B. Pyloric Ulcers.

There is a choice between two methods—the indirect one of gastro-jejunostomy, and the direct method of excision by the Billroth I procedure. It is here especially that good results have followed gastro-jejunostomy in the treatment of gastric ulcer, and there is much to be said for the performance of such a simple procedure, especially as, when the ulcer is surrounded by much fibrosis, pylorotomy may become technically very difficult. When the risk is not too great, however, better results are to be expected from the Billroth I method, as being much less disturbing to normal physiology and eliminating the possibility of gastro-jejunal ulceration. Bland-Sutton in a Hunterian Lecture recommended this course, and it is a policy which I have adopted for the last two years.

C. The Treatment of Duodenal Ulcers.

This problem has not been so satisfactorily solved. There is a difference of opinion as to the value of indirect measures, and the technique necessary to employ direct methods is rather difficult to carry out. The authorities of weight in this country, and some in America, claim very satisfactory results from gastro-jejunostomy in a high percentage of patients, and in this they differ strongly from the majority of Continental surgeons. It is always so very difficult to make accurate deductions from medical statistics, where many significant factors are too variable and uncontrollable for scientific exactitude. The divergence of opinion is undoubtedly related to these irremediable facts. I do not think it possible to dogmatize on the operative treatment of duodenal ulcer in the present state of knowledge. It must be admitted, without reserve, that simple gastro-jejunostomy has cured many patients, yet, the pathology of such ulcers being so similar to that of gastric ulcers, which are acknowledged to be exceedingly resistant to indirect measures, the assertion that the proportion of failures is of moderate size cannot be thrust on one side without further consideration. Future experience must settle this question, and for this it is necessary to give direct measures a fair trial. This is being done in the Surgical Unit of St. Mary's Hospital, where we are making it a routine to resect the duodenum in every case where it seems practicable without undue risk. During 1923 and 1924 down to the date of writing this, 28 duodenal ulcers have been operated upon. This is not a large number, but regard has to be had for the teaching of general surgery, and it is undesirable that the number of cases of any particular disease at one time in the wards should be too great. Of these 28 cases, 10 had simple gastro-jejunostomy performed, sometimes with infolding of the ulcer, once with perforation of the ulcer base with a cautery; 18 cases have had duodenectomy carried out. The immediate results of the latter procedure have been uniformly successful in all but one patient, who died on the eleventh day, when the *post-mortem* examination revealed astonishing healing of the operation site but cardiac muscle degeneration. It is much too small a series as yet from which to make deductions, and time alone will demonstrate whether the results are lasting. The operation is one of the most tedious in surgery, and requires great care to avoid damage to the pancreas and its duct or the common bile duct. After resection of the affected part of the duodenum the stomach in nearly all cases is joined axially to the duodenum so that physiological relations are more nearly restored. A striking fact has emerged from these 18 cases: it is that in a very large proportion there are two ulcers, and the second has several times been discovered only when the stomach has been cut across and access has been obtained to the posterior aspect of the duodenum.

CONCLUSIONS.

1. The primary treatment of gastric and duodenal ulceration is always medical.
2. Surgery is indicated when medical treatment has failed, or in recent cases when a large ulcer crater is demonstrable by x rays.
3. It is probably true to say that medical measures can be continued with advantage longer in the case of duodenal than gastric ulceration.

4. For ulcer of the lesser curvature away from the pylorus, sleeve resection is the operation of choice.

5. For ulcers of the lesser curvature close to the pylorus or ulcers at the pylorus, excision of the affected portion of the stomach, including the sphincter, followed by axial union, is best.

6. For cicatrized pylorus following a healed ulcer pylorotomy is preferable, but gastro-jejunostomy gives very good results.

7. For ulcer of the duodenum it is not decided yet whether resection of the duodenum with its attending increased risks gives results so much better than gastro-jejunostomy that it should replace the short-circuit operation.

REFERENCE.

1 L. R. Dragstedt and A. M. Vaughan: *Arch. Surg.*, 1924, 8, p. 791.

THE TREATMENT OF INFANTILE PARALYSIS:

WITH

A PLEA FOR THE REORGANIZATION OF OUR HOSPITAL SYSTEM.*

BY

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The subject of poliomyelitis is of much scientific and practical importance, for it is one which should bring pathologist, neurologist, and surgeon into close touch with the general practitioner. Further, it is a good example of one of many administrative problems the consideration of which may serve to shock the spirit of complacent satisfaction with our present hospital system.

