The Bradshaw Lecture on the prevention of acute rheumatism : delivered at the Royal College of Physicians, London, November 4th, 1924 / by F. John Poynter.

THE BRADSHAW LECTURE 1924

ROYAL COLLEGE OF PHYSICIANS

F JOHN POYNTON

The Bradshaw Lecture

ON THE

PREVENTION OF ACUTE RHEUMATISM.

DELIVERED AT THE ROYAL COLLEGE OF PHYSICIANS, LONDON,
NOVEMBER 4TH, 1924.

David Nabarro -

BY

F JOHN POYNTON, M.D., F.R.C.P.LOND,
PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL AND THE HOSPITAL FOR SICK CHILDREN,
GREAT ORMOND STREET.

Reprinted from the BRITISH MEDICAL JOURNAL, *November 29th, 1924.*

LONDON:
PRINTED AT THE OFFICE OF THE BRITISH MEDICAL ASSOCIATION,
429, STRAND, W.C.2.

1924.

THE PREVENTION OF ACUTE RHEUMATISM.

Following as I do in the path of distinguished Fellows of this College, it is with great diffidence that I deliver this lecture. Fortune has, however, favoured me to this extent, that the subject is one of which I feel sure our benefactor would have approved, and which will, I think, also be of interest to the College.

However indifferent my venture may be to grapple with the difficult and complex subject of the prevention of acute rheumatism, the severe suffering with which it is concerned, the possibility that much good may eventually result from its closer study, and the far-reaching scientific problems involved make it, I feel, a worthy theme.

To me this subject seems the more appropriate because in this country acute rheumatism has been a disease to which many of our learned Fellows have devoted the best of their mental energies and much of their life's work, so that to-day I can justly claim that this College has taken a vital and prominent part in the study of this important disease.

It has been my privilege to have been a pupil of some of these distinguished men, and I know that I am carrying on, at least in spirit, that work to which they contributed so greatly. There are four names in particular imprinted on my memory, for they were all my teachers. Two have finished their labours—Dr. W. B. Cheadle and Dr. D. B. Lees. Two—Sir Thomas Barlow and Sir Archibald Garrod—are among our most distinguished Fellows, and I should indeed be ungrateful if I did not take this opportunity both to do them honour and to express my personal debt to their wise instruction.

Difficulties of the Subject.

The prevention of acute rheumatism is faced with many difficulties, and I think the more closely it is studied the more apparent these become.

1. The first of these difficulties is nomenclature, for acute rheumatism may be the most insidious of maladies. Yet if we leave out "acute" and use the term "rheumatism" we are at once overwhelmed by the various disorders with which we are confronted, and if we abandon the term "rheumatism" altogether we shall have great difficulty in finding a substitute. It is when the prevention of acute rheumatism is entertained upon a great scale that this weakness in the nomenclature becomes of practical importance.

2. The next difficulty is concerned with the etiology of acute rheumatism considered as an infective disease. This view of the causation has a most important bearing upon the possibilities of prevention, but is at present in a state of uncertainty. When, in 1898, I first became associated with my faithful and valuable colleague Dr. Alexander Paine, Dr. Cheadle had already enunciated the clinical reasons for suspecting that acute rheumatism was due to some infective process. At the moment the whole question is being reinvestigated, and I believe I shall not be wrong if I put the present position somewhat thus: that many of those who have given the most attention to the subject recognize the importance of the strepto-diplococcus, but do not think that it affords a complete explanation of the etiology, and would look elsewhere for this—to some filter-passer, for example. Neither do I look upon this micrococcus as a complete explanation, but I do not anticipate the discovery of another infective agent. I look for help from the unravelling of the tangled skein of the secondary factors which combine with the micrococcus to produce this specific disease. Until the solution is revealed I feel, with the utmost respect for my able opponents, that I have caught something of the spirit which inspired Giordano Bruno to reply to the sentence of his inquisitors: "Majori forsitan cum timore in me sententiam dicitis quam ego accipiam."

