Reports on school hygiene.

Submitted to the Public Health Act Committee on 14th March, when the meeting approved of the steps taken, and recommended that the work should be continued as opportunity was offered.

REPORTS

ON

SCHOOL HYGIENE.

CONTENTS

COUNTY OF LANARK.

MIDDLE WARD DISTRICT.

District Offices,
Hamilton, *8th March, 1906.*

Dear Sir,

I desire to report to the Public Health Act Committee that during the last few months I have, when other duties permitted, given some attention to the important question of School Hygiene. This is a subject that has been specially brought under the notice of the Local Authority by circular letters issued by the Local Government Board in October, 1901, and in July, 1904. It has also been specially brought under the notice of Parliament and the public by the report of the Royal Commission on Physical Training, issued in 1903. In England and some other countries School Hygiene is receiving a considerable amount of attention, and I have taken the liberty of referring to some official publications relating thereto.

That section of School Hygiene which is of most interest to local authorities relates to (1) School premises and (2) The control and prevention of infectious or contagious disease. In many towns, including Glasgow, Edinburgh, Aberdeen, and Dundee, the general physical condition of school children has recently been the subject of close investigation. The results in some cases have given rise to the belief that there were signs of physical deterioration. Although this subject might be considered to some extent outwith the duties of a Public Health Authority, a careful perusal of all the published literature led me to believe that some preliminary inquiry might be of interest, and could be made without any additional expense.

The work done and now reported upon relates only to a small portion of the Middle Ward District, but deals with (1) School premises, (2) Infectious disease and general health, and (3) Eye-sight and Hearing. The first part of the inquiry has been reported upon by myself, the second by the Assistant Medical Officer, and the third by a friend connected with the Ophthalmic Institution, Glasgow, who kindly undertook the examination of the eyes.

The work done has been appreciated by the school authorities, it has proved of considerable interest to myself, and, if it is approved by the Local Authority, might be continued as opportunity is offered.

I am,

Yours faithfully,

JOHN T. WILSON,
County and District Medical Officer.

W. E. Whyte, Esq.,
Middle Ward District Clerk.

REPORT BY THE MEDICAL OFFICER OF HEALTH

ON

SCHOOL HYGIENE ADMINISTRATION.

From time to time, and in various ways, during the last few years, attention has been directed to the importance of school hygiene in England as well as Scotland.

In October, 1901, the Local Government Board for Scotland issued a circular-letter directing "the attention of Local Authorities to the mutual advantage of co-operation with the School Boards in their districts in the discharge of their respective duties." This circular-letter dealt with:—(1) Infectious diseases and school attendance, (2) the sanitary supervision of school premises, and (3) children who present themselves at school in a state of uncleanness so gross that they cannot be allowed to mingle with other children. See Appendix No. 1.

At the same time a circular-letter was issued by the Scotch Education Department dealing with "the difficulties presented to School Boards in enforcing the attendance at school of neglected children." Regarding that class of children who, "either by disease, uncleanness, want of clothing, or other results of neglect and unwholesome conditions, are rendered unfit to sit in school with other scholars," the circular states, "such children, it is to be feared, are too often allowed to remain away from school for long periods, and even to grow up without the benefit of any education at all, with consequences not only harmful to the children themselves, but dangerous to society." "In dealing with this class of children who are rendered unfit to attend school by conditions due to filthy and unsanitary homes, it is of immense importance that the School Board should act in concert with the Local Sanitary Authority. Reference is made to the Public Health (Scotland) Act, 1897, generally and specially to Section 40 of that Act. It is evident that much might be done by systematically reporting to the Local Authority cases to be dealt with by them under this Act."

The three subjects specially mentioned in the Local Government Board's memorandum may be briefly referred to—

Infectious Disease.—The statutory powers and the procedure adopted for the control of infectious diseases among school children is specially dealt with in the report prepared by Dr. Hislop, pages 23 and 24. I would emphasise the urgent need of some arrangement with School Boards for supplying information to the medical officer of health of all cases of non-notifiable infectious diseases, which include Measles, Whooping-cough, Croup, Mumps, Chicken-pox, Ringworm, and Scabies or Itch. Such an arrangement has long been in operation in town districts, and was provided for in the Education (Scotland) Bill of last year, Clause 46 (3).

School Premises.—As the definition of the word "house" as given in the Public Health Act includes schools, these are subject to the same sanitary supervision as dwelling-houses. School premises are, however, specially referred to in the Public Health Act. Section 16 (8) deals with the cleanliness, ventilation, and overcrowding of any school house; Section 29 deals with the provision of conveniences in sufficient numbers for the separate use of each sex. Under the building by-laws (Public Health Act, Section 181) plans of new school premises, and of certain alterations or extensions of existing buildings, require to be submitted to and approved by the local authority.

Cleanliness.—Section 40 of the Public Health Act is specially mentioned in the circular of the Education Department as a means of dealing with that class of children "who are rendered unfit to attend school by conditions due to filthy and unsanitary homes." There is, however, another statute—the Cleansing of Persons Act, 1897, which authorises Local Authorities to provide cleansing and disinfection for persons infected with vermin.

In England the Board of Education issued in October, 1901, to managers and teachers of urban elementary schools, a circular-letter calling attention "to certain conditions injuriously affecting the eyes and eyesight of the scholars," and expressing the hope that measures may be generally adopted for arresting the extension of evils prejudicial to the national welfare.

Two classes of conditions were referred to, one being defective eyesight that might be detected by means of test-types, and that might be corrected by the use of spectacles. It was suggested that "sufficient testing" of a scholar's eyes for school purposes may

be accomplished by a teacher in five minutes, and whenever vision falls below the normal standard, or whenever small print is instinctively brought very near the eyes, the parents should be advised to take the child to an ophthalmist or to a surgeon.

The second class of conditions referred to various forms of eye diseases, some of which are highly contagious, and which might become of serious importance to the school as a whole.

In the recognition and treatment of such cases, the Board approved of the employment of visiting nurses, who already had been found very useful in dealing with skin diseases, discharging ears, sore and dirty heads, &c.

The British Medical Journal, commenting on this circular, says:—"The Board of Education have recognised some of the insanitary conditions of school life; let them insist on some hygienic knowledge from every certificated teacher, and do their duty by providing an efficient staff of medical inspectors, instead of shirking responsibility by leaving the children of the wealthiest nation in the world to be looked after by voluntary associations and the charity of the hospital doctor."

In 1903 the report of the Royal Commission on Physical Training (Scotland) was issued, in which they recommended the medical inspection of school children. See Appendix No. 2.

In 1904 an Inter-Departmental Committee (England) on Physical Deterioration submitted their report, and also referred to the need of medical inspection of school children. See Appendix No. 3.

In July, 1904, the Local Government Board for Scotland issued a circular-letter to medical officers of health, directing their attention "to the question of the closing of schools on account of infectious disease, and offering for their guidance some suggestions as to the considerations which ought to determine resort to such a measure. The circular is given *in extenso* in the Annual Report of the County Medical Officer for 1904. (See pages 20 and 21).

In March, 1905, an Education (Scotland) Bill was printed, which contained clauses providing (1) for the medical examination and supervision of scholars by the School Board; (2) for the inspection of schools by the medical officer or the sanitary inspector, and reporting the result of same to the School Board; and (3) notification to the medical officer by the School Board of all cases in which the excuse assigned for the absence of a child from school is the existence of an infectious disease. See Appendix No. 4.

In April, 1905, the *Journal of the Royal Sanitary Institute* published the proceedings of a Conference on School Hygiene held in England in the month of February. The subjects discussed included—

(1) Physical and Mental Development during School Life.
(2) Physical Inspection.
(3) Building and Equipment of Schools.
(4) Sanitary Inspection of Schools.
(5) Training of Teachers.
(6) Training of Scholars.

Arrangements are presently being made for an International Congress on School Hygiene, to be held in London during 1907.

In November, 1905, a report by an Inter-Departmental Committee on the Medical Inspection of School Children, &c., in England was published. This report contains much interesting and instructive information regarding the work done in England, where the school authority and the education authority are practically the same body. See Appendix No. 5.

Regarding the work done on the Continent, the report of the Committee of Council on Education in Scotland for the year 1904-1905 contains an account, by one of His Majesty's Inspectors of Schools, of the results of visits paid to what we should call the Elementary Board Schools of Berlin and Charlottenburg. Under the heading "Provision for the Welfare of School Children," he writes: "It would scarcely be too much to say that considerations of health and of the physical welfare of the pupils are the most striking features of school-life in Germany to-day." Interesting information is given at pages 447, *et seq.*, regarding medical inspection.

In the United States of America medical inspection of school children has been in operation for many years, and the results published in the annual reports of the health officer of such towns as Boston and New York are of great interest.

The Code of Regulations, 1905, for Day Schools, issued by the Scotch Education Department, provides for school closure by the Local Authority in the following terms:—

Article 30.—"If the sanitary authority of the district in which the school is situated, or any two members thereof, acting on the advice of the medical officer of health, require either the closure of the school in whole or in part, or the exclusion of certain children for a specified time, with a view to preventing the spread of disease or any danger to health likely to arise from the con-

dition of the school, such requirements **must at once be complied with,** but, after compliance, appeal may be made to the Department if the requirement is considered unreasonable."

