

THE ROUTINE SCHOOL MEDICAL INSPECTION

A study of the efficiency of the  
present form of examination

by

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## INTRODUCTION

The objective of the school health service is the promotion of health of the school child.

The attainment of this objective requires an efficient programme of health supervision so that defects can readily be detected; a programme of personal health guidance so that the child can be taught the ways of healthy living; and a programme of environmental control to protect him against undesirable physical and emotional strain.

The present system of administration places most emphasis on health supervision, and the present basis of this supervision is the routine medical inspection.

There is great need for reappraisal of the present position by the school health service and in particular of the means by which efficient health supervision can be obtained. In so far as the routine medical inspection is used primarily for the detection of defects, its efficiency in this role must be assessed.

This study, carried out during the years 1959 and 1960, is part of that assessment. The purpose of this thesis is to demonstrate that the present system of medical inspection is inaccurate, that the inaccuracy is serious, and is due in important measure to the circumstances under which the present system of medical inspection is carried out.

## THE PRESENT POSITION

Education authorities in Scotland have a duty under the Education (Scotland) Act, 1946, to arrange for the medical examination at periodic intervals of all children attending schools in their areas and under their management. This periodic examination, the routine medical inspection, is carried out by the school health service at age groups laid down by the Secretary of State under powers given by the above Education (Scotland) Act. The age groups, usually five, nine, 13 and 16 years, are set out in annual circulars (D.H.S. Circulars 71/1959: 69/1958 etc.) issued by the Department of Health for Scotland. The circulars also direct school health services to provide for the special examination of pupils suspected by teachers, parents, nurses and others to be suffering from defects, and for re-examination where necessary. This arrangement of routine medical inspection of all school children at precise age groups and the special examination and re-examination of selected children when required, is the basis of the system of medical investigation used by the school health service for the discovery of defects. The more important in numbers is the routine medical inspection, of which 226,539 were carried out in 1959 compared with a total of 175,797 for all special and repeat examinations. The school child population at that time was 866,581 (D.H.S. Scottish Health Statistics 1959).

The system of three routine medical inspections during the period of compulsory education, together with special and repeat examinations when

necessary, is also typical of the school health service of England and Wales (Statutory Instrument 1953: 1156).

The inspection as a clinical exercise is open to criticism. It must be carried out in schools unless special authority is otherwise given (Education Scotland S.I. 1947). Many schools are too small or too old to have medical rooms, and so accommodation is often very inadequate. The attendance of parents at inspections of older children is very poor (Weir (1958)<sup>a</sup>, Riddell (1958)<sup>a</sup>) making it difficult to obtain adequate histories. The number of inspections to be done limits the examination to some seven or eight minutes. Eight per hour is accepted practice (Soc. Med. Off. Hlth (1960)<sup>a</sup>). It is questionable whether three medical inspections during the school life of the 15 year old school leaver, with special case referrals by non-medical personnel when required, gives adequate continuity of health supervision.

The W.H.O. Expert Committee on School Health Services questioned seriously the value of the all too common cursory medical inspection carried out as a routine (W.H.O. tech. Rpt. 30<sup>(a)</sup>).

Many criticisms have been made but rarely have these been supported by factual evidence. Withnell (1958) examined the results of his own routine medical inspections and came to the conclusion that they had revealed very few defects and these could probably have been detected by a procedure less time-consuming than the routine medical inspection. Lee (1958) reported that the school health service record cards contained only 60 per cent of the medical defects which caused

rejection of a number of recruits for the Armed Forces: Herford (1957)<sup>a</sup> reported that the school health service record cards contained only 40 per cent of the medical defects found by him in a group of young persons examined for employment. The Society of Medical Officers of Health (1960)<sup>a</sup> reported that 10.2 per cent of certain types of defect found in a survey of school leavers had not been detected at previous school medical inspections.

The investigations of Lee and Herford cast doubt on the accuracy of present methods. The results are based, however, on the comparison of school health records with those obtained from examinations quite unconnected with the school health service, having a different purpose from that of the school medical examination, and conducted in situations unrelated to school health practice. They were also carried out on young persons after they had left school. Withnell and the Society of Medical Officers of Health made their observations from examinations conducted under present arrangements and therefore subjected to present restrictions. It now seems necessary to study the situation where the school health records are compared with the findings of a school medical examination conducted within the school health service environment, but from which the known defects of the present form of medical inspection have been removed and, in particular, the defects of limitation of time, inadequacy of place and of history, the examination to be conducted within the school health service whose records are under examination and on children who are still at school. This is the plan of this present study.

## THE PLAN OF THE STUDY

The plan of the study is the medical examination under the best possible school health service conditions of a group of children about to leave school, and the comparison of the findings of this examination with those contained in the school medical records of the children in the group.

The study medical examination was planned so that all the known difficulties under which the school health service has to work were avoided. Every effort was made to provide the best possible medical examination rooms, adequate time for the examination, special arrangements for the encouragement of parents to attend at the examination and the use of questionnaires to obtain information from teachers and parents. Certain other services were provided such as audiometry, chest X-ray and the services of psychologists.

The medical officers of the school health service normally enter the results of all routine medical inspections and special examinations in the routine school medical card, the form of which is standard throughout Scotland (D.H.S., N.M. & C. Circular 60/1938). It is possible, however, that some special examinations may have been recorded on other cards and great care was taken in the study to obtain all the medical records in the possession of the school health service concerning the children of the study group.

Each child selected would be referred to a physician from outside the school health service for examination.

## The requirements of the study

The study required about 600 school children who were soon to leave school. The figure of 600 was chosen because it might be expected to produce sufficient children with defects on the basis of the Scottish average for children examined at routine medical inspections, 37 per cent (D.H.S. Scottish Health Statistics 1958); because the time which could reasonably be expected to be given to the study by medical examiners was about 60 sessions, and because of the need to complete the collecting of information before the children left school.

The study required an area which satisfied the following criteria:-

- (a) the school health service of the area had shown consistent and high annual returns of defects found in school children at routine medical inspection. That is, the area must appear on this criterion to have an active school health service:
- (b) the area must be able to provide at least 600 children of near school leaving age who had received all the routine medical examinations normally given. That is, the school health service had carried out all the examinations likely to be called for and therefore would be expected to have made a full medical appraisal of each child:

- (c) there should be more than one school medical officer normally operating in the schools of the area:
- (d) sufficient high standard and suitably placed school clinics should be available for the medical examinations:
- (e) the school health service for the area should be able to provide clinic nurses, health visitors, audiometricians, psychologists and clerical staff:
- (f) there should be available to the area physicians of consultant status to carry out the medical examinations: and
- (g) the area should contain industrial, semi-industrial and rural populations.

The arrangements of the study

North Lanarkshire was chosen. It not only satisfied all the above criteria but the school health service and the educational service were most willing to co-operate in the study.

The medical examiners selected were physicians of consultant status. Three were necessary for the purpose because of the amount of work involved. None had carried out school routine medical examinations in the past, but all had had considerable experience in the clinical examination of children.

Preliminary meetings were held with the physicians, with the medical officers and nurses of the school health service and with the Director of Education and the headmasters of the schools in the area. The purpose and planning of the survey was explained and discussions held on the timing.

The timing of the study was influenced by factors such as school holidays, school examinations and the availability of the physicians. It was decided to conduct the investigation during the year following the 13 year old routine medical examination, which is the last routine examination given to children before they leave school at 15 years.

Eleven schools were selected by the Senior School Medical Officer and the Director of Education. The basis of the selection was solely that of convenience to the teaching staff, children and parents attending clinics and to the school curricula. The Director of Education was asked to arrange for teachers of final year classes in those schools to select children of the 14 year old group by taking every second child on the class register. The Director was asked to so arrange this that the total number of children presented would be approximately 600 and that there would be approximately equal numbers of boys and girls.

The following schools were selected; the number of boys and girls from each are shown -

|                             | <u>Boys</u> | <u>Girls</u> |
|-----------------------------|-------------|--------------|
| Rutherglen Academy          | 24          | 27           |
| Gateside Junior Secondary   | 36          | 36           |
| Kildonan Secondary          | 31          | 28           |
| Gallowflat Junior Secondary | 18          | 22           |
| Earnock Secondary           | 30          | 31           |
| Wishaw Central              | 29          | 28           |

|                      | <u>Boys</u> | <u>Girls</u> |
|----------------------|-------------|--------------|
| St. Joseph's Central | 30          | 40           |
| St. Patrick's R.C.   | 29          | 31           |
| Motherwell Central   | 39          | 35           |
| Baillieston R.C.     | 9           | 11           |
| Baillieston Junior   | 7           | 9            |

A total of 580 children, that is, 282 boys and 298 girls were therefore presented by the Director of Education for the study.

Three school clinics were chosen for the medical examination, one for each examining physician. These clinics were the best in the area and were among the best in the county. In comparison, the medical examination rooms which had been available to the school health service in the 11 schools chosen were graded by the Senior School Medical Officer into categories of suitability for medical examination.

The school medical rooms were graded as follows:-

|                   |  |
|-------------------|--|
| Excellent         | - Rutherglen Academy<br>Gateside Junior Secondary<br>Gallowflat Junior Secondary |
| Very Satisfactory | - Kildonan   |
| Satisfactory      | - Earnock Secondary<br>St. Patrick's R.C.  |
| Unsatisfactory    | - Wishaw Central<br>St. Joseph's Central   |
| Impossible        | - Motherwell Central<br>Baillieston R.C.<br>Baillieston Junior Secondary         |

While these are subjective impressions they were so graded from the base line that anything below satisfactory was unsatisfactory in a

sense that it was thought the accuracy of medical examinations conducted in those rooms would be affected. It was the case then that five out of the 11 schools had medical rooms which were so unsatisfactory that they might affect the accuracy of the medical examinations carried out there. When the schools were chosen for the study no appraisal had at that time been made of the school medical rooms and, therefore, the choice of schools was not influenced by the suitability or otherwise of the medical accommodation.

The school health service made available to the study examiners the school nurse/health visitors normally in attendance at routine medical examinations; these nurses were available for clinic assistance and for home visiting.

The routine medical inspections carried out by the school health service are usually limited in time to seven to eight minutes each because of the number of children to be seen. The study medical staff were allowed to take as much time as they wished for each case; an estimate of 15 minutes per examination was made at the commencement of the survey for planning purposes.

Every effort was made to obtain the attendance of one or other parent at the examination of the children. A letter was sent to each parent via the child as follows:-

Dear Parent,

From time to time in the school health service it is necessary to re-examine some special aspect of our work in more

detail than is usually possible with a view to making changes and improvements. On these occasions we are very dependent on the co-operation of parents, teachers and pupils.

It is on such an occasion that I now write to ask you to help us in a special survey of pupils born in the year 1944. This group includes your own child.

We propose to give him/her a special medical examination and to achieve this a Consultant from one of the large hospitals will interview a selected number of pupils at a specially equipped centre. An X-ray or other investigation may in cases also be necessary.

It is specially desired that you, the pupil's parent, be present so that the Consultant may have an opportunity of asking you additional questions relating to your child's health.

The Headmaster has arranged to allow your child off school for this appointment. Any travelling expenses involved will be refunded on a claim being made to .....

We now want you to do two things. (1) Fill in the enclosed questionnaire about your child's earlier illnesses. (2) Sign this form below indicating your consent and immediately return both to the Headmaster. A letter will follow giving you the date, time and place of the examination.

Yours faithfully,

Signature of Parent

Very few parents attend the routine medical inspection of the senior school children and it was thought desirable to ask the parents to complete questionnaires against the contingency of their absence from the study examinations. In the cases where the parents did attend it was thought that the questionnaires would contain useful additional information to the parents' own history. Questionnaires were prepared as follows:-

Questionnaire to Parents

Child's full name .....

Date of Birth .....

Address .....

Family Doctor's Name .....

---

If your child has suffered from any of the following illnesses at any time please write YES opposite the particular illness. If he has not suffered from the illness please write NO opposite that illness. If you are doubtful please write NOT SURE opposite the illness.

1. Measles .....
2. Mumps .....
3. Whooping Cough .....
4. Scarlet Fever .....
5. Diphtheria .....
6. German Measles .....
7. Poliomyelitis .....
8. Rheumatism .....
9. Tuberculosis .....

- 10. Chorea (St. Vitus' Dance) .....
- 11. Fits (Epilepsy) .....
- 12. Ear Disease .....
- 13. Sore Throats or Tonsillitis .....
- 14. Frequent Cough .....
- 15. Bronchitis .....
- 16. Pneumonia .....
- 17. Asthma .....
- 18. Heart Disease .....
- 19. Skin Disease .....
- 20. Any other Disease (please give details) .....
- .....
- 21. Any operation (please give details) .....
- .....
- .....

---

22. Is there anything about your child's health which is causing you concern. Please give details?

.....

.....

---

Date ..... Signed .....

Relation to child (Father, Mother  
or Guardian)

The school health service does not obtain information routinely from teachers. It is believed that teachers can make a great contribution to the history of a child by providing information on behaviour, disposition, scholastic attainment and intelligence. Teachers were asked to complete the following questionnaire:-

Questionnaire to Teachers

1. Name of Child ..... Date of Birth .....
2. Address of Child .....
3. School and Class .....
4. School attendance: (a general statement on attendance with any available information on the cause of prolonged absence or frequent short absences)  
.....  
.....
5. Behaviour and Disposition:
  - (a) Is the child of solitary habits? .....
  - (b) Does he associate with other children of his own age or younger? .....
  - (c) Is the child amenable to school discipline? .....
  - (d) Is he aggressive, bad-tempered or unduly timid? .....
  - (e) Is there a history of truancy? .....
  - (f) Is there disturbed relationship between the child and parents, brothers or sisters? .....
  - (g) Any additional information on the child's behaviour and disposition .....

6. Scholastic Attainment and Intelligence

(a) Is the child above average, average or below average in scholastic attainment? .....

(b) Is the child above average, average or below average in intelligence (please give I.Q. rating if known)? .....

(c) Where the scholastic attainment is not in keeping with the intelligence level can you suggest reasons? .....

7. Home Environment (A general statement on the apparent quality of home care.)

8. Please give any other information concerning the child's physical and mental health which may be of value to the medical examiner.

Date .....

Signed .....

The standard form of routine medical record card used by the school health service in Scotland is considered to be quite unsuitable for the recording of clinical findings. A medical card was specially prepared for the study. The content of the card is as follows.

MEDICAL RECORD CARD

BOY/GIRL

I. Name ..... Date of Birth .....  
Address .....  
School .....  
Family Doctor: Name .....  
Address .....  
.....

---

II. Personal History:

---

III. Family History:

---

IV. Parent: Present/Absent

---

V. Medical Examination

No defect = V Defect present = X

Date .....  
1. Nutrition .....  
2. Maturity .....  
3. Skin .....  
4. Teeth .....  
5. Nose and Throat .....