3. In any case, even if we admit that acute rheumatism is due to a specific infection, we find ourselves confronted by further problems, among which are the many factors predisposing to the infection—such as heredity, environment, and nerve strain.

4. Again, our conception of the disease is still deficient in two particular directions: we have very little accurate knowledge either of the life-history of such an infection when once it has gained access to the human frame, or of the influence of the tissue characteristics and habits of the patient upon its course. On this account I have always connected with any scheme for the prevention of acute rheumatism the provision in such for opportunities for research.

5. The varied symptoms of the disease dependent upon the various important organs attacked constitute yet another difficulty, though one which must steadily diminish with increasing knowledge, and which will be met by careful medical instruction and by the gradual education of the public.

6. Then there is the difficulty of treating this disease with success, and upon this point, so far as children are concerned, I unfortunately find myself at variance with many able physicians. Except for the relief of pain, my experience as to sodium salicylate and other members of that group has been so unsatisfactory that I have no hesitation

in stating that in the most formidable cases of carditis in the young my best results have been obtained without their use. Until, then, some new remedy is discovered or some additional assistance to these drugs I feel that we have little direct control over the course of acute rheumatism.

Reasons for Attempting Prevention.

It may be asked whether it is not premature, in the face of so many difficulties, to enter upon elaborate attempts at prevention; but to this I believe we may safely answer "No," and for these reasons: It is generally admitted that acute rheumatism is a cause of three disorders of national importance: first and foremost, organic heart disease; secondly, chorea; and thirdly, arthritis and fibrositis. It is not a rare disease but a frequent one, and the heart lesions, chorea, and arthritis are common manifestations. It is much more rife in the poorer classes, and this can only mean that hidden in the complex problem of poverty are some of the important factors in the determination of the incidence of the disease; and the study of poverty with a view to its amelioration is undoubtedly a function of a civilized country. Again, it is a disease which certainly responds to careful supervision and treatment, and there are at the present time flaws in our supervision capable of at least considerable mending. Lastly, it is not a disease of the old and failing, which would be, I admit, a sufficient evil, but it is one that kills and maims children and young adults, damages useful citizenship, and wastes much money spent on education. This is well illustrated in an inquiry by Dr. H. A. Chadwick into the nature of 140 fatal cases of acquired heart disease in children all under 12 years of age. In 89 the heart disease was rheumatic, whereas the next in order of frequency, the pneumococcic, numbered only 27.

A recent Blue Book on the subject of the "Incidence of rheumatic diseases" in its quiet pages supports all the statements I have just made. This Blue Book I have heard criticized in a way which I can perhaps best express by likening it to one of those strange dishes which appear at intervals in schools, and which is supposed to contain the odd fragments left from many and various meals covered in, not by blue paper, but by a pie-crust. For my part I have no criticism to make, but look upon it as a document of first importance, for it brings home two essential truths: The first, the great national importance of rheumatism. The second, the formidable difficulties that confront us in dealing with the problem, for I am convinced that when efforts for the prevention of acute rheumatism are made upon a large scale, those concerned more closely with the aspect of investigation will certainly find themselves perplexed as to where the lines are to be clearly drawn between the various forms of "rheumatism." This Blue Book does great service in pointing out the

morass of "rheumatism," and it remains for investigators to make paths through this sufficiently broad and safe to enable the medical profession and public to see how far attempts at prevention can be made sane and practical. Any scheme to be successful must appeal to the public as well as the medical profession as a reasonable proposition.

The Medical Practitioner.

In the prevention of acute rheumatism it is clear that the doctor in general practice must, as in all the great problems of preventive medicine, take a prominent and essential part—not only in early diagnosis and treatment, but in the supervision of those who have suffered from the results of the disease. To their further activities I will allude later on in this lecture; but it is not too much to say that if this branch of our profession failed us—which is not thinkable—the whole fabric of prevention would be unsound at its foundations. The responsibility for adequate training in the clinical and pathological aspects of the disease rests with the great teaching centres. To them we must look for rousing in the minds of future practitioners an enthusiasm for the great opportunities they would have for helping to make a success of a scheme which holds out such great possibilities.