PATHOLOGY.

Until recently, poliomyelitis had only occurred in the form of scattered sporadic cases, and any information as to the essential nature of the disease was derived from autopsies on late cases. Such information simply pointed to the destruction of motor cells in the anterior horns of the spinal cord, and it was assumed, therefore, that there was an essential destructive process affecting these structures alone. But the occurrence of the disease in an epidemic form both in Scandinavia and in America has given the opportunity for more accurate investigation, not only of human cases, fatal in the early stages of the disease, but also by means of animal experiment. Certain species of monkeys can be inoculated with the disease, and in these animals it often runs a fatal course. It has been abundantly established that the disease is a definite myelitis of patchy distribution. Vascular engorgement followed by round-celled infiltration of the cord is the primary lesion, and it is probable that the destruction of the nerve cells is only a secondary consequence of the inflammation.

That the disease is not confined to the anterior horns is shown clinically by the fact that in the early stages of the disease there is marked hypersensitiveness of the skin, pointing to affection of the nerve roots and their ganglia. The conception of the disease as one of diffuse inflammation has much more than a theoretical interest, because it affords a rational basis for the treatment by absolute rest in its early period.

CLINICAL STAGES OF THE DISEASE.

It is easy to distinguish three well marked stages in the disease. The first or active stage corresponds to the period of inflammatory infection of the cord. It is marked by general malaise, a febrile temperature, and paralysis with hyperaesthesia of wide distribution. This lasts for a period varying from a few days to a few weeks. The second or quiescent stage is one of convalescence from the constitutional illness. The temperature is normal and the tenderness and hyperaesthesia have passed away. The paralysis, which was extensive in the stage of onset, gradually disappears in the majority of muscles originally affected, but this recovery of motor function will depend

* An address given to the Dorset Medical Society, January 16th, 1925.

largely upon the care with which the case is treated, especially in regard to rest and avoidance of meddlesome attempts to force exercises too early. In a severe case the second stage of quiescence and recovery lasts for one or two years or even longer. The third or final stationary stage is the condition in which the patient is left when all possible recovery of motor power has taken place. Certain muscles or muscle groups are permanently affected with paralysis and wasting of a lower neurone type. If the disease has affected a child in early life, and if a limb is extensively involved, then the growth of the bones in the affected member will be inhibited to a marked extent.

TREATMENT IN THE EARLY STAGES.

In the early stages of the disease rest will be instinctively demanded by the patient, whose flaccid limbs and tender skin forbid anything else. Two mistakes may easily be made: first, that in this country, where so far the cases have only been sporadic, the nature of the illness may be overlooked; and secondly, if and when a correct diagnosis has been made, the rest is neither efficient nor secured for a long enough time. When all the limbs and the trunk are affected nothing short of fixation of the whole body on a suitable frame or a plaster bed is satisfactory. The arms must be abducted at the shoulders, the forearms pronated, and the elbows flexed. The legs must be abducted with a very little flexion of the hips and knees, and a full dorsiflexion of the feet. The completeness of this early fixation not only affords the greatest comfort to the patient, but it serves to limit the ultimate extent of the paralysis.

It is in the second or quiescent stage of the disease, when pain and fever have passed and the patient feels capable of moving many muscles, that it is most necessary to insist on the continuation of the fixation. The object now will be to prevent contractures of the joints and to nurse back to useful function the partly paralysed muscles. The fixation should not be so absolute as at first. Each limb will in turn be released from the splint and the joints gently moved. The patient is turned over at least once a week and the back washed.

Dr. Lovett,¹ whose unique experience in the Vermont epidemic gave him unrivalled authority on this subject, collected a large number of observations on the value of various remedial agencies. I am indebted to his writings for the greater part of what I say in this connexion.