6. Eyes .....
7. Ears ..... R ..... L .....
8. Speech .....
9. Intelligence .....
10. Mental Health .....
11. Cardiovascular system .....
12. Respiratory system .....
13. Genito urinary system .....
14. Abdomen .....
15. Nervous system .....
16. Orthopaedic conditions .....
17. Developmental conditions .....
18. Menstruation .....
19. ....
20. ....

VI. HEIGHT:

WEIGHT:

VII. VISION:

|                 |   |   |
|-----------------|---|---|
| Without glasses | { | R |
|                 | { | L |

|                |   |   |
|----------------|---|---|
| <u>ACUITY:</u> | { | R |
| With glasses   | { | L |

COLOUR VISION .....

.....

VIII.

HEARING:

AUDIOMETRIC TEST RESULT .....

.....

---

IX.

URINE ANALYSIS: Alb. .... Sugar .....

Microscopy .....

---

X.

X-RAY REPORT .....

.....

---

XI.

SPECIAL TESTS: e.g. Hb .....

---

XII. REPORTS ON DEFECTS FOUND:

For each defect found:

(1) Type, severity and probable time of onset.

(2) Treatment (Satisfactory if given,  
required if not given)

(On separate sheet, with additional sheets if required.)

---

XIII. VOCATIONAL GUIDANCE (Any employment considered unsuitable)

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#### XIV. VALUE OF INFORMATION RECEIVED

Please indicate if the diagnosis of any defect was materially assisted by:

- (a) questionnaire from - 1. Parents  
2. Teacher
- (b) presence of parent at examination;
- (c) information given by Health Visitor;
- (d) a special examination (e.g. X-ray, audiometric test, urine analysis, etc.)

---

The child guidance service of the education authority agreed to see every child referred by the study medical examiners and examiners were informed of this at the outset. The child guidance service is staffed by educational psychologists of considerable experience and used to co-operating with the school medical officers of the county. These arrangements did not offer any service additional to that available at all times to the school health service in its conduct of school medical examinations.

School children are not given routine blood pressure estimations or routine urine analysis at school medical inspections. Arrangements were made for both of those investigations to be carried out. Similarly, colour vision is not examined routinely. Arrangements were made for each child to be tested by the Ishihara method. School children are not given routine X-ray examinations of the chest. The Director of the local chest clinic arranged for these examinations to be given to each child of the study group.

School children over the age of nine years are not examined routinely by audiometry for defects of hearing. Arrangements were made for this to be done for all children of the study group. Audiometers were provided by the school health service. The school health service supplied two trained audiometricians who were well experienced in the conduct of sweep and threshold audiometry in children of school age.

The medical examinations took almost a year to carry out and at the end of that time all reports prepared during the study were collected by the author. The school health service was then asked to hand over all medical records in its possession concerning the children. Care was taken to make certain that all records were obtained. The contents of the study medical reports and the contents of the school health service medical records were then compared for each child of the study group.

FINDINGS OF THE STUDY

Invitations were sent to the parents of 282 boys and 298 girls about to leave school, asking them to present their children for medical examination. 562 children, 276 boys and 286 girls attended.

The medical examination of the 562 children revealed the presence of 497 defects. The school health service had no record of 308 (62 per cent) of these defects.

The following table gives the details for the different groups of defects:-

ALL DEFECTS

Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT             | Number of cases where School Health Service Recorded |            |            |                |           |            |                     |          |           |              |            |            |
|--------------------|--|------------|------------|----------------|-----------|------------|---------------------|----------|-----------|--------------|------------|------------|
|                    | Number found   |            |            | Same Diagnosis |           |            | Different Diagnosis |          |           | No diagnosis |            |            |
|                    |  |            |            | Boys           | Girls     | Total      | Boys                | Girls    | Total     | Boys         | Girls      | Total      |
| Skin               | 28   | 29         | 57         | 15             | 7         | 22         | 1                   | 3        | 4         | 12           | 19         | 31         |
| Nose and Throat    | 20   | 29         | 49         | 6              | 6         | 12         | 1                   | 3        | 4         | 11           | 22         | 33         |
| Vision             | 45   | 64         | 109        | 38             | 55        | 93         | -                   | -        | -         | 7            | 9          | 16         |
| Other Eye Defects  | 17   | 7          | 24         | 4              | 6         | 10         | -                   | -        | -         | 13           | 1          | 14         |
| Ears               | 33   | 44         | 77         | 3              | 6         | 9          | -                   | -        | -         | 30           | 38         | 68         |
| Speech             | 2  | 1          | 3          | -              | -         | -          | -                   | -        | -         | 2            | 1          | 3          |
| Intelligence       | 8  | 5          | 13         | 6              | 4         | 10         | -                   | -        | -         | 2            | 1          | 3          |
| Emotional Health   | 8  | 8          | 16         | 3              | 1         | 4          | -                   | -        | -         | 5            | 7          | 12         |
| Heart (Functional) | 21   | 30         | 51         | 1              | 2         | 3          | -                   | 1        | 1         | 20           | 27         | 47         |
| Heart (Organic)    | 5  | 8          | 13         | 1              | -         | 1          | 2                   | -        | 2         | 2            | 6          | 10         |
| C.V.S.             | 3  | 2          | 5          | -              | -         | -          | -                   | -        | -         | 3            | 2          | 5          |
| Lungs              | 8  | 6          | 14         | 2              | -         | 2          | -                   | -        | -         | 6            | 6          | 12         |
| Urinary System     | 12   | 1          | 13         | -              | -         | -          | -                   | -        | -         | 12           | 1          | 13         |
| Orthopaedic        | 20   | 21         | 41         | 5              | 4         | 9          | -                   | 2        | 2         | 15           | 15         | 30         |
| Abdomen            | 1  | 2          | 3          | -              | -         | -          | -                   | -        | -         | 1            | 2          | 3          |
| Nervous System     | 2  | 1          | 3          | 1              | -         | 1          | -                   | -        | -         | 1            | 1          | 2          |
| Developmental      | 2  | -          | 2          | -              | -         | -          | -                   | -        | -         | 2            | -          | 2          |
| Others             | 3  | 1          | 4          | -              | -         | -          | -                   | -        | -         | 3            | 1          | 4          |
| <b>Total</b>       | <b>238</b>   | <b>259</b> | <b>497</b> | <b>85</b>      | <b>91</b> | <b>176</b> | <b>4</b>            | <b>9</b> | <b>13</b> | <b>147</b>   | <b>161</b> | <b>308</b> |

The total cases recorded by the school health service at or since the 13 year old routine medical inspection are shown in the following table.

ALL DEFECTS

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

|                    | Number recorded |       |       |
|--------------------|-----------------|-------|-------|
|                    | Boys            | Girls | Total |
| Skin               | 23              | 18    | 41    |
| Nose and Throat    | 29              | 28    | 57    |
| Visual Acuity      | 38              | 55    | 93    |
| Other Eye Defects  | 8               | 9     | 17    |
| Ears               | 4               | 7     | 11    |
| Speech             | 1               | -     | 1     |
| Intelligence       | 6               | 4     | 10    |
| Emotional Health   | 3               | 1     | 4     |
| Heart (Functional) | 4               | 5     | 9     |
| Heart (Organic)    | 1               | 3     | 4     |
| C.V.S.             | 1               | 6     | 7     |
| Lungs              | 5               | 1     | 6     |
| Orthopaedic        | 8               | 7     | 15    |
| Nervous System     | 1               | -     | 1     |
| Totals             | 132             | 144   | 276   |

DISEASES OF THE SKIN

The study team diagnosed 28 cases of skin disease in 276 boys and 29 cases in 286 girls, a total of 57 cases of skin disease in 562 children. Of those 57 cases, the school health service had recorded the same diagnosis as the study team in 22 cases, made a different diagnosis in four cases, and recorded no diagnosis in 31.

The details according to skin disease are as follows -

DISEASES OF THE SKIN

Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                 | Number of cases where School Health Service Recorded |       |       |                |       |       |                     |       |       |              |       |       |
|------------------------|--|-------|-------|----------------|-------|-------|---------------------|-------|-------|--------------|-------|-------|
|                        | Number found   |       |       | Same Diagnosis |       |       | Different Diagnosis |       |       | No Diagnosis |       |       |
|                        | Boys   | Girls | Total | Boys           | Girls | Total | Boys                | Girls | Total | Boys         | Girls | Total |
| Acne                   | 10   | 8     | 18    | 8              | 4     | 12    | -                   | -     | -     | 2            | 4     | 6     |
| Seborrhoea             | 1  | 6     | 7     | -              | -     | -     | -                   | 2     | 2     | 1            | 4     | 5     |
| Eczema                 | 3  | 2     | 5     | 2              | -     | 2     | -                   | 1     | 1     | 1            | 1     | 2     |
| Ichthyosis             | 3  | 2     | 5     | 2              | 1     | 3     | -                   | -     | -     | 1            | 1     | 2     |
| Boils                  | 1  | 1     | 2     | -              | -     | -     | -                   | -     | -     | 1            | 1     | 2     |
| Psoriasis              | -  | 2     | 2     | -              | 1     | 1     | -                   | -     | -     | -            | 1     | 1     |
| Scabies                | 1  | 1     | 2     | 1              | -     | 1     | -                   | -     | -     | -            | 1     | 1     |
| Naevus                 | 1  | 2     | 3     | 1              | -     | 1     | -                   | -     | -     | -            | 2     | 2     |
| Athletes Foot          | 2  | -     | 2     | -              | -     | -     | -                   | -     | -     | 2            | -     | 2     |
| Pityriasis             | 1  | -     | 1     | -              | -     | -     | -                   | -     | -     | 1            | -     | 1     |
| Papilloma              | 1  | -     | 1     | -              | -     | -     | -                   | -     | -     | 1            | -     | 1     |
| Urticaria              | 1  | -     | 1     | -              | -     | -     | -                   | -     | -     | 1            | -     | 1     |
| Neurodermatitis        | 1  | -     | 1     | -              | -     | -     | -                   | -     | -     | 1            | -     | 1     |
| Warts                  | 1  | -     | 1     | 1              | -     | 1     | -                   | -     | -     | -            | -     | -     |
| Vitiligo               | -  | 1     | 1     | -              | -     | -     | -                   | -     | -     | -            | 1     | 1     |
| Alopecia               | -  | 1     | 1     | -              | -     | -     | -                   | -     | -     | -            | 1     | 1     |
| Cheiropompholyx        | 1  | -     | 1     | -              | -     | -     | 1                   | -     | 1     | -            | -     | -     |
| Fungal Infection Nails | -  | 1     | 1     | -              | -     | -     | -                   | -     | -     | -            | 1     | 1     |
| Dermatitis             | -  | 1     | 1     | -              | 1     | 1     | -                   | -     | -     | -            | -     | -     |
| Impetigo               | -  | 1     | 1     | -              | -     | -     | -                   | -     | -     | -            | 1     | 1     |
| Totals                 | 28   | 29    | 57    | 15             | 7     | 22    | 1                   | 3     | 4     | 12           | 19    | 31    |

The school health service had recorded 23 cases of skin disease in all in the 276 boys and 18 cases in all in the 286 girls, giving a total of 41 cases in the 562 children.

DISEASES OF THE SKIN

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                | Number recorded |       |       |
|-----------------------|-----------------|-------|-------|
|                       | Boys            | Girls | Total |
| Acne                  | 7               | 10    | 17    |
| Eczema                | 3               | -     | 3     |
| Ichthyosis            | 2               | 1     | 3     |
| Boils                 | 1               | -     | 1     |
| Psoriasis             | 1               | 1     | 2     |
| Scabies               | 1               | -     | 1     |
| Naevus                | 1               | -     | 1     |
| Pityriasis            | -               | 1     | 1     |
| Warts                 | 3               | -     | 3     |
| Dermatitis            | -               | 1     | 1     |
| Impetigo              | 3               | 2     | 5     |
| Intertrigo            | 1               | -     | 1     |
| Molluscum Contagiosum | -               | 1     | 1     |
| Herpes                | -               | 1     | 1     |
| Totals                | 23              | 18    | 41    |

The information contained in the parents' questionnaires was examined. Of the 57 cases diagnosed by the study team, 13 were noted in the parents' questionnaires to have skin disease. The questionnaires noted two other cases which were not confirmed by the study team. The school health service had records of eight of the cases confirmed by the study team.

The following table gives details by diagnosis of the cases reported by parents in their questionnaires to have skin disease, and which were confirmed by the study examination. The table also shows the school health record findings for the same cases.

Confirmed cases reported in parents' questionnaires

| DEFECT          | Number reported in<br>parents' questionnaire |       |       | Number recorded by<br>School Health Service |       |       |
|-----------------|--|-------|-------|---|-------|-------|
|                 | Boys   | Girls | Total | Boys  | Girls | Total |
| Acne            | 1  | 1     | 2     | 1   | 1     | 2     |
| Seborrhoea      | 1  | 1     | 2     | -   | -     | -     |
| Eczema          | 3  | 1     | 4     | 3   | 1     | 4     |
| Ichthyosis      | 1  | -     | 1     | 1   | -     | 1     |
| Warts           | 1  | -     | 1     | 1   | -     | 1     |
| Urticaria       | 1  | -     | 1     | -   | -     | -     |
| Neurodermatitis | 1  | -     | 1     | -   | -     | -     |
| Alopecia        | -  | 1     | 1     | -   | -     | -     |
| Totals          | 9  | 4     | 13    | 6   | 2     | 8     |

DISEASES OF THE NOSE AND THROAT

The study team found that 49 children, 20 boys and 29 girls, were suffering from diseases of the nose and throat. Of those 49, the school health service had previously diagnosed 12 cases, six boys and six girls, had previously made a different diagnosis in four cases, one boy and three girls, and had made no diagnosis in 33 cases, 11 boys and 22 girls. Details for the different type of defects are given in the following table:-

DEFECTS OF NOSE AND THROAT

Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT            | Number of cases where School Health Service Recorded |           |           |                |          |           |                     |          |          |              |           |           |
|-------------------|--|-----------|-----------|----------------|----------|-----------|---------------------|----------|----------|--------------|-----------|-----------|
|                   | Number found   |           |           | Same Diagnosis |          |           | Different Diagnosis |          |          | No Diagnosis |           |           |
|                   | Boys   | Girls     | Total     | Boys           | Girls    | Total     | Boys                | Girls    | Total    | Boys         | Girls     | Total     |
| Tonsils           | 11   | 14        | 25        | 6              | 4        | 10        | -                   | -        | -        | 5            | 10        | 15        |
| Adenoids          | 1  | 2         | 3         | -              | -        | -         | -                   | -        | -        | 1            | 2         | 3         |
| Nasal Catarrh     | 5  | 6         | 11        | -              | 1        | 1         | -                   | -        | -        | 5            | 5         | 10        |
| Nasal Obstruction | 3  | 3         | 6         | -              | 1        | 1         | 1                   | 2        | 3        | -            | 2         | 2         |
| Palatal Defect    | -  | 1         | 1         | -              | -        | -         | -                   | -        | -        | -            | 1         | 1         |
| Sinusitis         | -  | 2         | 2         | -              | -        | -         | -                   | 1        | 1        | -            | 1         | 1         |
| Allergic Rhinitis | -  | 1         | 1         | -              | -        | -         | -                   | -        | -        | -            | 1         | 1         |
| <b>Total</b>      | <b>20</b>  | <b>29</b> | <b>49</b> | <b>6</b>       | <b>6</b> | <b>12</b> | <b>1</b>            | <b>3</b> | <b>4</b> | <b>11</b>    | <b>22</b> | <b>33</b> |

The school health service had recorded defects of the nose and throat in 57 children altogether, 29 boys and 28 girls. Ten of these children, five boys and five girls, had however received treatment as a result of recommendations made by the school health service. Details for the different defects are given in the following table:-

DEFECTS OF NOSE AND THROAT

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

| DEFECT               | Number found |           |           |
|----------------------|--------------|-----------|-----------|
|                      | Boys         | Girls     | Total     |
| Tonsils              | 27           | 23        | 50        |
| Adenoids             | 1            | 1         | 2         |
| Nasal Catarrh        | -            | 2         | 2         |
| Nasal Obstruction    | -            | 1         | 1         |
| Enlarged Neck Glands | 1            | 1         | 2         |
| <b>Totals</b>        | <b>29</b>    | <b>28</b> | <b>57</b> |

The parents' questionnaires recorded suspicious history of disease of the nose or throat in 45 children, 16 boys and 29 girls. The study team confirmed the presence of disease in 33 of those cases, eight boys and 25 girls. Of the cases confirmed, the school health service has recorded 11 cases, three boys and eight girls. It therefore appeared that of the 49 cases of nose and throat disease diagnosed by the study team, 33 were reported by the parents in the questionnaires and, of that 33 known to the parents, the school health service was unaware of 22 of them.

