conducted in three directions. The effort may be made to modify inherited tendency by appropriate educational measures; or else to modify opportunity for crime by segregation and supervision of the unfit; or else—and this is attacking the evil at its very root—to regulate the reproduction of those degrees of constitutional qualities—feeblemindedness, inebriety, epilepsy, deficient social instinct, &c.—which conduce to the committing of crime." [7] Goring then went on to say that we must have facts, and suggested that the results he had obtained might serve as a stimulus to a more extended inquiry, including the homes and haunts of the offenders. We must go beyond this; the inquiry most necessary now is into the mental life of the delinquent, on the lines on which Dr. Healy is working in America.

In conclusion, I would refer briefly to the Birmingham scheme for special medical examination of mental defectives and other persons of unstable mentality brought before the courts. This scheme was inaugurated because it was realised that in spite of the working of the Mental Deficiency Act, 1913, there were still mental defectives coming before the courts, and in some cases actually being sent to prison. What was intended in the first place chiefly for the benefit of mental defectives should have far-reaching consequences for the benefit of the more normal. It has given those of us who are concerned in the work the opportunity of showing that in addition to mental defectives there are a large number of other persons who ought not to be looked upon as fully responsible, because there is some psychic abnormality resulting from an environment over which they had no control.

## THE JAW-NECK SYNDROME: ITS SIGNIFICANCE IN THE RHEUMATIC GROUP OF DISEASES.

BY ARTHUR STANLEY HERBERT, O.B.E., M.D., B.S. LOND.,
LATE GOVERNMENT BALNEOLOGIST TO THE DOMINION OF NEW ZEALAND.

WHILE it is well-known that involvement of the temporo-maxillary joint is common in certain forms of arthritis and uncommon in others, the paramount importance of this point as a differentiating symptom in the diagnosis, and consequently in the treatment, of the so-called rheumatic diseases is not, I believe, sufficiently widely recognised. The whole heterogeneous medley of diseases generally and vaguely classed under the heading of "rheumatic" or gouty can be divided sharply into two groups, those in which the temporo-maxillary joint is involved, and those in which it is not.

### *Temporo-Maxillary Joint and Conditions due to Bacterial Toxins.*

The importance of the division lies in the fact that if in any case of arthritis we find this joint affected, we can at once conclude that we are dealing with a condition due to some bacterial toxin, and can say definitely, confidently, and finally that it is *not* one of gout, however closely that disease may be simulated. Could we with any certainty define our conception of rheumatism and limit the application of the term to cover only rheumatic fever and those subacute and chronic cases which are its sequelæ or appear to be caused solely by climatic conditions, I would extend the axiom, and say that we can definitely exclude both gout and rheumatism. For while acute rheumatism is generally conceded to be due to microbic invasion, yet the toxin does not appear to select this particular joint.

A rheumatic or gouty person may, of course, have his jaws affected, for he is no more and no less immune than other people from the various toxins which affect the joints, but the jaw lesion is due to some secondary or superadded infection, and we may seek the underlying cause in gonorrhœa, rheumatoid arthritis, dysentery, oral sepsis, or in some other form of infective or toxic agency. One other and confirmatory symptom shares in this pathognomonic import—namely, pain, stiffness, and sometimes grating in the back of the neck just below the occiput. The cause of this pain is, perhaps, a little obscure, for the X ray appearances are variable, and post-mortem evidence in these cases is difficult to obtain. There would generally seem to be an arthritis more especially of the occipito-atlantoid or upper cervical intervertebral joints, but sometimes the symptoms seem to be caused rather by involvement of the spinous processes and of the periosteal and fibrous tissues in connexion with them, for in advanced cases there is often bony thickening of the cervical spines, with much fibrous matting about the back of the neck, while there may be no pain on vertical pressure, although this is, of course, inconclusive evidence.

Some light is thrown on the pathology of the condition by the experiments of Nathan,[1] who produced a polyarthritis in dogs by inoculation with streptococci, and showed that the vertebral changes were similar to those induced in the skeleton elsewhere—viz., endosteal and sub-periosteal inflammation, with a sterile intra-, peri-, and para-articular exudation. In the spine this exudate involved the epidural space and the vertebral notches, and caused root or spinal irritation or compression. This symptom is not met with in pure rheumatism or gout, it is nearly always coincident with the jaw symptom, and like it, is always a sign of some other form of arthritis.

