

the pericardial sac were 19 oz. of straw-coloured fluid. The parietal layer of pericardium was adherent to the left lung, and the visceral layer was covered with organized fibrin, especially at the base of the heart. The myocardium was pale and slightly softened. Three cavities, or aneurysmal dilatations (Fig. 2), occupied the posterior part of the base of the left ventricle; their diameters were $1\frac{1}{2}$, $1\frac{1}{2}$, and $1\frac{1}{2}$ in. Their ventricular surface was covered with rough injected granulation tissue; externally they were covered by the area of greatest pericardial thickening. On section the walls of the aneurysms were found to consist of fibrous tissue containing considerable deposits of calcium. All the valves were normal. The aorta showed only very slight atheroma, and the coronary arteries were patent except for a branch of the circumflex division of the left coronary, which was obstructed as it crossed one of the aneurysmal pouches. The other organs showed chronic venous congestion only. Microscopic section of the aneurysmal walls showed necrotic tissue bounded by dense fibrous tissue, the last infiltrated with plasma cells and lymphocytes, the plasma cells predominating. The vessels surrounding the degenerated area showed marked obliterative changes, and in some cases the lumen was occluded.

Comment.

Aneurysm of the ventricle is not an uncommon finding; it nearly always follows cardiac infarction resulting from atheroma and thrombosis of the coronary arteries. Syphilitic aneurysms of the ventricle are rare. The site of election for an aneurysm which is the result of an

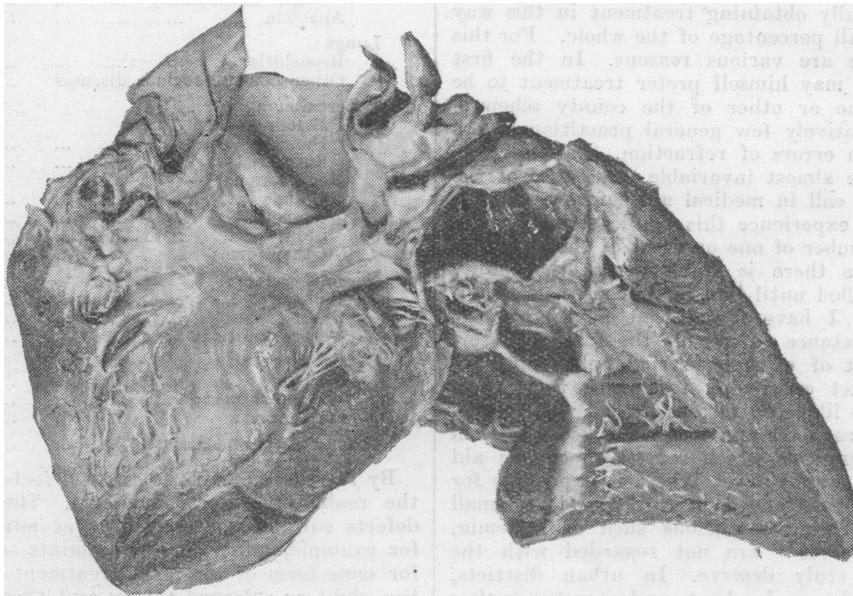


FIG. 2.—Showing the left ventricle opened. The anterior wall has been reflected to the left; the three aneurysms lie in the posterior wall at the base. The wall of the lowest pouch has been incised to show layers of calcified tissue.

infarct is at or near the apex of the left ventricle; syphilitic aneurysm of the ventricle, judging from the few cases published, seems to be commoner near the base. Morris¹ records one occupying the same site as those in the case herewith described. McFie and Ingram² relate the case of a native boy of the Gold Coast who fell dead; he had two aneurysms near the apex of the left ventricle, one of which had ruptured; in the interventricular septum

just below the aortic valve was a mass of 10 mm. diameter, which appeared macroscopically and microscopically to be a gumma; it is presumed that the aneurysms were of syphilitic origin. A similar heart in which a gumma and an aneurysm were found is recorded by Young³; the aneurysm was at the base of the left ventricle.

