The Splenic Angle.—The diagonal incision already described is very useful here, as it gives excellent exposure of the angle and allows the colon to be easily freed. It is very necessary to free the colon thoroughly to get the ends to come comfortably together. Care has to be taken in freeing the angle itself not to damage the lower part of the spleen, which is in very close contact, or the kidney and pancreas, which are close behind it. Some of the best results I have seen have been in cases of resection of the splenic angle. I removed a carcinoma of the splenic angle in a jockey eleven years ago, and this year he won one of the classical races.

The Pelvic Colon.—This is the commonest situation, and more than half the cases of resection are included in this area of the colon. Much depends upon the part of the pelvic colon involved. If it is in the descending colon, or upper part of the pelvic colon, the resection should not be difficult. Greater difficulty, however, occurs when the lower part of the pelvic colon is involved. In all cases the outer layer of the pelvic mesentery should be divided near its base for a considerable distance and the bowel carefully stripped up so as to free it well from the left iliac fossa. There are no vessels entering the mesentery at the outer aspect, so that free stripping is quite safe, and considerable mobilization of the colon can thus be obtained. The chief difficulty arises with cases of diverticulitis, as there are frequently dense adhesions to other structures, more particularly the bladder in males, and the uterus or left tube in females. It is very important to interfere as little as possible with adhesions in cases of diverticulitis, as serious sepsis may be lighted up. On the other hand, the condition is not malignant, and excision should be carried out when possible, even though parts of other organs have to be sacrificed. I have on several occasions removed the whole uterus and left tube and resected portions of the small gut in order to remove tumours due to diverticulitis. If the bladder is extensively involved excision is, of course, out of the question.

The Lower End of the Pelvic Colon.—For two reasons this is the most difficult situation. The first is that there is often not enough healthy bowel below the tumour to allow of a proper resection, or the bowel is so short that the resection has to take place within the abdominal cavity. The second, and more serious, difficulty is that the blood supply to the upper part of the rectum is liable to be gravely interfered with if a portion of the pelvic colon immediately above has to be removed. The surgeon may be faced with serious difficulty in deciding what he should do. One alternative is to make a complete abdomino-perineal excision, leaving a permanent colostomy of the upper end, and this may be the only procedure possible when the growth is low down in the pelvis, but still excisable. Another alternative is the tube method, which was described by me in 1908; the principle of this is that after removing the tumour a long rubber tube of large calibre is sewn into the upper end of the bowel, and then passed down through the rectum and out of the anus. The tube is then drawn on until the upper bowel is lightly invaginated into the upper end of the rectum and is secured there by a few stitches. This method gives very good results, but it is decidedly dangerous owing to the fact that the blood supply to the rectum cannot be relied upon. If this method has to be used the surgeon must be certain that he is not seriously damaging the blood supply to the rectum, which will depend entirely on the two lower sigmoid arteries. In view of this doubt good drainage should be provided from behind, and a temporary caecostomy or colostomy performed.

The results of colectomy are good both from the point of view of immediate risk and from that of restoration of function. The mortality from operation is about 16 per cent., but this is counting many of the older cases and can certainly be reduced much below this figure. The following table shows the mortality following colectomy (53 cases) and the condition for which the operation was performed.

	Cases.			Deaths.		
Cancer	41	...	...	7	...	...
Diverticulitis	9	...	...	2	...	...
Chronic volvulus	3	...	...	0	...	...

There must always be some risk as the patients are not only old, but often in a bad state of health from partial obstruction and dyspepsia over long periods, which cannot be entirely compensated for by the preparatory treatment. Also colectomy carries with it a fairly high risk of post-operative infarct. The risks are not serious when we consider the grave nature of the lesions for which the operation is done.

It is now quite exceptional to have any faecal fistula after partial colectomy. As a rule the wound heals by first intention and the patient is up in under three weeks quite healed. The restoration of function is perfect, as the loss of a few inches of colon causes no inconvenience. When performed for cancer this operation gives the best results of all cancer operations, as there is no mutilation or limitation of normal function, and the tendency to subsequent recurrence is very low.

REFERENCE.
1 BRITISH MEDICAL JOURNAL, 1927, i, 1.

Notes

ON

JUVENILE RHEUMATISM:

BEING A COMPARISON OF THE REPORTS OF THE BRITISH MEDICAL ASSOCIATION AND THE MEDICAL RESEARCH COUNCIL.