The Hospitals.

Our hospitals, and in particular the children's hospitals and the children's departments in the general ones, would in any scheme hold, I presume, the same position they do now, in that they would receive the acute cases and any which required particular observation or investigation. They would also carry out the training of the undergraduate students in the recognition of the disease and its manifestations, and the methods of prevention and immediate treatment. The notes of the cases, which will often be concerned with first attacks, should clearly become of great value for future reference and of increasing importance in any large undertaking for prevention. The out-patient departments of hospitals would be mainly consultative. They would in the poorer cases take the place of the general practitioner as supervisor, but their most essential functions would lie in deciding a difficult diagnosis, in admitting to the hospital, and advising doctors and patients as to the best procedures at the moment. Experience shows me that it is not satisfactory to bring many of these delicate children by train, tram, and tube, to wait about in hospitals during the winter and early spring months. The parents, too, are placed in a difficult position, for they naturally cannot exactly judge whether such a child is fit to travel, and yet fear to lose their appointment at the hospital. A system, too, which converts a hospital physician into a human turnstile to aid hospital grants is intrinsically unsound.

We are now met by a weak point in our management. It is common knowledge that recovery from acute rheumatism is often slow, and that neither cardiac inflammation nor chorea is a condition suited to ordinary convalescent homes. These children are notoriously unstable, the rheumatic infection admittedly treacherous, and to group them with strong children recovering from surgical injuries, a passing debility, or a rapid pneumonia, so unsatisfactory that physicians are well aware of the dangers. The alternatives are to keep them in a sick ward in the middle of a great town, or to send them home.

When hospitals fulfil the intentions of their philanthropic benefactors, in treating the children of the necessitous poor, many must be sent back to entirely wrong surroundings. The weakness, then, in the present position is twofold: we are not doing the best for our rheumatic patients, and we are using beds in expensive institutions which are required for urgent or obscure cases.

Recovery Hospitals.

Each year it is becoming more evident that the great cities, and London in particular, require *recovery hospitals* in the adjacent country in vital touch with the mother hospitals. Should public opinion in the future favour a step in this direction, you will appreciate that two alternatives arise: either such hospitals will be *special* and in this case devoted to the rheumatic, or be *general* with a special section for the rheumatic. I favour the latter, but would naturally accept the former as a step in advance of the present position.

In an ideal hospital of this type the cases would have the necessary time for convalescence, would, in the surrounding grounds, be trained for physical exertion, and eventually classified according to their ultimate degree of recovery, and they would also—a point of great importance—continue their education. The history of acute rheumatism would be continued in a sequel to the first hospital notes, and eventually the children returned to their parents with a short practical statement as to their capabilities.

There would be one link in this chain which must require the most careful consideration, for it is essential. There must be an intimate and vital connexion between the parent and recovery hospital. If the latter once drifts into a second-rate, soulless abode for "uninteresting cases" its value is lost and it becomes a monument of inefficiency. This danger, when once realized, can certainly be prevented by organization if our profession so determines.

Pioneer attempts have already been made in this country—as, for example, at the Edgar Lee Home (Stonebridge Park), Broadstairs; at the Chiene Hospital; in Birmingham and at Bristol, and doubtless elsewhere. The Invalid Children's Aid Association, in particular, has taken a

prominent part in this movement, and has recently started a home of fifty beds for females up to 14 years and males to 7 years of age at Hartfield in Sussex. I have the honour to be one of the honorary visiting officers, and though it is too soon to make a report on progress, for we have not been through a winter, I may remark that at present the results are encouraging. The gains in weight, the absence of attacks of rheumatism, the improved physique, and happiness of the children, who are continuing their education and living and sleeping practically in the open air, make me hopeful that we are entering upon a real advance in the treatment of rheumatic heart disease. To those who have given their time and skill in these pioneer efforts I feel deeply grateful.

