I have noticed that the exacerbations of the tetanic state (especially in the first case related) were always associated with a painful contraction of the stomach, and that when the wave of contraction had reached the pylorus, the latter, which was previously incapable of being felt, formed a distinct hard tumour. The abdominal pain then became very intense, and the tetanic cramps in other muscles came on, or if already present became intensified. From this sequence of events I have come to the conclusion that the cause of tetany is a double one.

First, the absorption of some poison from the dilated stomach, which increases the excitability of the nervous system; and secondly, a reflex effect produced by the painful contraction of the pylorus.

The practical outcome of these observations is that where tetany or allied conditions are associated with gastric dilatation, surgical treatment is well worth considering before the symptoms become so severe as to lead to the almost hopeless condition described in the report of some of the fatal cases.

THE TREATMENT OF RHEUMATISM, WITH SPECIAL REFERENCE TO PROPHYLAXIS AND TO CARDIAC COMPLICATIONS.

Abstract of an Introduction to a Debate at the Chelsea Clinical Society.

By WM. EWART, M.D., F.R.C.P.

Senior Physician to St. George's Hospital and to the Belgrave Hospital for Children.

THE PREVALENCE OF CARDIAC RHEUMATISM.

The time is not distant when the full extent of the rheumatic evil will be realised by the laity, whose sympathies have been chiefly bestowed upon the more obvious fatality of phthisis. The Registrar-General's tables do not supply definite information, for, according to Dr. J. Tatham, the returns of fatal cases of heart disease are not a reliable guide as to the relative number attributable to rheumatism as a cause, yet at the lowest computation the mortality is sufficiently appalling to claim to be ascertained in the future with accuracy.

The prevalence of rheumatic fever is likewise an imperfectly-known quantity, whether we consult the records of its mortality or those of its occurrence. Yet, as shown by the epidemiological studies of Dr. Newsholme,¹ accurate data as to its fluctuations are essential to our knowledge of the disease and to its future prevention. A knowledge of its geographical and of its seasonal incidence is also dependent upon complete returns.

Notification,² such as that which has long obtained in Scandinavia, is the only reliable means of solving most of these essential preliminary questions, but the all-important function of the statistical method and our own urgent duty is to ascertain the effect of various forms of treatment in checking the frequency of rheumatism and of its cardiac lesions.

THE "INFECTIVE" THEORY AND THE ARGUMENTS IN ITS SUPPORT.

The arguments advanced in favour of the yet unproved infectious origin of rheumatism are ably set forth by Newsholme.

The meteorological argument is based upon a periodical increase in prevalence coinciding with periods of deficient rainfall and continuous relatively high temperature of air and soil. The lowering of the ground water would favour in the subsoil the growth of any telluric contagium such as he assumes. The bacteriological argument loses much of its strength owing to the diversity of the organisms described, and to the frequency with which they have been looked for in vain. The epidemiological argument is based upon the occurrence of epidemics, and of remarkable local fluctuations disclosed by his studies of the statistics available, upon the greater prevalence in towns than in country districts, and upon the occasional concentrated prevalence in certain cities, streets, or even houses. Lastly, the clinical argument lays stress upon the many features which are analogous to those of infective fevers, and upon the quasi-specific power of the salicylates.

THE PROPHYLAXIS OF RHEUMATISM.

In this direction suggestions are still wanting, but the statistical method might have proved more productive had it

been more thorough. The benefits of notification are largely due to a stimulation of clinical observation and thought; and in the case of rheumatism the clinical method is specially recommended by the prominence of the individual factor of predisposition.

1. *General prophylaxis*, pending fresh bacteriological revelations, seems to be limited to the scope of sanitation; but the improvements in the latter have not, as in the case of phthisis, resulted in a steady decrease. The recrudescences ascribed to a desiccation of the subsoil do not suggest any prophylactic indications. But we must still trust to the obvious indication for "desiccation of the surface soil," and particularly of the sites for houses, as well as of the habitations themselves. Again, the prophylactic indications connected with climate can only find their application in the individual case.