It is very doubtful whether massage or electrical treatment has any value, and this applies more particularly to the earlier phases of the disease. The one potent active remedial reagent is muscle re-education. This, reduced to its simplest term, consists in allowing the patient to move his own muscles, aided in such a way that at first each movement shall have to lift the minimum load. Thus the quadriceps may be able to straighten the flexed knee when the patient lies on his side, but it would be incapable of doing this when the leg hangs over the edge of the bed. If the paralysed muscle is asked to do too much or to do it too often, the exercise will do harm and not good, and a recovering muscle may become completely and permanently paralysed. Although a fair idea of strength and function may be gained by carefully aided movements, yet a much more accurate measurement ought to be made by means of a spring balance. It is only in this way, by recording the actual strength of each muscle, that any just appreciation can be gained as to the rate of progress and the effect of remedial measures.

Some may be disposed to think that the picture I have drawn of the treatment of a bad case of poliomyelitis in its early period is fantastic and impossible, implying as it does elaborate splinting and daily exercises of many muscles done with meticulous accuracy, and I am fain to admit that

I have hitherto been speaking of the work of others and not of my own. But I have seen the treatment carried out and can testify to its practical efficacy.

TREATMENT OF THE FINAL STAGE OF THE DISEASE.

If all this has been done in the early stage of the disease, then, when the extent and distribution of the paralysis have become fixed and definite, we ought to have no contractures or deformities requiring correction, and the treatment will resolve itself into the provision of appliances, the fixation of flail joints, and the transplantation of tendons. But unfortunately efficient treatment in the early stages of the disease is quite exceptional in this country, partly because the nature of the disease has not been recognized early, partly because practitioners and physicians are not alive to the urgency of preventive surgery, and chiefly because we are so ill provided with suitable institutions where the necessary treatment can be carried out for prolonged periods. In actual practice, therefore, the cases are usually brought to the surgeon in the final stage of the disease with the paralysis complicated by contractions and deformities. The surgery of infantile paralysis consists then in correcting deformities which ought not to have arisen before attempting any reconstruction methods.

I will give an account of two recent cases in illustration of this.

A strong and intelligent boy was brought to me in October, 1922. He was wheeled in, and when lifted from the chair he collapsed on the ground, his legs being doubled up under him. He was able to crawl along the ground and to lift himself up on to a chair by the intelligent use of his arms, which were powerfully developed. Both legs were completely paralysed except for the hamstrings of the right leg. The hips and knees were acutely flexed and fixed by contractions; the feet were flail. He had become paralysed in infancy, and when 18 months old had been taken to one of the city hospitals, where he had been treated by electricity and had had extension applied to his legs. He had been sent home without any provision for after-care, and had remained without treatment for fourteen years under the impression that nothing further could be done. He was admitted to the General Hospital, and within twelve months had undergone arthrodesis of one knee and ankle, tendon transplantation for one knee, and tenotomies for both hips. He is now able to walk with crutches and callipers, and I hope eventually he will be able to discard the former.

FIG. 1.—Showing method of walking with the arms.

The other case was even more striking, because the patient had reached the age of 23 before any serious attempt at treatment was made.

A woman, aged 23, when 2 years old had whooping-cough, followed by a further illness, and she was never able to walk afterwards. Between the ages of 4 and 6 she attended a hospital as an out-patient and had electrical treatment; she was dismissed as incurable. When she came to me in April, 1924, she was paralysed in both legs, which she kept doubled up under her. She had acquired a remarkable mode of progression: she grasped the dorsum of each foot with one hand and then, by lifting each in succession, was able to crawl along with some celerity (Fig. 1). After four operations both knees and hips were straightened out, one knee being fixed by arthrodesis. She is now able to walk with crutches.

In both these cases many years had been wasted—fourteen in one instance and seventeen in the other—and it is almost certain that if treatment had been continued from the time of the occurrence of the paralysis, not only would the degree of paralysis have been much less, but all the operations would have been avoided. Perhaps if these two patients were seen for the first time to-day it would be remarked that after all they are still cripples on crutches, but even this is an immense advance over their condition before treatment, when they were mere helpless crawling creatures unable to move outside their own doors and having to be carried upstairs.

THE DISTRIBUTION OF PARALYSIS.

The ultimate distribution of paralysis, as observed by Lovett, has many points of great interest. Paralysis is much more severe and more frequent in the lower limbs than in the upper. The upper limbs recover more frequently than the lower. In the upper limb the severity of the

paralysis is more marked in the proximal than in the distal muscles. The deltoid, biceps, and triceps suffer in this order, whilst paralysis of the forearm muscles is rare. In the lower limb the distal muscles suffer more severely than the proximal. The muscle groups of the leg which are most frequently involved are the glutei, the quadriceps, and the gastrocnemius—that is to say, the muscles associated with the maintenance of the erect position. The tibials and peronei are often affected alone or with the gastrocnemius.