Official Medical Supervision.

Leaving now the part played by hospitals I come to the far-reaching activities of the Ministry of Health, Board of Education, and medical officers in the London County Council schools. Hidden away in their not superficially attractive reports there are some of the most fascinating chapters in modern medicine; which leads me to confess that I have hardly done justice to my colleagues in these great departments—a lapse which I take this opportunity to correct.

Infant Welfare.

There is already, as you are well aware, considerable medical supervision in this country. During the first years of life we have the infant welfare centres; from 5 to 14 years the school medical officers; and from 16 years onwards the national insurance. There are two breaks in complete continuity—one between the second and fifth years and the other between the fourteenth and sixteenth years. The break between the second and fifth years—which in theory does not exist but in practice does—will doubtless eventually be bridged and already is encroached upon on the one side by the infant welfare organization and on the other by the school authorities.

I have given considerable time and attention to the subject of acute rheumatism under 5 years of age, and, though I am not implying that the disease is frequent then, I am sure that it occurs more often than is generally suspected, and that it is liable in these early years to cause great damage to the heart. Supervision between 2 and 5 years should eventually throw light on the earliest phases of the disease.

School Medical Service.

The period of school life is by far the most important in the history of acute rheumatism in this country. The incidence of the disease rises rapidly after the fifth year to about the tenth, and chorea, which I have seen as early as 9 months, and occasionally in the second year, comes

now to the front. It follows that the school medical service must take an ever-increasing share in the problem of prevention. This becomes apparent if we study a report of the chief medical officer devoted to heart disease and rheumatism in 1912. In this we are at once impressed by the vast number of children dealt with, the importance of organic heart disease as a factor of ill health, and by the frequency of acute rheumatism as its cause. Already there the importance of prevention is realized, as also the following up of cases, the need for precaution on return to school, and the possibilities of residential schools.

The appearance of chorea during the school age demands, I think, special attention. I shall not delay with statistics showing that it is a rheumatic manifestation: I have myself made four analyses, each from a different source, which convince me of the essential truth. This manifestation is a most interesting one, for, on account of the peculiar movements, it becomes the most sensitive clinical index we have of active rheumatism; it is also the manifestation which most frequently occurs alone, and it has a most striking sex incidence. Accordingly, the study of the course of chorea gives us a very fair insight into the general behaviour of acute rheumatism; thus we see acute attacks which terminate rapidly, and we see cases which linger on for some months and are continually recurring. As many as six attacks may be recorded in a few years, and some children between attacks are never quite free from the effects and may be thought mentally deficient. We recognize two elements—the infective and the nervous. There is no doubt that nervous tissue is slow in recovering from its injury even after an active infection has been destroyed, but when we recall that repeated chorea is a frequent indication of an early mitral stenosis, we suspect that both these lesions are pre-eminently the result of the *smouldering activity* of infection.

I see in chorea the danger of a great national system of education framed by adults for delicate, sensitive rheumatic children. Do not suppose that I am hinting at harshness or cruelty on the part of the teachers—that I dismiss at once; but the process of education begins very young, and the routine is a strain upon constitutions of which we may truly say "the spirit indeed is willing, but the flesh is weak." The rheumatic child is bright and eager, but cannot last the course, for she is lacking in stamina. Routine on the one hand and a constitution that requires frequent rests on the other must clash, and not infrequently does—for example, over scholarships. I believe there is a gradual lowering in general vitality, and then the infection attacks first the nervous system, which is the most strained, and often also the heart and other organs.

For my part, seeing the frequency of chorea in London children (9 per cent. of the out-of-school children in 1923),

I would not leave one stone unturned until either, on the one hand, I proved that the view I held was a bogy, and that other causes to account for its frequency must be discovered, or that, if it was mainly correct, steps were taken to analyse the exact nature of the educational strain.