In the present case the walls of the aneurysms were composed of fibrous tissue of great thickness and density, and in them were considerable deposits of calcium. It must be concluded, there-

fore, that the condition had been present for a long time—probably many years. During this time a slow replacement of muscle tissue would be taking place with the gradual development of heart failure. The pericardial effusion was no doubt the last straw which increased the cardiac burden beyond endurance.

I am indebted to Sir Thomas Lewis for the electro-cardiogram, and for details of the patient's condition when in University College Hospital; and to Dr. G. E. Beaumont for permission to use the findings when she was admitted under him at the Middlesex Hospital.

REFERENCES.

- ¹ Morris, L. M.: *Amer. Heart Journ.*, 1926-27, ii, 548. ² McFie, J. W. S., and Ingram, A.: *Ann. Trop. Med.*, 1920, xiv, 147. ³ Young, W. A.: *Trans. Roy. Soc. Trop. Med. and Hygiene*, 1925, xix, 87.

THE PROBLEMS PRESENTED BY SCHOOL PREVENTIVE MEDICINE IN RURAL AREAS.*

BY

A. C. T. PERKINS, M.C., M.D., D.P.H.,

ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH, WEST SUFFOLK COUNTY COUNCIL.

THE problems presented by school preventive medicine in rural areas, though not differing fundamentally from those arising in urban districts, are to a large extent modified owing to the scattered nature of a country population. Moreover, solutions which have been found satisfactory in large centres of population are in many cases totally impracticable when applied to country districts.

The district dealt with in this study is a typical rural area in which about 75 per cent. of the population are engaged in agricultural pursuits, and live for the most part in scattered villages and hamlets. The population at the census of 1921 was returned as 108,982, with a density of approximately 290 per square mile as compared with 588 for England and Wales as a whole. In the whole of the administrative county there are only four towns with a

population exceeding 3,000. Leaving out these four towns, there are left in the rural areas proper approximately 9,392 children distributed in 139 village schools, making an average attendance of 67 per school.

The medical staff concerned in administering the county school medical service consists of a school medical officer, who is also county medical officer of health, one assistant school medical officer, one dental surgeon, one dental attendant, and four school nurses. All of these officers are whole-time and also employed in other public health duties in the county. This staff, as I shall show, is totally inadequate for the work which confronts it, but nevertheless it probably represents a fair average of that which is to be found in any similar district. No use is made of private practitioners in respect of the school medical service, though their services are to some extent made use of in other departments of the county's public health activities.

Two medical inspections are carried out at each school yearly. The first of these is the routine inspection, at which the age groups laid down by the Board of Education are examined. In addition, those children marked for "re-inspection" are also seen. These are children in whom some defect requiring treatment or observation has been noted at a previous inspection. At the second visit these "re-inspections" are again reviewed.

Whenever a defect requiring treatment is found, except in such minor conditions as impetigo, etc., the initial

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procedure is always the same. The parents are informed verbally or by notice of the defect found and urged to call in their family doctor. If at a subsequent inspection it is found that treatment has not been obtained, further pressure is brought to bear, the *modus operandi* differing according to the circumstances of the case. It is our invariable practice, in nearly all cases, to urge that the necessary treatment be carried out through the family doctor. Nevertheless, experience has shown that the number of cases actually obtaining treatment in this way constitutes a very small percentage of the whole. For this state of affairs there are various reasons. In the first place the local doctor may himself prefer treatment to be carried out under one or other of the county schemes. For example, comparatively few general practitioners are prepared to deal with errors of refraction. Secondly, we have to cope with the almost invariable reluctance of the parents themselves to call in medical aid before a child is obviously ill. In my experience this applies even when a child is a juvenile member of one or other of the approved societies. Even where there is frank illness the family doctor is often not called until late in its course, if at all. In nearly every case I have found that poverty is the explanation of a reluctance to consult the family doctor. A tremendous amount of work is carried out by private doctors in this district every day for which they know only too well they are likely to receive little or no return. But even so, many cases escape attention because of a certain sturdy independence which refuses to call in aid for which it knows it cannot pay. Where it is possible for definite illness to go unattended in this way it is small wonder that less alarming conditions such as anaemia, malnutrition, or "nerves" are not regarded with the gravity which they truly deserve. In urban districts, where an ailing child can be kept under more or less frequent observation, the onset of more serious trouble may be detected and dealt with early, but in a rural area like this the biannual visits of the school medical officer are, in many cases, quite useless from a preventive point of view.