Many of these points in the distribution of paralysis may be associated with the strain put upon the muscles either by gravity or by too early and ill advised attempts at active exercise. Thus the arm is naturally kept at rest or is subjected to no strain, whilst the leg is strained by attempts to walk. The upper arm muscles have to support the weight of the limb and so suffer more than those of the forearm. The lower leg muscles are subject to greater strain in proportion to their size than the upper when attempts are made to walk; and lastly, every effort at standing even with crutches will strain the glutei, quadriceps, and calf muscles, and these are the ones which suffer most. This all emphasizes the fact that the final permanent paralysis is largely determined by failure to rest the damaged structures in the early stages of the disease.

TENDON TRANSPLANTATION.

Tendon transplantation is, of course, the most rational and the least mutilating of any of the operations for paralysis. But unfortunately the scope of this method is very limited, as there must be a strong and healthy muscle to take the place of one which is paralysed. It is therefore only of use in cases of limited disease. The results of tendon transplantation in the foot and leg are not to be compared with those which follow the operation in the forearm done for musculo-spiral paralysis. This is due to the greater strength required of the new muscle in the lower limb and to the long and careful preparatory and after treatment. In the foot, there are two movements of the ankle lost by partial paralysis which may be restored by tendon transplantation; these are the movements of flexion and of version. The former is the more difficult problem. Thus, if the gastrocnemius is paralysed, it may be reinforced by taking the tibialis anticus and the peroneus longus and fixing these into the medial and lateral sides of the tendo Achillis, but they can seldom be strong enough to replace the calf muscle. If the dorsiflexors are paralysed the gastrocnemius cannot be sacrificed, nor can it be split, and it is better to use the tendons of the anterior tibial and the long peroneus as a sling by cutting each tendon two inches above the ankle and passing it through a hole bored in the tibia, the foot being strongly dorsiflexed.

As regards version of the foot, the tibialis anticus and the peroneus longus may be interchanged in cases of paralytic varus or valgus. But whilst all these artificial exchanges of muscle sound so simple and attractive, success can only be achieved by great care and patience. In the first place, it is absolutely necessary to correct all deformity before transplanting the tendon. Thus, in a case of varus with paralysis of the peronei, the inversion must be corrected by wrenching and plaster until the

deformity is overcorrected and the foot lies in a valgoid position. Then, and not till then, can the anterior tibial muscle be brought across and fixed to the peronei or to the cuboid bone. It is useless to employ a transplanted muscle under tension to correct a deformity.

After the transplantation the foot is again put up in an overcorrected position, and after healing has occurred—that is, in about a month—muscle training is begun, but no weight can be put on the foot for four or six months, and a year's after-treatment should be provided for in every case. The operation is only one incident in the treatment, of which preliminary correction of deformity and subsequent muscle re-education are also essential parts.

The other muscle transplantation for paralysis of the lower limb concerns the restoration of the quadriceps. If

all the hamstring muscles are healthy, then the biceps may be taken from the outer side of the leg and the gracilis and semitendinosus from the inner side; these may be sewn to the quadriceps just above the patella, or, better still, passed through a tunnel from side to side in that bone. If the knee flexors are paralysed or weak, then recourse may be had to the tensor fasciae femoris, using the fascia lata as its tendon of insertion into the patella.

THE CORRECTION OF DEFORMITIES.

In neglected cases, the common condition is for the hip and knee to be strongly flexed and for the ankle to be flail. But there may be any type of contracture of the ankle-joint—equinus, calcaneus, varus, or valgus, according to the type of paralysis.

In dealing with each of these deformities it is necessary to plan out a method of treatment which can be carried out step by step. Thus, if a flail-foot is the main lesion, it is worth while to do some fixation operation; but if it is part of a general paralysis of the leg which will require the wearing of apparatus, then the foot can usually be fixed by the latter. Generally speaking, it is wise to correct deformities little by

little, and by wrenching or division of tendons and ligaments, rather than by big operations, and especially operations upon the bones and joints. The limbs are ill nourished and repair is both slow and feeble, and extreme correction of deformity done by great force is very liable to be followed by gangrene.

