A British Medical Association Lecture ON POST-ENCEPHALITIC PARKINSONISM;

WITH SOME REMARKS ON THE RESULTS OF
TREATMENT BY BELLADONNA.*

BY

ARTHUR J. HALL, M.A., M.D. CANTAB., F.R.C.P.,
PROFESSOR OF MEDICINE, UNIVERSITY OF SHEFFIELD.

Of all the later manifestations of epidemic encephalitis that which is known as Parkinsonism, to distinguish it from Parkinson's disease (paralysis agitans), is not only the most common but the most serious. It has been estimated to occur in about 25 per cent. of all cases of epidemic encephalitis. Probably this is too high, and as a matter of fact there are many difficulties in making an estimate at all. Thus, the figure will vary with the time after the epidemic at which the estimate is made. It is by no means uncommon for the condition not to show itself for six, twelve, or eighteen months after the acute attack, or even, in rarer cases, not for years.

In the second place, the original number of cases of encephalitis in any single epidemic can only be estimated by the number of cases which are notified as such. As time goes on, however, it is found that a large number of Parkinsonian cases appear among patients who were not included in the original list of notified persons, the acute attack having been so slight as not to call for medical attention. If these are added to the list it is obvious that the proportion of Parkinsonian cases must become improperly raised, because it is likely that quite as many other inhabitants also had mild attacks without developing sequelae. If, on the other hand, one takes the figures of notified cases only, there is the fallacy that probably the mildest cases are omitted from the list. Out of 300 cases of encephalitis notified in the city of Sheffield during 1924 about 20 per cent. were definitely Parkinsonian at the end of 1925, so that the rough estimate given above is not very far out for notified cases; but there are almost as many Parkinsonian cases in the district traceable to the same year's outbreak who were not among the notified.

GENERAL FEATURES.

The general features of the disease are so familiar that it is not necessary to devote much time to their description. One of them is an increase of muscular tone. This leads to the postural changes which make the condition so easily recognizable at first sight. Whatever part is affected the resultant posture assumed when at rest is, with certain exceptions, the same in all cases. These postures are not the natural postures of rest, nor are they postures habitually assumed by the neuro-muscular system in ordinary life. Indeed, they cannot be said to be restful postures, using that term in the ordinary sense. To a normal person they are distinctly irksome and tiring, yet in the Parkinsonian condition their continuance appears to cause no undue fatigue. They are most noticeable in the head, upper trunk, and arms. The bowed head, which at first sight suggests muscular weakness allowing it to fall forwards, is in reality an active pull. It may continue just the same against supporting pillows removed. It is sometimes more marked on one side than the other, so that the pull forwards is oblique. In one of my cases it was so marked as to cause caries of the cervical spine to be suspected.

Hypertonus and Tremor.

This hypertonic condition leading to postural changes is, of course, a familiar feature of ordinary paralysis agitans, but its importance in that disease is usually overshadowed by the accompanying tremor, which dominates the picture. In post-encephalitic Parkinsonism tremor also occurs, but its amount is, as a rule, considerably less. In a few cases it is severe, or becomes severe; in most, at any rate

for considerable periods, it is only slight; and in a certain number it is practically absent, and remains so.

It must not be forgotten that in making these statements I am speaking of cases of which nobody has yet seen the end. The oldest recognized post-encephalitic case cannot be of more than eight or nine years' duration, even if infected in the first known epidemic, whilst in this country by far the greater number of Parkinsonian cases date from the outbreak of 1924, and their duration is thus under two years.

There seems little doubt that "tremor" and "hypertonus" are distinct processes. Walshe has shown that hypertonus may be for the time completely removed in an affected muscle by the local injection of novocain, whilst tremor is not at all reduced thereby. Other drugs which also remove the hypertonus to a considerable extent and for considerable periods do not as a rule cause similar improvement in the tremor.

Sialorrhoea.

Sialorrhoea is a striking and often an early symptom. In its mildest degree there is merely a sense of increased moisture about the lips, which becomes rather inconvenient when talking or about meal times. It may often be recognized by the presence of a few bubbles between the lips when the patient is telling his history. In more marked conditions it is obviously inconvenient, and the saliva requires frequent efforts to swallow it. At times it even escapes from the angles of the mouth. In the severe stage it is a more or less continuous "drooling."

Frequency of Pulse Rate.