BY

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IN July, 1926, there appeared the first report of the British Medical Association Committee of Inquiry into Rheumatic Heart Disease in Children.¹ It dealt with four important aspects of the problem of juvenile rheumatism, of which I am now chiefly concerned with two—namely, the "Environmental and other Predisposing Causes of Rheumatic Infection," and the "Effect of Tonsillectomy on Rheumatic Infection in Children."

In March, 1927, the Medical Research Council published a report² on "Social Conditions and Acute Rheumatism," one of a series of "Child Life Investigations." As the title implies, this dealt with some of the same questions as those parts of the B.M.A. Report already mentioned.

It is the purpose of this communication to examine these two reports where they overlap and to compare their results. This has not yet been attempted: the reports made no mention of each other, and indeed were drawn up by entirely different committees and based on investigations undertaken altogether separately from each other. Both sets of investigations were prolonged and widespread, consequently where agreement is found in the two reports there is a considerable weight of evidence in favour of the result reached.

In April, 1927, the B.M.A. Committee issued a second report,³ with which I am not here directly concerned.

The chief points of contact between the two reports here to be considered are six in number. On four of them it may fairly be claimed that agreement is shown; these relate to the influence of (1) social status, (2) heredity, (3) school environment, and (4) tonsillar disease and tonsillectomy. In the remaining two questions, those of the influence of (5) contagion and (6) damp dwellings, agreement appears to be lacking.

1. The Influence of Social Status.

In this matter the B.M.A. Report made two points—namely, that rheumatic infection is far more common in the poorer classes than in the well-to-do; but that, on the other hand, the incidence of the disease was less in the lower than in the upper strata of the poorer classes. With both these views the M.R.C. Report agrees. On the first point Dr. G. F. Still gives valuable figures (p. 7):

"In the Children's Out-patient Department of King's College Hospital, where only children up to 10 years of age are treated, there were, amongst 1,000 consecutive cases, 229 children between 6 and 10 years old: out of these 229 cases, 13.1 per cent. showed

evidence of acute rheumatism (3.5 per cent. joint symptoms and the rest heart affection or chorea). In a private practice dealing almost exclusively with the well-to-do, there were, amongst 700 consecutive cases between the ages of 6 and 10 years, 5 cases of acute rheumatism (2 of joint affection, 2 of endocarditis, and 1 of chorea), so that less than 1 per cent. (0.7 per cent.) showed evidence of rheumatism."

On the second point, the lessened prevalence amongst the poorest children, the M.R.C. Report states (p. 95):

"if the hospital patients are divided into three classes according to the degree of poverty, the poorest of these three, the very poor and destitute, show a lower incidence of rheumatism than the other two."

It may therefore be held to be established that juvenile rheumatism is a disease of the poor, but not particularly of the poorest.

2. The Influence of Heredity.

The B.M.A. Report examined the evidence which had been recently published on this point and tended to the conclusion that the influence of heredity on the large-scale production of the disease was less potent than many had been inclined to think. On page 7 the following occurs:

"Figures such as these cannot be ignored, but it is difficult to know precisely what importance to lay upon the hereditary factor. In the first place, rheumatism is a very common disease, and it is concentrated in the families of the poorer classes; thus in any case it is bound to appear frequently in the families of rheumatic children. Again, if strictly environmental causes are of great importance, it must be remembered that in most instances they will operate alike on the family and the patient."

"The point at issue is this: Does the hereditary and family tendency swamp the environmental factors at work in producing the disease? Taken at their face value, the figures quoted above might suggest that this is so, but I doubt if they justify a conclusion more definite than that perhaps the hereditary influence aids and abets the environmental influence."

The M.R.C. Report, after sifting its evidence carefully, concludes (p. 95) that "no sufficient evidence of heredity was forthcoming."

It is satisfactory that there is found to be so close an agreement on this matter, which is clearly of great importance in the problem of the prevention of the infection.

3. The Influence of School Environment.

The B.M.A. Committee used the term "school environment" in a broad sense, meaning the circumstances of a child living at home and undergoing compulsory education at a day elementary school. It is in this sense that the term is used here. The opinion of the B.M.A. Committee was to the effect that in the production of rheumatism the influence of the child's home was greater than that of its school; but that, on the other hand, attendance at school had an important influence on increasing the severity of the infection in rheumatic children, thus favouring heart disease. The view of the Committee is, perhaps, best summarized in its *second* report (p. 122).