A partial solution of the difficulty lies in the extension of the Insurance Acts to cover the dependants of insured persons. A workable scheme of this nature would ensure a great deal of potential chronic disease being checked in its early stages, and also considerably facilitate co-operation between private practitioners and the school medical service. On the other hand, the financial aspect of such a scheme is formidable in the extreme, and it would need the greatest consideration and circumspection to formulate a practicable working arrangement.

A problem, more grave because less susceptible of solution, is that arising in connexion with *cases of defect not diagnosed at medical inspection*. Actually, in my experience, in a large number of cases requiring active treatment this is shelved because, as will be shown, inadequate facilities for "following up" result in a failure to arrive at a definite diagnosis. An examination of the figures showing the distribution of defects found to require treatment in this area during 1927 is illuminating.

Return of Defects (excluding Uncleanliness and Dental Diseases) found by Routine Medical Inspection to require Treatment in 1927.

Malnutrition	...	...	...	...	...	...	2
Skin:							
Ringworm—							
Scalp	...	...	...	...	...	...	8
Body	...	...	...	...	...	...	1
Scabies	...	...	...	...	...	...	1
Impetigo	...	...	...	...	...	...	23
Other diseases (non-tuberculous)	...	...	...	...	...	...	8
Eye:							
Blepharitis	...	...	...	...	...	...	12
Conjunctivitis	...	...	...	...	...	...	4
Keratitis	...	...	...	...	...	...	—
Corneal opacities	...	...	...	...	...	...	—
Defective vision (excluding squint)	...	...	...	...	...	...	86
Squint	...	...	...	...	...	...	4
Other eye conditions	...	...	...	...	...	...	2
Ear:							
Defective hearing	...	...	...	...	...	...	1
Otitis media	...	...	...	...	...	...	1
Other ear diseases	...	...	...	...	...	...	6

Nose and throat:							
Enlarged tonsils only	...	...	...	...	...	...	32
Adenoids	...	...	...	...	...	...	1
Enlarged tonsils and adenoids	...	...	...	...	...	...	5
Other conditions	...	...	...	...	...	...	14
Defective speech	...	...	...	...	...	...	1
Heart and circulation:							
Heart disease—							
Organic	...	...	...	...	...	...	—
Functional	...	...	...	...	...	...	4
Slight abnormality	...	...	...	...	...	...	—
Anaemia	...	...	...	...	...	...	5
Lungs:							
Bronchitis	...	...	...	...	...	...	4
Other non-tuberculous diseases	...	...	...	...	...	...	—
Tuberculosis:							
Pulmonary—							
Definite	...	...	...	...	...	...	—
Suspected	...	...	...	...	...	...	1
Non-pulmonary—							
Glands	...	...	...	...	...	...	2
Osseous	...	...	...	...	...	...	—
Skin	...	...	...	...	...	...	—
Other forms	...	...	...	...	...	...	—
Nervous system:							
Epilepsy	...	...	...	...	...	...	1
Chorea	...	...	...	...	...	...	—
Other conditions	...	...	...	...	...	...	—
Deformities:							
Rickets	...	...	...	...	...	...	1
Spinal curvature	...	...	...	...	...	...	5
Other forms	...	...	...	...	...	...	—
Other defects and diseases	...	...	...	...	...	...	16