The provisions of the Public Health Act relating to the Prevention of Infectious Diseases authorise medical inspection of persons by the Medical Officer of Health in the following terms:—

Section 45.—"The medical officer may, at reasonable times, in the day time, enter and inspect any house or premises in the district in which he has reason to believe that any infectious disease exists, or has recently existed, and the medical officer may examine any person found on such premises with a view to ascertaining whether such person is suffering, or has recently suffered, from any infectious disease."

As many infectious diseases, such as diphtheria and scarlet fever, occur in very mild forms, which escape recognition, it has often been found necessary to examine school children for the purpose above mentioned. In doing so the medical officer is careful to give no cause of offence. He takes each child in a class in turn and examines the skin (exposed parts), mouth, throat, nose, and glands of the neck. Should any evidence of infectious disease be obtained, inquiry is made at the child's home, and there further examination is made if necessary.

The work of a class is thus only interrupted for a few minutes by the medical examination, which has often been the means of checking the spread of disease.

In making such an examination it is not difficult to take note of cleanliness and general health conditions. In view of all that has been written on the subject of medical inspection of school children, and referred to in the documents above quoted, I thought it might be of interest to local authorities and to school boards if I were to arrange for some inspections being carried out on the lines above indicated. I therefore communicated with the School Boards of Blantyre and of Bothwell Parishes in the following terms:—

"I should like to arrange for the medical inspection of school children at two or three of the schools throughout the Middle Ward District of the County, and would be glad to know that the . . . School Board would not object to my visiting one or two schools under their jurisdiction on a day and hour convenient to the teachers, to examine the scholars in one or more classes.

"Our objects would be:—(1) To examine the children, without undressing, for the existence of anything of an infectious or contagious

nature, and (2) to arrange for testing the sight and hearing, and probably also for taking the height and weight. Nothing whatever would be done to a child that a parent might take exception to. Indeed, the examination would not be much different from that we are accustomed to make under Section 45 of the Public Health (Scotland) Act, and only general results would be published. Of course, if anything of a contagious or infectious nature were discovered, we would deal with this; and if any child were discovered with markedly defective sight or hearing, such as would interfere with the child's health and education, the teacher would be advised thereof."

A similar communication was also addressed to the clergyman of the R.C. School in Blantyre, and of the R.C. School at Cadzow, in Hamilton Parish. The permission asked for in all these communications was granted, and arrangements were then made to visit all the schools in Blantyre and one or two of those in Bothwell Parish.

A preliminary visit was first made, and the headmaster informed of the objects we had in view. It was pointed out that, if he approved, the teacher in each class could be of great service in testing both the eyesight and hearing. As all the headmasters seemed willing to assist us in every way, test types were obtained for testing the eyesight, and watches for testing the hearing. These were left along with the following printed instructions:—

EYESIGHT.

The preliminary test of acuteness of vision among school children may be carried out by the teachers, as it consists in finding out what size of type can be read at a distance of 6 metres or 20 feet.

The results of this test should be carefully noted for each child on a form provided for the purpose, and handed to the medical inspector or oculist who will further examine all those falling below a certain standard.

Directions for using Types in testing Distance Vision.

The card of test types should not be exposed to view until required.

Place the card on a wall with a good light falling on it, and at a level not much above that of the child's eyes.

By a chalk line on the floor mark a distance of 20 feet straight in front of the card.

Place the child at the chalk line, and test, first the right eye, then the left, the child using a piece of cardboard to cover one eye.

By pointing with the finger on the card, ascertain the lowest and smallest type line which can be read.

Each line is distinguished by a number, and the lowest type the child can read should be recorded as the limit of vision.

If the child wears glasses test with these on.

HEARING.

The preliminary test of acuteness of hearing among school children may be carried out by the teachers, as it consists in finding out at what distance the ticking of a watch can be DISTINCTLY heard.

Directions for applying the Watch Test.

Use a watch that ticks distinctly and loudly enough to be heard by a normal ear at a distance of 10 feet or more. The actual distance is immaterial. It should be precisely ascertained by experiment on a considerable number of persons known, on other grounds, to possess normal hearing. When the hearing distance for normal ears is ascertained, let this be called the normal distance.

Select the quietest room in the school. Mark on the floor a space about 1 foot square for the child to stand in. From this space draw a line on the floor to a distance of some 12 or 15 feet. Divide this line into one foot spaces.

Let the child first hear the tick of the watch, held quite close to the ear. Direct him to shut his eyes. Then hold the watch at the extreme distance of the line. Bring it nearer and nearer until the tick is heard. Carry it further away, then nearer, two or three times, until you are satisfied that the replies of the child are not random replies. While one ear is being tested it is well either to plug the other ear with a little cotton wool or to have it covered with the child's hand.

To record the observation make the "normal" distance of the watch the denominator and the actual distance at which it is heard the numerator of a fraction. Thus if the watch is heard at an average distance of 5 feet, and the normal distance for this watch is 10 feet, the observation recorded would be $\frac{5}{10}$. The same method should be followed if the record is taken in inches. Thus if a watch, whose normal distance is 30 inches, is heard only at 5 inches, the record would be $\frac{5}{30}$.

The results of the teacher's examination were carefully recorded, and, after these had been received, a medical inspection was made. Dr. Jas. A. Hislop, the Assistant Medical Officer, undertook, with my help, the general examination, while Dr. Jas. A. Wilson, of the Glasgow Ophthalmic Institution, kindly undertook the examination of the eyes (retinoscopy) and of the ears. In this way the whole examination of a school was completed either in one day, or, at most, a day and a-half. A report of the results is given by each of these examiners, while I have dealt with the school premises.

APPENDIX No. 1.

CO-OPERATION OF LOCAL AUTHORITIES AND SCHOOL BOARDS.

Local Government Board,
Edinburgh, 10th October, 1901.

SIR,

The Local Government Board desire to direct the attention of Local Authorities to the mutual advantages of co-operation with the School Boards in their districts in the discharge of their respective duties.

It is unnecessary to dwell on the national importance of the health of children, on the influence thereon of the physical conditions existing at home and at school, on the relations of both to education, and the consequent practical utility of sympathy and active friendliness between Local Authorities and School Boards. It need scarcely be added that approaches by either body to the other regarding these subjects of common interest ought to be made without censoriousness and received in a friendly spirit.

Through Section 57 of the Public Health (Scotland) Act, 1897, relative to infectious diseases and school attendance, and Article 30 of the Education Code regarding closure of schools or exclusion of scholars on the notice of the Local Authority, a certain amount of administrative co-operation is required and recognised. The Board are aware that between many Local Authorities and School Boards and their respective officials there already exists a carefully organised system of co-operation for the prevention of the spread of infectious diseases through the agency of schools, which experience has shown to have great utility both in the control of epidemics and the promotion of education. The Board are satisfied that without such co-operation it is impossible to deal effectively with the infectious diseases of children.

By the definition of "house" in the Act, all the statutory obligations of the owners of dwelling-houses are laid upon School Boards as regards school premises. There are also provisions specifically applicable to "schoolhouses" in Sections 16 (8) and 29. In the great majority of cases the primary structure of such premises is unexceptionable, and calls for no interference on the part of the Local Authority, but in maintaining the structure, especially in the prompt detection of defects in drains and plumber work, disrepair or irregularity in the cleansing of conveniences, &c., School Boards require the assistance of Local Authorities. This ought to be freely rendered by the exercise of regular supervision over schools.

Those points of administrative contact between Local Authorities and School Boards are plainly indicated by statute. Other opportunities of co-operation ought to be sought in pursuance of a settled policy of helpfulness.

The Board are informed that School Boards sometimes have difficulty in dealing with children who present themselves at school in a state of uncleanness so gross that they cannot be allowed to mingle with other children. In cases where this is associated with a "filthy or unwholesome condition" of the home and its contents, the Local Authority should, on receiving information to that effect, consider as to the exercise of their powers under Section 40 of the Public Health Act, 1897. In burghs the provisions of Sections 118 and 119 of the Burgh Police Act will also be available. It ought to be remembered that such conditions as defective water supply, darkness and want of ventilation, disrepair of floors, walls, &c., want of proper water-closet accommodation, encourage personal and domestic uncleanliness.

In this connection the Board direct attention also to the Cleansing of Persons Act, 1897. That Act provides:—

"1. On and after the passing of this Act any Local Authority shall have the power, when in their discretion they shall see fit, to permit any person who shall apply to the said authority, on the ground that he is infested with vermin, to have the use, free of charge, of the apparatus (if any) which the authority possess for cleansing the person and his clothing from vermin. The use of such apparatus shall not be considered to be parochial relief or charitable allowance to the person using the same, or to the parent of such person, and no such person or parent shall by reason thereof be deprived of any right or privilege or be subject to any disqualification or disability.

"Local Authorities may expend any reasonable sum on buildings, appliances, and attendants that may be required for the carrying out of this Act, and any expenses for these purposes may be defrayed out of any rate or fund applicable by the authority for general sanitary purposes or for the relief of the poor."

"3. In the application of this Act to Scotland, "Local Authority" means and includes any Local Authority under the Public Health (Scotland) Act, 1867, and any Acts amending that Act; but the Local Authority shall not erect buildings for the purposes of Section 1 hereof, except with the sanction of the Local Government Board for Scotland."

Local Authorities should, on the application of any School Board, be prepared to consider how far they can exercise their powers under this Act and afford facilities for cleansing the persons and clothing of children. If any Local Authority should resolve to erect buildings for the purpose, the Board will be ready to give the sanction required by Section 3, unless strong reasons exist for refusing.