2. *In individual prophylaxis* we seem to have hitherto neglected or missed our opportunities. Where does the weakness reside which lays a child open to insidious rheumatism or an adult to rheumatic fever when others undergo the same depression, fatigue, or exposure with impunity? By what sign shall we tell the predisposition? And, if able to suspect its presence, how shall we best arm the subject against it?

A study of the distinctive features of a rheumatic predisposition or of the earliest rheumatic premonitions is an obvious requisite. The tonsils, which are strongly suspected of introducing and of harbouring the germs of phthisis, have also been suggested as the portals of a rheumatic infection. May not indications be traced in their aspect or behaviour which might aid us in recognising the rheumatic proclivity? Is the frequent immunity from arthritis, whilst the liability to carditis persists, in any way connected with the more active function of the tonsil in early life? Can anything be achieved by treating the tonsils which could in any way influence the rheumatic bias? This practical question might conceivably be answered by the results of surgical interference—that is, is the rheumatic tendency favoured or in any way affected by removal of the tonsils and of adenoids? Valuable indications might, perhaps, be gained by a systematic examination of children at schools with a view to prophylaxis.

We learn the importance of schools being removed from town to country. Concerning the selection of a local climate, atmosphere, and soil, we yet know too little. Is rheumatic fever ever developed at sea? Is the rheumatic tendency counteracted by marine climates, and, if so, by which variety—the soft or the bracing?

Prophylaxis by Drugs. Is Salicylate Indicated?—Too much stress cannot be laid upon the importance of management and regulation of the alimentary functions in this form of delicacy. With special reference to the iodides and to cod-liver oil, are the indications analogous to those approved in the scrofulous predisposition? But we need further guidance as to the prophylactic use of antirheumatic remedies at all stages of the liability. Belief in the specific virtues of the salicylates would almost imply as a duty their systematic administration in all threatened individuals. Unhappily that belief is shaken by some exceptions, but periodical courses of salicylates may be of advantage for the sake of their hepatic action. The responsible question still remains, Can their continuous administration be detrimental, particularly in the young?

THE VARIETIES OF ACUTE RHEUMATISM, WITH SPECIAL REFERENCE TO THEIR LIABILITY TO CARDIAC COMPLICATIONS.

In spite of its rapidly advancing cleavage, owing to the identification of various specific microbes or toxins, the rheumatic group is still unwieldy. For the purposes of treatment a provisional sorting of cases, according to their clinical kind, is expedient.

The Distribution of the Arthritic Lesions, their local incidence, the order of their migrations, and their varying tendency to permanence may serve as indicators to contrasts and affinities between acute rheumatic and rheumatoid arthritis. Four broad types stand out clearly:

A. *Monarthritic*.—Whether rheumatic or rheumatoid, this is in both affections an outlying and mysterious variety.

B. *Symmetrical Rheumatoid Arthritis*.—This is the typical form, both in acute and chronic cases.

c. *Non-symmetrical or Erratic Rheumatic Polyarthritis*.—In its most acute form, rheumatic polyarthritis is conspicuously non-symmetrical. It is erratic as well as migratory. Symmetry, when it does occur, would seem to be an exception rather than the rule, and a departure from the purest type.

d. "*Symmetrical Rheumatism*," *Acute and Subacute*.—In some cases, usually not the most severe and often subacute, symmetry is a prominent feature of the arthritis. The more I have looked for this symmetrical condition, the more I have been impressed with its frequency and with its peculiarities.

Clinical Classification showing Transitional Varieties.

1. Chronic rheumatoid arthritis.	{	Subvariety (a) with symmetrical, permanent, incurable deformity.
" (b) with symmetrical deformity capable of some degree of recovery.		
2. Acute and subacute rheumatoid arthritis.	{	" (c) distinctly "rheumatoid"; heart not affected.
" (d) "rheumatoid" in the local persistence of its joint lesions, and "rheumatic" in its heart lesions.		
3. Acute symmetrical rheumatic arthritis.	{	" (e) with persistent and refractory joint mischief (a rheumatoid feature) with or without heart lesion.
" (f) with transient joint mischief, and no permanent heart lesion.		
" (g) with permanent heart lesion and transient joint mischief.		
4. Acute cardiac rheumatism without arthritis ("juvenile" type).	{	" (h) joint pains only (usually bilateral) with cardiac lesion.
" (i) febris rheumatica sine arthritide.		
5. Acute rheumatic polyarthritis.	{	" (j) polyarthritis without heart lesion.
" (k) polyarthritis with heart lesion.		
" (l) hyperpyrexia and various acute complications.		