By far the majority of these defects do not come within the realm of general medicine. They consist chiefly of defects suitable for treatment at minor ailment clinics—for example, minor skin complaints—or conditions calling for some form of specialist treatment—for example, defective sight or enlarged tonsils and adenoids. We all know, however, that such defects do not, in practice, constitute the bulk or even a large proportion of the morbid conditions which, in childhood, are found to require treatment. To take a concrete example, rheumatic diseases of the heart, and many other manifestations of chronic rheumatism, have their inception in acute or subacute conditions occurring in childhood. In London it has been computed that 25 per cent. of chronic invalidity in children is due to rheumatism.¹ In rural districts, where a child has frequently to walk long distances in inclement weather, with no adequate provision for drying clothes at school or for a suitable midday meal, conditions predisposing to rheumatism are even more prevalent than in towns. Yet the records for this area show that comparatively few defects definitely attributable to rheumatism have been noted. No case of organic heart disease requiring treatment was diagnosed during 1927, though there were 104 cases of abnormality recorded as requiring observation. Chorea was not recorded in a single instance, while "growing pains" were only noted in a few cases accompanying more gross lesions such as enlarged tonsils. It is fundamentally improbable that juvenile rheumatism in this county is as rare as these figures would suggest. It is more likely that in the hurly-burly of a routine medical inspection minor manifestations of rheumatism have been, in the past, entirely missed. Careful observations made by the writer during the year 1928 on this specific point suggest that not less than 2 to 3 per cent. of all children are definitely rheumatic, though the complete figures are not yet available.

The lack of due recognition accorded to rheumatic manifestations throws into relief the comparative superficiality of much of the work done at school medical inspections. In my opinion, this is largely due to the lack of any proper means of following the minor degrees of defect found at school inspections down to their real place of origin in the home. It is a point easily lost sight of that, while, for reasons of convenience, inspection of children takes place in school, yet some five-sixths of a child's life, even in term-time, is spent outside the school precincts. It is in the home, in the street, in the field, that defects have their origin—not in the comparatively hygienic environment of the school. If it is to be truly preventive in its functions school medicine must follow the *early* defect back to its origin in the home.

When every allowance has been made for inherited predisposition to disease it still has to be admitted that faulty hygiene, in some form or other, is the match which sets ablaze the ready-laid faggots we call a diathesis. It is the duty of school medicine first, on the preventive side, to extinguish the match; secondly, on the curative side, so to drench the faggots of predisposition that they are no longer combustible.

Under the present system it is only the more severe degrees of defect which are followed up, and this, indeed, fully occupies the available time of the existing medical staff. Minor degrees of defect are merely recorded, and then forgotten until the child comes up for the next routine inspection three to five years later. This is a grave fault. Any defect, however slight, indicates a morbid process already at work. Before the child is next seen the invader may have become too firmly entrenched to be easily ejected. A defect inevitably points to some faulty hygienic factor in the environment, and it is only while it is still slight in degree that rectification of the faulty factor will result in a cure of the defect. *To investigate the environment we must go from the school into the home.*

Every practitioner is familiar with the type of child who is quite obviously physically unfit, and yet in whom systematic examination reveals no morbid condition to which a definite label can be attached. We call the condition debility, slight anaemia, "nerves" (the common parental diagnosis), and so on. These are merely symptoms, and in most cases definite disease is not revealed even by the most careful examination. But all symptoms must have causes, and if we write down the cause in this type of case as "faulty home hygiene," we shall usually be not far wrong.

It is, however, rarely possible at the school to detect the precise factor in the home environment which is at fault. I have found inquiries in this direction especially difficult owing to the fact that the parents of a child are frequently absent at the time of inspection; this is largely due to the parents living at a distance from the school, indifference, etc. Accordingly one has not even the advantage of being able, by questioning the parents, to obtain reliable information as to the home environment. I have found that the only practicable method of investigating the home conditions is to send a school nurse to make a personal visit to the parents. Unfortunately I have found it quite impossible, in practice, for the present staff of school nurses, with numerous other public health duties to perform, to make more than a mere start upon the immense amount of work waiting to be carried out in this connexion. Apart from the preliminary inquiries, many "following-up" visits are required in order to ensure that the environmental faults detected are being satisfactorily corrected. In order to carry out the necessary work adequately a total of not more than 1,500 pupils per *full-time* school nurse has been suggested for urban districts.² In a rural area this would need further reduction, and a figure nearer 1,000 would be more reasonable. This would entail, in this district, a staff of twelve *full-time* against the present staff of four *part-time* nurses.

If it be admitted that most of the defects found in children of school age actually originate in the home, our focus is at once shifted to the pre-school child. In 1927, excluding uncleanness and dental defects, 4.7 per cent. of entrants were found to require treatment, compared with 5.5 per cent. and 5.02 for leavers and intermediates respectively. Moreover, I have found that most children requiring treatment at a later age have usually possessed a slighter degree of defect as entrants.