The M.R.C. Report brought forward novel and important evidence on this question by comparing the prevalence of rheumatic infection in day elementary schools with that in Poor Law institutions. The incidence of the disease in the latter was found to be almost abolished.

Four Poor Law institutions, in reality residential schools, were examined. In one the children lived in "barrack" schools housing a large number in each; in the others they lived in houses, or so-called "cottages," housing twelve to fifty children each, living under a "foster-mother." The total number of children in residence was over 1,800. They went out for their education, presumably like the boys of a large public school.

Thus it is seen that this comparison appears to throw the emphasis back again on to the "home" as opposed to the "school" itself, for this evidence points to the conclusion that children taken from the rheumatic stratum of society escaped the disease if transferred to a school which they attended from healthy "home" surroundings.

4. The Influence of Tonsillar Disease and Tonsillectomy.

Tonsillar Disease.—In common with the results of previous investigations both reports found a high incidence of diseased tonsils in rheumatic children. The figures reached in both reports were closely similar. The B.M.A. Report (p. 16) found diseased tonsils in 83 per cent. of cases in

active stages, and in 73 per cent. of those seen in quiescent stages. The M.R.C. Report (p. 99) gave 75 per cent. as the proportion of rheumatic children showing unhealthy throats, as compared with 55 per cent. in non-rheumatic hospital children. It also made another interesting observation—namely, that in the Poor Law institutions in which the incidence of rheumatism was conspicuously low, the percentage of children showing unhealthy throats was down to 36.5. The agreement here is therefore particularly close.

Tonsillectomy.—The influence of the complete removal of diseased tonsils in rheumatic children was investigated by the B.M.A. Committee, and the conclusion reached (p. 4) was that their inquiry

"suggests that in the child whose tonsils have been completely removed a milder type of rheumatic infection in which the cardiac lesions are relatively light is likely to be seen."

This opinion was based on investigations detailed in Part III of the Report (pp. 16-20), where the attempt was made to establish three propositions: (1) that the clearest estimate of the value of tonsillectomy in juvenile rheumatism was to be obtained, not by a "follow-up" method, but by a study of active rheumatism in tonsillectomized children; (2) that, if this were done, it would be found that in such cases the rheumatism was of a type milder than the ordinary, the heart being conspicuously spared; (3) that the commonest manifestation of any severity in tonsillectomized cases was chorea, and that this tended to be "uncomplicated" by heart disease.

The M.R.C. Report did not directly address itself to the important question of the influence of tonsillectomy, but one set of the figures published in it was so strongly confirmatory of the conclusions referred to above that it must here be mentioned. The Report (p. 40) says:

"It is curious to note the preponderance of attack by chorea over other forms of rheumatic manifestation in those 60 cases whose tonsils had been removed. 66.7 per cent. of those who developed a first attack of rheumatism some time after removal of the tonsils had it in the form of chorea, and of these all but 4 had no other manifestation of the disease."

These figures are noteworthy as they represent the largest series yet published of cases of chorea in tonsillectomized children, and that 40 such cases can be quoted in which no fewer than 36 showed no other manifestation of the infection is an important observation. The comment made in the M.R.C. Report on these figures is merely that they "suggest that removal of the tonsils affords no protection against attack by chorea"; but surely the significant conclusion to be drawn from them is that of the modifying influence of the operation on the severity of the infection.

Thus on the two points of the preponderance of chorea and the comparative absence of carditis in the rheumatism of tonsillectomized children, the M.R.C. Report appears to offer important evidence confirming the conclusions of the first B.M.A. Report.

On the curious frequency of chorea as the manifestation of rheumatic infection in tonsillectomized children, Carey Coombs has recently written⁴:

"Now, chorea is the most easily excited of all the rheumatic phenomena. It takes a smaller dose of infection to upset the brain than it does to inflame the heart or joints, or to call into being a subcutaneous node. Chorea is more often met with as a solitary manifestation of rheumatic infection than any of the others."

Since this was written the figures quoted above have appeared in the M.R.C. Report. It may be hoped that they will help to oust juvenile rheumatism from its proud position of being the only relapsing or chronic infection closely associated with tonsillar disease in which it is thought desirable to retain unhealthy tonsils *in situ*.