The different diseases of the nose and throat are now considered separately.

#### Disease of the Tonsils

The study team found that 25 children in all, 11 boys and 14 girls had diseased tonsils. Of the 11 boys one was recommended for further observation and 10 for hospital treatment. The one boy for observation had not previously been diagnosed by the school health service. Of the 10 recommended by the study team for hospital treatment, four had not been diagnosed by the school health service. Of the six which had previously been diagnosed by the service, four had been recommended by that service for observation and two for hospital treatment.

Of the 14 girls diagnosed by the study team as having diseased tonsils, one was recommended for observation and 13 were recommended for hospital treatment. The one for observation had not previously

been diagnosed by the school health service. Of the 13 cases recommended by the study team for hospital treatment, nine had not been diagnosed by the school health service. Of the remaining four which had been diagnosed by the school health service, two had been recommended by that service for observation and two for hospital treatment.

The above findings may be summarised as follows:-

The study team diagnosed 25 cases of diseased tonsils, two for observation and 23 for treatment. The two cases for observation had not previously been diagnosed by the school health service. Of the 23 cases for treatment, 13 had not previously been diagnosed by the service. In the case of the 10 previously diagnosed by the service, six had been recommended by the service for observation and four for hospital treatment.

The parents' questionnaires were studied for each case. The questionnaires gave reference to throat illness in 15 boys. The study team confirmed that seven of them had tonsil disease. Four of the confirmed cases had not been recorded by the school health service and therefore the parents were aware of four cases which were unknown to the service. The parents' questionnaires contained reference to throat illness in 20 of the girls and the study team confirmed this in 16 cases. The school health service had no record in 10 of the confirmed cases. Altogether, the parents' questionnaires reported 35 children with throat illness. The study team confirmed this

in 23 of the cases; the school health service had recorded nine of them as having tonsillitis. The service therefore was not aware of 14 cases of throat illness known to the parents.

The school health service had recorded 50 children, 27 boys and 23 girls, with diseased tonsils and had recommended observation in 39 cases and hospital treatment in 11. The study medical records were examined to discover what had happened to those children.

The study team found that, of the 21 boys placed under observation by the school health service, 17 showed no defect and four required hospital treatment. The team also found that of six recommended by the service for hospital treatment, four had received treatment and two were still untreated. The study team agreed that those two cases required treatment.

The study team found that of 18 girls recommended by the school health service for observation, 16 had no defect and two required hospital treatment. Of the five girls recommended by the school health service for hospital treatment, three had received treatment and two were still untreated. One of the untreated girls still required treatment and one did not.

The above findings are summarised as follows:-

Of the 50 children diagnosed by the school health service as having disease of the tonsils, 39 were recommended by the service for observation and 11 for treatment. The study team found that 33 of the 39 cases recommended by the school health service for observation

had no defect and six required hospital treatment. Of the 11 cases recommended by the school health service for hospital treatment, seven had received treatment, three still required treatment, and in one case treatment was not required.

### Adenoids

Three cases, one boy and two girls, not previously diagnosed by the school health service, were found by the study team to be in need of hospital treatment. In one case, a girl, the parents' questionnaire contained a suspicious history of adenoids and this was confirmed by the study team. The school health service had not recorded this case.

Two cases, one boy and one girl, were recorded by the school health service and recommended for hospital treatment. Both cases were found by the study team to have received treatment.

### Nasal Catarrh

Eleven cases, five boys and six girls, were diagnosed by the study team. Two of the cases, one boy and one girl, were recommended for observation. Nine cases, four boys and five girls were recommended for hospital treatment. Of the two cases for observation, one had been recorded by the school health service and recommended for observation. The other case had not been recorded by the school health service. Of the nine cases recommended for treatment, none had been recorded by the school health service.

The parents' questionnaires contained suspicious history in four cases, one boy and three girls; all were confirmed by the study team. The school health service had no record of any of the four cases.

Two cases, both girls, were recorded by the school health service and recommended for observation. One case was confirmed by the study team and recommended for further observation. The other case was diagnosed by the survey team as one of nasal obstruction and recommended for hospital treatment.

#### Nasal obstruction

The study medical examiners diagnosed six cases of nasal obstruction three boys and three girls. Two of the boys and the three girls were recommended for hospital treatment. The remaining boy was recommended for observation.

Of the six cases diagnosed by the study examiners, the school health service had recorded the same diagnosis in one case, a girl, but had recommended observation, whereas the study examiner had recommended hospital treatment. The service had recorded a different diagnosis in three cases, a boy and a girl with nasal catarrh, and a girl with tonsillitis: the service had no record of defect in the remaining two cases.

The parents' questionnaires contained suspicious history in two of the three girls diagnosed by the study examiners. Both cases were under observation by the school health service.

### Enlarged neck glands

The school health service had diagnosed two cases; one boy recommended for observation and one girl for hospital treatment; treatment had been given. No cases of enlarged neck glands as a separate entity were diagnosed by the study team and no parents' questionnaires contained suspicious histories.

### Deformity of palate

The study team diagnosed one girl with palatal deformity and recommended hospital treatment. The parents' questionnaire contained no reference to the deformity and no cases had been recorded by the school health service.

### Sinusitis

The study team diagnosed two cases of sinusitis, both girls. One case was recommended for hospital investigation and the other recommended for observation. Both cases showed suspicious history in the parents' questionnaires but neither had been diagnosed previously by the school health service, although in one case the service had noted the existence of a nasal condition (unspecified) requiring observation.

### Allergic rhinitis

One girl was diagnosed by the study team and recommended for hospital treatment. The parents' questionnaire contained a suspicious history of the condition but the case had not been recorded by the school health service.

## EYE DEFECTS

### Defect of vision

It is common practice for the school health service to employ school nurses for the application of routine tests of visual acuity. Snellén's test types are ordinarily used. In this study the same procedure was adopted.

The test is regarded by the author as a screening test by which children can be selected out of the school child population for further investigation.

For the purposes of this study, any child who was unable to read Snellén's test types 6/6 with either eye was recorded as having a defect of vision. Also, any child found by the study examiners to have been issued with spectacles was assumed to have been known to the school health service whether or not an entry to this effect had been made in the school medical record card.

The study examination revealed 109 children, 45 boys and 64 girls, with defects of vision. The school health service had knowledge of 93 of them, 38 boys and 55 girls. Of the remaining 16 children apparently unknown to the service, only one had a defect of vision worse than 6/12 Snellén's in the better eye.

### Colour Vision Defect

The Ishihara method was used.

Nine boys were found with colour vision defect out of the 276 boys examined. Seven had green blindness, one had red/green blindness, and one had red blindness. No cases had been recorded by the school health service.

The 286 girls of the study group were also given the test but no cases of colour vision defect were found.

### Squint

Of the 276 boys of the study group, four cases of squint were found by the study team. Two cases had been recorded by the school health service and were under treatment at the eye clinic. The other two cases had not been recorded by the service.

Of the 286 girls of the study group, six cases of squint were found by the study team. Five of those had been diagnosed by the school health service and were under treatment at the eye clinic. One girl found by the school health service to have squint and fitted with spectacles had no squint when examined by the study team.

### External Eye Disease

The study team found five children with external disease of the eye, three boys with blepharitis, one boy with coloboma of the right iris,

and one girl with blepharitis; the school health service had recorded all the cases except two of the boys with blepharitis.

The school health service had records of nine children with external disease of the eye: five boys and two girls with blepharitis, one boy with coloboma of iris and one girl with blepharoconjunctivitis. The study team confirmed the presence of blepharitis in one boy and one girl, and the coloboma of iris.

### General Findings

The study team found 133 cases of eye defect in the 562 children examined. The school health service had records of defect in 103 of the 133 cases.

The school health service had recorded a total of 110 cases of eye defect in the 562 children of the group. Seven were found to be normal by the study team.

The following tables summarise the findings:-

#### EYE DEFECTS

##### Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT               | Number found |       |       | Number recorded by School Health Service |       |       |
|----------------------|--------------|-------|-------|--|-------|-------|
|                      | Boys         | Girls | Total | Boys                                     | Girls | Total |
| Vision               | 45           | 64    | 109   | 38                                       | 55    | 93    |
| Colour Vision        | 9            | -     | 9     | -  | -     | -     |
| Squint               | 4            | 6     | 10    | 2  | 5     | 7     |
| External Eye Disease | 4            | 1     | 5     | 2  | 1     | 3     |
| Total                | 62           | 71    | 133   | 42                                       | 61    | 103   |

EYE DEFECTS

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

| DEFECT               | Number found |       |       | Number not confirmed<br>by Study Team |       |       |
|----------------------|--------------|-------|-------|---------------------------------------|-------|-------|
|                      | Boys         | Girls | Total | Boys                                  | Girls | Total |
| Vision               | 38           | 55    | 93    | -                                     | -     | -     |
| Colour Vision        | -            | -     | -     | -                                     | -     | -     |
| Squint               | 2            | 6     | 8     | -                                     | 1     | 1     |
| External Eye Disease | 6            | 3     | 9     | 4                                     | 2     | 6     |
| Total                | 46           | 64    | 110   | 4                                     | 3     | 7     |

DISEASE OF THE EARS

Each child received a clinical examination of the ears and an audiometric investigation of hearing. A chart was prepared for each child by the audiometrician showing the threshold level of hearing for each frequency over the speech range; the audiometricians also classified every child with hearing loss into one of the following categories -

Grade 1 - Children who can hear and understand the conversational voice at 20 ft. or over, under ordinary classroom conditions. They can benefit by education in ordinary school without any kind of adjustment. (Hearing loss up to 35 decibels (pure tone audiometry).)

Grade 2 - Children who can hear and understand the ordinary conversational voice between 20 ft. and 2 ft. (Hearing loss between 35 and 60 decibels (pure tone audiometry).) This grade may be sub-divided.

- 2(a) - Children who can be educated in the ordinary school, if special facilities are provided (e.g. a favourable position in the class, hearing aids, etc.)
- 2(b) - Children who require special school education but not of the type required for those whose speech and language are seriously affected.

These categories are used by all school health services in Scotland and are set out in a circular issued by the Department of Health for Scotland (60/1938).

Where wax was found the decision for repeat audiometry was left to the study medical examiner. Generally speaking if soft wax was present no repeat examination was carried out. Where the wax present was likely to affect the hearing the wax was removed at the minor ailment clinic of the school health service or by the family doctor. A repeat threshold audiometric examination was then carried out.

The case reports of children found to have defects at the study examination were divided into the following groups.

1. Deafness discovered by audiometry only.
2. Deafness discovered by audiometry and also by the study medical examiners.
3. Deafness discovered by audiometry with some organic defect found by the study medical examiners.
4. Organic defect without deafness.
5. Defect found by the school health service but not found by the study team.

Findings were as follows.

Deafness discovered by audiometry only

The audiometricians found 13 boys with deafness. Ten were placed in Grade 1 and three in Grade 2(a) handicap; the latter group had deafness in both ears.

The parents' questionnaires contained reference to ear disease in three of the boys and these were confirmed by the audiometricians to have deafness, two being placed in Grade 1 handicap and one in Grade 2(a).

The school health service had no record of deafness in any of the 13 boys.

The audiometricians found 20 girls with deafness and placed 14 of them in Grade 1 handicap and 6 in Grade 2 handicap. Twelve cases had a hearing loss in one ear only and eight had a hearing loss in both ears.

Parents' questionnaires had reference to ear disease in four of the girls and these were confirmed by the audiometricians and placed in Grade 1 handicap. The teachers' questionnaires queried deafness in one child and reported an education attainment below the intelligence level in another.

The school health service had no record of deafness in any of the 20 girls.

Deafness discovered by audiometry and also by the study medical examiners

One boy was found to have defective hearing in the left ear. This was confirmed by audiometry and classified Grade 2 handicap. The parents' questionnaire reported that the child had a habit of turning his head when listening. The school health service had no record of deafness in this case.

Three girls were found to be deaf by the study medical examiners and by the audiometricians. One of the girls had Grade 1 deafness with both ears affected and the case was referred to hospital for investigation; one girl was found to have Grade 1 handicap with a hearing loss in the left ear - the parents' questionnaire reported ear disease; the third girl was found to have deafness with onset at 12 years of age. The audiometrician diagnosed Grade 2(a) handicap. The parents' questionnaire gave a history of ear disease and reported that the child had attended hospital.

The school health service had no record of deafness or ear disease in any of these cases.

Deafness discovered by audiometry with some organic defect found by the study medical examiners

The cases found were sub-divided into three groups according to the type of organic defect recorded by the study team -

1. Drum indrawn, lustreless or distorted.
2. Perforation of the drum.
3. Otorrhoea.

1. Deafness with eardrums indrawn, lustreless or distorted

Seven boys were found to have drums which were indrawn, lustreless or distorted. All seven cases had some degree of deafness; the school health service had no record of ear disease or deafness in the cases.

Details are as follows:-

Case 1

Grade 1 deafness, right and left ear. The parents' questionnaire gave history of ear disease and the case was referred to family doctor for treatment.

Case 2

Grade 1 deafness, right and left ear. The parents' questionnaire gave a history of deafness and no treatment was recommended.

Case 3

Grade 1 deafness, right ear. The parents' questionnaire gave a history of deafness.

Case 4

Grade 2(a) deafness both ears. The parent made no mention in the questionnaire of ear disease but the teacher did note that the education attainment was below that expected from the intelligence level of the child.