It is useless to tackle the environment of the school child if he is left to pass his pre-school years unheeded. The toddler requires a periodical medical inspection and subsequent following up by a nurse even more urgently than his bigger brothers at school. Unfortunately there is at present in rural districts no adequate machinery for carrying out such examinations. Mothers cannot usually even if willing, bring their younger children long distances to a child welfare clinic. In this county we have only nine such clinics. I have found that while these are well patronized by parents living close at hand, children are not brought to them from any considerable distance. To

derive real benefit from child welfare clinics in a rural district it is essential to establish one in practically every village throughout the area. Such a large number of clinics could only be staffed adequately by utilizing the services of local practitioners on a very much bigger scale than at present.

In the case of the pre-school child this would offer definite advantages. The child could be seen at more frequent intervals. The local practitioner has usually an intimate knowledge of the previous and family history of each child, and parents are probably more willing to bring their children to be examined by the family doctor than by a comparative stranger from the public health department. Finally, "following up" would be easier, since the local practitioner is constantly in and out of the homes in his district. In this county I have found that the child welfare centres conducted by a local practitioner go with a distinctly greater "swing" than do those for which the whole-time staff of the public health department are responsible.

The importance of preventive work in the pre-school years cannot be overestimated. Most of the defects which I find at school inspections can be traced back to the toddling age, and could have been prevented by adequate medical supervision during that critical period. Sir George Newman has remarked on the fact that "year by year there is a steady stream of defect or physical impairment of the entrants coming into the schools... apparently never lessening, which requires medical or surgical treatment." My experience in a scattered rural district suggests that this deplorable condition is due largely to a system which, ignoring the vague imponderable signs of a faulty environment, takes cognizance of it only when its inevitable results have become established. Such a system may avoid a certain amount of permanent crippling; it cannot be termed truly preventive. The stream of defect by the time it reaches the school has become too large to be mopped up, like a puddle, without leaving a trace. It must be followed back, and that without delay, to be stemmed at its source in the home during the pre-school years.

The disposal of exceptional children is another big problem which faces the school medical service in rural areas. By the term "exceptional children" is to be understood those children suffering from a defect of such a nature as to preclude their deriving the maximum benefit from instruction in an ordinary elementary school. There are in this county 392 such children, including 16 children totally or partially blind or deaf, 84 mental defectives, 7 epileptics, 65 cases of active tuberculosis of all types, 122 crippled children (including orthopaedic defects and those with severe heart disease), and 95 cases classed as merely "delicate"—for example, pre- or latent tuberculosis, malnutrition, anaemia, etc. Of these children 332, or 84.8 per cent., attend ordinary elementary schools. They are scattered over the district—one, two, or three in each school. In existing circumstances it is impossible to organize them into special classes, where they might receive the attention and instruction best suited to their individual needs. The only alternative at present is to send them to suitable residential special schools. Unfortunately to carry out such a scheme for any considerable portion of the exceptional children in this area has been found to present practically insuperable difficulties. The annual cost of maintaining a child in a residential school is about £80. If every exceptional child in this county were thus dealt with, the annual cost would be about £25,000, or ten times the present total expenditure on school medical services. Further, the benefit to the child (and ultimately to the community at large), especially in the case of mental defectives, has not been found commensurate with the expenditure involved. Moreover, it is often impossible to obtain parental consent to the removal of children suffering from only a moderate degree of defect. Finally, the accommodation available at residential special schools is still so limited that it is often difficult to secure admission for any given case.

The disposal of exceptional children is a problem largely peculiar to rural areas. In urban districts it is easy to provide non-residential special schools or classes within a

reasonable distance of children's homes. In London 6,282 out of a total of 6,307 mental defectives are attending certified special schools or other institutions.⁴ To attain a similar result in this district it would be necessary to provide a number of special classes sufficiently accessible for all those children suitable for them. For approximately 400 children the total number of such classes could hardly exceed about thirty in all. Scattered over the county, they would be so separated that it would be impossible for children to attend without providing some means of mechanical transport. This is obviously not an economic proposition, since it would involve sending a vehicle daily to each village solely to pick up one or two children.