Another sign which appears to be common is an increase in the frequency of the pulse rate. This has been noted by various observers. My attention was called to it by Dr. Hewitt of York, with whom I saw a typical case in a young woman. Her pulse was persistently 120 or over. A few days later an examination of the pulse rates of all the Parkinsonian cases attending my hospital out-patient clinic on one morning was made, and we found that the average in 13 cases was 109. The highest was 128, the lowest 96. An examination of the records of the pulse rate in five in-patients, taken over periods varying from two to twenty-six weeks, when they were lying in bed and afebrile, was 96.

Slowness of Action.

The most characteristic feature of Parkinsonism is the extreme slowness of action. It is this which gives the chief early clue to the condition in many cases. It may be limited to one part, or it may be generalized. It may be obvious to the patient even when very slight, or it may be hardly realized by him even when obvious to the onlooker. This difference appears to depend partly on the extent of its distribution. Thus it is quite common for the onset of the disease to be noticed by the patient himself, as an inability to use one hand as freely or as quickly as the other.

A musician told me that his first trouble was an inability to keep up with the right hand at the same pace as the left. A shorthand typist whose right hand was alone affected found a similar difficulty. A married woman found that in her housework her "right hand was lazy." A man with the left hand only affected said that when "dealing" he could not get the cards away with his left thumb and finger. In all these cases the patient had the opposite healthy limb for purposes of comparison.

When, however, both arms and the head and neck are affected I have seen cases in which the patient, although extremely slow, failed to appreciate that he was slower than before. Two young men whose Parkinsonism began somewhat insidiously were discharged from their posts because of their slowness. Both of them complained bitterly that so far as they knew they did things just as quickly as before.

Such slowness, when generalized, shows itself in everything, but is necessarily most noticeable in the ordinary daily actions in which the arms are principally involved—such as dressing, washing, feeding, putting on boots, etc. Whether really appreciated by the patient himself or not, this soon becomes a source of trouble in the household, and it is not long before someone has to assist him. So that

* Delivered before the Tunbridge Wells Division on December 18th, 1925.

whether they actually appreciate the slowness subjectively or not, it is daily and even hourly impressed on them from without. What, however, they do complain of is the constant overwhelming efforts that are required to perform these and all other actions of daily life.

We have recently been attempting to measure this rate of ordinary actions, and find that it presents some very interesting features. In the case of unilateral arm affections the difference in rate of movement on the two sides is very clear, whilst in the generalized cases with extremely retarded action the rate of movement may be at least ten times slower than normal.

The amount of actual muscular weakness is variable. That the muscular power does eventually fail in most cases is certain, but that it may remain fairly good for long periods is equally so. One of the most striking differences between Parkinsonism and paralysis agitans is the unexpected muscular strength which the former may at times exhibit. Possibly this may be due in part to the different ages at which the two conditions arise.

Time does not permit of more than a passing reference to many other interesting and important features. The mentality of these cases is most varied. Some are profoundly depressed and melancholic; a certain number have attempted suicide, some with success. Another group appear quite apathetic, they seem to have given up the struggle, or accepted it from the first as hopeless. There is, however, a third type, whose cheerful sanguine optimism appears to be pathological. They are always "better" in spite of the complete absence of any improvement. Nor is it possible to discuss the phenomena of micrographia, of the festinating gait and quick speech, or the curious changes in the blink reflex.

TIME OF ONSET.

Whilst in a few cases the onset is early, in the greater number it is late. Among 120 cases of Parkinsonism which have come under my personal notice the most common time of onset has been six to twelve months after the initial attack. Occasionally it has been longer, and, as is well known, cases have been recorded in which there have been intervals of five, six, or even seven years. It is, however, often difficult to fix the exact time of onset, as this is often insidious, and in many cases the beginnings are not recognized as such, hence the date of onset is too late.

Careful inquiry often shows that Parkinsonism really dates back much further than is supposed. Thus in one patient in whom it was said to have begun in the spring of 1924, I found that slowness had been noticed two years before—in June, 1922—and that he was actually discharged from his work on that account in October, 1922. As a matter of fact, it was the shaking which began in 1924 and led to the diagnosis. His initial attack of encephalitis had evidently been in March, 1921, when he was feverish, drowsy, and had "religious" delirium.

In some cases the interval between the initial attack and the onset of Parkinsonism is said to be one of complete recovery. In my experience that is rare. In most cases the recovery has been anything but complete, and in many there has been a series of changing phases—insomnia, respiratory anomalies, changes in moral character, mental abnormalities, rapid increase in weight, in some polydipsia, neuralgic pains, and so forth. With the onset of Parkinsonism some of these symptoms may persist, modifying the clinical picture, though not an essential part of it.