I am further to remind Local Authorities that, in the execution of their duties under the Education Act, the officers of School Boards are frequently led into houses and localities which stand in need of sanitary supervision. In the course of their domiciliary

visits they cannot fail to observe various "nuisances" and insanitary conditions.

The Board are aware that in certain of the large burghs the systematic communication to the Local Authority by the School Board of the observations thus made by their officers has been encouraged and has proved of signal service to the Local Authority in the execution of their duties. The Board highly approve of all such understandings, and recommend them for the adoption of Local Authorities generally.

I am to express the confident anticipation of the Board that Medical Officers of Health and Sanitary Inspectors will cordially welcome the assistance which the officials of School Boards may in this way render, and will generally aid their Local Authority in acting upon the lines of this circular.

Three copies of this circular are sent, together with three copies of a circular addressed by the Scotch Education Department to School Boards, and I am to request you to submit these circulars to an early meeting of the Local Authority, and to hand copies to the Medical Officer of Health and Sanitary Inspector for their information.

I am, Sir,

Your obedient Servant,

G. FALCONAR STEWART,
Secretary.

The Clerk to the Local Authority.

Scotch Education Department,
Dover House, Whitehall,
London, S.W., 10th October, 1901.

Sir,

My Lords have had under special consideration the difficulties presented to School Boards in enforcing the attendance at school of neglected children. The more ordinary aspects of this question need not be referred to where the question is simply one of truancy, due to absence of home control, vagrancy, and general wildness. It is sufficient here to suggest that, in dealing with these cases, School Boards should avail themselves, more freely than is usually the case, of the assistance that may be obtained by co-operation with the Police Authorities, which will be specially useful to them in obtaining knowledge of and securing the attendance at school of children belonging to the migratory classes, who may otherwise escape the usual School Board Census.

But it is to a special class of children that my Lords wish now to direct attention, viz., of those who, either by disease, uncleanness, want of clothing, or other results of neglect and unwholesome conditions, are rendered unfit to sit in school with

other scholars. Such children, it is to be feared, are too often allowed to remain away from school for long periods, and even to grow up without the benefit of any education at all, with consequences not only harmful to the children themselves, but dangerous to society.

While recognising that the physical condition of such children, and the dangers to other children arising therefrom, may be "reasonable ground" for refusing admission to them in terms of Article 17 (a) of the Code, my Lords must hold that School Boards are none the less responsible for their obtaining education; and that it is, therefore, the Board's duty to use every means in their power whereby their condition may be sufficiently improved for them to attend school. In this they feel sure that they will have the full agreement of School Boards. Some doubt may, however, be felt as to a Board's power to cope with this difficulty, and it is their Lordships' present object to point out some of the resources available for the purpose.

The most important of these is, doubtless, the individual effort of school managers themselves, who by personal influence can effect much that lies beyond the reach of a corporate body. On the other hand, in order to be really effective, such effort should be employed, not in a desultory manner, but as a supplement to a systematic plan of action on the part of the School Board, acting both by themselves and in co-operation with other bodies. It is to the importance of such co-operation that my Lords desire to call special attention.

Mention has been made of the assistance that may be, and, in certain cases, has been obtained by School Boards from the Police Authorities in dealing with cases of truancy. Similarly, in dealing with the class of children who are rendered unfit to attend school by conditions due to filthy and unsanitary homes, it is of immense importance that the School Board should act in concert with the Local Sanitary Authority. I am to refer the Board to the Public Health (Scotland) Act, 1897, generally, and especially to Section 40 of that Act. It is evident that much might be done by systematically reporting to the Local Authority cases to be dealt with by them under this Act. In burghs a similar use may be made of the Burgh Police (Scotland) Act, 1892, Sections 118 and 119. Attention is also called to the Cleansing of Persons Act, 1897. Instances already exist proving the extent to which officers of the School Board and of the Local Authority can render each other mutual assistance, and my Lords have little doubt that any School Board will obtain from the Local Authority all the aid which they ask for, if they bring themselves or their attendance committee into systematic relations with them.

By acting on these lines School Boards may be able largely to reduce the number of children of the class now under consideration. But there will remain cases which are beyond the scope of such action, especially those of confirmed disease. Many of such diseases are of a more or less infectious nature, and, in any case, they are most repugnant to other children. The risk of infection,

however, is almost entirely removed and the repugnance is mitigated, if the sores or affected parts are properly dressed. My Lords are advised that it is beyond the power of the Board to provide medical treatment out of the school fund; but a substitute for paid service may, perhaps, be found in philanthropic agencies having medical aid within their scope, and it has been suggested that every school in which such cases occur with any frequency might be associated with some society of this kind. Either in this way, or by other means which may suggest themselves, the Board should endeavour to secure that every such case is either properly attended to by the parents themselves or that, where the parents or guardians are, from whatever cause, incapable of giving proper attention, they should be put in the way of obtaining the necessary assistance.

The form in which the question under consideration occurs will naturally differ widely according to the character of the school district, as will also the means at hand for dealing with it. But in all cases it is hoped that the School Board will recognise the duty to deal with it, which is implied in their duties under the compulsory clauses of the Education Acts, and will seriously consider in what direction their present practice in the matter may be extended.

It has been thought expedient to enclose, for the information of your Board, a copy of a circular, relating mainly to the same subject, which is being issued by the Local Government Board to Local Sanitary Authorities.

I have the honour to be,

Sir,

Your obedient Servant,

H. CRAIK.

APPENDIX No. 2.

Extracts from the Report of the Royal Commission on Physical Training (Scotland), Vol. I.

XI.—Summary of Recommendations.

* * * * * *

(6) *Medical Inspection.*—School Boards should have the command of medical advice and assistance in the supervision of schools; a systematic record of physical and health statistics should be kept, and a small number of medical and sanitary experts should be added to the inspecting staff under the Education Department.

VI.—Medical Inspection.

157. We think, therefore, that school authorities should have better means of obtaining adequate medical assistance in connection with their work.

158. We suggest that the medical officers of burghs and counties should, where their services can be obtained, act as referees and consulting officers to whom the School Boards within the area should be able to resort for advice in regard to special difficulties, and that, where this is not the case, special officers should be appointed for the purpose. They should receive reports from local medical officers, and, if necessary, call the attention of the school authorities to any striking features in these reports. Their remuneration might take the form of a retaining fee proportionate to area and population, perhaps not exceeding £100 a year, and, in our opinion, it ought to be borne by imperial funds.

159. Next, it should be the duty of the district medical officers to visit and report upon all the schools in their district, being remunerated by a certain fee for each school, proportioned to the number of scholars. They should certify as to the school being closed or re-opened on account of infectious illness, should decide on the questions that emerge in cases of infectious disease in particular children, should furnish the certificates required in the case of children withdrawn from school, and should prepare statistical reports upon the physical condition of the pupils of the schools. They should be in touch with the school authorities, and should be paid by these authorities, although we think that a certain grant in aid of such remuneration should be paid out of the Parliamentary Vote. They should also report on special points, as occasion may require, to the County Medical Officer.

160. Lastly, we think that great assistance might be given to the school authorities by the appointment, to serve under the Education Department, and as supplementary to the present inspecting staff, of a certain number of sub-inspectors, to make occasional visits to the schools for the purpose of examining their sanitary conditions and the health and cleanliness of the scholars. The assistance of women might often be useful in this work so far as regards the girls and infants, and the effect of physical training in their case.

APPENDIX No. 3.

Extracts from Report of the Inter-Departmental Committee (England) on Physical Deterioration, Vol. I.

Part III.—Summary of Recommendations.

* * * * * *

(41) *Medical Inspection of School Children.*—The Committee are emphatic in recommending that a systematised medical inspection of children at school should be imposed as a public duty on every school authority, and they agree with the Royal Commission on Physical Training (Scotland) that a contribution towards the cost should be made out of the Parliamentary Vote. With the assistance of teachers properly trained in the various branches of hygiene, the system could be so far based on their observations and records that no large and expensive medical staff would be necessary. The lines on which the inspection should be conducted are laid down in Paragraphs 323-326 of the Report.

* * * * * *

Medical Inspection of School Children.

324. The Committee believe that, with teachers properly trained in the various branches of hygiene, the system could be so far based on their observations and record that no large and expensive medical staff would be necessary. The general inspection may safely be limited to that class of school which, from its character and surroundings, affords clear evidence of the type of which its scholars are composed, and it should be repeated as often as the Medical Officer thinks necessary. In other cases it will be enough for him to examine such children as may be submitted to him by the teachers, and it would be for him to determine whether circumstances called for expert assistance. In no instance should the inspector do more than state the facts that require the attention of the parent, cases of poverty or neglect being left to the proper authorities to deal with.

325. The Committee further think that the services of the medical inspector should be at the disposal of the school authority in respect of all matters where the advice of a person skilled in the hygiene of child life may be wanted, and they look in the result to a much more intelligent handling of many of the problems with which that authority is charged.

326. Owing to the healthier conditions commonly prevailing in regard to the nurture and growth of the country population, the Committee do not think that these recommendations will have any appreciable effect in augmenting the charge for education that now devolves upon the rural ratepayers; on the contrary, they are of opinion that bringing the sanitary administration of the county into touch with the schools may lead to the anticipation and prevention of many of those epidemics which are now such a fertile source of local expense.

APPENDIX No. 4.

EDUCATION (SCOTLAND) BILL.

(Ordered to be printed 8th March, 1905.)