5. The Influence of Contagion.

Passing to the first of the two subjects on which the two reports fail to confirm each other's results, the possible influence of contagion in spreading the disease has been most seriously considered in the M.R.C. Report. The subject is introduced thus (p. 8):

"The question of most practical importance is whether rheumatism is infectious, and, if so, whether it is carried by persons, by fomites, by dwellings, or in any other preventable way. . . . Most of the statistics and observations contained in this Report are directed especially to the solving of these problems. . . ."

Much space was given, in the Report itself and in three appendices, to the sifting of evidence on this point. The results obtained were summarized on page 98 as follows:

"On the whole, while it cannot be said that there is, in the facts collected, any conclusive evidence of contagion, many of them are consistent with this view."

There was contained in the Report much more argument on the matter than can be quoted here, and the general impression left on the reader's mind is that on the influence of contagion the verdict of the Report was one of "not proven" rather than "not guilty."

On the other hand, the B.M.A. first Report, although specially concerned with the question of the mass-production of the disease, made scant reference to the possibility of its spread by contagion. In the Preface, expressing the views of the Committee as a whole, such a possibility remained entirely unmentioned. In the section (Part I) devoted to the "Environmental and other Predisposing Causes of Rheumatic Infection," for which I was responsible, the only mention made of this matter was (p. 7):

"All the evidence points against the importance of this factor (direct contagion), although everyone has from time to time seen two cases arising synchronously or close together in a family. Probably we should liken rheumatism in this respect to pneumonia or appendicitis rather than to tuberculosis. . . ." (p. 9): "Direct infection from one case to another is of no practical importance."

Should the theory that infection from case to case plays any real part in the production of juvenile rheumatism on a large scale be accepted, the whole of our treatment of the disease will require alteration. It is therefore of great importance that we should not be persuaded to drift into agreement with such a conjecture. For this reason the following considerations which weigh against such a view are submitted here.

(a) We have already seen with what purpose the M.R.C. investigations were undertaken, and the negative character of the evidence elicited in the study of cases of rheumatism amongst the poor in their own homes. A further study of the few cases which arose in Poor Law institutions was made, with the result that "no evidence of 'infection' from one case to another could be found in any of the schools visited" (p. 84).

(b) The fact that although rheumatism is a disease of the children of the poor it is less common in the poorest than in the stratum above them, shows clearly that overcrowding is not a factor of prime importance in the production of the disease. This peculiar class incidence is admitted in the M.R.C. Report; its significance against the theory of contagion is hardly faced.

(c) In hospitals the disease is not seen to spread. This fact of universal experience is not mentioned in the M.R.C. Report, so far as I can ascertain.

(d) The theory of possible contagion is apparently attractive to those who are now beginning to study rheumatism from the standpoint of public health; it is important, therefore, to state candidly that there is no such tradition on the side of clinical medicine. The B.M.A. Committee which issued the first Report was composed entirely of hospital physicians experienced in the rheumatism of children, and they passed the possibility of contagion over as of no practical importance. In this they were at one with hundreds of other physicians up and down the country. Is it likely that for years they have been studying a disease which is really infectious and they did not know it? If it may be said without impropriety, the interest in the disease at St. Mary's Hospital has always been particularly keen, as becomes the school of Sibson, Broadbent, Cheadle, Lees, Poynton, Paine, Symes, Coombs, and others: we know nothing of its infectious nature there.

(e) There is one further point: that a theory of contagion is against all the modern bacteriological conception of the disease. The discussion of this in Part II of the B.M.A. Report is to the effect that the bacteriological problem has swung away from the difficulty of accepting a streptococcus as the causative micro-organism, to the difficulty of understanding how an apparently normal inhabitant of the digestive tract can take on such a definite pathogenic role. If this be so, the part played by contagion must be at most of the slightest importance,

analogous, as has been quoted above, to such a possibility in pneumonia and appendicitis. It may seem unmannerly to suggest that in scientific matters there are such things as fashions, but to many of us specially interested in rheumatic problems the persistent reiteration that we know nothing of the causative agent of rheumatism, nor even if it be an infection at all, seems little other than a fashion and a fatigue. To write as though the researches of Poynton and Paine had taught us nothing and pointed nowhere, seems as inaccurate as to suggest that the present efforts being made against juvenile rheumatism are not in reality the outcome of Poynton's many years of pioneer work and teaching.