Case 5

Grade 2(a) deafness both ears. The parent made no note of ear disease in the questionnaire but the teacher recorded that the education attainment was below the intelligence level.

### Case 6

Grade 2(a) deafness diagnosed in both ears. The parent recorded ear disease in the questionnaire; no treatment was thought necessary by the study team.

### Case 7

Grade 1 deafness diagnosed in the right ear. The parent and the teacher had made no note of ear disease in the questionnaire and no treatment was thought to be necessary.

Eight girls were diagnosed within this group, seven having Grade 1 deafness and one having Grade 2(a) deafness. Two of the eight cases had a diagnosis of ear disease or deafness recorded in the school health records.

Details of the cases are as follows:-

### Case 1

Grade 1 deafness in both ears. Parents' questionnaire gave positive history. No treatment was thought necessary.

### Case 2

Grade 1 deafness in right ear. The parents' questionnaire contained no reference to ear disease and the case was referred for further investigation.

### Case 3

Grade 1 deafness in both ears. The parents' questionnaire contained reference to ear disease. No treatment was thought to be necessary.

Case 4

Grade 1 deafness diagnosed in both ears. The parents' questionnaire made no note of deafness and the case was referred to hospital for specialist opinion.

Case 5

Grade 1 deafness diagnosed in both ears. The parents' questionnaire contained reference to ear disease. No treatment was thought to be necessary. This case was diagnosed by the school health service as having otorrhoea, right and left ears, and the hearing recorded as normal.

Case 6

Grade 2(a) deafness in both ears. The parent had made no note in questionnaire of ear disease but the teacher noted that the education attainment was below the intelligence level. The case was referred to hospital for specialist opinion. The school health service had a record of wax in the ears with Grade 1 deafness present.

Case 7

Grade 1 deafness in both ears. The parent had no note in the questionnaire of ear disease and no treatment was thought to be necessary.

Case 8

Grade 1 deafness in left ear. The parents' questionnaire had no note of ear disease and no treatment was recommended.

2. Deafness with perforation of the drum

Four boys were found in this group. The school health service had record of one case only. Details are as follows:-

Case 1

Healed perforation right drum with opaque left drum. Grade 1 deafness right ear. The parent noted ear disease in questionnaire. No treatment was recommended.

Case 2

Perforation right drum, malodorous discharge. Grade 1 deafness both ears. The parent noted ear disease in questionnaire. The boy was receiving treatment from his family doctor. The school health service had record of otorrhoea and treatment by the family doctor but hearing was reported to be normal.

Case 3

Perforated left drum and cicatrix right drum. Grade 2(a) deafness. The parent had noted ear disease in the questionnaire.

Case 4

Large dry perforation right drum with history of otorrhoea of two years duration. Grade 1 deafness. The parents' questionnaire contained reference to ear disease and the teacher reported aggressiveness and educational attainment below intelligence level. The case was referred to hospital for advice. Two girls were found with deafness and perforation of the drum; the school health service noted one of the cases.

### Case 1

Perforation left drum. Grade 1 deafness. The parents' and teacher's questionnaires contained no relevant information. No treatment was recommended.

### Case 2

Old perforation of both drums with Grade 2(a) deafness. Parents' and teacher's questionnaires contained no reference to ear disease; the school health service recorded that the child had Grade 2(a) deafness.

### 3. Deafness with Otorrhoea

Nine children, three boys and six girls, were found by the study medical team to have the above condition. Two of the boys and three of the girls had already been recorded by the school health service as having defect of the ears or of hearing. Details are as follows:-

#### Case 1 - Boy

Chronic suppurative otitis media with a history of mastoidectomy 1957. Grade 2(a) deafness. The parents' questionnaire contained reference to ear disease and the child was under hospital care at the time of the study examination; the school health service had no record of the case.

#### Case 2 - Boy

Right chronic suppurative otitis media with left drum thick and lustreless. Grade 2(a) deafness. The parents' questionnaire had mention of ear disease. The school health service had recorded the child as having otorrhoea but had no record of any deafness.

Case 3 - Boy

Chronic otorrhoea with left drum replaced by granulation tissue. Grade 2(a) deafness. The parent reported the disease in the questionnaire and the teacher described the boy as a "lone wolf", unpopular and a butt of other boys. He had had hospital treatment but was referred back for further treatment by the study medical examiners; the school health service had recorded "left otorrhoea dry now". No record of deafness was present.

Case 4 - Girl

Bilateral otitis media with gross destruction of drums. Deafness Grade 2(a). History of ear disease since five years of age. The parent and teacher reported ear disease in their questionnaires and the teacher reported an educational attainment below the intelligence level. The child was under treatment and was wearing a hearing aid. The school health service had knowledge of the case and reported Grade 2(a) deafness.

Case 5 - Girl

Otorrhoea with Grade 1 deafness; reported by parent in questionnaire. The school health service had no record of the case.

Case 6 - Girl

Long-standing otitis media both ears with Grade 2(a) deafness. The parent reported ear disease in the questionnaire and the child was under treatment. The school health service had recorded the otorrhoea and the deafness.

Case 7 - Girl

Chronic suppurative otitis media right ear with grade 2(a) deafness. The parent had not recorded the condition but the teacher queried hearing loss in her questionnaire. The school health service had recorded deafness but not otorrhoea.

Case 8 - Girl

Chronic suppurative otitis media with Grade 2(a) deafness. Neither the parent nor teacher had recorded the condition and the school health service had no record.

Case 9 - Girl

Bilateral otitis media, perforation of drums and Grade 2(a) deafness. History of ear disease of 12 years' duration. The parents' questionnaire contained reference to the condition and the child was undergoing hospital treatment at the time of the study examination. The school health service had no record of the case.

Organic defect without deafness

Five boys and five girls were found to have distortion or perforation of the drum without deafness. The parents' questionnaires contained reference to ear disease in two of the five boys and in three of the five girls. The school health service had no record of ear disease in any of the 10 cases.

Defect found by the school health service but not found by the study team

One boy was recorded by the service to have Grade 1 deafness; the parents' questionnaire contained a suspicious history of ear disease. One girl was recorded with a history of left otorrhoea but the parents' questionnaire contained no reference to ear disease. The school health service had made no recommendation concerning disposal in either of the cases.

Summary of findings for all ear disease

562 children were examined.

1. Deafness found by audiometry only

The audiometricians found 33 cases of deafness and classified 24 as Grade 1 handicap and nine as Grade 2 handicap; the parents' questionnaires contained suspicious entries of deafness or ear disease in seven of the children and the teachers' questionnaires reported educational attainment below intelligence level in four of the cases. One teacher also queried the presence of deafness in one of the four cases and reported that another was very nervous and highly strung. The study medical examiners and the medical officers of the school health service had no record of deafness in any of the 33 children.

2. Deafness found by audiometry and by study medical examiners

Four children were found by the study medical examiners and by the audiometricians to have deafness, two of Grade 1 and two of Grade 2 handicap. The parents' questionnaires contained reference to ear

disease or deafness in three of the cases. The school health service had no record of ear disease in any of the four cases.

3. Deafness with organic defect

Fifteen children were found to have indrawn lustreless or distorted eardrums accompanied by deafness. Eleven had Grade 1 deafness and four had Grade 2(a) deafness. The parents noted suspicious histories in the questionnaires of seven of the 15 children and the teachers recorded educational attainment below intelligence level in three of the 15 children. The school health service had recorded ear defect in two of the cases.

Six children were found to have perforated eardrums with deafness, four had Grade 1 deafness and two had Grade 2(a) deafness. The parents' questionnaires contained reference to ear disease in four cases and one teacher reported aggressiveness and educational attainment below intelligence level in one of those cases. The school health service had recorded otorrhoea in one case and Grade 2(a) deafness in one other. The service had no records of ear defect in the other four cases.

Nine children were found to have otorrhoea with deafness, all but one being of Grade 2(a) severity. The parents' questionnaires contained records of ear disease in seven of the nine children and the teachers' questionnaires contained suspicious reports in two of the children reported by the parents and in one other. The school health service had records of some ear defect, either otorrhoea or deafness, in five

of the nine cases discovered by the study medical examiners. The service had no record of three cases which were reported by the parents but had records of all cases reported by the teachers.

4. Organic defect without deafness

Ten cases were found to have distortion or perforation of the drum without deafness. The parents' questionnaires recorded that five of the cases had ear disease. The school health service had no record of diagnosis in any of the 10 cases.

5. Recorded by school health service only

The school health service had recorded Grade 1 deafness in one boy and otorrhoea in one girl. Those cases were found to be normal at the study medical examination.

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The following tables summarise the position further:-

EAR DEFECTS

Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                          | Number found |       |       | Number found by School Health Service |       |       |
|---------------------------------|--------------|-------|-------|---------------------------------------|-------|-------|
|                                 | Boys         | Girls | Total | Boys                                  | Girls | Total |
| Deafness only                   | 14           | 23    | 37    | -                                     | -     | -     |
| Deafness with organic defect    | 14           | 16    | 30    | 3                                     | 6     | 9     |
| Organic defect without deafness | 5            | 5     | 10    | -                                     | -     | -     |
| Total                           | 33           | 44    | 77    | 3                                     | 6     | 9     |

EAR DEFECTS

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                          | Number found |       |       | Number not confirmed<br>by Study Team |       |       |
|---------------------------------|--------------|-------|-------|---------------------------------------|-------|-------|
|                                 | Boys         | Girls | Total | Boys                                  | Girls | Total |
| Deafness only                   | 1            | -     | 1     | 1                                     | -     | 1     |
| Deafness with<br>organic defect | 3            | 6     | 9     | -                                     | -     | -     |
| Organic defect only             | -            | 1     | 1     | -                                     | 1     | 1     |
| Total                           | 4            | 7     | 11    | 1                                     | 1     | 2     |

SPEECH DEFECT

Two boys and one girl with slight stammer were diagnosed by the study medical examiners. The school health service had not recorded speech defect in any of the three cases but had recorded one boy with speech defect who was found to be normal for speech by the study medical examiners but to have a slight hearing loss. The details of the cases are as follows:-

Case 1

A slight stammer. The parent reported that the boy had a stammer, was moody and quick-tempered. The teacher reported him to be a stutterer and to be nervous. The boy was recommended for speech therapy.

Case 2

Slight stammer. The parents' questionnaire recorded stammer and the boy was recommended for speech therapy.

### Case 3

A girl with slight stammer recorded in the teacher's questionnaire as having a speech defect.

### Case 4

The school health service had recorded dyslalia and had arranged for speech therapy. The study medical examiners found no speech defect but discovered that the boy had a slight degree of deafness and recommended examination by hospital consultant.

### MENTAL HANDICAP

The term mental handicap is given to those children recorded by the study medical examiners or by the school health service as having poor or limited intelligence or intelligence which is below average.

Routine intelligence tests were not conducted as part of the study, but the study medical examiners had available at the time of the examination a report by each child's teacher in the form of the teacher's questionnaire. The teacher was asked in the questionnaire to give an opinion of the child's intelligence and educational attainment and in most cases the teacher gave a precise intelligence quotient which had been obtained from an intelligence test applied to the child at an earlier date and unrelated to the study. The medical examiners had available also the services of the educational psychologist of the local authority child guidance service for psychometric or other investigation where required.

The study group of children were in attendance at ordinary schools and so the group did not include children who had been ascertained by the school health service as requiring special educational treatment and who had been admitted to special schools for the mentally handicapped.

### The Findings

Thirteen children were found by the study team to have mental handicap. The teachers reported poor intelligence or poor educational attainment in every case. The school health service recorded mental handicap in 10 out of the 13 cases and did not record any cases not found by the study team. The details are as follows:-

The study medical examiners diagnosed mental handicap in eight boys and in every case the teacher reported that the intelligence or educational attainment was below average; the teachers also reported that six of the boys had intelligence quotients of under 75 and that two of the boys could not read. The parents' questionnaires contained no reference to poor intelligence in any of the eight cases. The school health service had recorded dullness or backwardness in six of the eight boys but there is no record of any action having been taken toward the provision of special educational treatment, although a specific recommendation for special schooling had been made in one case some time previously by the education psychologist of the education authority. It is not possible to say how many of the eight boys ascertained by the study team as having mental handicap required

special education. Further detailed investigation would be required into the intellectual, emotional and physical state of the boys and into the educational progress already made before this could be decided. It can be said with some certainty, however, that six of the cases showed deviations from normal intelligence or educational attainment sufficient to justify full assessment of handicap and of need for special educational treatment although it is doubtful if this would be of much value to the child at this late stage.

Five girls were reported to have mental handicap. The teachers recorded intellectual or educational retardation in every case; the parents' questionnaires contained no reference to mental handicap. The school health service reported dullness or backwardness in four out of five cases but no action appears to have been taken following the diagnosis although specific recommendations of special educational treatment for three of the cases had been made some time previously by educational psychologists of the education authority. With the qualifications already mentioned concerning the boys it is reasonable to consider that three of the girls reported as having intelligence quotients of 72 or under would have been candidates for full assessment of handicap and of need for special educational treatment. The school health service did not report any cases which had not been recorded by the study team.

The details of cases found by the study team but not recorded by the school health service are as follows:-

### Case 1

The study medical examiner reported the boy as being low in intelligence to a degree whereby future employment would be affected. The teacher reported the boy to be retarded to a degree whereby the ordinary school could not give the individual tuition necessary. The teacher recommended full investigation of intelligence.

### Case 2

The study medical examiner reported poor intelligence and the teacher reported that the boy was a non-reader, that his intelligence quotient was 74 and that his educational attainment was below his intelligence level. The boy's school attendance was infrequent.

### Case 3

The girl was reported to be obviously well below average in intelligence. The teacher reported that the girl refused to obey orders, was moody, aggressive and inattentive and that the educational attainment was much below that expected from the intelligence. The intelligence quotient was given as 81.

### Emotional Disturbance

The children of the study group attended ordinary schools and would not be expected to reveal disturbances of an extent or nature where admission to a residential school for maladjusted children would be considered necessary.

The study team diagnosed 16 children with emotional disturbance. The teachers' questionnaires contained suspicious history in 14 cases, and the parents' questionnaires in six cases. The school health service had records of four of the cases.

Eight boys were found to have emotional or behavioural disturbances. In six of them the teachers' questionnaires contained evidence of the existence of disturbance and in four cases the parents' questionnaire also contained reference to this condition. The school health service had records of three of the eight cases. The details of the cases are as follows:-

#### Case 1

The study medical examiner reported the boy to be very nervous since childhood and to be a nail-biter. The parent reported him to be nervous and easily tired. The school health service recorded that he was a nail-biter.

#### Case 2

The teacher reported the boy to be silent and with a tendency to stammer; also that he rarely answered questions. The medical examiner found that the boy was easily excited.

#### Case 3

Reported by the medical examiner to be unhappy and unsettled and anxious. The teacher reported the boy to be aggressive, resenting authority and forward; also that everyone was out of step but him.