26. It shall be lawful for a School Board . . . to incur expenditure . . . in providing under their own direction or through managers any form of education or instruction which may from time to time be sanctioned by any code or minute of the Department, and in providing for the physical training and recreation of the pupils attending schools within their education district, and for their medical examination and supervision: . . .

46. (1) A School Board and the managers of every school in receipt of annual Parliamentary grant, or of any grant out of the Education (Scotland) Fund, shall permit the medical officer or the sanitary inspector of the local government district or burgh in which any school under their charge is situated to have access to such school at any reasonable time, whether during school hours or not, for the purpose of ascertaining the sanitary condition of the school.

(2) It shall be the duty of the medical officer or the sanitary inspector, as the case may be, to transmit to the School Board or other managers of any school, as aforesaid, a copy of any report upon such school that he may be required to make by any order or direction of the Local Government Board for Scotland.

(3) It shall be the duty of a School Board and of the managers of every school, as aforesaid, not under the charge of a School Board, as the case may be, to report, or cause to be reported, forthwith to the medical officer all cases in which the excuse assigned for the absence of a child from school is the existence of infectious disease.

APPENDIX No. 5.

Extracts from Report of the Inter-Departmental Committee on Medical Inspection and Feeding of Children attending Public Elementary Schools in England.

According to the terms of reference the committee were appointed for the following purpose:—

(1) To ascertain and report on what is now being done, and with what result, in respect of medical inspection of children in public elementary schools.

(2) And further, to inquire into the methods employed, the sums expended, and the relief given by various voluntary agencies for the provision of meals for children at public elementary schools, and to report whether relief of this character could be better organised, without any charge upon public funds, both generally and with special regard to children who, though not defective, are from malnutrition below the normal standard.

Regarding medical inspection, the committee began their inquiries by sending a circular to all local authorities, asking to be supplied with information including * * * "(2) whether the authority have established any system of medical inspection of the children in public elementary schools (*a*) for the detection and prevention of infectious diseases, and (*b*) as to general health and physical development, that is to say, as to the sight, hearing, teeth, and personal condition of the children, and their physical ability to profit by the school teaching."

With regard to the medical staff employed in the work the report states Clause 18:—

* * * * * * *

"There are distinct advantages in the school medical officer being also medical officer of health. The duties of the two offices naturally overlap, or may do so. The inspection of children for the prevention of the spread of infectious disease and the sanitary inspection of the premises are examples of this. The union of the two offices tends to prevent duplication of work. It has the additional advantage that the staff of the authority's sanitary department is thus made easily accessible for any special work. They are employed for disinfecting schools, and for following up cases of dirty and verminous children, and for obtaining attention to the condition of the homes as well as of the children. At the same time the medical officer of health finds that his position as educational medical officer greatly facilitates his work in preventing the spread of infectious disease. The chief danger of the arrangement is that the work for the prevention of infectious disease may tend to swamp the work in other directions. In saying this we must not be understood to be in any way under-estimating the value of this work; we merely desire to point to the possible danger of other important branches of medical inspection not receiving due consideration,"

REPORT ON SCHOOL PREMISES.

New Buildings.

Plans submitted under the by-laws regulating buildings are carefully examined and reported on by the building inspector, but only so far as the by-laws are applicable. It should be remembered that there are many important questions of hygiene for consideration in the construction and equipment of schools not dealt with in these by-laws. These questions are believed to be carefully looked into by the School Board and the Scotch Education Department. Some note will be taken of these special points in future when plans are submitted, meanwhile some general observations on the details of construction elicited by examination of plans under the by-laws are briefly stated.

The size of the schools throughout the district vary, of course, with the requirements of the locality, but most of those recently built in populous places provide accommodation for about six hundred scholars.

Lighting is generally in excess of the requirements for dwelling-houses, which must have a window area not less than one-tenth of the floor area. School desks are generally so placed in relation to the windows that the light will fall sideways upon the scholar, and not upon his back or face; but this has not been attained in all class-rooms.

Heating in large schools is provided by a low-pressure hot-water system, and in some class-rooms there is also an open fireplace. In small schools in country districts it is customary to have fireplaces only.

Ventilation.—Mechanical means (propulsion and extraction) have, so far as I am aware, not been adopted in any of the schools in this county, and I believe this is true of most schools in large towns in the west of Scotland, including the City of Glasgow. In the east, however, mechanical ventilation is more common. For example, in the City of Aberdeen all the schools and most public buildings are mechanically ventilated. By this method all the air required is taken in at a given point slightly above ground level. The air is washed, and in winter time it is warmed to the requisite

temperature. By means of a fan the air is conveyed to and delivered in each room from an inlet near the ceiling. The foul air escapes near the floor level by an outlet connected with a duct leading to the outside near the roof.

The most common means of ventilation in large schools is similar to that in the Committee's hospitals. Air inlets are provided in the window-breasts, where radiators are placed, and outlets are placed in the ceiling, or in the walls near the ceiling. In the latter case they generally connect with ducts placed alongside chimney flues. All the windows are hung, and opposite the bottom sash a board is often placed inside, so that when the window is raised the incoming air is deflected upwards.

Central halls from which the class-rooms are entered, and in which drill exercises can be performed in winter, are common in large schools.

Water supply is generally obtained from public gravitation supplies throughout the district. Drinking cups are provided.

Drainage.—All the drains are carefully tested by the building inspector, and the means of sewage disposal does not call for special comment.

Cloak-rooms are generally formed in recesses of the main entrance lobby or vestibule.

Lavatories are now always provided, and these are of various designs. Towels are generally supplied.

Latrines.—These generally consist of urinals and trough water-closets provided with an automatic flushing cistern.

All new buildings are inspected during erection.

Existing Buildings.

School Boards have in all cases made arrangements for the proper maintenance and cleaning of the buildings, but a systematic inspection of all schools in the Middle Ward by the officers of the Local Authority should, I think, be carried out at least once a year. Such inspections would probably reveal some sanitary defects or insanitary conditions.

During the last few months a large number of schools have been inspected, and in a few cases sanitary defects in the latrines have been detected. These will be brought under the notice of the school authorities concerned.

During school hours the teachers seem to pay attention to the ventilation of the class-rooms.

MEDICAL INSPECTION OF SCHOOL CHILDREN.

BLANTYRE PARISH.

REPORT ON THE GENERAL EXAMINATION.

By JAMES A. HISLOP, M.D.

INTRODUCTORY.

The inspection at the schools was made under certain limitations. The objects in view were—an examination of scholars from a public health aspect, and some inquiry into the general health and condition of each scholar. With reference to the former, the sections of the Public Health (Scotland) Act, 1897, chiefly applicable to schools, are as follows:—

(*a*) Sec. 45 provides for entry into schools and the examination of children for infectious disease.

(*b*) Sec. 57 imposes a penalty on sending children to school so as to spread infectious disease.

(*c*) Secs. 46 and 47 provide for the disinfection of schools.

(*d*) Sec. 56 imposes a penalty on exposure of infected persons or things.

(*e*) Sec. 44—Notification of infectious disease.

When an illness is notified under the Infectious Disease Notification Act, 1889, the Medical Officer of Health, if the illness occurs in a house in which there are children of school age, immediately sends notice to the teacher in charge of the school attended by the children, and attention is at the same time called to Section 57 of the Public Health (Scotland) Act, 1897, which states that—

"Every parent or person having care or charge of a child who is or has been suffering from infectious disease, or who resides in a house where such disease exists, or has existed within a period of three months, who shall knowingly or negligently permit such child to attend school without procuring and producing to the teacher, or other person in charge of such school, a certificate from the medical officer, which he shall grant free of charge, or from some legally qualified medical practitioner, that such child has become free from disease and infection, and that the house and everything therein exposed to infection has been disinfected to the satisfaction of such medical officer or medical practitioner, shall be liable to a penalty not exceeding forty shillings. . . . *Any teacher or person in charge of any school who shall knowingly permit any child to attend such school in contravention of the provisions of this section shall be liable to a penalty not exceeding forty shillings.*"

When the child has recovered, or has been removed to hospital, and the house and articles therein exposed to infection have been disinfected, a further notice certifying accordingly is sent to the teacher, and the child or children are then free to return to school.

There are other infectious diseases non-notifiable, however, which are equally dangerous to school children, and it would seem necessary, in order to prevent explosive epidemics, that some means of procedure be adopted for obtaining early intimation of the first cases that occur in schools similar to that practised in large cities like Glasgow. Measles and hooping-cough may be specially mentioned, as they each cause more deaths in young children than do all other notifiable diseases combined.

In connection with parasitic and contagious skin diseases, it has been found that children are absent for months on account of ringworm. Cases of this disease, if neglected at the outset, sometimes run a very intractable course, and require careful and assiduous treatment. The delay in cure is often due to the patient or parent not giving sufficient attention to the medical advice tendered, and a great loss in school attendance is thereby incurred. An educating personal influence is required in such cases, to point out danger to health without hurting their susceptibility, and to impress on parents their responsibility for the well-being of their children.

With reference to the inquiry into the general health and condition of scholars, it might be pointed out that the investigation was confined to an examination of the exposed parts of the body, so as to obviate any objections on the part of parents to a more detailed examination.

No records have been made of the number of children suffering from dental caries, but a cursory examination of the mouth showed neglect of proper care of the teeth. The majority of cases of glandular enlargment appeared to be due to this cause. A difficulty lies in suggesting a remedy. So long as the child is not inconvenienced by pain perhaps little attention will be paid to the state of the teeth, but instruction in cleansing the teeth might lead, to some extent, to a reduction in the number of children suffering from caries.