There is a passage in the report of the chief medical officer of the Board of Education which deserves particular attention. It comes from a report in 1923 of the consultative committee on the differentiation of the curricula for boys and girls respectively in secondary schools. This committee draws attention to the present danger to health connected with the strain of examinations and of accomplishments added to the boys' curricula, and they note the relatively heavy household duties devolving at this age on many girls. I see in this passage light for the future and a sense of the reality of things, which cheers me almost as much as the sight of a flowering shrub upon the walls of one of those gaunt buildings with which we are so familiar.

Early Adolescence.

Still keeping our attention to the official side of the medical problems, we come now to the age of early adolescence—14 to 16 years—and to the time when the child leaves the supervision of the school medical officer and has the choice of occupation immediately ahead. Everyone recognizes that this is a critical period in life, and it is unfortunate that just at this time there is a break in the continuity of official supervision. The school medical officer is left and the national insurance has not begun. I am not in a position, nor have I the time, to enter into details of the difficulties surrounding this gap, but will try to indicate the present position.

The inspections of the school medical officer are concerned with three groups of children: the "entrants" to the school; those between 7 and 8 years; and lastly, the "leavers." The leavers' examination may take place one or two years before leaving, and there is often available medical information extending over nine years of school life. These histories are strictly confidential, but they are available for the use of juvenile employment bureaux, who are concerned with placing in employment children who leave at 14 years. Again, in the case of children continuing their scholastic career in schools for higher education and children suffering from severe physical defects up to 16 years, the school medical service is available, but as you are aware the number of such children is very limited.

Factory Surgeons.

We come now to the factory surgeons, some of whom are school medical officers and all of whom are encouraged by Sir George Newman to co-operate closely with those officers.

These examine adolescents of 16 years entering factory life, and those under that age who enter employment, including certain specified workshops, which requires an earlier training. When, however, we consider the problem of the London children we find many enter occupations which do not require a certificate of fitness. This is a weak link in the chain, and perhaps the more apparent because some three years ago the gap between 14 and 16 years was practically closed by the day continuation schools. The axe, however, fell, cutting through this slender neck, and the young head of the school medical period tumbled into the basket of economy.

The report of the Departmental Committee issued this year shows, moreover, that the Factory Act has not proved satisfactory. In 1920 it was found that nearly 8,000 individuals were rejected in the United Kingdom by the factory surgeons on medical grounds, and 576 of these for diseases of the heart and lungs. This clearly points to some leakage in the period between leaving school and applying for factory employment. We must bear in mind that this Act does not require co-operation between the school medical service and their reports and the local authorities and their reports on the one hand, and the factory surgeons on the other. Valuable suggestions for strengthening this weak link have been made by the Committee, which from my point of view are also links in the prevention of acute rheumatism. The phase of that problem which is mostly affected by such improvements will concern individuals who have already had attacks of rheumatism and have probably some damage to their heart, for, though first attacks occur between 14 and 16 years of age, it is the recurrences that are more frequent. I should, perhaps, at this point say that I include in the prevention of acute rheumatism the sequelae, because I believe at present no practical line can be drawn between active infection and improper strain thrown upon a damaged organ. In children, certainly, some active infection is usually the secret of most cardiac breakdowns.

We see from this short outline of the official side of the medical problem that one of its most important duties is akin to that of the signalmen on our railway lines—at certain stages along the line of life these officials indicate danger and pull up the train. The medical practitioners and hospitals clear the track and endeavour to prevent further breakdowns.

Works' Doctors.

There is another link, and one of increasing value, in the chain of prevention. This is the appointment by many large industrial concerns of special medical officers, matrons, and nurses, to supervise the health of their staffs. There cannot be any doubt that this link, forged though it may be on the anvil of strict business by the hammer of self-defence, must

do great good, particularly when that service is far-seeing and kindly. If we are to prevent acute rheumatism and minimize its dangers it is essential, especially for the young, that we should be able to come to their assistance quickly and not allow them to drift on until they are brought by grave illness to a standstill. The very existence of such a medical service, in touch with capital on the one side and labour on the other, must eventually help greatly in the development of any scheme for prevention.

The General Practitioners.