PARKINSONISM FOLLOWING INJURY.

In two of my cases the Parkinsonian syndrome first showed itself in recognizable form soon after an injury. This is obviously of importance in relation to the question of compensation, and deserves consideration.

The first case which I saw was that of a man aged 45. He was a farmer, and in this case no question of compensation arose. There was no history of previous illness, and no date for the encephalitis could be obtained. In December, 1924, he wounded his right hand. This was followed by an axillary abscess. After this he complained of stiffness in the back, from which he could not get relief. He said that when he turned he turned "all of a piece"! It persisted during the first half of 1925. In July the feeling of stiffness extended to the neck and sialorrhoea was

noticed. Stiffness of the jaws when eating also occurred, so that they became fixed. I saw him in August. He was then a typical case of Parkinsonism, with tremor of the tongue and lips, sialorrhoea of the second degree, marked rigidity of the trunk, slight tremor in the right arm and leg; and "monotone" speech.

In this case the date of infection must remain unknown. It may have been at or subsequent to the date of injury to the right hand. Seeing, however, that there were no symptoms pointing to this, and that as a rule Parkinsonism is delayed until six to twelve months after infection, it seems much more likely that his primary infection was one of those which occurred, unnoticed, during the big outbreak in the first half of 1924. The second case presents no such element of uncertainty.

The patient, a man aged 51, had a definite attack of epidemic encephalitis in March, 1924, with diplopia, insomnia, and, later, lethargy, and was notified at the time. He recovered sufficiently to continue his work as a cutler—a skilled trade requiring sureness of eye and arm—until May, 1925. He then bruised the left thumb, which became septic. This was followed by swollen painful axillary glands. I saw him on September 17th, 1925. The wound had not healed; he presented typical Parkinsonian symptoms, with head bent forward, tremors of tongue, sialorrhoea, unequal pupils, loss of convergence, weakness of left face.

In this case the question of compensation did arise and it was impossible to say that the injury played no part in causing his symptoms. There are several reasons for thinking that it is more than coincidence. Paralysis agitans may follow very soon after an accident. This possibility is mentioned in the textbooks, and I have myself seen more than one such case. Again, in a somewhat similar form of nerve poisoning—namely, syphilis—the frequency of cerebral lesions appearing as the result of trauma is universally recognized.

Finally, some interesting observations have recently been made on cases of encephalitis following vaccination, which may have some bearing on this point. If trauma plays a part at all, it is probably that of unmasking a latent Parkinsonism and precipitating its onset.

PROGNOSIS.

The question of prognosis is one of considerable difficulty. A complete answer to it is still not possible because sufficient time has not yet elapsed to follow most of the cases to their termination. It is, however, now possible to say more than two years ago. Some of the cases progress very rapidly. Two of my cases from the 1924 epidemic died within six months from the onset of Parkinsonism. Others from that and from previous epidemics have died after rather longer periods. The total number of deaths, however, from Parkinsonism has not been large. In a second group the disease has progressed so that the patients have become helpless, and require constant attention. In this stage, however, they seem to remain stationary: their general health keeps good, and the disease does not seem to alter much one way or another. There is a third group in which the condition does not develop into more severe or crippling phases; indeed, it hardly seems to change at all. Weeks and months go by, and the syndrome does not extend its original limits or change its character. Indeed, in some respects they appear to be rather better, probably because with the adaptability of youth they are able to compensate for their partial disability.

One man attending my clinic, a tall powerful fellow in the thirties, had his primary infection in March, 1919. In 1920 he had marked festination and retropulsion. The face and arms, however, were less affected, and there was hardly any bending forward. Now, five years later, he has to a considerable extent overcome the festination by walking slowly and deliberately. He is very clumsy, and if he has to go through a difficult or narrow place, or if he has to hurry, the festinating gait returns at once. In ordinary circumstances, however, it has gone. After five years he has not recovered, but is not in any way worse.

Another patient, a married woman, aged 33, began also in 1919. In her case no part except the face and the right arm has ever been involved. The latter is hypertonic and slower than the left, with definite postural change. This has not increased at all in five years; in fact, she has learned to make the arm more useful, and it does not inconvenience her so much.

It is clear, then, that the condition may remain stationary for long periods. But in arriving at a prognosis in any individual case it must be remembered that, besides these stationary cases, instances do occur in which temporary improvement may take place of a surprising

character, even in patients who have been bedridden and helpless for long periods. I am not here referring to the condition known as "kinesia paradoxa," with which everyone who has seen many of these cases is familiar. Striking examples of this momentary alertness and agility of patients whose habitual slowness of action is extreme have been frequently quoted in the literature.