In venturing to suggest a tentative solution of the grave difficulties I have detailed, I approach my task with some diffidence, for I have no personal experience of the practicability of such a scheme as I am about to suggest, nor do I know of any other district where a similar scheme is already in operation.

Shortly, I suggest the total abolition of the present numerous small village schools and their replacement by a small number of large central schools, each providing accommodation for at least 1,000 pupils. Children from outlying villages could then be brought in by motor buses, run by the county council. The whole of the children attending an average village school could easily be accommodated in a single bus of modern type. Two buses would be ample to transport all the children at even the largest of the village schools. Leaving a convenient central point at a fixed time daily, the bus could easily stop at one or two points *en route* to pick up children who at present have to walk long distances to school from outlying hamlets. This would be of immense benefit to many young children who at present reach home at the end of the day tired out and often soaked to the skin. The expense of providing this transport could be partly covered by allowing some or all of the buses to run as public conveyances during the hours between and after the school journeys.

A scheme of this magnitude, like Rome, could not be built up into existence in a day, but it is not Utopian. The advantages of central schools are already recognized by the Board of Education on quite general grounds. In this county small steps towards centralization have already been made. During the last two years five village schools have been entirely closed, and transport has been provided to convey the children attending them to the nearest large school. This movement is likely to increase more rapidly in the near future.

With the establishment of central schools the exceptional children problem solves itself. Instead of one or two such children in each school there would be forty or more. Such a number would make feasible the establishment of special classes. Three such classes, of about fifteen children each, would be a convenient number in the average central school. One would provide for the older mentally defective or seriously backward children; one for the younger, and one for older physically defectives. In fairly small classes of this nature children could have just that individual attention which is necessary if they are to derive the maximum amount of benefit from their instruction. Within wide limits the disadvantage of mixing children of different educational standards would be offset by the individual instruction received.

I have referred in some detail to this exceptional children problem because it is one which is incapable of any solution under the system of elementary education at present practically universal in rural areas. But the advantages offered to the school medical service by central schools by no means end with the disposal of exceptional children. I will briefly outline some of the directions in which my experience suggests that the provision of central schools would greatly facilitate and even augment the work done in other branches of school medicine.

Provision is made for the treatment of certain specified classes of defect under a scheme of the education authority, notably defects of vision, dental defects, and certain minor ailments. Some of these are dealt with by local practitioners or dentists, but something like four-fifths are treated directly under the county schemes. Owing to the fact that inadequate transport facilities make it impossible

for most children to attend at a central clinic, nearly the whole of the refraction and dental work has to be carried out at the schools themselves. The dental surgeon, or myself, arrives at a school where there are children to be treated, perhaps only two or three in all, equipped with all the necessary impedimenta for the work in hand. It is not difficult to imagine the degree of disorganization in the ordinary school routine entailed by our visit. Many of these village schools consist of a single room, and few of them have more than two, so that, practically speaking, the school has to be more or less cleared. If it is raining and the children cannot be turned into the playground, the difficulties of all concerned are increased tenfold. I have vivid memories of hours spent in cramped quarters, doing refractions in darkened lobbies, provided with no form of artificial heating even in mid-winter, and surrounded by the wet, malodorous hats and coats of the scholars. In such circumstances it is astonishing what satisfactory results are obtained, but the waste of time entailed in the repeated packing, unpacking, and inter-school travelling is immense.

The arrangements for treating minor ailments are even more chaotic. The conditions dealt with include minor skin diseases—impetigo, for example—and such small injuries as bruises and slight cuts, with miscellaneous defects such as chilblains, and so on. Usually all that can be done is to give directions for their treatment to the parents and head teacher, relying for skilled supervision on such comparatively infrequent visits as the school nurse (who may have forty or more widely separated schools in her district) is able to pay. It is probable that much work coming under the head of minor ailments which at present is referred to the local doctor would, if better facilities were available, be dealt with under the county scheme. This is usually work which, as Dr. Alfred Cox has pointed out,⁵ the private practitioner would prefer to be without, since it entails an amount of trouble quite incommensurate with the recompense likely to be obtained.