As I have already stated, throughout early life the doctor in general practice is taking an unobtrusive yet important part in attending rheumatic children, but, as Dr. Carey Coombs has suggested, they could offer more special assistance by the formation of voluntary groups in various districts around some great city. In this way some point under investigation in the city hospital, such as the incidence of the disease in certain areas or the appearance of a local epidemic, would enable them to use their special knowledge and experience. We must remember that limitations of time necessarily make the great store of clinical experience in this branch of our profession difficult to call upon, but this suggestion by Dr. Coombs would, I am sure, give them this opportunity and be most helpful in extending our accurate knowledge. When the insurance age is reached, and indeed in every stage of life, the general practitioners who give time, opportunity, and interest to this particular subject can continue to furnish valuable data not to be otherwise obtained. The British Medical Association, alive to the importance of the problem, which was brought before it in 1923 in a valuable discussion opened by Dr. R. Miller, has already taken steps to lend assistance in advancing our general knowledge.

Increased Co-operation.

I must here make a short digression to touch upon a somewhat delicate subject, on account of which my remarks must be looked upon as an expression of a purely personal view.

Taking a broad outlook there are three great medical forces in this country: the hospitals, with a magnificent history of past and present work, but financially unstable; the Ministry of Health, young and powerful, with immense resources and advantages; and the general practitioners, with the all-important assets of experience of the dawn of disease and intimate acquaintance with their patients. Each can take a most valuable part in the prevention of acute rheumatism, but greater results are to be expected if these forces can be drawn closer together. Greater organization between them would, in my opinion, enhance the value of the school medical service, which appears to me often to be in

the position of a doctor whose patient has been under a consultant's care and returned to him without a note of guidance. Looking to the future for one of these forces I can only see one fate, and this is that the hospitals become the strong right arm of the Ministry of Health. I use the word "strong" advisedly, for to be strong there must be wide liberty of thought and action, and not the suffocating growth of "officialism."

This digression is not intended to be controversial, but has, I think, a distinct bearing on the subject of this lecture. For my part, I should like to see skilled officers, somewhat on the lines of our hospital medical registrars, but representatives of the Ministry of Health, linking up the cases and notes of the rheumatic patients in our hospitals with those of the school medical officers, and bringing to us hospital physicians the particular lines of thought and investigation under the consideration of the Ministry, and in turn keeping the latter in intimate touch with hospital activities. In another direction also there are great possibilities, and that is in the co-operation of hospitals and almoners with the Board of Education and their army of voluntary workers and the Child Care Committees. The importance of this co-operation is, I believe, appreciated at some of our hospitals and should be of particular value; and these organizers, by bringing the activities of the hospitals into touch with the outer world of medical service, could widen the horizon of the student and indeed of all of us. From the standpoint of the rheumatic children they would give great assistance in following up these cases when they leave the hospitals and keeping in closer touch with them. At the Hospital for Sick Children already I have had valuable continuation histories and home details of my rheumatic cases supplied by this agency. In the common aim at the prevention of acute rheumatism I see a good opportunity to bring the three great medical forces in this country closer together, and in this direction further possibilities for prevention.

Environment.

The influence of environment upon the incidence of acute rheumatism is one of the problems in prevention which appears to me particularly to need more extensive investigation. This aspect is one which I always associate with the honoured name of Sir A. Newsholme, who showed us the importance of urban life as a factor in causation. My personal experience of this side of the problem is not an effectual one, because my activities have been confined to technical research and clinical study in hospitals, but I have noticed these points. Damp and cold houses and districts tend to make acute rheumatism drift into a chronic course, and it is my belief that a child returning from hospital, after an attack, to such surroundings is certainly in great danger of chronic invalidism and likely to die in a few

years. Whether or not this is the entire explanation I am convinced that there are houses which are most injurious to such children; this is based on my knowledge of healthy families coming to such houses and several members developing acute rheumatism, which also recurred when they returned after convalescence. I am also most suspicious of cold winds when there has been a spell of hot weather and much dust in the towns, this combination producing tonsillitis and increasing the incidence of acute rheumatism. The medical officers of health would have a prominent part in this investigation, and already to my knowledge they are taking the problem in hand, and the Care Committees should prove invaluable.