#### Case 4

Medical examiner reported a facial twitch which was sometimes painful. The teacher reported an educational attainment below the expected intelligence level and the parent reported him to be very nervous. The boy was under treatment by his family doctor. He had been examined by the school psychologist in 1950 who reported him to be bad-tempered, badly trained and that the trouble lay in the home. Home visitation was advised at that time.

#### Case 5

The medical examiner reported the boy to be timid and over-dependent on his mother and that he was a thumb sucker. The teacher had nothing to report but the parent did record the thumb sucking.

#### Case 6

The medical examiner reported the boy to be tense at the examination and recommended a psychologist's report. The teacher stated that he was moody, a poor mixer, was poor in intelligence and was an introvert. The parent reported that the boy was nervous and quarrelsome at home.

#### Case 7

The medical examiner reported the boy to be enuretic and that his intelligence was below average. He also reported that home conditions were not conducive to good mental health. The teacher recorded infrequent attendance at school, that there were

disturbed relations at home and that the boy was sullen and cried when questioned about his frequent absences from school. The educational attainment was below the intelligence level of I.Q. 96 and the teacher recommended further investigation.

#### Case 8

The medical examiner reported that the boy was unable to write his address and that he could not spell. The teacher recorded that he was aggressive and tended to bully and there was a history of truancy; the family had a police record and there was a broken home. The educational attainment was much below the intelligence level. The school health psychologist had recorded some time previously that the boy was constitutionally lazy and that more pressure was needed to obtain better attendance at school.

Eight girls were reported by the study team to have emotional or behavioural disturbance. The teachers reported emotional disturbances in all eight cases. The parents' questionnaires gave no direct reference although two parents reported conditions which suggested the possibility of emotional disturbance. The school health service had recorded mild emotional disturbance in one case only.

The details of the cases are as follows:-

#### Case 1

Apathy and tiredness with need of encouragement. The teacher reported that the girl was too tired to think and that the educational attainment was well below the intelligence level of I.Q.

107. The parent also reported continual tiredness and the psychologist thought that the parental handling was at fault. The parents were given advice. The school health service had no record of the defect.

#### Case 2

Unhappy and without hope. Mother tense, father domineering. The medical examiner recommended that the psychologist see the case. The teacher reported that the girl had no interest in school, was lazy and inattentive and with an educational attainment much below the expected level of an intelligence of I.Q. 91. The psychologist saw the case and reported that he was making efforts to fortify the girl against the home conditions.

#### Case 3

Diffident, nervous and a nail-biter. The teacher reported the girl to be tense with a sense of inferiority: also that she was prematurely grey. The school health service had recorded that the child was a nail-biter.

#### Case 4

Very timid, afraid and nervous. The child was unhappy, was a nail-biter and told the medical examiner that she was adopted. The teacher reported disturbed relationships at home and an educational attainment of below the intelligence level. The case was referred to a psychologist.

### Case 5

Natural diffidence and shyness aggravated by chorea, eczema and obesity. The teacher reported the child to be retiring and self-conscious. The parent reported a skin disease. The school health service recorded that the child had acne.

### Case 6

Psychogenic abdominal pain. The teacher reported the child to be a bad attender and stayed off school for trivial reasons. The educational attainment and the intelligence were below average and the child was reported to be lazy. The parent recorded the child as having severe abdominal pains and to be suffering from appendix adhesions.

### Case 7

Diffident and nervous to the point of abnormality. The child had a slight hearing loss and defect of vision corrected by spectacles. The teacher reported the intelligence and educational attainment to be below average, that the child was unable to read the blackboard without spectacles and that she seemed to have difficulty in hearing properly. The school health service had no record of the emotional disturbance, the hearing loss or the defect of vision.

### Case 8

Social background abnormal. The teacher reported that a third of the time the child was absent from school because of

truancy, that there was lack of interest, the home was very disturbed, parents unmarried. The educational attainment was below the intelligence level. The parent reported that the child's hair was falling out. The child was seen by the psychologist who reported that not much could be done and that it should have been reported earlier by the headmaster as a matter of school attendance.

### Emotional disturbance and hearing loss

The teachers reported certain cases with emotional disturbance where the study medical examiners had discovered hearing loss. Those cases have already been recorded under the section dealing with defects of hearing but they are given again here to illustrate the importance of hearing loss as a possible cause of emotional disturbance and conversely the importance of assessing hearing acuity in all cases showing emotional disturbance.

#### Case 1

The teacher reported the boy to be a poor attender at school and to be always in trouble, also that he was becoming nervous and ill. The educational attainment was below the intelligence level of I.Q. 80. The medical examiner found that the child had seriously impaired hearing (Grade 2(a)). The school health service had reported the child to be permanently backward and recommended that special education was required although there was no evidence that this had been done. There was no record of emotional disturbance or of deafness in the school health records.

### Case 2

The teacher reported the child to be hypersensitive, hypertensed with a kind of tic. The parent recorded that the child had a habit of turning his head and was inclined to be nervous. The medical examiner found that the child had a serious degree of deafness (Grade 2(a)) and that the tic was probably due to the child turning his head to listen. The school health service had no record of the emotional disturbance, the tic or the deafness.

### Case 3

The teacher reported the boy to be a "lone wolf", to be slightly unpopular with the other boys. The parent recorded a running ear and the medical examiner found there was a severe hearing loss (Grade 2(a)). The school health service had recorded otorrhoea but there was no record of hearing loss.

### Case 4

The teacher reported the child to be very nervous and highly strung with an educational attainment below the intelligence level. The parent reported a hard skin and the study medical examiner found the boy to have ichthyosis and Grade 1 deafness. The school health service had no record of emotional disturbance or of deafness.

### Case 5

A girl reported by the teacher to be lacking in initiative and drive, very quiet and dreamy, always tired looking, work slow and without interest. The medical examiner reported a serious hearing loss (Grade 2(a)). The school health service had no record of emotional disturbance or of deafness.

### Case 6

The teacher reported the girl to be below average in intelligence and educational attainment, that she was unable to read the blackboard without glasses and that she seemed to have difficulty in hearing properly. The intelligence quotient was given as 82. The medical examiner found the child to be diffident and nervous to the point of abnormality, to have a vision defect corrected by spectacles and some degree of hearing loss (Grade 1)). The school health service had no record of defect.

## DISORDERS OF THE HEART

### Heart murmurs

The school health service medical record card contains entries for functional and for organic heart defect. It was assumed for the purpose of the study that all heart murmurs found by the medical officers of the school health service would have been recorded whether the murmurs were functional or organic. The Senior School Medical Officer of the study area confirmed that it was the practice for all murmurs heard to be recorded. The study medical record card contained the entry "heart

disease" and contained no entry which would suggest that functional murmurs should or should not be recorded. It was ascertained at the end of the survey that the medical examiners had recorded all the murmurs heard by them.

The findings of the study are as follows:-

#### Functional heart murmurs

Fifty-one children out of the study group of 562 were found to have functional murmurs. The school health service had recorded three of the 51 children as having functional murmurs, and one with an organic murmur. The remaining 47 cases had not been recorded by the school health service. The service had, however, recorded six cases with functional murmurs in whom no murmurs had been found by the study team.

The parents' questionnaires contained direct reference to heart disease in four girls. The school health service had recorded heart murmur in the four girls, three with organic murmurs and one with a functional murmur. All four cases had been reported by the school health service medical officers to the parents of the children and doubtless this was the reason for the parents recording heart disease in the questionnaires. The study medical examiners recorded functional heart murmurs in three of the cases and recorded organic heart disease in one case.

#### Organic heart disease

Cases in this group are those in whom the study medical examiners recorded organic heart disease, organic heart murmurs or described a

condition of the heart with a recommendation for further observation or supervision.

Thirteen children out of the study group of 562 were found to have organic heart disease. One child of the 13 was similarly recorded by the school health service, one was diagnosed by the service as having a functional murmur and one as having a rough sound at the apex. The school health service had no record of diagnosis in the remaining 10 cases.

The school health service had recorded in all four children with organic murmurs, the study medical examiners agreeing in one case but finding no defect in the other three.

The details are as follows:-

The study team found five boys with organic heart disease. The school health service noted organic heart disease in one of the cases, a functional murmur in one case and a rough sound at the apex in one other. The service recorded no defect in the other two boys. The parents' questionnaires contained direct reference to heart disease and shortness of breath in the one case where the school health service and the study medical examiners agreed in the diagnosis.

The study team reported eight girls with organic heart murmurs; the school health service recorded no defect in all eight cases. The service had however reported three girls with organic murmurs who were found to be normal by the study team. The parents' questionnaire contained reference to heart disease in one case and this case was

diagnosed by the study team as having rheumatic heart disease.

The details are summarised in the following tables:-

HEART DEFECT

Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                  | Number of cases where School Health Service Recorded |           |           |                |          |          |                     |          |          |              |           |           |
|-------------------------|--|-----------|-----------|----------------|----------|----------|---------------------|----------|----------|--------------|-----------|-----------|
|                         | Number found   |           |           | Same Diagnosis |          |          | Different Diagnosis |          |          | No diagnosis |           |           |
|                         | Boys   | Girls     | Total     | Boys           | Girls    | Total    | Boys                | Girls    | Total    | Boys         | Girls     | Total     |
| Functional Heart Defect | 21   | 30        | 51        | 1              | 2        | 3        | -                   | 1        | 1        | 20           | 27        | 47        |
| Organic Heart Defect    | 5  | 8         | 13        | 1              | -        | 1        | 2                   | -        | 2        | 2            | 8         | 10        |
| <b>Total</b>            | <b>26</b>  | <b>38</b> | <b>64</b> | <b>2</b>       | <b>2</b> | <b>4</b> | <b>2</b>            | <b>1</b> | <b>3</b> | <b>22</b>    | <b>35</b> | <b>57</b> |

HEART DEFECT

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                  | Number recorded |          |           | Number not confirmed by study team |          |          |
|-------------------------|-----------------|----------|-----------|------------------------------------|----------|----------|
|                         | Boys            | Girls    | Total     | Boys                               | Girls    | Total    |
| Functional Heart Defect | 4               | 5        | 9         | 3                                  | 3        | 6        |
| Organic Heart Defect    | 1               | 3        | 4         | -                                  | 3        | 3        |
| <b>Total</b>            | <b>5</b>        | <b>8</b> | <b>13</b> | <b>3</b>                           | <b>6</b> | <b>9</b> |

## ANAEMIA

No cases of anaemia were found in the 562 children of the study group. The school health service had recorded seven cases of anaemia in the group. One was a boy where no recommendation had been made for further investigation or treatment. Of the other six cases, all girls, two were referred by the service to the parents with a recommendation for treatment. There was no record that blood investigation had been carried out in any of the seven cases.

## ABNORMALITIES OF BLOOD PRESSURE

Three boys and two girls were found to have abnormalities of blood pressure. The school health service had no record of any of the cases.

Details are as follows:-

### Case 1

Hypertension, B.P.  $\frac{160}{80}$ . Albuminuria. Referred to family doctor for further investigation.

### Case 2

Hypertension, inequality in right and left arm readings. B.P. right  $\frac{140}{80}$ , left  $\frac{110}{70}$ . Short V.S. murmur in right supraclavicular fossa. Blood pressure readings confirmed at examination some days later. Referred to school health service for further investigation.

### Case 3

Blood pressure high ( $\frac{125}{85}$ ). Referred to school health service for further investigation.

Case 4

Hypertension, right  $\frac{130}{90}$ , left  $\frac{120}{80}$ . Albumin in urine thought to be pre-menstrual. History of blurred vision in half-hour episodes from the age of nine to 11 years. Case referred to school health service for further investigation.

Case 5

High blood pressure,  $\frac{150}{90}$ . Loud second aortic sound consistent with the hypertension. Weight 13 st. 3 lbs. was thought to be possible cause of abnormality of blood pressure.

DISEASE OF THE LUNGS

The study examination included routine chest X-ray of every child. The school health service does not conduct routine X-ray examination of school children but can refer any case to the chest clinic of the area for special investigation when required.

Findings

The findings set out below are divided into those cases diagnosed by the study medical examiners on clinical examination and in whom the X-ray findings were of little or no help, and into those cases where the diagnosis was made on the findings of X-ray examination.

The clinical examination revealed eight cases, four boys and four girls, with conditions of the lungs. The school health service had records of one of the boys but had no record of defect in the other seven cases. The parents' questionnaires contained direct reference to bronchitis, persistent cough or tuberculosis in seven cases. The study medical examiners found defect to the lungs in six out of those seven cases. In the one other case the examiners recommended hospital investigation by the ear, nose and throat unit. The school health service had no record of defect in five of the cases reported by the parents.

The findings in the four boys were as follows:-

Case 1

A boy with chronic bronchitis and emphysema since childhood. No abnormality found on X-rays. The parents' questionnaire gave a history of bronchitis. The case was recommended by the medical examiners for hospital investigation. The school health service had no record of the defect.

Case 2

Nasopharyngeal catarrh and bronchitis, onset early childhood; no abnormality found on X-rays. The parent reported frequent cough and bronchitis in the questionnaire. The medical examiner recommended hospital investigation. The school health service had recorded recurrent bronchitis but had made no recommendation for disposal.

### Case 3

A boy with chronic bronchitis and nasopharyngeal catarrh of some years duration. X-ray normal. The parents' questionnaire contained a history of bronchitis and pneumonia and the case was recommended by the medical examiners for an opinion by the ear, nose and throat unit of the hospital. Breathing exercises were also recommended. The school health service had no record of the defect.

### Case 4

Mild respiratory infection, enlarged tonsils, hyper-resonant lungs with persistent rhonchi. No abnormality was found in the X-ray. The parents' questionnaire contained no suspicious history. The case was recommended by the medical examiners for hospital investigation and for breathing exercises. The school health service had no record of the defect.

The school health service had records of three boys with disease of the lungs; one case with asthma and bronchial catarrh, one case of hay fever and bronchial catarrh, and one case of bronchial catarrh. The study medical examiners found no defects present and the X-ray examination was normal in all three cases.

Four girls were found by the study examiners to have disease of the lungs. The school health service had recorded no defect in all four cases. The details are as follows:-

#### Case 1

Bronchial asthma, onset early life. No defect found in X-ray. Parents' questionnaire gave history of bronchitis. Recommended for breathing exercises and observation at chest clinic. The school health service had no record of defect.

#### Case 2

Bronchitis, mild. No defect found on X-ray. The parents' questionnaire contained no suspicious history but the teachers' questionnaire reported very poor attendance at school. The case was recommended for further observation. The school health service had no record of defect.

#### Case 3

The lungs were clear on physical examination but there was a suspicious history of persistent cough. Parents' questionnaire reported a very persistent cough and a history of pneumonia. X-ray was normal. Breathing exercises were recommended.

#### Case 4

History of pulmonary tuberculosis, onset 1957. Examination of the lungs showed less expansion and less air entry in the left lung especially. The X-ray was satisfactory. The child gave a history to the study examiners of four months stay in a sanatorium and continued attendance at chest clinics thereafter. Parents' questionnaire reported tuberculosis: the teachers' questionnaire showed knowledge of the stay in a sanatorium. The study medical

examiners reported that treatment was adequate and continuing.