### *Meaning of the Syndrome.*

The syndrome has been spoken of as pathognomonic of rheumatoid arthritis. This, however, is only a half-truth. While it certainly is present in nearly every case of rheumatoid arthritis, it is pathognomonic, not of that disease, but of a whole group of infective and toxic diseases of which rheumatoid arthritis is but a member and a type. Garrod[2] maintained the diagnostic value of the jaw-neck syndrome in rheumatoid arthritis, pointing out its absence in gout and acute rheumatism and its "occasional" presence in gonorrhœal rheumatism, and several writers of monographs on rheumatoid arthritis have been equally emphatic, but the text-books on medicine as a rule, although they stress the involvement of the jaws in rheumatoid arthritis and mention that arthritis of the spine is common in this complaint, do not sufficiently emphasise the localised cervical arthritis; nor does any authority so far as I am aware hint at the broader significance of the syndrome as a sign pathognomonic of one great group of infective arthritic diseases.

I would put it as a definite law that in gout and true rheumatism the syndrome is always absent, and conversely, that in the toxic and infective group it is practically always present.

It must be admitted that the above statements may appear somewhat dogmatic and sweeping; there may be, indeed there must be, exceptions to this as to every other hard-and-fast convenient rule, but I think the exceptions are not numerous. Thus, while the syndrome is never present in gout, and I believe never in rheumatism, it is occasionally absent in the toxic group, and more especially it may be incomplete, the jaw symptom being the sign generally lacking. Again, the syndrome may be absent more frequently in some countries and climates than in others, a phenomenon quite explicable, for we know that variations in the strains of micro-organisms occur under such conditions.

Thus the rule was formulated from a careful analysis, extending over a period of 17 years, of a very large number of arthritic cases seen in hospital and private practice while I was in charge of the Government Baths and Sanatorium at Rotorua, New Zealand, and the exceptions to it appeared negligible. Yet, on my return to England, and with much less clinical

[7] Goring: Op. cit., p. 274.

material, I have found the syndrome much more frequently incomplete (amongst cases at Harrogate).

Nearly thirty years ago, at the Bath Mineral Water Hospital, I was taught the diagnostic significance of the temporo-maxillary joint in rheumatoid arthritis, using that much abused term, not as synonymous with, but as absolutely distinctive from, osteo-arthritis. The accompanying neck symptom in this complaint was also noted. Further experience showed the syndrome to be practically invariable in poly-articular gonorrhœal arthritis. Then, as the importance of buccal and other infections became appreciated, the same rule was found to hold good; and later, in a veritable epidemic of post-dysenteric arthritis, consequent on the Gallipoli campaign, the syndrome was again unfailing. In 11 cases of arthritis occurring during or immediately after the acute specific fevers, the jaw and neck were always affected; and finally I found it in two cases which appeared to be caused by, or at any rate exacerbated by, some toxic action of the thyroid.

### *Two Main Divisions of Polyarthritis.*

Not in a single instance could I discover it in a case of rheumatism or gout in which other infection could be excluded. Thus gradually but irresistibly the conclusion was arrived at that polyarthritic cases could be divided into two main groups, the jaw-neck syndrome cases, that were never gouty or rheumatic, but were always due to a definite infection or toxin, and might be classed broadly as the infective or toxic group, and the non-syndrome cases, that were due to gout, rheumatism, or traumatism.

It is true that acute rheumatism is also almost certainly due to an infection, so that it is perhaps hardly logical to call one the infective and the other the non-infective group, and a more precise term is certainly desirable for the gouty and rheumatic group; indeed, were it not for the fear of rendering the confusion of names worse confounded, I would suggest calling one the "rheumatic" group, and the other—the syndrome series—the "rheumatoid" group, for the latter name commits us to no theory. Whatever the nomenclature, however, the division is practically convenient, more especially from the point of view of treatment.