Among my cases a man with extreme rigidity and marked tremor, who can only shuffle along, will suddenly go off with a "hop, skip, and jump" for a few yards, as agile as a boy. Directly afterwards he returns to his Parkinsonian shackles. A youth with a similar advanced condition was one day persuaded to bathe in the sea; on coming out of the water he sprinted along the beach to his mother as well as ever he did in his life, only to relapse into his previous state when he reached her.

The periods of improvement to which I wish to call attention, although not so sudden in onset or so dramatic in character, are surprising in extent, and last, at any rate, for a considerable time.

TREATMENT.

Hyoscine.

In 1901 Erb first pointed out that hyoscine hydrobromide (scopolamine) has a definite effect in relieving the rigidity in paralysis agitans, and since then it has been frequently used for that purpose. More recently various observers have recorded its value in cases of post-encephalitic Parkinsonism. In a certain number of cases it produces quite definite and even marked improvement.

Hohman¹ has reported its effects in eighteen cases under his care; he made three groups, according to whether the improvement was slight, definite, or marked. Of the 18 cases, in 6 the results were slight, in 5 definite, and in 7 marked. As indicative of "marked improvement" he mentions "return to work after months of invalidism, and ability to attend to personal wants after being bedridden and helpless." Unfortunately there is no statement in his paper of the length of time over which these observations continued.

Personally I have tried it in a few cases, and in one or two the improvement has been quite definite. Probably my lack of success in other cases has been due to giving insufficient doses, for I have felt somewhat reluctant to prescribe considerable quantities of this powerful drug to out-patients seen only once a week, or perhaps even less often. Had I seen Hohman's encouraging paper earlier I might have been bolder, and more successful.

Belladonna.

That it is possible to obtain results from the administration of belladonna, in cases of Parkinsonism, has been known for some time, but perhaps insufficiently emphasized. I began to give it at first in order to check troublesome sialorrhoea, and for some time found it rather disappointing in this respect.

About six months ago it occurred to me that the doses were too small: 10, 20, or even 30 minims of the tincture were therefore given thrice daily. With these doses the sialorrhoea in some of the cases was considerably relieved, but much more striking than this was the improvement in the patients' general condition. They were obviously much more alert.

It was then tried systematically on a number of Parkinsonian patients, quite irrespective of whether they had sialorrhoea or no. The results were briefly as follows:

Out of 19 cases, 6 did not benefit at all; 3 stated they felt better, but there was little definite objective confirmation of this; in 10, however, there was no question about the improvement. In some of these the change was astonishing.

One, a youth aged 17, who had begun in March, 1924, with a most violent epileptiform and myoclonic onset, of long duration, developed Parkinsonism about six months later, with severe "drooling" of saliva. He had not washed, dressed, or fed himself without assistance for several months. Tincture of belladonna, 45 minims daily, was begun on September 16th, 1925. When he came to hospital a week later the salivation had stopped, and he was bright and alert. His mother said that he had begun to wash and dress himself. Now, three months later, although, of course, still a very obvious case of Parkinsonism, the salivation has not returned, and the improved condition persists.

A second youth, of about the same age, began similarly, with an extremely severe insomnia choreiform phase, and developed generalized Parkinsonism within a few months. He lost flesh rapidly, and became completely helpless. In the summer of 1925 he was in hospital, where he was bedridden, had to be fed, and could not stand up without support. After a few weeks he was discharged from hospital in the same helpless condition. He was brought to the out-patient clinic from time to time in an ambulance, and wheeled into the room. Tincture of belladonna was begun on October 14th, 1925, and the following week he walked into the clinic, having come by train and tram from his home—about eighteen miles away. Two months later he was still better. He now does everything for himself, chops the sticks, and helps his mother in household work every day.

Other records are briefly as follows:

Male, aged 29. After treatment with tincture of belladonna, 30 minims a day, began to wash and dress himself; he no longer requires helping with his meals. Two months later the improvement was maintained on the same dose.

Male, aged 30. Received 45 minims of tincture of belladonna daily. Salivation less; feels more brisk and lively; not so drowsy. Feels quicker in action.

Female, aged 15. Given 15 minims of tincture of belladonna daily. Not so tired; less saliva; now able to wash and dress herself; washes pots and helps in household.