With the advent of the central school all this wasteful expenditure of time and energy could be obviated. It would be easy enough to provide suitable accommodation at the school itself for all the work of the school doctor and nurse. Reduced to essentials, two rooms would suffice. There should be a nurse's room, equipped for the efficient treatment of the various minor ailments, and a doctor's room, which could easily be arranged to be suitable for purposes of both inspection and treatment. In respect of minor ailments, it would be easy enough for the school nurse to visit each central school in her district at a fixed hour daily and attend personally to the treatment of all children requiring it. If the present number of school nurses were augmented to the figure suggested earlier in this essay, each school would have its own individual and full-time nurse.

The school nurse could also carry out another invaluable service which at present is not attempted at all. Teachers often present to me children concerning whom they wish for one reason or another to have a skilled opinion. Under our present system it is often months before a chance comes for a child to be thus presented. If a school nurse were in attendance daily, teachers could present children about whom they were worried for a preliminary "screening." The nurse, who in this as in most areas is a highly trained individual, would be quite competent to advise as to the best mode of procedure in each case. Some she would be able to advise or treat herself. In others—probably the majority—she would advise the services of the family doctor to be sought, and from such a source there would be more likelihood of the advice being followed than if it came from the teacher. The remaining cases would be referred for special examination by the school doctor at his next visit. These visits would take place at least once a fortnight at each school, instead of, as at present, two or three times a year. Thus there is no reason why a child should not receive medical attention within a short time of anything wrong being noticed. In addition, the more frequent attendances of doctor and nurse would make it much easier than at present to follow up vigorously any special case, and to ensure that adequate treatment was obtained without delay.

A further argument for abolishing the present village schools lies in the extremely unsatisfactory sanitary conditions obtaining in the majority. Many are old and built without that provision for satisfactory lighting and ventilation which modern research has shown to be necessary for health. Heating, in nearly all cases, is by open grate or slow combustion stove, which makes for bad distribution and insufficiency. In many schools there is no supply of water fit for drinking purposes, and in the majority the closet and urinal accommodation is inadequate and correspondingly insanitary. At no school is there any special arrangement for the drying of children's clothing and boots. In this connexion I would cite the report of the chief medical officer to the Board of Education for 1925.⁶ The sanitary condition of most of the schools in this area is as bad as, if not worse than, any of the instances there quoted. Rectification of these conditions, in view of the local circumstances of isolated country villages, would be in many respects quite impracticable, and in any case would impose upon the managers a much greater expense than could reasonably be insisted upon. It would probably be a more economic proposition to close unsatisfactory schools as rapidly as circumstances permit, transferring the pupils to suitable central schools.

I do not wish to suggest that the expenditure which would be involved in the establishment of central schools would be justified in the interests of the school medical service alone. As a matter of fact, if these schools were built on an open-air pavilion system, leaving ample space for expansion as circumstances required, the initial outlay would not be nearly so great as at first sight would appear. In any case the demands of school preventive medicine do appear to me to offer strong support to any arguments

in favour of establishing central schools on more general educational grounds. My attention was first drawn to the possibilities of such schools from a medical point of view by numerous conversations with head teachers throughout the county; these I have found to be, almost without exception, strongly in favour of such a move on quite general grounds, both of economy in administration and as the best means of attaining a higher standard of elementary education in rural areas. Of these wider considerations I am, of course, not entitled to speak with authority, but my experience leads me to believe that they do in fact exist, and provide a thorough justification for urging the claims of the school medical service to a share in the benefits that the central school has to offer.

In conclusion, I would reiterate what I have endeavoured to show earlier in this study—namely, that in all cases even a slight departure from the normal and healthy condition has its origin in a faulty environment. Sometimes that faulty environment may be found in the school, but far more often it is to be found in the home, where, after all, the child passes the greater part of its early and adolescent years. More and more are we beginning to realize the importance of the pre-school years to the future history of the individual. In the proper direction of those critical years the local practitioner might be granted a very much larger share than he has been offered in the past.

REFERENCES.