The group polyarthritis has a subvariety (j) without heart lesions. This immunity I have specially noted in some of the most acute rheumatic attacks, whilst valvulitis occurs chiefly in Group IV from subacute and almost latent attacks in the young.

Acute Symmetrical Rheumatism.—The acuteness of the arthritis in these cases is usually not of the first order, but its tendency either to stay or to return is marked. In the subvarieties (f) and (g) it closely resembles, but for its systematic distribution, the ordinary acute polyarthritis; whilst in subvariety (d) its persistence or steady relapses, and the eventual deformity, identify it as "rheumatoid" in spite of its originally "rheumatic" appearances and of the heart lesions frequently present, and indeed the most striking feature of the whole group is the frequent implication of the heart. It would be important to determine whether the cardiac lesions are, as I think, verrucose rather than vegetative.

The difficulty of separating the rheumatoid subvariety (d) from the rheumatic subvariety (e) is great. Some acute or subacute attacks are confined to, or settle, quite early in a pair of joints, and remain in possession in spite of salicylates, or may relapse for weeks. They suggest the rheumatoid type, except in two particulars: the joints get quite well, but the valves are commonly affected. The "juvenile type," where the swelling, the stiffness, or the pain are bilateral, is analogous to this merely in respect of the great prevalence of the valvulitis, and of the relative mildness of the arthritis. The local persistence of the arthritic process (often limited to one pair of joints) and the frequent absence of response to salicylates suggest that some forms hitherto considered rheumatic are rheumatoid arthritis in a truly acute form, with a tendency to affect the heart.

In the symmetrical cases there has been more of the "rheumatic" cutaneous rashes, with less of the profuse sweating. It is significant that not only the rheumatic exanthemata but the eruptions of subcutaneous nodules are almost invariably bilateral, and would fall within this group.

The common failure of the salicylates supports the view that they control the hyperæmic and more ephemeral arthritis rather than that associated with fibroid nodules and with warty valvulitis.

THE SALICYLATE TREATMENT.

If this is to be regarded as a specific treatment, why does it sometimes fail to relieve the arthritis and the fever? Why

does it usually fail to cure or to prevent the cardiac complication? Idiosyncrasy and individual divergence in biochemical processes are possible factors, as well as differences between forms of the disease. Similarly the failure to protect the heart may be due to purely cardiac reasons, in spite of an antirheumatic action. Meanwhile the main question is still whether the remedy strikes at the cause or merely at some of the symptoms.

The Mode of Action of Salicylates.—At least three views may be entertained. The action may be that of a sedative for the pyrexia by some influence upon the nerve centres, and for the local inflammation by some influence upon the peripheral vasomotor mechanism; or that of an antiseptic or microbe destroyer; or that of a metabolic or antitoxic remedy. So long as the existence of a specific micro-organism remains a postulate the second view cannot be discussed with profit. According to the third, the suppression of an infective toxin or of the products of an unhealthy metabolism might be brought about merely by a stimulation of the normal protective function of the liver, irrespective of any fixed proportion between the quantity of the morbid material and that of the drug. In Professor Latham's theory, however, a definite proportion must obtain. The greater the production of glycolic acid (together with that of lactic acid arising from an assumed vasoparalysis in the muscular area), so much more of the salicylate will be required to remove it in the shape of a salicylurate, thus obviating a further excess of the uric acid, which, in Latham's view, tends to paralyse some departments of the vasomotor centre. It has been objected to this chemical theory that we lack evidence of any excess in the blood of the lactic acid, or of the uric acid, though it is consistent with the excessive acidity present.