Female, aged 25. After treatment with tincture of belladonna, 45 minims daily, showed great improvement: dresses and washes herself; walks better. Two months since treatment was begun. Later, this patient had a relapse. She was a 1920 case, and had recently been losing flesh rapidly.

In addition to these cases I may quote from two letters received from medical men with regard to advanced Parkinsonian cases under their care in whom belladonna has been tried at my suggestion.

The first case was that of a married woman, who had her primary attack of encephalitis in April, 1919. Parkinsonism was first noticed three years later. Although not actually bedridden, she was able to do very little, and was soon exhausted. She was put on tincture of belladonna about October 20th, 1925. On November 26th the doctor writes as follows: "Mrs. X has been on belladonna since you saw her. I pushed it up to 25 minims, but this was more than she could tolerate, and she is now having 20 minims thrice daily. The effect has been more than one could have possibly hoped for. . . . The other day she went a walk of about three and a half miles, and although very tired came home smiling and tremendously pleased with herself."

The second case was in a young single woman, of the 1924 outbreak. She could hardly stand by herself, and had to be assisted in washing, dressing, or feeding. The doctor writes: "M. has made a great deal of progress. She has even walked three miles. It is hard work to sound a note of warning to the very delighted parents."

It is obvious that a large part of this improvement is due to something more than the mere action of belladonna. In all these Parkinsonian cases the "functional" element is pronounced and "suggestion" is potent. But there are many facts which indicate that in most of these cases suggestion has not been the starting point of their improvement. Thus, at my clinic, nothing was said in the first instance to the out-patients about the virtues of the "new medicine" for the simple reason that these were quite unanticipated by the prescriber. Many drugs had been tried during the previous months without any benefit whatever, and a mere change of medicine was nothing new. Secondly, in the case of Mrs. X quoted above, the factor of personal suggestion, so far from acting favourably, rather did the opposite. The patient asked me at our interview some very pointed questions about her prospect of recovery, and I was obliged to answer them, which evidently depressed her considerably, and as the immediate result of my visit she was worse than ever. But the most convincing evidence that this is not primarily due to suggestion came from a quite independent and outside source. A few weeks ago I was asked by the representative of a large manufacturing concern to examine and report on one of their head managers, who had been off work ill for some months. He had been diagnosed as a case of neurasthenia until two weeks before, when he had consulted a leading neurologist in the district where he lived, who had recognized that it was post-encephalitic Parkinsonism. The representative, though not a medical man, gave a description so characteristic as to be easily recognizable. He said the patient was bent over, imitated the posture of his arms, and mentioned the shuffling gait, salivation, and extreme slowness. Next week the man was brought to see me. At first sight it seemed as though there must be some mistake. There was a well set-up, straight, active-

looking man without any postural changes at all. On examining him carefully, however, there were evident stigmata of his condition—a slightly tremulous tongue and lips, a suspicion of too fixed a gaze, and so forth, but everything was minimal. He said that this surprising change had begun within a few days of taking the medicine ordered by the neurologist; that for the first time for some months he had ceased to have the feeling of being "tied up by his muscles," that he could move them freely, and that, two days before, he had walked ten miles! The prescription contained three ingredients—chloral hydrate, tincture of hyoscyamus, and tincture of belladonna. It is possible that the good effects may have arisen from the hyoscyamus, and not from the belladonna. The doses were small, about six minims of each. My previous experience with the latter, however, makes me feel sure that, even in such doses, it is quite capable of producing the result by itself, and of the three ingredients was probably the chief agent.

In thus laying stress on the effects of belladonna it must be admitted that the bulk of the improvement is something inherent in the patient's nervous system—an auto-suggestion set going by a feeling of release from some constant oppression. In these cases the oppression is described by the patients as the effort required to perform any action. Directly even the slightest relief is felt from that a condition of "euphoria" is produced, which extends its beneficent influence over every part. This soon leads to the disappearance of that great mass of functional symptoms which often, in these cases, mask the extent of the real disorder. One is familiar with a similar course of events in many purely psychasthenic cases. Once a start can be made and a definite sense of improvement in one factor obtained, the reaction of the patient's own nervous system continues the process at compound interest—a circle not "vicious," but turned to a good purpose.

The difficulty in cases of Parkinsonism is to obtain the initial change, because here we have a very definite substratum of organic disease in which mechanical factors are involved. Belladonna, by acting in some way on some part of the neuro-muscular arc which is being over-stimulated in the Parkinsonian patients, relieves the hypertonia, allows the muscles to be used with less effort, and the higher centres do the rest.