### *The Term "Rheumatism."*

At present we are confronted with the fact that the word rheumatism is used in conjunction with such an adjective as gonorrhœal. It has always been the bane of discussion on the "rheumatic" diseases that there has been no accepted definition of the meaning of the term rheumatism, and further, that in speaking of the different members of the so-called rheumatic group different authorities have used the same term to signify different conditions; I refer especially to the use of the words "rheumatoid arthritis." This had led to a hopeless confusion of issues, and I would enter a plea for a fundamental clearing of our nomenclature, so that we may know exactly what we are talking about. Before venturing to suggest a comprehensive classification, therefore, I propose to submit a definition of the terms employed. The term "rheumatic" is so useful and so universal that we can hardly forgo it, indeed, there is no other adjective to fill its indispensable place; at the same time it is so vague, and used in such varying senses, as to be extremely misleading. This, perhaps, is due to the gradual evolution of our ideas from a humoral pathology, through a chemical and neural phase, to a bacteriological view, and at the back of our minds is there not still a hazy subconscious blending of these various outlooks? While invasion by micro-organisms is generally conceded as a cause of many of the "rheumatic" conditions, there is, as has been already mentioned, evidence that the influence of internal secretions may in some cases possibly prove a factor in the problem; and so the wheel goes round full circle to meet the old humoral point.

If we must use the word "rheumatic," and there seems at present no help for it, and if we are not going to confine it strictly to rheumatic fever, I would define it in its loose generic sense to cover all forms of arthritis that do not tend habitually to suppuration. Thus pneumococcal and syphilitic arthritis, for instance, would be excluded, for the former tends very frequently to suppuration,[3] [4] and the latter, though sometimes classed amongst the rheumatisms, would appear, in untreated cases,[5] very frequently to do the same, and it is only because we so seldom meet with absolutely untreated syphilis that we see the milder forms of arthritis. Probably it will be found that such a division would include nearly all cases of toxic arthritis and a minority of cases of actual joint invasion.

Again, the term might be stretched to cover the symptoms habitually associated with such arthritis, such as fibrositis and certain forms of neuritis and iritis. Further, to include the test of reaction to salicylates or to weather is hopeless, for nearly all pains react to weather and to acetyl-salicylic acid. Used in this loose form "rheumatism" is a useful word, whose place cannot be filled by the substitution of "arthritis," which, in names like gonorrhœal arthritis, does not by any means cover the whole ground. If, as well may be, such a use of the word rheumatism is objected to, a new and universally accepted term must be invented.

### *Definition of Terms.*

The diseases usually considered as belonging to the "rheumatic" group are: gout, acute and chronic; rheumatism, acute and chronic, rheumatoid arthritis, including Still's disease[6]; gonorrhœal arthritis; various forms of infective and toxic arthritis; osteo-arthritis, including spondylitis deformans; and certain forms of neuritis, iritis, and affections of the skin. In addition, there are certain borderland and disputable conditions, such as chorea and erythema nodosum, which, as we are only concerned with the classification of *arthritis* by means of the syndrome, can be dismissed from present consideration.

#### *Group A.*

1. *Gout.*—Acute or chronic is an entity of which we hold, or think we hold, a fairly clear conception, and it needs no definition here.

2. *Acute rheumatism* or *rheumatic fever*, whether or no we agree as to its causation by the diplococcus of Poynton and Paine, is equally clearly-cut in our minds. *Chronic rheumatism*, if we admit the unofficial term, means (it is to be supposed) recurrent subacute attacks of arthritis or fibrositis in a person who has had rheumatic fever, or at least has a strong family history of it, and whose symptoms are not due to some other infection. These constitute the non-syndrome group.

#### *Group B.*

In this group the usual cause of the arthritis appears to be a toxin, though in some cases there may be an actual invasion of the joints by micro-organisms. The group as a whole is distinguished from Group A by the almost invariable presence of the jaw-neck syndrome. In rare cases the syndrome may be incomplete, especially as regards the jaw symptom.

3. *Gonorrhœal "rheumatism."*—This condition is interesting as, while it is a well-defined and well-recognised entity, it constitutes a prototype of the whole ensuing group. The disease may be a toxic arthritis, or the joints may be directly infected and show the gonococcus in pure culture, or again there may be a secondary infection with other organisms (cf. infra, Influenza).