Notification.

Here the question arises as to notification, and it seems to me that a suggestion I have heard is worthy of consideration. It is that a partial and temporary notification might be helpful. General notification in the present state of our knowledge would probably lead only to great expense and confusion. It might, however, be advisable to notify acute heart disease in childhood, or chorea, or obvious cases of acute rheumatism up to a certain age and for a limited time, and I understand that the medical officers of health would thereby be put in a stronger position. Personally, I am not sure that notification is needful or for the best, and leave it as an open question.

Contagion is an aspect which at present I should not care to be brought into prominence, believing that it does not take an important part in the history of acute rheumatism. An epidemic of sore throat in a household predisposed to the disease might result in several members developing active symptoms, and I have met with cases in these circumstances sleeping in the same bed, one of whom developed cardiac rheumatism, the other chorea; but these are very exceptional events. There are occasionally outbreaks in strictly limited areas, and in 1919-20 around and in London there was a distinct wave of increase of incidence. This feature is one which certainly requires more study, but I think it would be premature to bring contagion to the fore in any public movement.

Education of the Public.

Two directions suggest themselves by which we can better instruct the public: the first, by educational leaflets and lectures to bring home to parents, patients, teachers, and labour employers the dangers of the disease; and the second, to assist them in choosing industrial occupations and in recognizing the limitations of employees who have been partially maimed by acute rheumatism.

The Ministry of Health could, I believe, render a great service if it would publish a leaflet for the guidance of the public, setting out in simple terms the dangers of acute

rheumatism, together with some simple instructions. These could be sent to hospitals, to medical services, to great factories, and wherever from its special experience it would think helpful. I have ventured myself to outline such a leaflet, and I know it has been of some value, but this would be better done by those more experienced in the practical needs of the public. In the other direction—the assistance of the public in the problem of employment—we require the best possible organization for providing information for the guidance of those who have rheumatic children to place in life. Schedules of suitable employments should be easily obtainable, and there is no doubt that in the future the deeper study of employment in relation to acute rheumatism and cardiac disabilities will give us much useful information. At present the school medical officers do valuable advisory work on these lines, but more can probably be done to gain the assistance and sympathy of employers. It certainly should become increasingly difficult for such a case to occur as recently came under my care. This was an undersized girl of 20 years with obvious mitral stenosis, who was working as a bottle labeller, underground, often in wet clothes, and lifting heavy cases. As a result she was admitted with a complete cardiac breakdown from which she has never recovered.

The Local Focus.

The next point is the removal of local focal infection as a factor in prevention. On June 7th, 1900, a man, age 28, came to St. Mary's Hospital suffering from a sore throat. The condition was one of acute tonsillitis and he had mitral and aortic disease, arthritis, and muscular pains. There was a previous attack of rheumatic fever four years before. Dr. Paine, by plate culture, isolated a strepto-diplococcus morphologically and culturally indistinguishable from that we had isolated from the lesions of acute rheumatism. Intravenous injections into a rabbit produced acute aortic and mitral endocarditis. Fitz-Meyer, two years later, by extensive experiments supported these results, and later with Mr. George Waugh we repeatedly verified the ability of this micrococcus obtained from unhealthy tonsils to produce cardiac and arthritic lesions without any previous injury to the valves. This was the birth of the local focus in rheumatism.