The Excretion of Salicylates.—In addition to the salicyluric acid a large quantity of salicylic acid is generally held to be excreted unchanged, and must be carried as such by the blood; hence the danger of an administration of the drug in renal impermeability. Suspecting that the drug might not be entirely eliminated as salicylic acid and salicyluric acid, and that some of it might split up into its synthetic components—carbonic acid and carbolic acid—and that the latter might be excreted as ethereal sulphate, I availed myself of Mr. J. Addyman Gardner's kind offer to analyse the urine from two patients during periods of freedom from salicylate and periods of its administration. The results were conflicting, indicating in one instance a rise, in the second a fall in the ratio of the ethereal sulphates to the metallic sulphates, and can only support the inference that if any phenol is produced in small quantities by a decomposition of the salicylate, the amount excreted as sulphate is inconsiderable. The lividity peculiar to subjects overdosed with salicylate and other symptoms pointing to increased venosity of the blood might be due partly to the carbonic and partly to the carbolic acid, and the major toxic events to a dangerous increase in their amount in circulation.

The beneficial effects might conceivably be due to them, for they are both general as well as local anaesthetics, their small production explaining why such large quantities of the drug, most of which passes out unutilised, should have to be put into circulation before a specific benefit can be obtained.

It is interesting to find that subcutaneous injections of a 1 per cent. solution of carbolic acid had been used by Marder (1873) in 3 cases, by Kunze (1874) in 4 cases, and by Senator (1875) in 25 cases (in one of these cases a 2 to 3 per cent. solution was employed), with excellent results as regards the pain and other local symptoms; but this treatment did not ward off complications or relapses, and little or no impression was made upon the pyrexia. The pain was controlled sometimes within an hour.

The results of inhalations of carbonic acid gas in the few cases to which I have hitherto tried it agrees to some extent with those just stated. The pain was lessened or relieved, but the improvement in the joints—which in one case was marked—was not in others sufficiently obvious to induce me to defer other methods of treatment. It was specially noted that the temperature did not improve in the same proportion as the symptoms.

THE PLACE OF SALICYLATES IN TREATMENT

Unreserved criticism of a method which has now become a

routine is perhaps opportune. First, Can the drug do any harm? The question is how far it may disagree in individual degrees of renal inadequacy or idiosyncrasy. A more usual risk is that we should be misled into overestimating its antirheumatic powers and relax too early both treatment and diet. On the other hand, May the drug be withheld without any detriment? If powerless against heart complications it need not be our rigid duty to administer it forthwith, but it would be our stringent duty to use any other drug capable of controlling them.

The Relative Frequency of Heart Lesion under Salicylate Treatment.—In recent literature³ we meet with the ominous statement that since its introduction cardiac complications have shown increasing frequency. If this result were due to the drug (Jaccoud), the remedy would be worse than the disease; it might, however, have occurred in spite of the drug. Pribram⁴ suggests that a similar increase has occurred in connection with other infective affections, and may be due to increasing care and facilities in clinical work. The plea for its almost exclusive use that some protection is afforded to the heart by the lessened duration of the rheumatic attack begs the question in assuming that the cause is relieved as well as the symptoms.

THE ALKALINE TREATMENT.—SHOULD SALICYLATES BE PRESCRIBED ALONE OR WITH AN ALKALI?

Fodor's⁵ experiments tend to show that some protection is afforded against various infective inoculations by the preliminary administration of alkalies. Pribram⁶ states that heart complications were less frequent among the patients which he formerly treated exclusively with sodium bicarbonate than among those placed under the modern salicylate treatment. Dr. W. Howship Dickinson,⁷ in a paper entitled "Alkalies in Rheumatism," arrives at similar conclusions, and ascribes the remarkable difference recorded to the influence of the alkalies in preventing the coagulation of fibrin. He has invariably employed the alkaline treatment during later years in conjunction with the salicylate, and comparing his cases with 62 cases treated with the salicylate alone, he finds that under full alkalies, and while under them, 1 case in 54 displayed heart affection; under the salicylate by itself, 1 case in 12. Reference is also made in Dr. Cyril Ogle's report to cases where the heart, though not natural on admission, became so under treatment.

The choice of the alkaline salt should take into account the greater alkalis and depressing power of potassium as compared with sodium. Again, a larger proportion of the metal is administered with the bicarbonate than with an equal weight of any organic salt, but I have had reasons to suspect that the almost permanent inflation to which the stomach is subjected whilst in an adynamic condition may be answerable for some of the temporary or even permanent dilatations of the stomach observed after a protracted attack of rheumatic fever treated with the bicarbonates.