The Foot.

The very many operations which have been devised for paralytic talipes is an indication of the difficulty of the problem. Apart from tendon transplantation, the main object of the operation must be to produce stability and a plantigrade position of the foot in walking. Such operations consist in removal of the astragalus, so as to lessen both height and the length of the foot; arthrodesis of the ankle-joint and the subastragaloid joint; or excision of the scaphoid and cuboid, in order to shorten and fix the foot. I have found it to be very effective to perform astragalotomy through an anterior incision, to remove all the cartilage from the astragalus, tibia, fibula, os calcis, and scaphoid, and then to replace the astragalus and to nail the bones together by a long bone nail passed through the sole of the foot (Fig. 2).

FIG. 2.—A method of fixing a flail-ankle. The astragalus has been taken out, all the cartilage taken from it and its bed, then replaced and the foot fixed with a long bone nail, driven up from below.

It frequently happens that the quadriceps and gastrocnemius are paralysed and the patient cannot stand. He will often attempt to do so by holding the knee with his hand to prevent it flexing. In such a case, if the foot cannot be prevented from dorsiflexion, then the knee will become automatically locked—that is to say, if the foot is placed on the ground the knee cannot be bent forward without dorsiflexing the foot; hence the suggestion has been made by Putti of placing a bony block in front of the ankle so that dorsiflexion is prevented. This is done by taking a piece from the shaft of the tibia and nailing it into the upper surface of the astragalus so as to stop the ankle-joint from dorsiflexion.

The Knee.

The contraction of the knee is best corrected by weight extension or by successive plasters rather than by any open operation, and this applies especially to growing children. If, however, the patient has finished growing, an arthrodesis may be done. The knee-joint is opened by cutting the quadriceps above the patella, turning the latter down, and then removing all the cartilage from those surfaces of the femur and tibia which are in contact in a position of straight knee. The cartilage is also removed from the patella and front of the femur after placing the joint in the fully extended position. The patella with its ligament thus acts as a brace, maintaining extension.

The Hip.

If the hip is much contracted it is difficult to get it down by traction or manipulation, because of the mobility of the pelvis and lumbar spine. It is therefore better to make an angled incision over the front of the iliac crest and upper part of the sartorius (the Smith-Peterson incision) and to strip all the muscles from the anterior superior spine and outer surface of the ilium. It is very seldom necessary to cut either the psoas tendon or the capsule of the joint. This will allow the hip to be put up in full extension, where it is fixed by a plaster spica.

The Inequalities of the Legs.

If one leg is sound and one extensively paralysed, the latter is usually two or three inches shorter than its fellow, and this will demand special treatment. That which is usually adopted consists in the provision of a high boot for the paralysed and shortened leg. This may suffice for the growing period, but when adolescence is reached something better is available. Various ingenious devices have been suggested for lengthening the short leg. But these are not satisfactory: first, because not more than one or one and a half inches can be gained; and, secondly, because the operation must be done on a weak atrophic bone, the firm union of which will be doubtful. The femur is divided by a Z-shaped osteotomy and then traction is put on the limb.

I think it is very much better to shorten the sound leg, and this may be done by an osteotomy of the femur at the junction of the shaft with the condyles. The shaft is then given a pointed shape, whilst the condylar portion is hollowed out and the former is then driven into the latter, so that an impaction of one inch may be secured easily. Greater shortening may be obtained by cutting off a portion of the shaft before performing the impaction.

The Restoration of Walking.

To enable the patient to stand and walk with or without crutches and apparatus is the ultimate aim of the whole treatment. The foot can always be stabilized and made plantigrade, the knee can always be fixed or controlled by tendon transplantation, and the hip brought down to full extension, whilst the two legs are made the same length by building up the short or cutting down the long leg. Then the critical question will arise as to the function of the glutei muscles. If these are sound, then the patient should be able to walk without crutch support. But if they are paralysed it is almost impossible to replace their action by any spring or stay, and the patient must be dependent upon crutches. But even walking thus he is usually a cheerful and contented person, instead of being a more or less helpless derelict.

THE HOSPITAL PROBLEM.