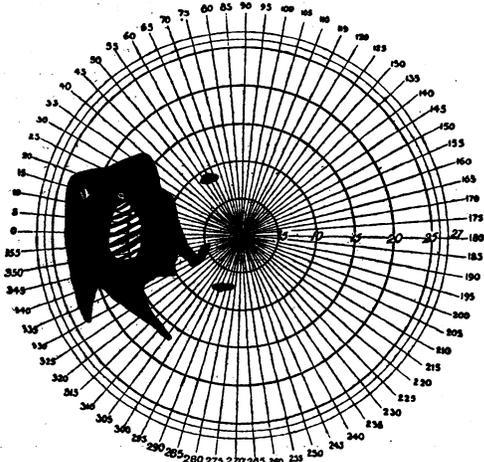
- ¹ London County Council, Annual Report of S.M.O. 1925.
- ² Kerr, I.: *Fundamentals of School Health*, 1926, p. 645.
- ³ *Health of the School Child*, 1925, p. 138 (H.M. Stationery Office).
- ⁴ London County Council, Annual Report of S.M.O., 1927, p. 174.
- ⁵ *British Medical Journal Supplement*, November 3rd, 1928, p. 191.
- ⁶ *Health of the School Child*, 1925, pp. 168-171 (H.M. Stationery Office).

Memoranda :

MEDICAL, SURGICAL, OBSTETRICAL.

OPTIC NEURITIS AND DENTAL SEPSIS.

On November 21st, 1928, a man consulted me because for three days previously he had been conscious of "a black cloud" in the outer field of his left eye; there was no gross



Central field of left eye, showing enlarged blind spot and scotomata. The cross-hatched area represents the normal size of the blind spot of Mariotte.

field defect. He had one dioptré of hypermetropia with slight astigmatism. The vision in each eye with correction was normal (6/6). There was no central scotoma. Young's "threshold" test (a very delicate one) for light difference was negative. The macula was unaffected, but the nasal edge of the left optic disc was "fluffy." So far, then, there was nothing much to be found abnormal beyond his consciousness of a cloud in his left field; but a definitely described symptom is a quarry always worth pursuing.

On examination of his central field with the Elliot scotometer the blind spot of Mariotte was found to be much

enlarged, with snail-track extensions towards the fixation point and one or two isolated scotomata (see diagram). The average normal blind spot is marked by cross-hatchings for comparison. This, in conjunction with the hazy nerve-head, pointed to optic neuritis. It was evidently not of the usual toxic type met with in tobacco and some other poisonings, where the papillo-macular bundle of nerve fibres is affected first, and macular vision with colour impairment is a very early symptom.

The patient, a watchmaker, aged 35, was a non-smoker, the urine was free from sugar and albumin, and syphilis could be virtually excluded. His breath was foul, and examination by a laryngologist showed a tonsil with stale secretion in one of the crypts; this was evacuated. Five days later the vision had fallen from 6/6 to 6/12, and there was slight loss of central colour perception. I then had his teeth examined radiologically, although they appeared sound to the eye except for some pyorrhoea of the lower incisors. He had root fillings in two upper bicuspids; the film showed probable septic trouble at the apices of these teeth. His dentist extracted them both, finding a broken-down granuloma at the root of one; he also extracted the lower incisors.

On December 4th vision in the left eye had now improved to 6/9 partly. The relative central scotoma was still present. His next visit to me was on January 25th, seven weeks later, during which time his mouth had been dealt with antiseptically. His vision was now 6/6 easily, and there was no central scotoma. The blind-spot enlargement and the two small scotomata had disappeared; he had lost the consciousness of a cloud, and the optic disc had resumed its normal appearance. He had made a complete recovery, and has regained much better general health.

I think there is no doubt that the optic neuritis was due to the apical dental sepsis, and that the patient's resistance was impaired by absorption from the septic tonsil and from the pyorrhoea.

At a time when there is a tendency to a reaction from the wholesale removal of teeth on x-ray findings it is well to remember that where an important organ such as the eye is in jeopardy, and search for other causes has failed, a suspicious tooth should be sacrificed without hesitation.

I should like here to emphasize the great value of the Elliot scotometer, which is, of course, only a very quick and convenient means of applying Bjerrum's test. The enlargement of the blind spot and the two small scotomata would be entirely missed by the ordinary perimeter. A 2-millimetre white object is used at a metre distance, and the central field up to 25 degrees is, as it were, magnified.