There would seem to be a natural fitness in associating in our treatment two remedies, the virtues of which seem to complete each other, the sphere of the salicylates being the rapid control of the pyrexia and of the arthritis, that of the alkalies the control of the tendency to endocarditis. It cannot be matter of indifference whether we give or withhold the alkali. It is enough that the two plans should yield diverging results in connection with the heart; one of them must be the better plan and should be preferred.

THE SALICYLATE TREATMENT IN ITS BEARING UPON THE PATHOLOGY OF RHEUMATISM AND OF CARDIAC RHEUMATISM.

Much in acute arthritis and in the rheumatic state might be explained in connection with vasomotor mechanisms and sudden revulsion from "chill." Perhaps too little is now made of the evil powers of "chill." Vasospasm, which in Raynaud's disease will kill the tips of the fingers, might be credited with the power of damaging delicate cells or trophic fibrils with the effect of robbing our juices of some of their vitalising, preservative or antitoxic virtues, and of rendering them irritating to joints or endocardium. A distinction is made by Dr. A. Garrod between the fibrous morbid changes and those which are merely hyperæmic and more amenable to salicylates.

But when we turn to the valves the nerve theory has no

place. Our pathology becomes, like the tissues, independent of vessels and of vasomotor nerves. The endothelial lesions lead up to coagulation and fibrosis, whilst in the thickness of the swollen valve the changes probably include swelling of the lymphatic endothelia. We might then regard rheumatism as largely made up of a perverted metabolism and of lesions of the lymphatic structures (including in some cases the serous membranes) and of the vascular endothelium, and on the other hand of passing hyperæmic and fluxional swellings rapidly disappearing under salicylates, and the proportion between these vascular and extravascular changes would vary in cases.

Endothelial Vulnerability.—Failure of the salicylates need not imply that the rheumatic process in the heart is different from that in the joints. The mechanical conditions alone differ: the joints can rest, but the heart and its valves never do. There is another paramount determining factor, that of predisposition. The liability to atheroma can be traced through families, and the same is true of cutaneous delicacy and of a tendency to eczema. Similarly in the rheumatic inheritance, the vascular endothelium may be yet more vulnerable than it usually is in children, and an analogous vulnerability of the lymphatic endothelia such as is also seen in phthisis might explain some of the extravascular lesions.

THE RHEUMATIC HEART COMPLICATIONS AND THEIR PROPHYLAXIS.

Lesions of the joints are easily recognised, but not always the early beginnings of the cardiac lesions, which may develop murmurs only at a late stage. The researches of Dr. Lees and Dr. Poynton have raised our estimate of the frequency of rheumatic carditis and its results in fatal cases of acute rheumatism. Clinically, though it is a safe rule to frame our treatment on the assumption that the heart is threatened in all rheumatic attacks by its own continued activity, not always restrained by a merciful immobilisation of acutely inflamed joints, the occurrence of pericarditis is the exception, and that of myocarditis and dilatation is far from being the rule. Not only is primary valvulitis the prevailing danger, but, as pointed out by Dr. Sansom, valvular disease may often arise secondarily as a late result of changes which were originally myocardial.

Cardiac lesions may accompany every form of arthritis down to febris rheumatica sine arthritis (Hawthorne), but their frequency and their degree are not proportionate to the degree of the joint affection nor to the intensity of the rheumatic attack.

The Treatment by Vesication and Serotherapy.—Systematic blistering which was introduced long ago by Herbert Davies (over the joints), and recommended by Harkin (over the heart), and recently urged by Dr. Caton, is now in most cases just as superfluous for the mere relief of the pain as the ice-bags applied to them long ago by Esmarch. But the cardiac inflammations have not been prevented or suppressed by the salicylate treatment, and they should not be denied any advantage such as that claimed from precordial blisters.

Is acute immobilising arthritis protective to the heart otherwise than in the measure of the mechanical rest afforded? Is the heart less safe when the articular effusion has been dispelled as well as the pain? There are indications for a renewed inquiry in this direction from the sero-therapeutic aspect. I have been struck by the circumstances that immunity from heart lesions often coincides with very free arthritic effusion and general acuteness of symptoms. Is this a guide for our treatment of those cases where, as in childhood, little or no articular effusion occurs? If so prophylaxis might demand in predisposed subjects the application of blisters for the threatenings of an attack.