This brief summary of the nature, course, and treatment of infantile paralysis will serve to prove the urgent necessity for the provision of special institutional care for these cases. A similar claim might also be made for other groups of surgical cases, such as tuberculous disease of bones and joints, and many cases of deformity—for example, club-feet, congenital dislocation of the hip, and septic arthritis. All these diseases have this in common—they are curable, but they require years for their treatment. They need to be treated by a team of men—physician, surgeon, mechanic, and physiotherapist—as well as by specially trained nurses, who shall do nothing else and shall not be taken away just as soon as they know their work. Further, fresh air and open-air hospitals with the maximum of sunshine are necessary for most, whilst from an economic point of view education must be provided during the prolonged treatment. Such open-air school hospitals have been springing up all over the country, chiefly as the result of individual philanthropy and enterprise. But very much more requires to be done in a national and systematic method, if the problem is to be efficiently dealt with. Every large city and every county has now many agencies which provide hospital treatment for the sick, but these have arisen in a haphazard fashion, and for the most part without co-ordination one with another.

Unfortunately the general public of this country have been brought up to think that our voluntary hospital system is fundamentally good and that it should be preserved at all costs; and yet we, as medical men, know that it has failed. The evidence of its failure is only too evident to all who have eyes to see. The majority of voluntary hospitals, crippled by financial stress and governed by committees with a narrow and parochial outlook, fall very far short of the best Continental, Dominion, and American hospitals.

In the original meaning of the term there are very few voluntary hospitals left, for all are forced to ask for payments from their patients. The original idea of voluntary subscriptions has been overshadowed by a levy upon the patients themselves, by systematic collections from work-people or householders which almost amount to a tax, and by recourse to various lotteries and other gambling transactions, which can only be sanctioned by the doubtful morality, that the end justifies the means. But the most striking evidence of the failure of the voluntary system is found in the fact that every year a larger proportion of the sick have to be handed over to the Poor Law authorities. It is certainly an understatement of the case to say that more than half those who require hospital treatment cannot be taken by our voluntary hospitals, but have to find asylum in the Poor Law infirmaries. It is quite true that many of the latter institutions are good, modern, well equipped, well built hospitals. But they are understaffed as regards medical men, and especially as regards those of consultant rank. And quite apart from any comparison between voluntary hospital and the Poor Law hospital, the fact remains that we, as a community, are obliged to send half our sick to a State or municipal institution, and therefore it is fair to say that the voluntary system has failed. It is usual to pretend that the hospital difficulty is chiefly one of finance, and yet at the present moment we are told that a sum of no less than thirty millions has accumulated under the National Insurance Act and now awaits distribution. I suppose it is no use casting longing eyes upon this golden hoard, although it is tempting to suggest that it might be made the basis of a national fund for reorganization of our hospital system. I only refer to the matter to show that by a simple insurance system money can be had for all our hospital needs. It is not the want of money, but the want of willing co-operation between those who govern hospitals, that is the root of the difficulty.

At the present moment these cases of chronic illness, of which I have been describing one example, are the subject of many philanthropic societies and medical institutions, and yet as a whole they are treated very badly. In every large city there are "voluntary" hospitals, children's hospitals, a Poor Law infirmary, a city health committee,

and also perhaps an orthopaedic hospital and a crippled children's society; and yet in a great many there is no adequate system for treating cases of chronic illness requiring an open-air school hospital. A patient is operated upon in one hospital and then returns home to relapse; he is then taken to another hospital as an out-patient, where he attends until the expiration of his note; he drifts into the Poor Law infirmary, where he stays for a few years; he is befriended by the cripples' society, which sends him away into the country for a few months; or he comes to the health committee, which sends him away to a distant county, because this seems easier at the moment than the provision of efficient treatment at home.

It would seem so obvious that all those who are responsible for the treatment of the sick ought to co-operate instead of competing with one another. But this is apparently impossible because their independence would be threatened if each ventured to join hands with the others, even for the common good.

The Ministry of Health, one would have thought, would be the ideal agency to invoke to bring about hospital reform. But a Ministry will never take action until popular feeling is aroused, and the only way to arouse popular feeling is for the members of the medical profession, who know the facts, to explain them to the public.

It would seem to me that the essential needs of our long overdue hospital reform are as follows:

1. All hospitals should be controlled by a single committee of management in each county or administrative district. Each hospital would still require its house committee, but in matters of policy the interests of each institution would be subordinated to those of the community at large.