6. The Influence of Damp Dwellings.

The first B.M.A. Report expressed the opinion that living in damp houses predisposed children to the rheumatic infection, and regarded this as an important factor in causing so much of the disease in this country. As the evidence in favour of this view has been summarized in the Appendix to their second Report³ it is not necessary to restate it here, except to say that the world distribution of rheumatism and its seasonal incidence in England make it almost impossible to conceive that cold and damp should be factors of no importance.

The M.R.C. Report, on the other hand, states (p. 96):

"The housing inquiry threw but little light on the problem; dampness which has generally been credited with playing a large part in the causation of rheumatism was only slightly more frequent in the houses of the rheumatic families than in those of the others."

The material investigated for the M.R.C. Report consisted of the following (p. 10):

	Rheumatic.	Controls.
Hospital for Sick Children, London	121 cases	None.
Royal Hospital for Sick Children, Glasgow	200 ..	100 cases
St. Thomas's Hospital, London	400 ..	100 ..

The results obtained in investigating the housing conditions of the rheumatic and "control" families were:

	Rheumatic.	Control Families.
Hospital for Sick Children, London (p. 73)	30.0% damp	—
Royal Hospital for Sick Children, Glasgow (p. 73)	33.5% ..	23% damp
St. Thomas's Hospital, London (p. 75)	39.8% ..	33% ..

Of the differences in the proportions of damp houses in the two sets of controlled figures, the Glasgow figures were said to be "probably significant" (p. 73), and the St. Thomas's figures to be "not significant" (p. 75).

The B.M.A. investigators made no attempt to deal with the difficult subject of what can be properly taken as rheumatic "controls," and contented themselves with reporting the proportion of rheumatic children who were, when first attacked by the infection, living in damp houses. The M.R.C. Report, on the other hand, dealt with the housing conditions in 200 control families, as we have seen, and it thus becomes necessary to deal with the reliability of the "controls" used. The figures produced in the M.R.C. Report illustrating the influence of damp appear open to criticism on four grounds.

1. The "control children" were "selected at random except as regards age and freedom from suspicion of rheumatic disease" (p. 11). It may readily be accepted that such children were apparently suitable for use as controls, yet when it is found that no less than 55 per cent. of them had unhealthy tonsils (p. 99) we see that, even in such a seemingly simple test as this, we are in difficulties in the matter of the material for "control" observations. With such a proportion of diseased throats who can tell what number of the children would develop rheumatism? This probability shows one of the difficulties in attempting any accurate control observations.

2. But with the "control families" there is in the M.R.C. figures a large element of error, for the so-called "control families" are by no means "non-rheumatic families." They are defined as follows (p. 9):

"These families were selected only in the respect that each contained a child attending the hospital for a non-rheumatic disease, and will be termed 'control families.'"

When the figures are examined it is found (Table 8, p. 16) that in the 200 "control families" there were 43 cases of rheumatism, apparently spread over (p. 18) at least 36 of the families. That these were not unimportant instances of previous rheumatism occurring in parents is shown by the following passage (p. 18):

"The difference in the incidence of rheumatism among the brothers and sisters of the rheumatic and control children respectively is striking, the percentage of those with rheumatism in the rheumatic families in the data from St. Thomas's Hospital being almost three times greater than that of the control families. . . ."

In view of these facts it can only be said that the so-called "control families" are not acceptable as controls. Any influence which the housing factor may have on the production of rheumatism would be, in such comparisons, considerably diluted by the presence of rheumatic families in the "control families."

3. There is no evidence in the M.R.C. Report that the housing conditions examined were those in which the disease first declared itself in the children.

4. The proportion of damp homes is much lower in the M.R.C. figures than in those of the B.M.A. Report. This is probably due to the use of a different standard of "damp," and as there appears to be no generally accepted standard such differences in separate investigations will be bound to occur.

That the M.R.C. Report was unable to confirm the traditional association between rheumatic infection and damp houses is regrettable, but, considering the type of "controls" used and the stress laid on them, it is hardly surprising. Yet there is this to be said, that even with the controls used the figures concerning the influences of damp homes, proximity to water, low-lying sites, terrace houses as opposed to tenement houses were in every case in favour of damp being a factor, though showing only small differences in the rheumatic and in the "control" series. This is surely of significance, for were there nothing in the theory of damp, the figures would hardly be likely all to point one way.