The size and the frequency of application are practical points for discussion, also the question related to the infective theory whether reabsorption should be allowed, from the constantly renewed vesications, of systematic doses of a serum presumably antitoxic, or the blisters incised and used merely as revulsive, derivative, and counter-irritant remedies.

THE GENERAL TREATMENT OF THE ACUTE ATTACK.

Absolute rest in bed for weeks and a careful graduation of resumed activity are rigid rules.

The characteristic anorexia and failure of excretion pointing to an embarrassment of metabolism are indications for

free outlets and carefully measured supplies. Indeed it is a question whether rheumatic arthritis could long coexist with diarrhoea. A mild cholagogue, diaphoretic, and diuretic action is a recommendation for the salicylates.

Probably the sodium salt of salicylic acid is the best to administer, though the strontium salt is favourably reported upon from America, and should be given in full doses, but in the presence of albuminuria all salicylates should be avoided and salines prescribed.

Whether with or without salicylates I venture to think that alkalies should never be omitted. The potassium salts are preferable, and for reasons stated the citrate may be largely substituted for the bicarbonate. Both the alkaline and salicylate treatment should be continued with diminishing frequency of administration for two or more weeks after the cessation of joint symptoms, and the urine kept alkaline during convalescence partly through the agency of diet. As the salicylate is diminished, quinine, which may be needed from the first is added or increased.

The iodides of potassium and of sodium, of undoubted service in acute rheumatoid arthritis, are likely to be useful in some of the "symmetrical" rheumatic cases included in the subvariety (e) when the skin is sufficiently tolerant. Dr. Caton prescribes them in acute rheumatism with repeated vesication over the chest, for the prevention and cure of endocarditis. They are specially recommended by the influence which they exercise upon the lymphatic system on the one hand, upon the blood on the other. Iodide of potassium has been credited with a power to consolidate aneurysms. In my own cases, after considerable doses taken continuously for many months no clotting was found within the sac. The real tendency of the iodide is, I think to lower the coagulability in spite of the favouring influence of a diseased arterial surface, and I expect good results from it in a disease where the absence of clotting is the great end to be secured.

Both in the rheumatoid cases and in the allied rheumatic cases the sodium salt would probably prove less depressant and more satisfactory in the result. During convalescence iron is not tolerated unless associated with adequate purgation, and alcohol is not needed in average cases.

Acute polyarthritis, with its pain and discomfort, needs attention to the varied requirements of individual cases. The heart being concerned gastric inflation should be guarded against and relieved.

A totally different treatment, so far as I have observed, is called for in the monarthritic acute rheumatic attacks.

THE LOCAL TREATMENT FOR ARTHRITIS AND THE CONSTITUTIONAL TREATMENT FOR RHEUMATISM.

The Treatment of Acute Monarthritides.—When drugs entirely fail the tendency is usually to localisation, and the primary indication is to treat the joint (by splint and bandage, elevation, leeches or blisters, inunctions, and graduated pressure), the next being internal support in the chief line of weakness by quinine, nervetonic, or stomachics. Mild salines are wanted, but salicylates and strong alkalies are worse than useless.

The Treatment of the "Acute Rheumatoid" and of the "Symmetrical Rheumatic" Attacks.—Here again (in Group II) there is localisation, and local treatment is needed, though of a different kind. As I have insisted elsewhere,¹ in harmony with Fuller's teaching, many, though not all, of these inveterate or relapsing pyrexial cases are made worse by continued rest, in spite of salicylates and alkalies, and are curable by movement and by a supporting treatment, after the acute swelling and pain have been subdued by Esmarch's ice applications or ice massage. Surgical treatment has been advocated and practised by Dr. O'Connor, of Buenos Aires, but of this I have no personal experience.

The cases in Group III most need an adjustment between the local and the constitutional treatment. Instead of dealing with an unyielding attack by increasing and oppressive doses of salicylates, we should trust to the milder alkalines or to iodides and blisters to protect the heart, in association with quinine, nerve tonics, or stomachics, as each case will suggest. The local measures may include tentatively leeching, blistering, ice massage, bandages, or splints.