No one can be *more* convinced than I am that the rheumatic infection has one important site of entry into the system through diseased tonsils, and particularly those which resemble, in their deep lacunae, culture tubes. No one probably is *less* convinced than I that wholesale removal is indicated in the rheumatic child, or that the removal of the local focus shuts the door. Nature is not so easily managed, and I have seen severe carditis in a first attack occurring some years after a complete enucleation. Recent American statistics bear out this experience, for Ingerman

and Wilson report that, of a series of cases in which tonsillectomy had been undertaken for rheumatic manifestations there occurred, in a period between one and eleven years after the operation, rheumatic relapses in 76 per cent. I look upon the tonsils as an important barrier; but as no man is more dangerous than a clever man who has lost his capacity, so are badly damaged tonsils a constant source of danger. Careful treatment of the throat, nasopharynx, and teeth in the prevention of acute rheumatism will be, in my opinion, a permanent factor. More investigation is required to determine other local foci as equally definite.

Research.

That further research is essential to advance the prevention of acute rheumatism is generally admitted, and this must mean the assistance of expert investigators trained in the modern methods of bacteriology, serology, and biochemistry. Opinions as to the best method for obtaining results will naturally differ, and I can but express my own views. I think there should be some institution in which the study of "rheumatism" should be continued uninterruptedly, and in a centre such as London I would have this institution concerned with the entire problem of rheumatic affections, for it is my experience that in research one is liable, if following a particular line, to reach a dead end; some fact or some technical detail is lacking or the brain becomes wearied. Then one needs to leave that line for a time and to work in other directions, returning later refreshed with new ideas or with new equipment. The problem of "rheumatism" would always have open spaces; now there might be fresh light thrown on malignant endocarditis, now a discovery in the bacteriology of rheumatoid arthritis, or some chemical advance bearing upon fibrositis. Thus the vitality of the research would be kept active.

I am no believer in an easy path. A keen intelligence even working on wrong lines will learn useful lessons and be the stronger, but one value in the establishment of a continuous research lies in the diminution of the likelihood that a young investigator would wander off the track for a long time. If I may give one personal illustration—Dr. Paine and I spent two years searching for a suspected bacillus and discarded the very micrococcus we eventually believed to be the causal agent of acute rheumatism. Two years is a long time, and wiser heads might have given us a hint that would have put us right earlier in this vain search. Such an institution could be organized for training investigators and putting them in touch with our great hospitals and infirmaries, and would have at hand an ample literature. I admit the scheme is ambitious, but I am looking ahead and outlining what appears to me the rational steps to bring about a steady progress in our knowledge, remembering always the great wastage of money that at present results from the ravages of rheumatism.

Conclusion.

I think that I have shown that we have in this country at least the skeleton of a valuable organization for the prevention of acute rheumatism. Given the *will* to clothe this skeleton with living flesh, there seems to me to be great possibilities. Dr. Carey Coombs very wisely points out that any scheme must be evolved slowly, and I am in entire agreement with him. It is my belief that the best results in most great endeavours are obtained by testing the strength and weakness of the materials already at hand rather than by wholesale revolution. I have attempted to disclose weak points, and these can be cautiously strengthened. No one would suppose that I should advocate filling the land with country hospitals, but *one* such connected with the children's hospitals in London would be an experiment justified by our knowledge of disease, and in this hospital acute rheumatism could form one section, and the results be carefully tested.

Of this I am convinced, that Sir George Newman and his powerful staffs will continue on their side to develop our resources for prevention, and the hospital staffs and practitioners are prepared to take their parts. It is for an enlightened public to consider whether they will help also, for it is for them and for their children that we are working. If we are met by the answer that there is no money for such endeavours, then we can but improve to the best of our ability, and by mutual organization, our present resources; but the public should realize how many children and adults in this country are maimed by this disease, and should know our difficulties, our need for research, and the present limitations of our resources.

In conclusion I would venture to repeat a prophecy I dared to give in 1913 in an address to the Invalid Children's Aid Association. "That as surely as I stood on the platform the time would come when the care of the rheumatic child would attract much more attention in this country"; and I would add now "in all civilized countries." I wish also in this lecture room, where the great name of Harvey has been so often glorified, to express my belief that the experimental production of organic heart affections by micrococci obtained from rheumatic carditis has opened up the road for a great advance in the treatment of cardiac disease and for the relief of much suffering, by leading our thoughts to the problem of the *prevention* of acute rheumatism.