2. The financial basis of our national hospital scheme should be made worthy of this great and rich country, and the present jumble of municipal rate aid, State aid, haphazard philanthropy, and importunate begging or gambling should cease. National insurance should be the basis of hospital finance.

3. The treatment of all cases of chronic illness should be conducted in open-air school hospitals in the country.

At present only one political party, and that the socialists, have ever thought it worth while to formulate a hospital policy; and the socialists' policy is so identified with the idea of whole-time State service as to make it repugnant to the medical profession. But the essential ideals of hospital reform in no way necessitate this State service, and it is our duty to aim for these ideals in every way in our power, both in season and out of season.

REFERENCE.

¹ *Infantile Paralysis in Vermont*, Burlington, Vermont State Department of Health.

SOME FEATURES OF THE RHEUMATIC INFECTION.

BY

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The following investigation was undertaken in order to gain information regarding (1) the life-history of the rheumatic infection in childhood, and (2) the effect of different methods of treatment of the first rheumatic manifestation. The analysis was made from the records of 141 cases of rheumatic infection which had been admitted to the Royal Hospital for Sick Children, Glasgow, between the years 1916 and 1921 inclusive. In 1923 the cases were traced, those available were examined, and their histories subsequent to dismissal from hospital obtained.

The period between the onset of the first rheumatic manifestation and the final examination varied from one to eleven years; in 20 cases the period was under three years, in 98 between three and seven years, and in 23 cases between seven and eleven years. Since their dismissal from hospital the majority of the children had been leading ordinary home lives and receiving no special care or treatment.

Manifestations of the Rheumatic Infection.

The following lesions have been considered as indicating rheumatic infection: (1) arthritis, (2) chorea, (3) carditis, (4) subcutaneous nodules, (5) tonsillitis, (6) cutaneous lesions—namely, psoriasis, erythema nodosum, erythema multiforme, purpura, and urticaria (these are only included when developing in cases with some other rheumatic manifestation).

First Rheumatic Manifestation.

The relative frequency of the different manifestations during the first definite rheumatic attack is shown in the following table. As it is impossible, except from physical examination, to gain exact information regarding the presence of carditis, it cannot be said how often this was present as a first manifestation, and hence in the table cases of carditis associated with any other rheumatic manifestation have been omitted.

TABLE I.—Relative Frequency of Various Rheumatic Manifestations during First Attack.

Rheumatic Manifestation.	Cases.	Percentage.
Arthritis	79	56.0
Chorea	35	25.0
Carditis without other lesion	10	7.0
Tonsillitis	7	5.0
Arthritis + chorea	5	3.5
Arthritis + tonsillitis	5	3.5

ARTHRITIS.

Though in the whole series of cases cardiac mischief occurred slightly more frequently as a manifestation of the rheumatic infection than did implication of the joints, arthritis will be considered in the first instance, not only because it occurred much more frequently as the first manifestation, but also because it is usually looked upon as the most characteristic of the various lesions. Arthritis occurred at some stage of the disease in 103 cases—that is, 73 per cent. of the total 141 patients. In 89 cases it was the first manifestation, but followed chorea in 10 cases and tonsillitis in 4 cases. It showed in addition a strong tendency to recur, 41 per cent. of the 103 cases having had four or more attacks, 6 per cent. three attacks, and 20 per cent. two attacks. In only 33 per cent. of the cases was there no recurrence.

Age of Onset and Sex Incidence.—No case of arthritis was recorded during infancy. One occurred during the second year, two during the third, and two during the fourth; 10 cases (10 per cent.) were under 6 years of age, 63 cases (61 per cent.) were from 6 to 10 years, and 30 cases (29 per cent.) were over 10 years of age at the onset of the first attack; 62 of the patients (60 per cent.) were girls and 41 (40 per cent.) boys, giving a ratio of 1.5:1.

Seasonal Incidence.—Although developing at all periods of the year, arthritis showed a definitely greater prevalence during the autumn and winter months. October and November were responsible for the onset in 32 per cent. of the total cases, while only

10 per cent. commenced during June and July (see chart). In Nordgren's series of cases for Stockholm the greatest number likewise occurred in October and November. In London, on the other hand, rheumatic arthritis would appear to be most common in September and October,² or May and November,³ while