That belladonna can act in this way is not remarkable if hyoscyne can do so. Both drugs belong to the atropine group, and have many pharmacological actions in common. Theoretically, the advantage should be with atropine, seeing that it has not the same tendency to a sedative action on the higher centres as hyoscyne. Possibly some combination of atropine and hyoscyne may be found to be more useful than either drug alone. My own experience in that direction, however, does not favour such a view. One of the cases in which belladonna failed signally found relief, both before and since, from hyoscyne.

Many points of interest arise in connexion with this action of the atropine group. How long can it be maintained? How can its effects be prolonged? Is the prognosis better in those cases which respond well than in those which do not?

There is also the question why some cases in whom the hypertonus seems equally well marked do not respond at all. It is interesting to note that in Hohman's series of cases treated by hyoscyne a certain number responded only slightly. Szyska² has recorded successful results with atropine pills, given for periods of three to six days, then a two to three day interval. Very large doses may be required and tolerated.

Before concluding, some reference must be made to cases recorded from time to time in which apparently considerable improvement follows divers forms of treatment. Thus, intrathecal injections of the patient's own serum are from time to time recorded as proving temporarily useful, also various forms of mechanical therapeutics are sometimes of benefit. It is, of course, possible that in any or all of these procedures some relaxation of the hypertonus may be brought about, as effective as when the atropine group is used. Our knowledge of the exact pathological process at

work is so slight that it would be foolish to deny such a possibility.

It is, however, rather more difficult to eliminate the factor of suggestion from without in any form of treatment which involves active intervention or daily personal influence. The very fact of a lumbar puncture being performed is in itself a powerful factor of suggestion. We are all familiar with Hutchison's "chronic abdominal woman" who recovers completely for a few weeks after each successive laparotomy!

Whilst, therefore, not for a moment denying the possibility that other methods may give as much relief as the administration of the atropine group, it seems possible that the former act more directly upon the reduced mental energy of the Parkinsonian patient, whilst in the latter the approach to the patient's higher centres is through the relief given to their neuro-muscular apparatus, and is indirect. Pharmacologically, the atropine group is said to have little or no effect on voluntary muscle. Whilst this may be true in normal conditions, it is not necessarily so when these are pathological.

There is no evidence that the actual lesion is in any way affected in its condition or progress by administering these drugs. Meanwhile, amidst all that is so dark and sombre in this disease, any measure that will give even temporary relief is worth our attention.

REFERENCES.

¹ *Bull. Johns Hopkins Hosp.*, 1924, xxxv, 335. ² *Münch. med. Woch.*, 1923, lxx, 47.

An Address

ON

INTESTINAL DIVERTICULA.

DELIVERED BEFORE THE MANCHESTER CLINICAL SOCIETY

BY

E. I. SPRIGGS, M.D., F.R.C.P., AND O. A. MARXER,

SENIOR PHYSICIAN,

RADIOLOGIST,

RUTHIN CASTLE (DUFF HOUSE), NORTH WALES.

(With Special Plate.)

DIVERTICULA, or accessory pouches of the intestine, have been noted occasionally by pathologists from the eighteenth century onwards. In recent years we have become familiar with the condition known as diverticulitis, which is due to inflammation extending from the multiple colic diverticula to the wall of the bowel and surrounding parts. This was described in this country by Sir Berkeley Moynihan¹ eighteen years ago, and has been exhaustively studied by Dr. Maxwell Telling.² More recently the development of accurate radiology has made it possible to recognize diverticula in the course of a routine examination of the alimentary canal. A good many records have been published, including two short papers of our own some five years ago³; but in most of these the association of diverticula with symptoms has either not been recognized or has received but little attention.

Some years ago I suggested that the term "diverticulosis" be used to embrace all phases of the disease, and particularly the existence of diverticula before gross inflammatory phenomena have involved surrounding tissues and given rise to the clinical signs of diverticulitis. Since then my colleague, Mr. Marxer, has been able to show that in the colon the outset of the disease can often be recognized before the little pouches have formed. This we call the prediverticular state. The nomenclature we adopt may, therefore, be set forth as follows:

I. Prediverticular state (in colon)	} Diverticulosis.
II. Quiescent diverticulosis	
III. Diverticulitis	

Each stage passes by gradations into the next; indeed, all the stages may be present in the same patient.

Our investigations have brought out three points. The first is that diverticulosis is much commoner than has been recognized hitherto. The second is that it is frequently associated with symptoms. The third point is that, contrary to the conclusions of nearly all writers on the subject, these symptoms are frequently amenable to treatment.