The clinical picture is too familiar for comment, but I would draw attention to the following points: The jaw-neck syndrome is nearly always present at some stage of the disease; there is frequently, especially in the acute stages, a characteristic careworn facies; and there is sometimes a bony spur from the os calcis into the plantar fascia, which makes a striking X ray picture. Atrophic bone changes in the phalanges, as in rheumatoid arthritis, have been described but must certainly be comparatively rare. There is, however, frequently seen in a skiagram a curious appearance of obliteration of the interphalangal joint-space, suggesting a non-existent ankylosis This is due presumably to atrophy of the articular cartilages, and, while by no means pathognomonic, is very suggestive of gonorrhœal infection. There is apt to be a good deal of constitutional disturbance, with a tendency to anæmia and debility. The joints are not much benefited by sodium salicylate, though they may be relieved

by aspirin. In view of the not infrequent secondary infections, it is important to remember that the condition may be waked by some other infection 20 years after a wholly forgotten and insignificant gonorrhœa followed by an equally mild and ignored "rheumatism."

4. *Post-dysenteric Arthritis or Rheumatism.*—The clinical picture is identical with that of the gonorrhœal variety except that there never appears to be a spur from the os calcis. This may be due, of course, to the relatively smaller number of patients that one sees. I examined, however, 50 cases for this condition with negative results.

5. *Toxic Arthritis or Rheumatism.*—In this condition the joint trouble is set up by the toxin evolved from an infected focus, and there is no invasion of the joints by micro-organisms. The toxin may act as a direct poison on the joint, or it is possible may act via the central nervous system; indeed, it is strongly held by some authorities that rheumatoid arthritis is a tropho-neurosis of this nature. Further, I would suggest that the toxin may act sometimes through the endocrine glands. (Vide infra, Thyroid.) The site of infection may be localised, as in the tonsil, a tooth, the nose, the ear, the gall-bladder, or the appendix, or there may be auto-intoxication from the bowel. The infecting organisms, and consequently the toxins, may be of varied nature, but the pathological changes in the joints, though they may vary thereby in intensity, do not vary in kind with the infection. The condition is sometimes wholly indistinguishable from rheumatoid arthritis, but as a rule the clinical picture is less complete, the arthritis less typical and severe, and there is less trophic disturbance of the bones and skin. Provided that no secondary nidus of infection has developed, it tends to clear up when the original cause—e.g., oral or nasal sepsis—is removed. In this respect it differs from those infective cases—e.g., some gonorrhœal ones—in which there is actual invasion of the joints by micro-organisms. According to Goldthwait,[7] however, the co-existence of toxic and infected joints may occur in the same individual.

6. *Rheumatoid Arthritis.*—This disease, possibly caused by a specific infection, is sometimes wholly indistinguishable from other members of the infective group. Whether it is a definite entity or whether it is merely a member of the group, a form of toxic arthritis caused by varying infections, is still a matter of dispute. The completeness of the clinical picture leads me personally to consider it a specific disease. Like the rest of the group, of course, it shows the jaw-neck syndrome, but is distinguished generally by the more pronounced symmetry of the articular and periarticular lesions, as evidenced especially in the first interphalangeal joints of the ring and middle fingers; by the more marked trophic changes of the bones, as evidenced in the X ray picture by the rarefaction of the phalanges in the neighbourhood of affected joints; by neurotrophic phenomena, such as sweating palms and bronzed skin; by persistent tachycardia; and by its predilection for women.

7. *Arthritis following the Acute Specific Fevers.*—Clinically these cases are quite indistinguishable from other members of the group. Except in its origin, there is nothing whatever to differentiate a case of post-measles arthritis from a post-dysenteric case, and I have seen during an epidemic of influenza an attack of that disease light up an old gonorrhœal arthritis. In recent years I have seen toxic arthritis consequent on measles, scarlet fever, enteric, mumps, and influenza—11 cases in all, and in each case there was observable the jaw-neck syndrome.