The school health service had no record of the case.

The school health service had recorded asthma and chronic bronchitis in one girl; the study medical examiner found no defect. The child denied having asthma to the study team but admitted to breathlessness in running and to being a mouth breather. The parents' questionnaire made no record of chest illness but the teachers' questionnaire reported asthma. The study medical examiner advised X-ray of the sinuses for the possibility of sinusitis.

The X-ray examination revealed abnormal findings in 15 children at first X-ray. Further investigation showed that four boys and two girls had lesions requiring further chest clinic or family doctor supervision.

The parents' questionnaires contained suspicious history in four boys and two girls out of the 15 children and in two boys and none of the girls out of the six children requiring chest clinic or family doctor supervision.

The school health service records contained reference to one case only, that of the boy with asthma.

The case details of the six children requiring further supervision are as follows, the four boys being given first.

#### Case 1

X-ray report small calcified opacities, roots of lungs both sides, fibrosis. Diagnosis pulmonary tuberculosis. The study examiner found the respiratory system to be normal, recommended

the child for E.N.T. advice because of nasal obstruction and diagnosed orthostatic albuminuria. The school health service had no record of the case.

#### Case 2

X-ray report asthmatic appearance. Study examiners diagnosed asthma and recommended breathing exercises. Parents' questionnaire and school health service both recorded asthma.

#### Case 3

X-ray report lack of translucency left upper quarter. Upper quarter appears to represent post-primary deposits. No obvious activity. Re-examination in six months revealed little change. The study medical examiners reported no defect on the lungs. The school health service had no record.

#### Case 4

X-ray report dense streaky shadows left base - old fibrosis. The study examiner reported the chest to be clear. The parents' questionnaire reported history of chest trouble and the case was referred to the family doctor. The school health service had no record.

#### Case 5

X-ray report appreciable area of translucency at each apex. Thick left upper root trunk. Repeat X-ray in three months showed no change and the case was put on a three-monthly check. The survey examiner found no defect in the lungs. The parents' questionnaire and the school health service had no record of defect.

Case 6

X-ray report some evidence of some previous pleurisy with calcified foci at left base. Skin test and re-X-ray recommended. Skin test positive X-ray showed no evidence of active lung disease. For re-X-ray in one year. The study examiner and the school health service recorded no defect.

DEFECTS OF RESPIRATORY SYSTEMS

Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                 | Number found |       |       | Recorded by School Health Service |       |       |
|------------------------|--------------|-------|-------|-----------------------------------|-------|-------|
|                        | Boys         | Girls | Total | Boys                              | Girls | Total |
| Bronchitis             | 3            | 1     | 4     | 1                                 | -     | 1     |
| Asthma                 | 1            | 1     | 2     | 1                                 | -     | 1     |
| Pulmonary Tuberculosis | 1            | 1     | 2     | -                                 | -     | -     |
| Others                 | 3            | 3     | 6     | -                                 | -     | -     |
| Total                  | 8            | 6     | 14    | 2                                 | -     | 2     |

DEFECTS OF RESPIRATORY SYSTEMS

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

| DEFECT            | Number recorded |       |       | Number not confirmed by Study Team |       |       |
|-------------------|-----------------|-------|-------|------------------------------------|-------|-------|
|                   | Boys            | Girls | Total | Boys                               | Girls | Total |
| Bronchitis        | 1               | -     | 1     | -                                  | -     | -     |
| Bronchial Catarrh | 2               | -     | 2     | 2                                  | -     | 2     |
| Asthma            | 2               | 1     | 3     | 1                                  | 1     | 2     |
| Total             | 5               | 1     | 6     | 3                                  | 1     | 4     |

## ALBUMINURIA

The study examination included routine investigation of urine in every child. Nurses were immediately available for the examination and arrangements were made with a laboratory of the Regional Hospital Board for further investigation where required.

### The Findings

Nineteen boys and 11 girls were found to have albumin in the urine. The study team reported that the presence of albumin in the urine could be disregarded in seven of the boys and in 10 of the girls because it was orthostatic in origin. The remaining 12 boys and one girl were recommended for further investigation.

One boy had a history of headaches, was thought to have nephritis and was referred to hospital. The remaining children, 11 boys and one girl, were referred to their family doctors. One boy also had hypertension, one had eczema and asthma, and one was suspected to have pyelitis. Follow-up enquiries were sent to the family doctors. Eight doctors replied, but in only two cases was there any indication that further investigation had been carried out, and these two were still under investigation.

### ORTHOPAEDIC CONDITIONS

The findings are considered under the following headings:

1. Flat feet.
2. Other conditions of feet.
3. Deformities of chest.

4. Deformities of posture.
5. Defects resulting from injury.
6. Other orthopaedic defects.

#### Flat feet

Seven boys were diagnosed by the study team as having this defect. The examiners recommended exercises in every case. In one boy the parents' questionnaire contained an entry of flat feet. The school health service record showed no diagnosis of the condition in any of the seven boys.

Four girls were found to have the defect and in three of the four cases there was a recommendation for further treatment: one for exercises, one for hospital opinion, and one to attend the family doctor. The parents' questionnaires contained direct reference to foot defect in two girls. The school health service recorded no defect in the four cases found by the study team but recorded flat feet in one case which was found normal by the study team.

#### Other conditions of feet

One boy was diagnosed by the study team as having hammer toes and was recommended for orthopaedic specialist advice. The school health service had no record of the diagnosis.

Nine girls were diagnosed by the study team to have foot defect other than flat feet. The school health service had no record of defect in seven out of the nine girls but recorded a diagnosis similar to that made by the study team for the other two cases.

The details of the defects in the girls are as follows -

Case 1

Enlargement of the tendo Achilles insertion. The parents' questionnaire contained reference to a foot defect.

Case 2

As above.

Case 3

Flexed toes third and fourth left and right: recorded by the school health service.

Case 4

Painful corns and chilblains. Advice re shoes and stockings.

Case 5

Painful toe joints: recommended for hospital opinion.

Case 6

Congenital club foot. Recorded in parents' questionnaire and in school health service records.

Case 7

Hammer toe deformity.

Case 8

Distal segment of second and third toes, right foot, missing.

Case 9

Fused toes second and third, both feet, congenital.

## Deformities of chest

The study team reported one boy with pigeon chest and two boys with cobbler's chest. The school health service had records of all three cases.

## Posture defect

One boy and five girls were found to have defects of posture. The school health service had recorded one case. The details are as follows -

### Case 1

Winged scapula, torticollis and bad posture. Recommended for X-ray investigation, physiotherapy and exercises.

### Case 2

Dorsal kypho-scoliosis. Recommended for physiotherapy.

### Case 3

Postural kyphosis. Recommended for remedial exercises.

### Case 4

Kypho-scoliosis with chest asymmetry. Recommended for exercises.

### Case 5

Dorsal kypho-scoliosis.

### Case 6

Lordosis. Recommended for orthopaedic treatment. This case had been recorded by the school health service as having a fracture of the coccyx.

## Defects resulting from injury

Six boys and one girl were found to have defects resulting from injury. The school health service had recorded two of the cases. The details are as follows -

### Case 1

Contracture of finger. The parents' questionnaire recorded severance of a tendon of the palm of the hand. The school health service had recorded the contracture.

### Case 2

Limited extension of the elbow following fracture. The parents' questionnaire and the school health service recorded the condition.

### Case 3

Hypertrophy of the tuberosity of left tibia following a kick at age 12 years. The case was not recorded by the school health service.

### Case 4

Limited extension of right knee with atrophy of right thigh following fracture of patella 1958. The parent recorded the condition in the questionnaire. The school health service had no record.

### Case 5

Limited supination of right hand following fracture. No record by the school health service.

### Case 6

Winged scapula with bad posture. Child had previously sustained a fractured skull and thigh. The parents' questionnaire recorded a defect. The school health service had no record.

### Case 7

A girl with wasting and power-loss of muscles of right wrist causing weakness of grip and powers of flexion. The wasting and weakness was probably associated with limited use following injury. The parent did not record this but the teacher had recorded that the child had had trouble with her wrist. The school health service had record of the injury only.

### Other conditions

The study team reported two boys and two girls with orthopaedic conditions other than those listed above. The school health service had no record of the two boys. The details are as follows -

#### Case 1

A boy with an unspecified lesion of the knee. The parents' questionnaire contained a reference to a knee condition, and the child was receiving hospital and family doctor care.

#### Case 2

Perthes disease of the hip 1953/54. The parent had no record of the condition in the questionnaire but the teacher had reported that the boy had had a dislocated joint and had been in hospital. The school health service had no record of the case.

Case 3

A girl with post-polio myelitis paralysis of the shoulder girdle. The parent reported the condition and the school health service had record of it.

Case 4

Contracture of the third left finger, extension poor, finger smaller than normal. The parent reported that the girl had had a septic hand and had been in hospital. The study team recommended further hospital treatment. The school health service had recorded the condition.

The following tables give summaries of the findings for all orthopaedic conditions:-

ORTHOPAEDIC CONDITIONS

Cases found by Study Team

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                        | Number of cases where School Health Service recorded |       |       |                |       |       |                     |       |       |              |       |       |
|-------------------------------|--|-------|-------|----------------|-------|-------|---------------------|-------|-------|--------------|-------|-------|
|                               | Number found by Study Team                           |       |       | Same Diagnosis |       |       | Different Diagnosis |       |       | No Diagnosis |       |       |
|                               | Boys   | Girls | Total | Boys           | Girls | Total | Boys                | Girls | Total | Boys         | Girls | Total |
| Flat feet                     | 7  | 4     | 11    | -              | -     | -     | -                   | -     | -     | 7            | 4     | 11    |
| Other Conditions of Feet      | 1  | 9     | 10    | -              | 2     | 2     | -                   | -     | -     | 1            | 7     | 8     |
| Deformity of Chest            | 3  | -     | 3     | 3              | -     | 3     | -                   | -     | -     | -            | -     | -     |
| Postural Defects              | 1  | 5     | 6     | -              | -     | -     | -                   | 1     | 1     | 1            | 4     | 5     |
| Defects resulting from Injury | 6  | 1     | 7     | 2              | -     | 2     | -                   | 1     | 1     | 4            | -     | 4     |
| Other Conditions              | 2  | 2     | 4     | -              | 2     | 2     | -                   | -     | -     | 2            | -     | 2     |
| Totals                        | 20   | 21    | 41    | 5              | 4     | 9     | -                   | 2     | 2     | 15           | 15    | 30    |

ORTHOPAEDIC CONDITIONS

Cases recorded by School Health Service

Children examined: Boys 276: Girls 286: Total 562

| DEFECT                           | Number recorded |       |       | Number not confirmed<br>by Study Team |       |       |
|----------------------------------|-----------------|-------|-------|---------------------------------------|-------|-------|
|                                  | Boys            | Girls | Total | Boys                                  | Girls | Total |
| Flat Feet                        | -               | 1     | 1     | -                                     | 1     | 1     |
| Other conditions of feet         | -               | 3     | 3     | -                                     | 1     | 1     |
| Deformity of Chest               | 4               | -     | 4     | 1                                     | -     | 1     |
| Postural Defects                 | 2               | -     | 2     | 2                                     | -     | 2     |
| Defects resulting from<br>Injury | 2               | 1     | 3     | -                                     | 1     | 1     |
| Other Conditions                 | -               | 2     | 2     | -                                     | -     | -     |
| Totals                           | 8               | 7     | 15    | 3                                     | 3     | 6     |

ABDOMEN

One boy was reported to have diarrhoea, the condition having lasted, according to the parent, for several years. The teacher also reported the condition in the questionnaire and also reported that the educational attainment of the boy was much below his intelligence level. The child had been under prolonged hospital supervision. The school health service had no record of the disease.

Two girls were found to have conditions of the abdomen. One girl had tenderness in the right iliac fossa and had been under prolonged supervision by her family doctor. The child was thought to have a possible appendicitis. The school health service had no record. The other child was reported to be slightly tender round the umbilicus and there was a history of abdominal pain of some 18 months duration. The medical examiner thought the case might be one of peptic ulcer and

recommended hospital investigation. The parents' questionnaire reported that the child had had abdominal pain. The school health service had no record of the case.

### NERVOUS SYSTEM

Two boys and one girl were reported to have defects of the above type. The school health service had records of one of the cases.

#### Case 1

Birth injury: boy's left side was doubtfully spastic, movement was clumsy and there was a left external squint. The parent reported a difficult birth with forceps delivery and stated that the child had a slight cerebral palsy of the hands. The school health service had no record of the case.

#### Case 2

Right spastic hemiplegia, congenital right wrist drop, depressed lower chest. The parent and teacher both reported the spastic condition and the school health service had recorded a spastic paralysis.

#### Case 3

One girl was found to have a history of epilepsy of the grand mal type. There had been no fits recently. Neither the parent nor the teacher recorded the condition although the child was under the care of the family doctor. The school health service had no record of the defect.

## DEVELOPMENTAL CONDITIONS

The study team reported two boys with the above condition.

### Case 1

The left side of thorax flattened compared with the right. The parent reported pigeon chest following a severe attack of whooping-cough. The school health service had no record.

### Case 2

Left leg shorter than right by two inches. Slight atrophy of the calf and thigh. The parent reported the shortness of the leg but the school health service had no record.

## OTHER CONDITIONS

The study team reported three boys and one girl in this group. The cases were, for the boys, gynomastia, albino with much bruising, and severe enuresis under hospital treatment. The girl was reported to have a thyroid enlargement probably pubertal in origin. The school health service had no record of any of the four cases.

## ABSENTEES

282 boys and 298 girls were asked to attend for examination. Six boys and 12 girls did not do so. That is, the absentee rate was approximately 3 per cent. No national rate exists with which this percentage can be compared.

The study medical examination, unlike the routine medical inspection, was not a compulsory medical examination and parents could

withhold their children if they so wished. The local school health service willingly co-operated by agreeing to send out health visitors to homes of children who were absent. Much importance was placed on this because it seemed possible that absentees from routine medical examinations, while small numerically, might be of great importance in relation to matters of health. It was decided that the reasons for absenteeism would be closely looked at.

Several children did not attend at the first appointment and it was found on investigation by the health visitor that the time of the appointment was the usual difficulty. Fresh appointments were made and special additional medical sessions arranged. Non-attenders were visited again. There remained a hard core of six boys and 12 girls who had not attended even after considerable trouble had been taken to accommodate them.

Two of the boys refused to attend for no good reason. The parents had signed the form permitting their attendance and the parents' and teachers' questionnaires contained nothing of importance. The remaining four boys were as follows -

#### Case 1

The boy forgot the first appointment, promised to attend the second but did not do so. He had spent five years in a special school for mentally handicapped children and had only attended about a quarter of the time at an ordinary school because of

frequent unexplained absences. His parents had been fined on four occasions for these. The mother reported by questionnaire that the boy was very nervous and in a poor state of health. The boy's father had died when the boy was six-and-a-half years old. The teacher reported an intelligence quotient of 82 and poor educational attainment.