The mental capacity of one or two of the scholars examined is also worthy of note. Some might be classed as having dull or retarded intelligence, and others as distinctly defective. The Scotch Education Code (Article 20, ii.) provides for the formation of special classes for children mentally defective, and for the admission of pupils to these special classes on the certificate of medical practitioners approved by the Department.

The adoption of this provision is optional, and requires that an "application shall be made to the Department beforehand for the recognition of any such special class." It is evident therefore that, where no such special class exists, a child may go on attending an ordinary class and derive little or no benefit from the usual course of instruction.

The scholars, who might be described as dull and yet not defective mentally, are cases that demand equally as much attention It may be that the dulness is due to a remediable cause which regular medical inspection could detect and remove with corresponding benefit to the child.

RESULTS OF EXAMINATION.

LOW BLANTYRE SCHOOL.

This was the first school examined, and the experience gained here proved beneficial in forming an opinion as to what might be adopted as a routine in the inspection of other schools.

The results may be classed under (1) cleanliness, (2) infectious disease, (3) skin affections, (4) throat and nose, (5) glandular enlargement, and (6) mental dullness or deficiency. Any marked cases of physical defect were also taken note of.

TABLE SHOWING RESULTS OF INSPECTION, LOW BLANTYRE SCHOOL, DECEMBER, 1905.

STANDARD.	Number Examined.	Average Age.	Cleanliness unsatisfactory.	Infectious Disease.	Skin Affection.	Throat and Nose.		Enlarged Glands.	Mental Defects.
						Enlarged Tonsils.	Pharyngitis and Nasal Catarrh.		
Supplementary, -	27	12·4	Not noted.	Measles was prevalent at the time, but no cases amongst the scholars were detected.	...	1	...	2	...
VI., - - -	62	12·1			1	...	...	...	...
V., - - -	95	11·7			1	3	...	15	...
IV., - - -	117	10·7			...	...	...	8	...
III., - - -	110	9·5			3	2	...	8	2
II., - - -	84	8·8			4	...	...	4	1
I., - - -	104	7·8			1	...	...	4	2
Total, -	599	...	...	...	10	6	...	41	5

NOTE.—The Infant Department was not included in any of the school inspections.

Cleanliness.—Speaking generally the skin and clothing of those inspected was fairly clean. Although, in some instances, the personal ablutions had been carelessly performed, yet it is satisfactory to be able to state that in no case was there any ground for action by the Local Authority as recommended by the Scotch Education Department in dealing with that class of children who, "either by disease, uncleanliness, want of clothing, or the results of neglect and unwholesome conditions, are rendered unfit to sit in school with other scholars."

The creases in the skin of the palms of the hands gave evidence of the hands having been used by scholars to clean their slates, and the observation is worthy of note in connection with the transference of infection from one child to another where slates are used in common. Athough it might involve considerable labour to allot and reserve a slate, pencil, and cleaning pad for the individual use of each scholar, it would be an obvious benefit.

Infectious Disease.—None of the scholars examined presented any sign or symptom of any of the ordinary febrile infectious diseases. Several were absent on account of measles, but the prevalence was not epidemic.

Skin Affections.—These consisted of one case of impetigo contagiosa, seven cases of eczema, and two cases of alopecia, which, however, does not require exclusion of the scholars from school.

Throat and Nose.—Only cases of markedly enlarged tonsils were noted, and six cases were recorded. The treatment of this condition is of importance, as the tonsils are frequently the seat of specific infectious disease, and their removal when enlarged is generally the beginning of improved health in the child affected Several cases of nasal catarrh were met with, but the condition does not call for comment, beyond the necessity of using a handkerchief. The skin of the upper lip over which the mucus was running showed considerable irritation in several instances.

Enlarged Glands.—By manipulating the parts in the neck the existence of enlarged glands can be detected, and this condition may be due to various causes. In judging of this condition it should be explained that only cases of marked enlargement were noted. There were 41 cases, or 6·8 per cent. A few were evidently strumous, and are important in that they may be the nucleus of general tubercular infection.

Mental Defects.—Five children were pointed out by the head-master as being dull or defective, and the following are examples of answers given by them :—

(1) 13 years—is in Standard II., and should be in Standard VI. at least. Examples—2 + 2 = 1; 1 – 1 = No answer. Cannot spell his own name.

(2) 9 years—is in Standard I., and should be in Standard III. Examples—3 + 2 = 6; 6 – 2 = 10; 2 + 4 = 5. Spelling—Up = oup; ward = wourd.

(3) 10 years—is in Standard I., and should be in Standard V. Examples—2 × 4 = 5; 2 × 6 = 7; 2 × 3 = 4. Spelling—Where = whear; start = staarte.

(4) 11½ years—is in Standard III., and should be in Standard V. or VI. Examples—2 × 6 = 6; 4 × 5 = 10; 12 – 3 = No answer. Spelling—Motion = mos—; cause = caws.

(5) 11 years—is in Standard III., and should be in Standard V. Examples—15 – 7 = No answer; 9 – 5 = No answer; 5 + 6 = No answer. Spelling—Receive = resev; Motion—mosting.

AUCHINRAITH SCHOOL.

TABLE SHOWING RESULTS OF INSPECTION OF AUCHINRAITH SCHOOL, BLANTYRE, JANUARY, 1906.

STANDARD.	Number Examined.	Average Age.	Cleanliness Unsatisfactory.	Infectious Disease.	Skin Affections.	Throat and Nose.		Enlarged Glands.	Mental Defects.
						Enlarged Tonsils.	Pharyngitis and Nasal Catarrh.		
Supplementary, -	10	12·6	Standards I., II., III., and IV. seemed below the average of the other classes.	Measles and Whooping-cough were prevalent at the time, but no cases were detected amongst the scholars.	..	1	1	2	...
VI., - - -	42	12·2			..	2	3	3	...
V., - - -	54	11·1			3	5	4	8	...
IV., - - -	66	10·3			1	6	5	11	...
III., - - -	64	9·7			3	5	2	4	1
II., - - -	66	8·6			...	2	1	16	...
I., - - -	78	7·4			3	7	1	23	*4
Total, - -	380	...	...	..	10	28	17	67	5

* One child 6½ years is in the lowest class of the Infant Division.

Cleanliness.—The skin and clothing of those inspected was fairly clean, but in some instances there was evidence of careless washing. These remarks apply more particularly to the lower

standards. The palms of the hands, especially amongst boys, had probably been used to clean their slates.

Infectious Disease.—None of the scholars presented any sign of the ordinary febrile infectious ailments, but measles was prevalent at the time of inspection.

Skin Affections.—None of the contagious skin diseases which interfere with school attendance were found, but two children were absent on account of ringworm. There were 8 cases of eczema, 1 of alopecia areata, and 1 of chronic dermatitis.

Throat and Nose.—There were 28 cases of enlarged tonsils, but these varied greatly in degree. The largest number was found in Standards I. and IV., where they average about 9 per cent. in each class. Several cases of nasal catarrh were met with, in some instances combined with pharyngitis, and evidently the result of ordinary "cold."

Enlarged Glands.—The submaxillary and superficial cervical glands were chiefly affected. The degree of enlargement varied greatly, but all cases that seemed abnormal were noted. Sixty-seven cases were recorded, or about 17·6 per cent. A few were due to unhealthy sores, others to carious teeth and strumous conditions. Standards I., II., and IV. had the highest percentage of cases.

Mental Defects.—Five children were pointed out by the head-master as being dull or defective, and the following are examples:—

(1) Age 6½ years. Has been 18 months in the lowest class of infant division, and should be in the highest class of same division, *i.e.*, two classes higher. When asked to recognise certain letters, the following were the answers given:—S = I; N = U H = U; M = U.

(2) Age 10 years, is in the lower class of Standard I., and should be in Standard IV. There appears to be a want of concentration of mind and an inability to retain what she is taught.

(3) Age 11 years, is in lower Standard I., and should be in Standard V. When this scholar was asked to read, he was quite unable to read with the same facility as others even younger than himself.

(4) Age 10 years, is in lower class of Standard I., and should be in Standard IV. When asked to spell simple words he could not do so, and said that 6 + 7 = 8.

(5) Age 13 years, is in Standard III., and should be in the supplementary class. She could not do simple multiplication of two figures, nor spell ordinary simple words.

HIGH BLANTYRE SCHOOL.

TABLE SHOWING RESULTS OF INSPECTION OF HIGH BLANTYRE SCHOOL, FEBRUARY, 1906.

STANDARD.	Number Examined.	Average Age.	Cleanliness Unsatisfactory.	Infectious Disease.	Skin Affections.	Throat and Nose.		Enlarged Glands.	Mental Defects.
						Enlarged Tonsils.	Pharyngitis and Nasal Catarrh.		
Supplementary, -	39	12·8	Standards I., II., III., and IV. seemed below the average of the other classes.	Mumps was prevalent at the time, but no cases were detected amongst the scholars.	...	2	...	3	1
VI., - - -	54	12·3			...	5	2	2	...
V., - - -	74	11·4			2	7	1	11	...
IV., - - -	79	11·1			...	6	2	15	1
III., - - -	61	9·6			1	5	...	10	...
II., - - -	77	8·6			...	5	...	19	...
I., - - -	61	7·8			...	7	1	4	...
Total, - -	445	...	...	...	3	37	6	64	2

Cleanliness.—The state of personal cleanliness varied, and in some instances there was room for improvement, more particularly in the lower standards. For example, the washing of hands before taking food is important, not only as a matter of cleanliness, but also as a means of minimising the risk of conveying disease germs to their mouth in the act of eating.