8. *Thyroid Arthritis.*—The name is introduced in all diffidence and with reservations, as it is doubtful whether the thyroid secretion should be regarded as a primary toxic influence directly causing the arthritis, or whether it may not be rather a secondary influence modifying a pre-existing joint infection. That it is the latter in some instances we have abundant evidence, but from time to time one meets cases which seem to suggest the possibility of the former theory. In the vast majority of recorded cases hyperthyroidism has been associated with the arthritis; in a very few cases only, hypothyroidism. Some connexion between thyroid activity and rheumatism has long been noted,[8] while Spender, I believe, first drew attention to an affinity between Graves's disease and rheumatoid arthritis.[9] Recently I have seen, and described elsewhere,[10] two cases exhibiting the jaw-neck syndrome, and clinically resembling ordinary toxic arthritis, which appeared to be caused by, or at any rate to be modified by, hyperthyroidism, and which cleared up under treatment direct to the thyroid. That they should resemble the toxic cases in exhibiting the syndrome is especially interesting in view of the possible toxic origin in Graves's disease of the thyroid condition itself. One extremely serious case in a middle-aged woman with "goitre and nerves," marked tachycardia but no exophthalmos, was treated by baths and medicines for three years with but slight benefit. The severe multiple arthritis cleared up rapidly with the application of oleate of iodine to the joints and ice poultices to the thyroid. The other case was that of a young girl of 18 with tachycardia and a slight soft goitre, and a condition of joints suggesting mild rheumatoid arthritis. Every conceivable treatment was tried without avail, until, on consideration of the occasional beneficial effect of suprarenal extract in exophthalmic goitre, despite the usually accepted view of the action of the adrenal secretion on the thyroid, she was finally given adrenalin by the mucous membrane of the lip, when the joints began immediately to improve, and the pulse-rate fell to normal.

*Group C.*

9. *Traumatic Arthritis.*—In the acute stage this is, of course, a surgical condition; in its final stage, unless complete recovery takes place, it is generally an osteo-arthritis. One variety of traumatic arthritis is occupational arthritis—in other words, arthritis due to repeated small injuries in one habitual direction, and is apt to be labelled chronic rheumatism. Closely allied is the secondary arthritis consequent on the abnormal stress of a distant deformity—e.g., the arthritis of a knee due to a flat-foot. It would seem rather absurd to call such cases rheumatic, and indeed they shade off inevitably and imperceptibly into Group D.

*Group D.*

10. *Osteo-arthritis.*—A condition wholly dissimilar from the rheumatoid arthritis defined in para. 6, and I would submit that in so far as the bony changes are concerned, it is not really a disease entity at all, but rather an end-process and final stage of many diseases, an effort of the system (not always too successful an effort) to limit and repair the ravages of disease or injury. It is characterised by osteophytic out-growth and by deposit of compact bony tissue, and would seem in some respects to afford a somewhat close analogy of function to callus. Just as callus acts as a splint to bone, so we may conceive osteophytic outgrowth as tending to limit the movement of damaged joints, thereby saving wear and tear of enfeebled tissues and giving essential rest in inflammation. Again, the deposit of compact resistant bony tissue would tend to limit the spread of infection. It occurs only in connexion with injured tissues[11] and under no circumstances will you find it arising de novo on an unimpaired surface. The face of the bone, or the articular cartilage covering it, may have been injured by any of the above forms of arthritis, or it may have suffered such gross injury as a fracture. In occupational arthritis the location and form of the resultant osteo-arthritis may at times be foretold with great accuracy by considering the nature of a man's employment; and conversely, the nature of a man's employment can sometimes readily be determined by the examination of the osteo-arthritic scars on his skeleton.[12]

Whether osteo-arthritis be monarticular or multiple, and whether the jaw-neck syndrome be exhibited, will depend on the number and nature of the antecedent lesions. Thus, in traumatic and occupational arthritis one joint, or a limited and definite group of joints, will be affected, while in osteo-arthritis secondary to gout or rheumatism, the lesions are likely to be multiple and the resultant osteo-arthritic deformity will be moulded by the antecedent disease. It was pointed out by Lane[13] that the amount of bone formation, represented by eburnation and bossing, bears a direct relation to the vitality of the osseous system. Thus in mollities ossium and Charcot's disease the arthritis is accompanied by little or no reparative changes. Hence, it may be remarked that, whereas in old gouty joints there is abundant bossing, in rheumatoid joints it is almost absent. It will be noted, too, that osteo-arthritis of the hip-joint is an exceedingly common result of the frequent small bruisings of the joint by the wear and tear of life, while rheumatoid arthritis of this joint is so rare that many observers have never seen a case.