#### Case 2

The mother did not know why the boy had not attended and was willing for a fresh appointment. This was not kept. The teacher reported poor attendance at school and also that the boy was timid and permanently backward and that he required special educational treatment.

#### Case 3

This boy was in hospital receiving treatment for a disorder of the knee. His teacher reported by questionnaire that he had about 80 per cent attendance and that he had attended a special school until 1958 because of epilepsy. The parents' questionnaire contained nothing of significance.

#### Case 4

Mother's illness given as a reason for non-attendance although she was particularly anxious for the boy to attend. She reported by questionnaire that he suffered from headaches and that these had followed a severe fracture of the skull some seven years previously. The teacher's questionnaire contained nothing of significance.

Of the 12 girls who did not attend, five had no satisfactory reason to give. In four cases the girls were off sick during the time of the appointment and the illnesses were given as dysmenorrhoea, bad cold, septic throat and an unspecified diagnosis. In the first of these four the teacher reported bad attendance at school for no apparent reason. In the other three the teacher and parent reported nothing of significance. The remaining three cases are as follows -

Case 1

The child was reported by the teacher to have a ridiculously poor attendance record at school, lacked stability and there was lack of co-operation by the home. The parent reported skin disease and sore throats and stated a willingness for the girl to attend for examination.

Case 2

Teacher reported poor school attendance without good reason; listless and slow and below average intelligence. Mother left home with the child at the time of the survey and father did not know the mother's new address.

Case 3

Teacher reported bad attendance at school and that the child always had a harassed appearance, was stubborn and careless.

The above details show that out of 18 children absent from medical examination reasons for absence could be found in 11. The reasons

were: illness of the child (five cases), illness in the mother (one case) and poor school attendance with mental backwardness or emotional disturbance (five cases).

DISCUSSION OF THE FINDINGS IN RELATION TO  
PRESENT-DAY SCHOOL HEALTH SERVICE PRACTICE

The accuracy of present-day methods of school health examination

The school health service working under restrictions of time, place, history and methods of examination common to present-day practice had records of the presence of 276 defects in 562 children at the time those children were 14 years of age, and one year after every child in the group had received a routine medical examination. The study team working under school health service conditions, in which every effort was made to give enough time, to provide proper medical accommodation, adequate histories and ancillary methods of investigation, confirmed the presence of 189 of the defects recorded by the school health service in the same group of children but found, in addition, 308 other defects which had not been recorded by the school health service. In other words the school health service had records of 38 per cent of the defects found by the study team.

Possible explanations

The study examination of each child included the use of certain techniques not used routinely by the school health service, namely colour vision examination, audiometry, urine examination, blood pressure assessment and X-ray investigation of the chest. Certain defects were revealed by those techniques which might otherwise have been missed by the study medical examiners. If those defects are

excluded from the above findings it is found that the study team discovered 427 defects in the 562 children: the school health service had records of 189, 44 per cent of the defects found by the study team.

Allowance might be made for the probability that some children would have developed defects during the twelve month period between the last routine medical examination carried out by the school health service and the study examination. The school health service would not be entirely ignorant of defects developing in children after the last routine medical examination since there is a statutory requirement issued by the Department of Health (D.H.S. Circular 71/1959) whereby every school health service must have an arrangement for the special medical examination of any school child referred by mother, teacher or nurse and this arrangement could probably be relied upon to bring serious conditions to the notice of the school medical officer. This arrangement for special examinations and the fact that several children with defects found at the routine medical inspection by the school health service had received treatment by the time the study examiners saw them, for example in cases of tonsillitis, suggest that the lapse of time was probably not an important factor in explaining the difference in findings.

It might be said that the school medical officer may not have been so particular in recording every defect he saw, particularly the minor form of defect. This present study does not measure the importance of

this factor as an explanation of the difference in the number of defects recorded and it would be difficult to demonstrate the defects observed by a medical examiner and yet not recorded by him. This difficulty was anticipated when the study was planned and it was met to some extent by the choice of an area for the study which appeared to have a good health service and which recorded a high number of defects at routine medical inspection.

Each school health service in Scotland sends annual statistics to the Department of Health for Scotland. These statistics include a table setting out the percentage of children found to have defects to children examined at routine medical inspection. The statistics over the years show that one school health service varies very much from another in the numbers found, but each service maintains a constant level of return for children with defects (D.H.S. Report 1957, Cmnd. 385). The following table gives the returns over the last five years for the four cities. The table demonstrates the constancy in any one area, the difference between the areas, and the high position of Lanark County. The national average for Scotland is also shown.

Routine medical inspections: Percentage children with  
defects to children examined 1954/55 - 1958/59

|             | 1954/55 | 1955/56 | 1956/57 | 1957/58 | 1958/59 |
|-------------|---------|---------|---------|---------|---------|
| Aberdeen    | 57.3    | 54.7    | 54.9    | 55.4    | 53.4    |
| Dundee      | 39.1    | 44.9    | 42.2    | 42.7    | 42.0    |
| Glasgow     | 34.5    | 35.2    | 33.9    | 34.5    | 34.0    |
| Edinburgh   | 30.0    | 29.1    | 28.1    | 26.1    | 25.1    |
| Scotland    | 37.1    | 37.0    | 36.4    | 36.6    | 35.3    |
| Lanarkshire | 49.2    | 49.2    | 50.7    | 55.8    | 48.7    |

The differences between areas in the returns of the findings at routine medical inspection are also demonstrated in the following table, which sets out, for the 35 education areas in Scotland, the number of children found at routine medical inspection to be free from defect expressed as a percentage of the total number examined during the school year 1958/59.

Lanark County is seen to have the second lowest percentage (D.H.S. Scottish Health Statistics 1959).

Routine school medical inspections  
Children free from defects: education authority areas  
School Year 1958-59

| Education Authority Area | Children free from defect as percentage of children examined |
|--------------------------|--|
| Aberdeen                 | 46.6   |
| Lanark                   | 51.3   |
| Moray and Nairn          | 53.6   |
| Bute                     | 57.1   |
| Fife                     | 57.2   |
| Stirling                 | 57.7   |
| Dundee                   | 58.0   |
| Berwick                  | 61.1   |
| Argyll                   | 61.3   |
| Dunbarton                | 61.3   |
| Wigtown                  | 62.9   |

| Education Authority Area | Children free from defect as percentage of children examined |
|--------------------------|--|
| Midlothian               | 63.7   |
| Renfrew                  | 65.0   |
| Kirkcudbright            | 65.8   |
| Glasgow                  | 65.9   |
| Angus                    | 67.4   |
| East Lothian             | 67.5   |
| Kincardine               | 68.0   |
| Aberdeen County          | 68.3   |
| Banff                    | 69.2   |
| West Lothian             | 69.4   |
| Ross and Cromarty        | 71.5   |
| Dumfries                 | 71.9   |
| Peebles                  | 74.3   |
| Perth and Kinross        | 74.5   |
| Edinburgh                | 74.9   |
| Inverness                | 75.2   |
| Ayr                      | 77.8   |
| Roxburgh                 | 78.9   |
| Sutherland               | 79.1   |
| Orkney                   | 85.6   |
| Zetland                  | 86.9   |
| Selkirk                  | 87.3   |
| Caithness                | 88.9   |
| Clackmannan              | 90.5   |
| Scotland                 | 64.6   |

The circumstance would arise where the school health service medical officer and the study medical examiner each observed a defect in a child but the school health service medical officer made a different diagnosis from his observation than that made by the study medical examiner. It could be said that the study medical officer was no more likely to be accurate in his diagnosis than the school medical officer experienced in routine medical inspections. The findings of the study show that 189 defects were observed both by the

study medical examiner and by the school health service medical officer and out of that number the study medical examiners and the school health service medical officers recorded the same diagnosis in 176 cases, that is they differed from each other in the diagnosis of 13 observed cases. This number is of little significance against the total disparity.

The criticism might be made that all school health records were not made available to the author. Both Lee (1958) and Herford (1957)<sup>b</sup> spoke of the difficulty of obtaining school health records of children and there was the possibility in their studies that they did not obtain complete records. In this present study the author worked in very close co-operation with the Senior School Medical Officer of the study area and received the school health records of the children before the children had left school. In this respect the circumstances were different from those of Lee and Herford since those two workers obtained the school medical records some time after the children had left school.

The above considerations do not explain convincingly the findings of the study that the school health service had no records of 62 per cent of the defects found in a group of children about to leave school.

#### Factors influencing the accuracy of present-day methods

An experienced school medical officer, Wright (1960), when reporting on his study of the nine year old routine medical inspection,

said that "much more is missed due to lack of information, time or interest than is due to lack of medical knowledge". The school medical officers of the school health service participating in the present study and who worked in the study area were experienced not only in the examination of children but also in the conduct of the routine medical inspections of large numbers of children. The medical examiners of the study teams were physicians of consultant status experienced in the examination of sick children but not experienced in the conduct of routine medical inspection of large numbers of children, many of whom would be in good health. It is probable that any advantage possessed by one group was, to some extent, cancelled out by an advantage possessed by the other, although this was not proved by the study; nor was it a purpose of the study to demonstrate the superiority of one group of medical examiners over the other. The study does demonstrate that the difference between the findings of the study examiners and those of the school health service is due in part to the difference between the circumstances under which the two sets of examination had been carried out. These circumstances are now discussed.

#### Insufficient time for examination

The study medical officers were allowed to take the time they thought necessary for proper examination with the knowledge that several hundred children had to be examined and that time was important

The study medical officers averaged 15 minutes per child for clinical examination alone. Herford (1957)<sup>6</sup> found that his clinical examinations of young persons for employment took an average of 15 minutes each. Information provided by practising school medical officers bears out that about 20 children are examined at one routine medical inspection session of two-and-a-half hours; that is, an average time for each examination of about seven minutes. The Society of Medical Officers of Health states in its booklet "School Medical Inspections" that the number of children examined should not normally exceed eight per hour. This time appears to be quite inadequate. The inadequacy is even greater when the main object of the routine inspection "is to help in creating a healthy adolescent and to provide a basis for a fit and happy life" (Leff & Leff (1959)) and that the inspection should be used for the individual health education of the child (Withnell (1958), MacQueen, Aberdeen (1959)<sup>8</sup>). These views on the aim and purpose of the routine medical inspection are quite justified and are shared by school health service medical officers generally, but it is doubtful if the school medical officer can attempt more than a rapid search for defect in the time available.

The increase of time could be provided by increasing the medical staff or reducing the other services given. The latter would be difficult except that a reduction in the time given by school medical officers to treatment clinics might be acceptable to the majority of school medical officers. The number of treatment clinics is already

being reduced in some areas in Scotland although treatment remains a statutory responsibility of the education authority under the Education (Scotland) Act, 1946. It may be possible to increase the time allowed for the routine medical examination of entrants and school leavers by the giving up of the nine year old examination or by its replacement by other methods of health supervision and appraisal. This has been explored by Wright (1960), Irvine (1959)<sup>a</sup>, MacDougall (1959) and others. The Department of Health for Scotland has relaxed the requirements of routine medical inspection to allow school health services in Scotland to omit the nine year old examination if they so wish (D.H.S. Circular 47/1956). The intention is to encourage school medical officers to explore other methods of health supervision.

Little has been done in Scotland (D.H.S. Report 1958, Cmnd. 697). Several areas in England have made use of the corresponding relaxation (Statutory Instrument 1953/1156). The Chief Medical Officer to the Ministry of Education reports (1960) that these are experimental in character, entail frequent visiting by the school doctor to school to see children presented by teachers, parents and school nurses in place of routine medical examination, and that this procedure does not save time, and may in fact require more time than a system of school medical inspection.

The Expert Committee on School Health Services set up by the World Health Organisation (1951)<sup>a</sup> goes further in recommending that "when planning the use of the physician's time available for school

children, the various priorities should be provided for properly.

The number of periodic examinations to be carried out must be decided after consideration of the time necessary for performance of the functions .... advice and consultation to parents, children, and school personnel, and diagnosis and treatment of conditions referred from screening procedures - which take precedence." The routine medical inspection has occupied a high place in the scheme of school health service in Scotland and it is unlikely that many medical officers would agree with the recommendations of the Expert Committee.

The second possibility is the increase of medical staff. There is no establishment of school medical officers laid down or recommended by statute. Each area decides its own requirements.

Information provided by the Scottish Education Department shows that there was about the equivalent of 119 full-time school medical officers for some 870,000 school children in 1959. School medical officers work only part-time on school health work in many areas, and no precise figures are available. This is an approximate load of one full-time school medical officer to 7,300 children. One Scottish school health service; with a proportion very near this figure, provides details in its Annual Report (Weir (1958)<sup>b</sup>) of the allocation of school health work to its school medical staff. It appears that about one-third of the time of its staff is given to routine medical inspection.

To double the time given to routine medical inspection to allow 15 minutes for each inspection would require about one full-time school

medical officer equivalent to 5,500 school children. Rural areas would require better staffing than this to allow for time required in travelling between schools.

### Quality of Medical Rooms in Schools

Five out of the 11 schools from which the study group children were drawn had medical rooms which were graded by the Senior School Medical Officer as unsatisfactory for the purposes of medical examination. One of the schools visited by the author and accommodating 1,000 pupils was found to have a room some 12 feet square on the second floor allocated for medical examination. The room contained some heavy tables laden with an assortment of sports and educational equipment. The tables which occupied most of the floor space were not cleared for medical inspections. There was no table for medical staff, no sink and no water supply, either hot or cold. The whole room was dismal, untidy and dirty. The children and parents waited in a cold draughty corridor. Girls were usually examined in a small rest room some 12 ft. by 7 ft. and so quite inadequate in size. The standard of some of the rooms was so low that it would readily be agreed that such accommodation would certainly affect the quality of medical examination, and it would be easy to indicate the particular shortcomings of the various medical rooms used, either that they were too noisy or too dark, lacking in privacy or too small. It is not, however, easy to prove that unsatisfactory medical examination rooms have an effect on the accuracy of medical examinations.

It was thought that the simple hearing of a heart murmur apart altogether from the diagnosis made might be affected by noise, by interruptions and by lack of privacy, all features of the unsatisfactory medical rooms. 335 children of the study group came from schools with satisfactory medical accommodation. The study medical examiners reported 52 of those children with heart murmurs. The school health service, having examined the children in the satisfactory medical rooms, reported 12 of the children with murmurs, that is 23 per cent of the study findings. 227 children of the study group came from schools with unsatisfactory medical accommodation. The study examiners found 12 children with heart murmurs. The school health service, having examined the children in the unsatisfactory medical rooms, reported one child with heart murmur, that is 8 per cent of the study group findings.

