were not of severe type, though the diagnosis seemed to be confirmed by the low urea figure, which is below a starvation amount.

UREA.

I did not have the good fortune to examine a case of sudden death shortly before the time of decease, but it is probably not unreasonable to conclude that an individual who is only excreting a fifth or a sixth of the proper amount of urea might be prone to the onset of the sudden death which is so commonly unanticipated in the disease; nor again is there cause for surprise that these two patients complained of not feeling well, although neither cardiac distress nor paralytic symptoms were prominent. They had no albuminuria.

The question arises whether the diminution of the urea is due to a locking up in the tissues, to a deficient removal by the kidneys, or to an actual diminution of output by the effective organs.

It may be stated here that none of the samples tested showed the slightest trace of albumen; this, coupled with the comparatively normal amounts of uric acid and kreatinin, points to the conclusion that the kidneys cannot have been seriously at fault. Moreover, the marked diminution of the phosphates and sulphates confirms the idea that the production is really at fault.

The two following direct observations are opposed to the idea of a locking up of already-formed urea in the body; though the readings are perhaps a little high, it is to be remembered that the sources were *post mortem*; and that there may have been other substances yielding nitrogen with hypobromite.

1. Residue of alcoholic extract of 100 grams of blood after removal of cholin-like bodies, etc., by means of alcoholic platinum chloride, yielded nitrogen corresponding to 0.0308 grams of urea, that is, 0.3 per mille.

2. Residue of 40 grams of pericardial fluid similarly treated gave nitrogen corresponding to 0.0112 grams of urea or 0.28 per mille. Hammarsten³ gives the normal urea content of the blood as 0.2 to 0.15 per mille.

OTHER CONSTITUENTS.

In contrast to the urea the kreatinin, as estimated by S. Johnson's process, may be hardly decreased, indeed it is proportionately increased in nearly all of the cases.

Whilst both the sulphuric and the phosphoric acids show absolute diminution the increase proportionately to urea is more marked in the case of the former than of the latter; it will be remembered that Scheube insists that the phosphoric acid is relatively increased in the majority of cases. Mott and Halliburton have shown that during degeneration nerves lose a considerable amount of their phosphorus, but their degenerated condition can hardly be the direct cause of the diminished excretion in that the phosphoric acid obtainable from the whole of the human nervous system is estimated to be only 12 grams. (Voit.⁴) whilst that of the muscles is given as 130 grams.

The proportions of the conjugated sulphuric acids and of the neutral sulphur were not found to be affected in the first few cases, so that further estimations were deemed to be superfluous.

Several estimations of the purin bodies were made, but