*Bearing of the Syndrome on Treatment.*

I feel that some apology is due for the fact that the question of therapeutics has been kept somewhat in the background. In extenuation I would advance that, accurate diagnosis being a necessary preliminary to treatment, I have endeavoured, by suggesting a classification, at any rate to clear the ground for subsequent therapeutic measures. This provisional classification—and in the present state of our knowledge all classification must be provisional—is suggested, not for the sake of an appearance of logical completeness, nor from an academic splitting of hairs, but with a view to its practical utility in treatment.

The essence of treatment is first, if possible, to remove the cause, and then, if necessary, to mitigate its effects, to relieve the symptoms. By applying

the syndrome test we can at once class our patient under group A or B, a classification that helps us to find the cause. In class A, the diagnosis lies between true gout and true rheumatism, and is, therefore, as a rule, comparatively easy, and the treatment is more or less specific. In class B the diagnosis will lie, in nine cases out of ten, between gonorrhœal, rheumatoid, and toxic arthritis; if it is the latter, we may perhaps be able to remove the cause—be it a tooth, an appendix, or an infected gall-bladder—without wasting time in attempting to relieve symptoms. But gonorrhœa as the primary cause is exceedingly common. To this infection I believed I was able to trace 10 per cent. of all my "rheumatic" cases admitted to the Mineral Water Hospital at Rotorua.

The diagnosis of rheumatoid disease is unfortunately generally easier than the treatment, but it is a fairly safe rule that all affections coming under class B require a *tonic* line of treatment, or in other words, that the resistance of the patient to micro-organisms and toxins must be increased. The whole group would appear to offer a peculiarly appropriate field for the use of vaccines, success in the use of which will depend so largely on accuracy in diagnosis.

In classes C and D we can sometimes remove the cause, and sometimes mitigate the symptoms, but, as a general rule, once osteo-arthritis had developed, even removal of the cause will be but a palliative, for it is removed too late, and the mischief already done is permanent. In this condition we may lessen the disability and increase the range of movement by mechanical means, and we may relieve pain, but very often our chief efforts should be concentrated on muscle rather than on bone, on the recuperation of important and essential muscles showing trophic wasting as a consequence of the arthritis.

*Suggested Classification of the "Rheumatic" Group of Arthritic Diseases.*

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|---|---|---|
| A.—Jaw-neck syndrome absent. | 1. Gout. (Acute. Chronic.) | Ending all in D. 10. Osteo-arthritis. |
| | 2. Rheumatism. (Acute. Chronic.) | |
| B.—Jaw-neck syndrome present. The toxic and infective group. | 3. Gonorrhœal. 4. Dysenteric. 5. Toxic. 6. Rheumatoid. (Arthritis or rheumatism.) | |
| | 7. Arthritis following acute specific fevers—e.g., Measles, Scarlet fever, Enteric, Mumps, Influenza, | |
| | 8. Thyroid arthritis or rheumatism. | |
| C.—Not rheumatic. | 9. Traumatic arthritis. | |

*References.*—1. Nathan: Amer. Jour. of Medical Science, November, 1916. 2. Garrod: Trans. Med. Soc. Lond., 1906, vol. xxxix.; vide also Llewellyn Jones's Arthritis Deformans, and Bannatyne, G. A. 3. Cave, E. J.: Pneumococcic Arthritis, THE LANCET, 1901, i., 82. 4. Lansdown, R. G. P.: Pneumococcal Arthritis, Bristol M.-C. Jour., 1911. 5. Lacapère and Laurent: La Syphilis Articulaire, Paris Médical, September, 1919. 6. Still, G. F., noted the jaw symptom in only three out of 12 cases, the neck symptom "usually," Med.-Chir. Trans., lxxx. 7. Goldthwait: Boston Med. and Surg. Jour. 8. Amongst more recent notes cf. Poynton, F. J., Brit. Med. Jour., 1919, i., 371. 9. Llewellyn Jones's Arthritis Deformans, and Bannatyne, G. A. (full discussion). 10. Herbert, A. S.: Hot Springs of New Zealand. 11. A recent paper by T. S. P. Strangeways (Brit. Med. Jour., 1920, i., 661), opens up interesting suggestions in this connexion: for if the nutrition of cartilage is affected through the synovial fluid, any injury sufficient to cause a synovitis will affect the nutrition of articular cartilage, and may therefore be the forerunner of osteo-arthritis. 12. Cf. Lane, Sir W. Arbuthnot: Trans. Path. Soc., 1884. 13. Ibid.