DIET.

An opinion may be ventured that rheumatism is in part a

dietetic disease, and that in its wide range of varieties the "feeding" plan finds application as well as the "starving" plan.

In rheumatic fever the diet at first cannot be too light. Meat and beef-teas have been held detrimental as a source of lactic acid, and milk only prescribed. A milk diet does not agree with all, and I am led to suspect that in some it may keep up the acidity and the rheumatism, for there is evidence that fermentation is set up in the stomach as well as on the tongue, and I regard this as another source of gastric distension in rheumatic fever. A small dose of salt (15 grains to the half pint) with, or added to, the milk, has been tried by me with success in these cases. In adults I now regard salt as an indispensable adjunct in all cases of long-continued exclusive milk diet, and I find the same method successful in those infants who fail to digest, and are supposed to be intolerant of milk. I am glad to find in Dr. Burney Yeo's *Manual of Medical Treatment* that he has recommended a salted alkaline milk drink in acute rheumatism.

It has seemed to me also that a temporary vegetarian diet is as much indicated by the rheumatic state as the avoidance of animal food, and that as the recovery of slow and refractory cases must be dependent upon a supply of suitable food, the administration of soups made of a variety of vegetables, such as I am now prescribing at St. George's Hospital, may furnish the food as well as in part the medicine required. Whilst meat renders urine acid, vegetables render it alkaline, and this is the result at which we aim.

I have reached the end of this cursory sketch of an almost unlimited subject. The points for elucidation are many, but the main questions are: How shall we prevent rheumatism? How shall we put a stop to the rheumatic heart evil?

REFERENCES.

¹ Milroy Lectures on the Natural History and Affinities of Rheumatic Fever; a Study in Epidemiology by Arthur Newsholme, M.D. Lond., *Lancet*, March 9th and 16th, 1895. ² A. Newsholme, A Discussion on a National System of Registration of Sickness, before the Society of Medical Officers of Health, *Lancet*, November 30th, 1895; also A National System of Notification and Registration of Sickness, paper read before the Royal Statistical Society, *Lancet*, December 24th, 1895, p. 1560. ³ A. Pribram, Der acute Gelenkrheumatismus (Nothnagel, *Specielle Pathologie und Therapie*), Band v, Theil 1, Wien, 1899, p. 464. ⁴ Pribram, *loc. cit.*, p. 426. ⁵ Pribram, *loc. cit.*, p. 426. ⁶ Pribram, *loc. cit.*, p. 423. ⁷ Occasional Papers on Medical Subjects, 1855-96, London, 1896; also *Med. Chir. Trans.*, vol. xlv. ⁸ *Medical Press and Circular*, 1899.

MEMORANDA: MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

SOME CASES OF BELLADONNA POISONING.

THE following account of some cases of belladonna poisoning, which I am enabled to publish by the kindness of Dr. Roberts, of Twyford, near Winchester, may be interesting:

On February 17th I was called to some racing stables three miles from here to see some of the lads, who I was told had been taking some of the "horse" medicine. The medicine was an electuary, sweet to the taste, containing belladonna and liquorice. I found six lads exhibiting well-marked symptoms of belladonna poisoning. Two of them (K. and N.) were wildly delirious, another (P.), who had taken most of the electuary, but fortunately for himself had been sick shortly afterwards, was in a semi-comatose state. The other three lads were able—one (R.) with difficulty—to answer my queries. They complained of dry throat and tongue, indistinct vision, and giddiness; their pupils were widely dilated. R. maintained his equilibrium with difficulty. Vinum ipecac. ʒiv was administered, followed by copious draughts of mustard and hot water to R., S., and H., and soon they had profuse emesis.

The other three (K., N., and P.), had had larger doses of the electuary. N., aged 17 years, was very amusing; he got down on his hands and knees and tried to take the bystander's boots off, at another time to saddle an imaginary horse, unbuttoning buttons, muttering to himself, reeling about, and talking incoherently. K., aged 19 years, was more violent, impatient of restraint, fighting with the air, picking at things real and imaginary, when not controlled rushing up