Infectious Disease.—Mumps was prevalent at the date of inspection, and several were absent on that account. A few children who had recently recoverd from mumps were noticed, some of these were more or less pale or anæmic.

Skin Affections.—One case of ringworm of the scalp was detected, and two cases of eczema. There has not been a single case of scabies in this or any of the other schools previously examined.

Throat and Nose.—Thirty-seven cases of enlarged tonsils were noted, and were evenly distributed over the various classes. Some were of minor importance, while others showed considerable enlargement, and appeared to be associated with adenoids. Several scholars were suffering from nasal catarrh and pharyngitis.

Enlarged Glands.—All cases where the glands were normal were noted. Sixty-four cases, or 14·4 per cent. of the scholars, showed enlargement in varying degree. The majority were in Standard II., with 24·6 per cent.

Mental Defects.—One child, who might be described as having a retarded intellect, was examined. The mental capacity of the individual was not equal to the average, although fairly well informed in some respects. Another child, who was said to be defective, was absent on the day of inspection.

In this school the height and weight of each scholar, without boots or shoes, was also carefully taken by the teachers, and the following table shows the height and weight in inches and pounds, respectively, of both male and female scholars at each year from seven to thirteen. The numbers examined were about 30 for each year of age for each sex, except at the age of seven years, where the results express the average of a dozen scholars for each sex.

HIGH BLANTYRE SCHOOL.

TABLE A.—AVERAGE HEIGHT AND WEIGHT OF CHILDREN.

AGE—YEARS,	13		12		11		10		9		8		7		
SEX,	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Height,	57·2	57·3	55·6	56·6	53·5	51·9	51·5	51·1	49·5	49·1	47·5	47·8	44·1	46·4	Inches.
Weight,	87·2	85·6	77·8	78·8	68·3	66·9	67·2	65·3	61·2	60·8	56·2	54·5	50·4	51·9	Pounds.

TABLE B.—EXTREMES IN HEIGHT AND WEIGHT OF CHILDREN.

AGE—YEARS,		13.		12.		11.		10.		9.		8.		7.		
SEX,		M.	F.	M.	F.	M.	F.	M.	F.	M	F.	M.	F.	M.	F.	
Height	Highest,	61	61	64	61	57	58	55	54	54	53	51	52	48	50	Inches
	Lowest,	53	52	52	52	49	48	48	46	43	46	42	43	43	44	
Weight	Highest,	120	119	121	107	85	84	85	85	70	76	64	70	57	62	Pounds.
	Lowest,	60	54	58	64	50	52	54	49	52	50	46	43	46	47	

TABLE C.—AVERAGE HEIGHT (WITHOUT SHOES) AND WEIGHT (INCLUDING CLOTHES) OF CHILDREN OF GENERAL POPULATION OF GREAT BRITAIN AT SAME AGES—ALL CLASSES, TOWN AND COUNTRY.

(From Report of Authopometric Committee, 1883.)

AGE—YEARS.	13.		12.		11.		10.		9.		8.		7.		
SEX, -	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Height, -	56·9	57·7	54·9	55·6	53·5	53·1	51·8	51·0	49·7	48·7	47·0	46·6	45·9	44·4	Inches.
Weight, -	82·6	87·2	76·7	76·4	72·0	68·1	67·5	62·0	60·4	55·5	54·9	52·1	49·7	47·5	Pounds.

COMPARATIVE TABLE OF AVERAGE HEIGHT AND WEIGHT OF SCHOOL CHILDREN AT HIGH BLANTYRE, AND OF THE POPULATION OF GREAT BRITAIN GENERALLY DURING AGE-PERIOD, 7—13 YEARS.

	HIGH BLANTYRE SCHOOL.			POPULATION OF BRITAIN.		
AGE PERIOD.	7-13 Years			7-13 Years.		
Sex, - - - - - -	M.	F.		M.	F.	
Average Height, - -	51·2	51·4	Inches.	51·3	51·0	Inches.
Average Weight, - -	66·9	66·2	Lbs.	66·2	64·1	Pounds.

The children at High Blantyre School were measured without shoes, so that the average height is strictly comparable to the average height given in Table C, taken from the report of the Authopometric Committee. It should be noted, of course, that the number of observations were of limited extent, and a wider range of observations might alter the results obtained. The figures show that the average stature of children attending this school is in the case of males equal to, and in the case of females slightly above, the general average. The conditions observed in the weighing of the children are also similar, and it will be seen from the figures given in the comparative table that the average weight of the Blantyre school children is somewhat above that of the general average of all classes in Great Britain.

At birth the child approaches in height and weight to certain given standards, and with each succeeding year these increase

gradually, and are dependent mainly upon race, heredity, nutrition, and disease.

Any of these factors may influence growth, and some hold that improper or insufficient nutrition in early years will affect the stature in succeeding years, while others hold the contrary. It seems, however, certain that the *rate of growth* is more or less dependent upon general nutrition and exercise. Exercise also gives proportion and due symmetry to the developing tissue elements, and tends to promote healthy nutrition, producing that state of body termed "good condition." The growth of the bony framework mainly determines height, and the skeleton with the soft tissues determines weight. The height and weight have an important bearing upon the child at school. If a sufficient number of children be examined it is found that in a healthy child the height bears a certain ratio to the weight. These standards are empirical, but give an idea of what may be expected in any individual scholar. If the height is excessive for the body weight, it may be that the child's growth is too rapid, and hence care must be exercised in determining its capacity for the strain put upon it in school hours. Obviously, such a scholar should not have the same amount of exercise, mental or physical, as one in whom the relation of height and weight is normal. The extra strain will only cause exhaustion and probably ill health. Education should therefore be dependent upon the fitness and capacity of a scholar.

MEDICAL INSPECTION OF SCHOOL CHILDREN.

BLANTYRE PARISH.

EXAMINATION OF EYESIGHT.

By JAMES A. WILSON, M.D.

EXPLANATORY.

THE eye may be looked upon as a photographic camera. It has a focussing or refracting apparatus and a sensitive plate—the retina.

Rays of light coming to the eye from an object twenty feet away may be considered to be parallel rays. On entering the normal eye, these rays fall, sharply focussed, on the retina, and do so without any focussing effort on the part of the eye; but rays of light coming from an object, say, one foot away from the eye, enter it as diverging rays, and require more refraction to bring them to a focus on the retina.

The eye has the power of increasing refraction, that is, of still further bending these diverging rays, or, as it is termed, power of accommodating.

The eye in repose is adapted to focus parallel rays, but when a near object is looked at the function of accommodating comes into play. The exercise of this function is associated with muscular effort. It is a capacity which is greatest at the age of ten years, but from this onwards it diminishes, and between forty-five and fifty the receding near point crosses the line of the usual reading distance, so that in reading, a book requires to be held further away from the eye. Then the refracting powers for near work require to be supplemented by glasses with convex surfaces.

Imperfect vision may be due to disease of the retina or of the optic nerve, but in the majority of cases the fault lies in the refracting or focussing capacity. The length of the eye-ball from before backwards varies in different persons, and this is the main element in the production of imperfect refraction.

A common defect among young people is undue shortness, and here the focussing point falls behind the retina. This defect is largely overcome by extra activity on the part of the accommodation, and when it has to be excessive, as in looking at a near object, the muscular effort is felt as strain. When the accommodation is unequal to the task, near objects form blurred images, while distant objects are

seen clearly. This condition is called long-sight, or Hypermetropia. Bi-convex glasses increase the refraction, and enable these people to see near objects distinctly without any undue strain. Hypermetropia is the usual cause of squint, and a squinting eye speedily becomes blind.

When the eye-ball is too long, the focussing point falls in front of the retina, and distant objects are seen blurred. Activity of accommodation here would only make matters worse, by bringing forward still further the point of focus. Rays of light from near objects, on account of their diverging nature, focus further back, and hence the long eye can see sharply objects that are near. This condition is spoken of as near-sight, or Myopia. By using bi-concave glasses, rays coming from a distant object are made to diverge as if coming from a near one, thus, focussing further back, the object is seen clearly.

The commonest of all defects, however, is where the anterior surface of the eye, the cornea, is unequally curved, rendering the refraction of one meridian different from that of the other, and preventing a definite point of focus. The image here is necessarily blurred, and the condition is called Astigmatism. This defect can be corrected by wearing glasses so curved as to equalise the surfaces. It is often associated with Hypermetropia and Myopia, and is a common cause of headache.

It follows that many people have bad vision, not because of any defect in the seeing power of the retina, but because of imperfect refraction.

Methods of Sight Testing.

Acuteness of vision is the degree of sight the eye possesses. In testing acuteness of vision certain test-types are used. These are constructed on a definite principle, with letters of different sizes, each of which can be read by the normal eye at different but definite distances. The smallest letter the normal eye can see at a distance of twenty feet or six metres is taken as the standard of full vision, and converging lines drawn from the upper and lower edges of this letter meet in the eye and form an angle of known size. This angle is such that if the lines were prolonged beyond the smallest letter they would embrace in their divergence all the other letters in the test-types at definite but increasing distances from the eye, the smallest being seen at twenty feet and the largest at two hundred feet. The distance of twenty feet is employed to get away from the influence of accommodation.