BRISTOL MATERNITY HOSPITAL.—On Nov. 11th a hospital of 18 beds for the reception of maternity cases was formally opened by Dr. Janet Campbell. The premises, which have been used for this purpose since February, were purchased from the committee of the Homœopathic Hospital, which has removed its work to larger premises in another part of Bristol. The patients' fees cover about half the annual expense, the remainder being found by voluntary contribution and Government subsidy. In her speech Dr. Campbell said that the Ministry of Health was in favour of the establishment of a number of small maternity homes rather than of one large hospital.

# A METHOD FOR DIMINISHING MORTALITY IN EMPYEMA IN INFANCY AND CHILDHOOD.

BY F. JOHN POYNTON, M.D., F.R.C.P. LOND.,
PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL AND HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET;
AND
F. N. REYNOLDS, M.R.C.S., L.R.C.P. LOND.,
RESIDENT MEDICAL SUPERINTENDENT, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

EMPYEMA is recognised as a serious and comparatively frequent event in childhood, and on this account we believe that the results of this investigation into its occurrence in infancy—that is, in the first two years of life—may be of general interest. As will be apparent, the mortality at this early age is high, and we venture to hope that the method employed by us, of which a detailed description, with illustrations, is given below, may be as helpful to others as it has been to us in diminishing that mortality. This method is not new in principle, as the literature clearly shows. In fact, the surgical principle is in itself as clear as daylight, and is maintained when the septic fluid is safely and completely withdrawn from the chest without recurrence. As a step forward in this direction the method has proved of practical service to us in dealing with children of all ages.

## *Present Position of the Subject.*

Before we enter upon the analysis of the cases in infants, which we have collected, a short review of the present position of the subject of the treatment of empyema will assist us in presenting the particular points we desire to emphasise. Empyema is recognised as one of the most treacherous and puzzling conditions in pulmonary disease. Some cases are simple and straightforward, but others are almost beyond diagnosis, even with radiological assistance, and empyema must be classified with typhoid fever and with tuberculous meningitis as one of those conditions which may humble the most confident diagnostician. The difficulties, as this analysis shows, are many and diverse, and depend in part on the nature, but still more upon the virulence, of the infection. They also depend upon the age and strength of the child, the regional anatomy of the abscess, and the duration of its existence. Post-mortem studies explain how it is that some empyemata are easy to deal with, some difficult, and some almost impossible. So much is common knowledge, but the question is whether in infants, and still more in older children, we can get rid of the abscess by any method safer and no less satisfactory than the usual incision, resection of a piece of rib, and drainage. Hard things have been said of drainage-tubes in treatment, but a physician will tell a surgeon that if there is one thing likely to cause suffering and harm to a child it is the premature removal of a drainage-tube; and this fact has bearing on the whole surgical aspect of the subject. The slipping of these tubes into the pleura, though unfortunately not an impossible occurrence, does not enter into the present problem; for our purpose it may be classed under "regrettable incidents." Let us suppose, however, that the pleura is opened without resection, drained, cleansed, and closed at once. If the case is a favourable one, the result is excellent, but if some pus is left behind, or the infection is still active, more pus is formed and the position becomes difficult. Children cannot be operated upon with impunity, and it is hard to decide when and where to explore again, and adhesions, too, may lead to trouble. Except that the wound is not open, the position is then closely akin to premature removal of the drainage-tube. It is not to be supposed that use of the drainage-tube is ideal or cannot be improved upon, but our analysis does not support any reason for a fierce