Further, there is the new evidence, already quoted from the M.R.C. Report, on the absence of rheumatism in such children of the rheumatic stratum as are moved from their own homes and placed in Poor Law residential schools. This is of great significance, for what has happened to these children to prevent their developing rheumatism? It might be thought that by their removal they had escaped from poorer food and clothing, and greater overcrowding; but these do not produce rheumatism, for the disease is less common in the poorest of the poor than in the strata of poverty above them. Again, they might be spared the disease by escaping from contact with other cases; but rheumatism is not a contagious disease. What, then, has happened? What factor, big enough to account for such a great change, has been altered? Is there any other left as likely as the condition of the house?

REFERENCES.

- ¹ BRITISH MEDICAL JOURNAL, 1926, ii, SUPPLEMENT, p. 1.
- ² Medical Research Council. Special Report Series No. 114.
- ³ BRITISH MEDICAL JOURNAL, 1927, i, SUPPLEMENT, p. 121.
- ⁴ Coombs, C. F.: *Lancet*, 1927, i, 634.

A REVIEW OF 1,000 CASES OF ASTHMA.

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THESE cases were seen between May, 1922, and the end of 1926, subsequently to the 270 cases the statistics of which I published in conjunction with the late Dr. Latham.

An etiological classification is still quite impossible, but cases reviewed in large numbers do tend to group themselves into more or less clearly defined types, differentiated by the prominence of some symptom or causal factor. Any one case may fall into several of the following types:

1. The type sensitive to foreign proteins.
2. The non-sensitive type.
3. The type that has asthma with colds.
4. The type that has asthma with enlarged tonsils.
5. The type that has asthma with catarrh.
6. The type having also paroxysmal rhinitis.
7. The colloido-clasic type.
8. The periodic type.
9. The type caused by bronchitis.
10. The type that also has a high blood pressure.
11. The type that has eczema.
12. The Adam's week-end type.
13. The seasonal type.
14. The type that is identified with localities.
15. The type that has asthma from severe shocks.
16. The occupational type.
17. The type sensitive to aspirin.

Type 1.—Many cases of asthma and similar complaints are due to an anaphylaxis comparable to the experimental anaphylaxis in animals. I am more than ever convinced of the value of the dermal reactions, and I have treated many patients successfully by this method. Reactions to wheat, milk, egg, dog hair, and cat hair have each led to many cases being freed from asthma without any other treatment than that based on these observations. A patient who had had asthma continuously for thirty-five years has now been entirely free for three years, after giving up his feather bed and pillows as a result of a small plus one reaction to feathers.

Statistics of Sensitization in 1,000 Cases of Asthma.

Age of Onset.	No. of Cases.	Percentage.	No. Sensitive.	Percentage.	Horse.	Cat.	Dog.	Other Animals.	Feathers.	Foods.	Pollen.
0-5	298	29.8	238	80	120	89	64	44	151	114	63
5-10	113	11.3	96	88	44	39	16	17	57	35	28
10-15	64	6.4	44	68	18	13	14	14	28	27	15
15-20	61	6.1	37	61	18	13	10	5	22	14	15
20-25	70	7.0	34	48	7	9	7	8	20	17	9
25-30	81	8.1	48	60	14	14	5	8	39	11	11
30-35	77	7.7	31	40	8	6	8	5	19	12	8
35-40	64	6.4	29	45	5	4	6	4	22	13	6
40-45	53	5.3	15	28	2	5	4	2	11	5	—
45-50	40	4.0	9	24	2	1	—	1	4	2	1
50-55	35	3.5	4	11	—	—	—	—	3	3	—
55-60	24	2.4	3	12	—	—	1	1	1	—	—
Over 60	20	2.0	1	5	—	—	—	—	1	—	—

The chief points to be noted in this table are these. Asthma commences far more commonly in babyhood and early childhood than at any other time, and the great majority of such cases belong to the sensitive type. The incidence falls steadily with increasing years, except for a small rise between the years of 25 and 30. At this age lack of exercise and frequent colds may force an incipient asthma to show itself.

The average duration of asthma in these 1,000 patients was fourteen years. I saw 539 males and 461 females; 52 per cent. of them gave a history of asthma or hay fever in their near relatives.

Beyond the fact that I am now obtaining more reactions (58 per cent.) than formerly, the figures show very little change from previous statistics. The increase in the number of cases found to be sensitive is due to the much larger range of proteins I now use for testing—some 180 in all. I use six different kinds of feathers—hen, goose, duck, pigeon, canary, and parrot—where formerly I had only one. The specificity of the reaction is so well marked that patients may react to one of these and not to