These letters, of varying sizes, printed on a sheet, are hung up, and the person to be tested stands twenty feet away, each eye being tested separately. An eye that reads the smallest letters is said to have full vision or $\frac{6}{6}$; an eye that only reads the line of larger letters

immediately above this is described as having $\frac{6}{9}$. Then follow $\frac{6}{12}$, $\frac{6}{18}$, $\frac{6}{24}$, $\frac{6}{36}$, and the largest of all, $\frac{6}{60}$.

The vision testing in schools by means of the test-types has been done by the teachers, and their results have been accepted. The work done by the teachers, and their hearty co-operation, have to be gratefully acknowledged. Their results are recorded in tabular form which may require some explanation.

For each school there is a separate table, which in the upper half is called Table A, and in the lower half Table B. Table A gives the teachers' results. Table B the results obtained by the oculist. On examining each eye separately, it is frequently found that the vision is unequal, the acuteness of vision or degree of sight being less in one eye than in the other.

In Table A a scholar is classed as having normal vision if with each eye $\frac{6}{6}$ or $\frac{6}{9}$ is read. The other classifications are made according to the worse eye, *e.g.*, a scholar who reads, say, $\frac{6}{6}$ with one eye, and $\frac{6}{12}$ with the other, is classed as $\frac{6}{12}$, and so on. Scholars classed as $\frac{6}{12}$, or worse, are considered defective, and these are further examined by the oculist.

These so-called defectives are now examined in a dark room by retinoscopy, and the apparatus used is the skiascope, devised by Dr. Wright Thomson, who is doing the work for the Glasgow School Board. A few words of acknowledgment are due here to Dr. Thomson. By the use of his apparatus it is now possible to employ in school work the scientific method practised by ophthalmic surgeons in estimating errors of refraction. Retinoscopy can now be done in a rapid and accurate manner, whereas by the method usually adopted in ophthalmic hospitals it is so tedious as to be practically impossible in school work. I had an opportunity a year ago, through the courtesy of Dr. Kerr, of the London County Council, of seeing the work done there by several of their school oculists, and later, on seeing Dr. Thomson at work in Glasgow, I was at once struck with the superiority of his method.

At ophthalmic hospitals retinoscopy is usually employed only after the pupils of the eyes have been dilated by the use of atropine, but without the use of this drug, and after certain allowances are made, the method is sufficiently accurate for school work, and the addition of retinoscopy to vision testing is a decided advance.

Some of the scholars with bad vision, as revealed by the test-types show, on retinoscopic examination no refractive error. In these cases an ophthalmoscopic examination is made, but often nothing is found to account for the bad vision, so there remains a small number of cases whose defective vision is probably due to general health conditions and to school work.

The system adopted here in the medical inspection of school children (eyes and eyesight) ranges over a fairly full field, and embraces among its defectives, scholars that, under other systems, would be classed as normal. It also gathers into its net cases of defect or blindness of one eye. Tables of some scientific value are obtained, and the final selection of cases as "requiring attention" is arrived at after a fair amount of discrimination. In comparing the results of different workers the basis of classification adopted should be kept in view.

Many scholars with defective eyesight are handicapped in school work, and will be handicapped later in certain occupations. Most of them will have their efficiency increased by wearing glasses. The vision in some cases will improve if the glasses are worn, and in others it will get worse if not worn. The actual necessity for glasses is left to be decided by further examination. The following is the form used in reporting defective vision. Some of the parents will doubtless disregard the recommendation, and, either through inability or unwillingness, the final testing may not be applied:—

..... *School.*

Standard .....

Scholar, ...

The Eyesight seems defective, and the parents are advised to consult their own doctor, taking this note with them.

The results of School Inspection of Vision were as follows:—

	Right Eye.	Left Eye.
Read test types, -	.....	.....
Retinoscopy showed	.....	.....
.....	.....	.....

.....

RESULTS.

Low Blantyre School.—The number of scholars examined by the teachers was 599, of whom 437 so read the test-types as to have their vision classed as normal, leaving 162 as defective for further examination. The degree of defect is indicated by the increase in the denominator of the fraction given in Table A. For example, $\frac{6}{12}$ indicate moderate defect; $\frac{6}{36}$, and worse, indicate high degrees of defect in visual acuity.

The defectives were examined by retinoscopy, and their number reduced from 162 to 61.

Auchenraith School.—The number of scholars examined by the teachers was 380, of whom 217 so read the test-types as to have their vision classed as normal, leaving 163 as defective for further examination.

The defectives, when examined by retinoscopy, were reduced from 163 to 38.

High Blantyre School.—The number of scholars examined by the teachers was 445, of whom 336 so read the test-types as to have their vision classed as normal, leaving 79 as defective for further examination.

The defectives, when examined by retinoscopy, were reduced from 79 to 33.

Taking the three schools together, the teachers found 71 per cent. of the scholars to have normal vision and 29 per cent. defective vision, as shown in the following Table A1 :—

TABLE A1.—SHOWING THE PERCENTAGE RESULTS OF VISION TESTING IN THE THREE SCHOOLS.

CLASS STANDARDS, - -	I.	II.	III.	IV.	V.	VI.	+VI.	TOTAL.
Average Ages, - - -	7·6	8·7	9·6	10·7	11·6	12·2	12·6	...
Numbers Examined, - -	243	227	235	262	223	158	76	1,424
Percentages Normal, - -	60	69	69	75	76	75	88	71
,, Defective, -	40	31	31	25	24	25	12	29

TABLE B1.—SHOWING PERCENTAGE RESULTS OF RETINOSCOPIC EXAMINATION.

Hypermetropia and Hypermetropic Astigmatism, -	16·4	12·3	11·9	8·0	8·9	8·8	3·9	10·8
Myopia and Myopic Astigmatism, - - -	1·2	2·2	1·7	1·1	·4	1·8	1·3	1·4
Mixed Astigmatism, - -	3·2	3·1	6·3	5·7	4·0	4·4	...	4·2
Bad vision, $\frac{6}{18}$ or worse, but without refractive defect, - - -	4·9	3·5	3·4	1·9	...	·6	...	2·3

The results of the retinoscopic examination of the defectives are given in Table B1, and here the grouping is according to the nature of the defect. Of these the more serious only have been selected and classed as "requiring attention." Of the total numbers tested by the teachers, only 132 scholars, *i.e.*, about 10 per cent., have been so classed, while 18·7 per cent. are recorded in Table B1. Those wearing glasses have not been included, but they only amount to 1·1 per cent. Each scholar classed as requiring attention received through the head-masters the printed form already mentioned, with the results of the inspection filled in. These forms have not been given out all at once, but only a few each week.

Regarding the nature of the defects, if we add the scholars with hypermetropia to those with hypermetropic astigmatism, we find that 10·8 per cent. of all the scholars suffered from these conditions. Table B1 shows, that taking the children class by class, the amount of hypermetropia was greatest in Standard I.—16·4 per cent.—and that it gradually diminished as the Standards advance till in Standard VI. it has fallen to 8·8 per cent.

If we add the number of scholars with myopia to those with myopic astigmatism we get a percentage of 1·4. This is a small amount of myopia, and may be due to the open nature of the country district in which the children live.

Mixed astigmatism was the cause of 4·2 per cent. of the defectives.

If all the defectives were examined, as they would be in an ophthalmic hospital, that is, after the use of atropine, the results would be somewhat different. Atropine throws the accommodation out of use, and leaves the full amount of hypermetropia exposed. Some of the cases of low hypermetropia, classed as normal, would fall into the Hypermetropia Classification. Over activity of the accommodation, as during school work, sometimes passes into a state of spasm, and a condition simulating myopia is produced. Hence one or two cases in the Myopia Group might require to be transferred to the Hypermetropia Group. Also some of the cases of mixed Astigmatism would move into the Group of Hypermetropic, or Myopic Astigmatism.

There was a small percentage of scholars with bad vision and with little or no refractive defect to account for it. These are also shown in Table B1. There was 4·9 per cent. in Standard I., and, like hypermetropia, it diminished as the Standards advance till, in Standard VI., it has fallen to ·6. It looks as if it were in some way associated with the prevalence of hypermetropia and consequent over use of the accommodation.

The following is an illustration of a class of cases commonly met with in ophthalmic work :—a girl, aged 13, could only read $\frac{6}{60}$ with each eye. Atropine was used for a week. This paralyses and so rests the accommodation. The atropine was then stopped, and a fortnight later it was found that the girl could read $\frac{6}{9}$ with both eyes without glasses. Such conditions are sometimes due to spasm of the accommodation, but

many are not. The defect in this case was a slight degree of hypermetropia—a condition calling for excessive and more or less continuous accommodation in school work, ending, probably, in exhaustion of the accommodation.

It has to be acknowledged that retinoscopy, without the previous use of atropine, is in a small number of cases difficult, if not impossible to do. Only a few such cases were found, and these have been classed among the normals.

The following diseases and other defects were found :—squint, 15 cases, or 1 per cent. ; opacities of the cornea, 11 ; blepharitis, 4 ; conjunctivitis, 2 ; styes, 2 ; cataract, 2 ; ptosis, 2 ; nystagmus, 1 ; eyes awanting, 1.

Disease of the eye-lids is often associated with error of refraction.

Summary of Results.	Low Blantyre.	Auchenraith.	High Blantyre.	Averages.
Percentages of defective vision as per test-types, -	27	42	17·7	29·1
Percentages of defective vision requiring attention,	10	10	7·4	9·1
Percentages wearing glasses, - - - -	1	1	1·5	1·1

BLANTYRE PARISH.—LOW BLANTYRE SCHOOL.

829 Scholars on Roll. *Mr. NESS, Headmaster.*

TABLE A.—VISION AS ASCERTAINED BY THE TEST-TYPES.

CLASS STANDARD,	I.	II.	III.	IV.	V.	VI.	+ VI.	TOTAL.
Average Age,	7·8	8·8	9·5	10·7	11·7	12·1	12·4	...
Number Examined,	104	84	110	117	95	62	27	599
Vision Normal, $\frac{6}{6}$ or $\frac{6}{9}$,	73	61	75	86	73	45	24	437
Vision Defective = $\frac{6}{12}$,	11	4	13	4	7	4	1	44
" = $\frac{6}{18}$,	13	8	10	14	8	6	...	59
" = $\frac{6}{24}$,	3	7	6	6	5	3	1	31
" = $\frac{6}{36}$ or Worse,	4	4	6	7	2	4	1	28
Total Defective,	31	23	35	31	22	17	3	162

TABLE B.—DEFECTIVE VISION FURTHER EXAMINED BY RETINOSCOPY.

Absent or Away,	1	2	5	2	1	3	1	15
[1] Emmetropia, or Normal,	9	4	4	3	6	3	1	30
[2] Hypermetropia,	8	8	11	9	6	5	...	47
Myopia,	2	3	1	1	1	1	...	9
[3] Astigmatism — Hypermetropic,	6	2	6	6	4	3	1	28
[3] Astigmatism — Myopic,	...	...	...	...	...	1	...	1
[3] Astigmatism — Mixed,	5	4	8	10	4	1	...	32
Diseases and other Defects,	3	1	2	2	2	2	1	13
Scholars whose Eyes require attention,	**9**	**12**	**9**	**15**	**9**	**6**	**1**	**61**

[1] Emmetropia includes low Hypermetropia.

[2] Hypermetropia includes only cases with two or more Dioptres.

[3] Cases are classed as Hypermetropic or Myopic Astigmatism if there is more than one Dioptre of difference between the meridians of the eyes.

BLANTYRE PARISH.—AUCHENRAITH SCHOOL.

529 Scholars on Roll. *Mr. WELSH, Headmaster*

TABLE A.—VISION AS ASCERTAINED BY THE TEST-TYPES.

CLASS STANDARD,	I.	II.	III.	IV.	V.	VI.	+ VI.	TOTAL.
Average Age,	7·4	8·6	9·7	10·3	11·1	12·2	12·6	...
Number Examined,	78	66	64	66	54	42	10	380
Vision Normal, $\frac{6}{6}$ or $\frac{6}{9}$,	27	36	39	46	32	29	8	217
Vision Defective = $\frac{6}{12}$,	22	14	12	12	12	3	1	76
,, = $\frac{6}{18}$,	10	6	5	3	2	2	...	28
,, = $\frac{6}{24}$,	11	5	2	2	4	3	...	27
,, = $\frac{6}{36}$ or Worse,	8	5	6	3	4	5	1	32
Total Defective,	51	30	25	20	22	13	2	163

TABLE B.—DEFECTIVE VISION FURTHER EXAMINED BY RETINOSCOPY.

Absent or Away,	6	2	2	2	4	3	...	19
[1]Emmetropia, or Normal,	25	15	11	15	8	1	1	76
[2]Hypermetropia,	7	7	3	2	5	3	1	28
Myopia,	1	1	1	...	...	1	...	4
[3]Astigmatism — Hypermetropic,	9	3	4	1	4	2	...	23
[3]Astigmatism — Myopic,	...	...	1	...	...	...	...	1
[3]Astigmatism — Mixed,	3	2	3	...	1	3	...	12
Diseases and other Defects,	3	3	2	2	1	2	1	14
Scholars whose Eyes require attention,	**14**	**9**	**6**	**3**	**2**	**4**	...	**38**

[1] Emmetropia includes low Hypermetropia.

[2] Hypermetropia includes only cases with two or more Dioptres.

[3] Cases are classed as Hypermetropic or Myopic Astigmatism if there is more than one Dioptre of difference between the meridians of the eyes.

BLANTYRE PARISH.—HIGH BLANTYRE SCHOOL.

606 Scholars on Roll. *Mr. DUNLOP, Headmaster.*

TABLE A.—VISION AS ASCERTAINED BY THE TEST-TYPES.

CLASS STANDARD,	I.	II.	III.	IV.	V.	VI.	+ VI.	TOTAL.
Average Age,	7·8	8·6	9·6	11·1	11·4	12·3	12·8	...
Number Examined,	61	77	61	79	74	54	39	445
Vision Normal, $\frac{6}{6}$ or $\frac{6}{9}$,	46	61	49	65	65	45	35	366
Vision Defective = $\frac{6}{12}$,	5	5	2	4	4	4	1	25
" = $\frac{6}{18}$,	5	4	6	3	2	2	...	22
" = $\frac{6}{24}$,	1	3	2	5	2	2	1	16
" = $\frac{6}{36}$ or Worse,	4	4	2	2	1	1	2	16
Total Defective,	15	16	12	14	9	9	4	79

TABLE B.—DEFECTIVE VISION FURTHER EXAMINED BY RETINOSCOPY.

Absent or Away,	2	1	1	2	1	3	1	11
[1]Emmetropia, or Normal,	3	5	2	2	3	2	1	18
[2]Hypermetropia,	2	2	1	1	1	1	1	9
Myopia,	...	1	1	2	...	...	1	5
[3]Astigmatism — Hypermetropic,	8	6	3	2	...	...	...	19
[3]Astigmatism — Myopic,	...	...	...	...	...	...	...	...
[3]Astigmatism — Mixed,	...	1	4	5	4	3	...	17
Diseases and other Defects,	...	2	2	1	2	...	1	8
Scholars whose Eyes require attention,	**7**	**4**	**6**	**8**	**2**	**4**	**2**	**33**

[1] Emmetropia includes low Hypermetropia.

[2] Hypermetropia includes only cases with two or more Dioptres.

[3] Cases are classed as Hypermetropic or Myopic Astigmatism if there is more than one Dioptre of difference between the meridians of the eyes.

REPORT ON EXAMINATION OF HEARING.

The preliminary testing of hearing was undertaken by the head-masters and teaching staff, to whom acknowledgment is due, and was conducted on the lines observed by other investigators. A loud-ticking watch was supplied and used as a standard for each school. By experiment it was found that the watch could be heard in an absolutely quiet room at 25 feet; but as absolute quietness cannot be obtained at school, only those scholars who could not hear at 15 feet or under were at first classed as defective.

Considerable difficulty was experienced in securing a room or place sufficiently free from noise. On examining the results obtained in this way it was noticed that frequently a series of bad results were recorded together, followed by a series of good results. The series of bad results were probably due to air currents, or the child's attention being distracted by movements or sounds in an adjoining room, and on trying one or two children under altered conditions the hearing was found to be quite normal. Ultimately those who could not hear at a distance of 6 feet were taken as defective, and referred for further examination.

Speaking generally, the watch test was not particularly reliable, as an affirmative answer was sometimes given when there was no possibility of hearing the watch, and the supposed sound was entirely imaginary. Probably on this account some cases may have been overlooked.

The results of examination of hearing at three public schools in Blantyre Parish are given in the following table:—

TABLE SHOWING NUMBER OF SCHOLARS WITH DEFECTIVE HEARING IN DIFFERENT SCHOOLS.

School.	Number Examined.	Number Defective.		Probable Cause of Deafness.						Total.	Per-centage.
		One Ear.	Both Ears.	Suppuration.	Wax with Deafness.	Perforation of Tympanum.	Retracted Tympanum.	Thickened Tympanum.	Other Causes.		
Low Blantyre;	597	21	5	2	9	8	3	2	2	26	4·3
High Blantyre,	401	8	7	1	6	2	4	2	...	15	3·7
Auchenraith,	380	22	20	4	17	4	3	9	5	42	11·0
Total,	1,378	51	32	7	32	14	10	13	7	83	6·0

From the Table it will be seen that the total number of children examined in the three schools was 1,378. This did not include the scholars in the various classes of the infant department. Of this number, 83, or 6·0 per cent., had defective hearing, and 32, or 2·3 per cent., were found defective in both ears.

Seven of the children were suffering from suppuration, a condition which should receive immediate attention. The neglect of efficient treatment may lead to irreparable damage and deafness, or even to dangerous complications in the brain. The treatment of this condition is often prolonged, and on that account the doctor's orders are, after a few weeks, frequently neglected by parents, and the ear allowed to go from bad to worse. In many cases the district nurse does not seem to be asked to assist.

On the other hand, in 32 cases out of a total of 83 defectives, or nearly 40 per cent., deafness was due to blocking of the external canal with wax, a condition which might be very easily remedied with immediate relief to the child by careful syringing. In some cases the ear was so full that it was scarcely necessary to use a speculum to ascertain the cause of defective hearing.

Other cases of deafness were probably dependent on a thickening of the turbinate bones of the nose, or enlarged tonsils with adenoids. A fact worth recording is that most of the children, with only a few exceptions, were totally unaware of their deafness, and hence the greater need for medical inspection. If the attention of parents or teachers were not drawn to such cases by pain, they have every chance of passing unnoticed.

Many of these cases would be benefited by appropriate treatment, while the want of detection, or neglect of others, will lead to permanent deafness.