The lack of privacy for undressing might influence the accuracy of diagnosis of skin disease of the body as distinct from skin disease of the face. The study team reported 18 cases of acne of the face: the school health service had recorded 17. The study team diagnosed 20 cases of skin disease of the body and legs: the school health service recorded eight. The lack of privacy for undressing and the lack of space for observation of gait and posture might affect the accuracy of the examination for orthopaedic defects. The study medical examiners discovered 28 cases of orthopaedic defects in the 335 children from schools with satisfactory medical rooms: the school

health service recorded 11 cases, that is 39 per cent of the study group findings. The study team recorded 13 cases of orthopaedic defect in the 227 children from schools with unsatisfactory medical rooms: the school health service had recorded four cases, that is some 30 per cent of the study group findings. In all the above cases the study medical examiners had been working in medical rooms which could be classed as excellent. While the above findings are of interest, any interpretation in relation to the effect of unsatisfactory medical rooms on clinical accuracy is made with great reserve.

Some medical rooms provided in the schools of the study group children were so bad that it seemed possible that the study area had included quite accidentally a larger proportion of unsatisfactory medical rooms than ordinarily prevailed in the county. The Senior School Medical Officer did not think so but it was not found possible for reasons unconnected with the study to have an assessment made of all the medical rooms in the county schools to obtain a comparison. An assessment of every school medical room in another large county was carried out by the Senior School Medical Officer of that county at the request of the author. This county was not unlike Lanarkshire in that it was a mixed industrial and rural area. The assessment of the medical accommodation in the 110 schools of the county showed that 29 were satisfactory, 30 fairly satisfactory, 37 were unsatisfactory

and in 14 schools medical examinations had to be conducted elsewhere than at school. That is, some 26 per cent of the schools had satisfactory medical accommodation and 46 per cent had unsatisfactory accommodation or no accommodation at all. The type of room supplied for medical use varies much in this county as in others in the country. Seventeen (15 per cent) of the schools had proper medical inspection rooms kept entirely for the purpose. The other schools had provided accommodation as follows: staff rooms - 41; class rooms - 17; dining rooms - 11; library - two; theatrical room - two; cookery room, housewifery room and hall - one each. A report was obtained from the Principal School Medical Officer of a smaller county and several of the medical rooms were visited by the author. Out of the 40 schools in the county, three were graded by the Principal School Medical Officer as very satisfactory, 22 as satisfactory, four fairly satisfactory, 10 unsatisfactory and one most unsatisfactory. That is, 27 per cent of the schools had unsatisfactory medical accommodation.

There is no reason to believe that the above examples are not representative of Scotland as a whole and it is probable that the situation generally is unsatisfactory. Even in the larger and more modern schools which have medical accommodation planned for the purpose, the contrary and opposing requirements of increasing accommodation for class teaching and the maintenance of good spacious medical rooms within a fixed school building not infrequently leads to the taking over for

education purposes of part of the accommodation originally allocated for medical use. The requirements for medical rooms laid down in Statutory Instrument 1959: 1096, are insufficient to prevent this trend. Serious difficulties exist in the smaller schools particularly where the school consists only of one or two classrooms and a staff room. These rooms are unsuitable for proper clinical examination and yet it is not reasonable to expect that self-contained medical suites could be available. In the absence of mobile medical rooms similar to those used for dental purposes, the school health service has little choice but to continue medical examinations under those circumstances. The restrictive nature of this on medical work can be seen from the following figures which have been taken from the Annual Report of the Scottish Education Department for 1958. 656 (approximately 20 per cent) of the 3,293 schools in Scotland have under 25 pupils each: 1,625 schools (approximately 50 per cent) have under 100 pupils each. The position is, of course, most difficult in the smaller counties. Sutherland has 36 schools, half with under 25 pupils each and 83 per cent with under 100 pupils each. The corresponding figures are for Argyll - 62 per cent and 82 per cent: Inverness - 45 per cent and 83 per cent: Ross and Cromarty - 42 per cent and 81 per cent: Caithness - 42 per cent and 84 per cent respectively. Even in the larger industrial areas there are quite a number of schools with few pupils; for example, County of Lanark, 9 per cent of the schools with under 25 pupils and 25 per cent

with under 100 pupils; County of Fife, 181 schools, 9 per cent and 36 per cent respectively.

There is a statutory requirement by the Secretary of State for Scotland that all routine medical examinations of school children shall be carried out in the schools unless otherwise authorised (S.R. & O. 1947: 415). In view of the unsatisfactory arrangements for medical examination in many schools, confirmed at least in part by this study, there seems to be an immediate need for the Senior School Medical Officer and Senior Education Officer of each area to examine the arrangements in each school. It is possible that, in many large authorities particularly, senior medical officers may not be fully aware of the circumstances under which their assistants have to work.

#### History from Parents

A main purpose of the routine medical inspection is the discovery of defect at a very early stage of development and before the defect has progressed to the point at which the parent is alerted to attend the family doctor. A medical investigation which will reveal those slight deviations from normal health is as likely to depend on medical history as on clinical examination. Histories obtained from parents by their attendance at routine medical inspections are generally accepted as of great importance (Barasi & Cartwright (1957), Wright (1960), Withnell (1958), W.H.O. Technical Report Series 1951, 30). Unfortunately the attendance of parents at routine medical inspections is not satisfactory and is particularly poor in the older age groups. It is

generally believed that older children do not wish their parents to attend with them at medical examination and it is also accepted that some parents may find themselves in some difficulty in attending either through domestic or employment responsibilities. No national figures of attendance of parents at routine medical inspections are available, and only certain education areas publish local figures. The following table gives the attendance of parents as a percentage of the children examined at the routine medical inspections of the four customary age groups in 1957/58 for a large industrial/rural county (Riddell (1958)<sup>a</sup>), a small rural county (Riddell (1958)<sup>b</sup>) and a large city (Weir (1958)<sup>a</sup>).

Routine Medical Inspections 1957/58  
Percentage of parents' attendance to children examined

|            | Routine medical inspection of children aged |         |          |          |
|------------|---|---------|----------|----------|
|            | 5 years                                     | 9 years | 13 years | 16 years |
| Midlothian | 63.9  | 38.5    | 7.4      | 1.0      |
| Peebles    | 57.1  | 28.3    | 3.4      | -        |
| Dundee     | 79.3  | 42.6    | 3.2      | 0.3      |

The study investigation included special efforts to obtain good attendance of parents by the use of a special explanatory letter (see page 10), an attempt to accommodate parents in the time arranged for the examination and a follow-up of non-attenders by health visitors visiting the homes. The attendance of parents as a percentage of children examined at the study medical examination, that is, when the

above special arrangements were in operation, was as follows:-

boys, 61 per cent; girls 60 per cent; all children, 60 per cent.

The corresponding attendances at the routine medical inspections held by the school health service a year previously were - boys, 11 per cent; girls, 19 per cent; all children, 15 per cent. It is interesting to note that, while the study figures are much higher than the other areas mentioned, one city gave a percentage attendance of parents at the 13 year old examination of 65.2 per cent (MacQueen (1959)<sup>b</sup>). This percentage level is quite unique for Scotland. No special measures appear to have been taken which might explain this high level, but the city is well known for its active health visiting service.

While the importance of the attendance of parents is generally accepted it is not easy to obtain some measure of its value. The medical examiners taking part in the study investigation were asked to state for each child examined whether or not the diagnosis of any defect found was materially assisted by the presence of the parent at the examination. Of 276 boys examined, the medical examiners found that the parents' attendance was of significance in 122 cases. Of 286 girls examined the figure was 127. That is, for 562 examinations, with the parents attending at 368 of them, the study medical examiners found that the attendance of parents materially assisted the diagnosis of defects in 249 of the examinations. The school health service had recorded a total attendance of parents at the 13 year old routine

medical inspection of the same group of children of 84.

A questionnaire is frequently used by the school health service to obtain limited information about immunisation and the occurrence of infectious diseases of childhood. No request is made for information on general medical history. A questionnaire was used in the study to obtain general medical history because it would provide some history of the child where the parent did not attend the examination and would provide a supplement to the history given if the parent did attend. The form of questionnaire used in the study has already been described (page 12).

All questionnaires were returned completed.

The medical examiners were asked for each questionnaire received to indicate if the diagnosis of any defect found had been materially assisted by the questionnaire. The examiners' records show that 345 (61.4 per cent) of the 562 received had been of material assistance.

The findings of the study were examined to discover if the parents had recorded any defects or history of defects which had been confirmed by the study medical examiners but had not been recorded by the school health service. In other words to discover if the parents were aware of defects or were suspicious of defects about which the school health service appeared to have no knowledge.

The parents noted in their questionnaires either defect or suspicious history of defect in 116 cases confirmed by the study team. The school health service had records of defects in 41 of those cases.

This suggests that the parents knew of, or were suspicious of the presence of, 75 defects which were unknown to the school health service. The majority of those defects, 46 of them, were diseases of the nose, throat and ear. The following table gives the details:-

Cases recorded in parents' questionnaires  
and confirmed by Study Team

| DEFECT                              | Number recorded<br>by parents |       |       | Number recorded by<br>School Health Service |       |       |
|-------------------------------------|-------------------------------|-------|-------|---|-------|-------|
|                                     | Boys                          | Girls | Total | Boys  | Girls | Total |
| Skin                                | 9                             | 4     | 13    | 6   | 2     | 8     |
| Tonsils and Adenoids                | 7                             | 17    | 24    | 3   | 6     | 9     |
| Nose                                | 1                             | 5     | 6     | -   | 2     | 2     |
| Other disease of Nose<br>or Throat  | -                             | 3     | 3     | -   | -     | -     |
| Deafness                            | 4                             | 6     | 10    | -   | -     | -     |
| Deafness with organic<br>ear defect | 11                            | 7     | 18    | 3   | 6     | 9     |
| Organic ear defect                  | 2                             | 3     | 5     | -   | -     | -     |
| Speech                              | 2                             | -     | 2     | -   | -     | -     |
| Emotional Disturbance               | 4                             | 2     | 6     | 3   | 1     | 4     |
| Organic Heart Disease               | 1                             | 1     | 2     | 1   | -     | 1     |
| Bronchitis                          | 3                             | -     | 3     | 1   | -     | 1     |
| Asthma                              | 1                             | 1     | 2     | 1   | -     | 1     |
| Pulmonary Tuberculosis              | -                             | 1     | 1     | -   | -     | -     |
| Other Lung Disease                  | 1                             | 2     | 3     | -   | -     | -     |
| Orthopaedic Conditions              | 6                             | 6     | 12    | 2   | 3     | 5     |
| Abdomen                             | 1                             | 1     | 2     | -   | -     | -     |
| Nervous System                      | 2                             | -     | 2     | 1   | -     | 1     |
| Developmental Conditions            | 2                             | -     | 2     | -   | -     | -     |
| Totals                              | 57                            | 59    | 116   | 21  | 20    | 41    |

A few field trials of questionnaires to parents have been conducted in England within recent years but these have been directed in the main to the demonstration of the questionnaire as an alternative to routine medical examination or as a time-saver in obtaining history from parents.

The present study used the questionnaire as an addition to the routine medical examination and with the purpose of increasing the accuracy of the medical assessment. The findings of the English workers are not, however, without importance in connection with the present study. Barasi & Cartwright (1957) produced the questionnaire to provide "routine information on prophylaxis and infectious diseases" and "the type of information which the school medical officer needed to make the most of the time available to him at the school medical examination". The workers found that, of the 276 questionnaires sent out, 75 per cent of them were returned completely filled up. Only one per cent were not returned at all. Their investigations led them to believe that parents did not regard the questionnaire as an alternative to their attendance at the routine medical examination. Wright (1960) used questionnaires based on those of Barasi and Cartwright in his study of the nine year old intermediate school medical examination. He investigated the possibility of the questionnaire as an alternative to this examination. Wright found that considerable reliance could be placed on the parents' questionnaire and that there was a high return rate. He decided to continue to use it as an alternative and slightly modified for routine purposes. Withnell (1958) planned a 15 question health inventory to be completed by parents which would not only supplement the history taken by the doctor from the parent as Barasi and Cartwright intended to do but to be a substitute for it. He found

that an accurately completed inventory together with an entrance medical examination at the age of five years would result in 94.2 per cent of all children over seven years with defect being screened out.

The reports of the above workers and the findings of the present study suggest strongly that a questionnaire to parents is a very valuable procedure. Little evidence was found to support the commonly raised arguments against parents' questionnaires that the parent might regard the questionnaire as alternative to attendance at routine medical inspection, that in any case there would probably be a low return rate of questionnaires and that the information obtained from them would be unreliable.

#### Information from Teachers

The teacher may refer children to the school health service for investigation or may consult the school medical officer on his visit to school for advice on certain cases. In most areas, no information is obtained routinely by the school medical officer from teachers about the health of school children. This is regarded as a serious deficiency in present methods. A child's teacher is in very close relationship to the child for almost as much of the child's waking time as the parents. She receives certificates from parents and from family doctors concerning reasons for absence from school. She has some knowledge, sometimes precise knowledge, on the child's intelligence and attainment level. There is general acceptance of the important

position she holds in relation to the mental health of the child. The W.H.O. Expert Committee on the School Health Services (1951)<sup>b</sup> reported as follows:

"An interested and observant teacher can be a tremendous aid to parents and school health specialists in helping them in the health needs of a child. As a trained observer who spends a great deal of time with the children, the teacher can be alert to the subtle changes in appearance or behaviour which may herald the onset of disease."

The difficulties existing at present appear to be the absence of routine methods of transfer of information, and awareness of teachers that knowledge they possess is important to the school health service.

This present study made use of a questionnaire to obtain information and the form of questionnaire has already been described (page 14). The questionnaire is not regarded as the best method or indeed by itself a satisfactory method of obtaining information.

The author believes that the teacher can be of greatest help when she is approached in person by the school medical officer. Questionnaires are too impersonal and too routine to be completely reliable but the arrangements of the study did not allow personal visitation by the medical officers to the schools from which the children were drawn.

The questionnaire was so planned that the teacher was asked for precise information on matters about which she might be considered to

have precise knowledge, that is, educational attainment, intellectual endowment and emotional or behavioural disturbances. The questionnaire did allow her to give information on the physical health of the child if she so wished but more confidence was placed on the parents' questionnaire for this aspect of the child's health.

The teachers' questionnaire proved of value in mental handicap, emotional disturbance and, to a lesser extent, in defects of hearing. Of the 13 cases of mental handicap discovered by the study examiners the teachers' questionnaires recorded all 13 cases; the school health service had records of 10 of them. The study medical examiners reported 16 cases of emotional disturbance; the teachers' questionnaires contained reference to 14 of them; the school health service had recorded four. The study medical examiners reported 67 cases of deafness, the teachers had recorded 11 and the school health service had recorded nine. The details are given in the following table:-

Cases recorded in teachers' questionnaires  
and confirmed by Study Team

| DEFECT                              | Number recorded<br>by teachers |           |           | Number recorded by<br>School Health Service |           |           |
|-------------------------------------|--------------------------------|-----------|-----------|---|-----------|-----------|
|                                     | Boys                           | Girls     | Total     | Boys  | Girls     | Total     |
| Deafness                            | 1                              | 1         | 2         | -   | -         | -         |
| Deafness with organic<br>ear defect | 5                              | 4         | 9         | 3   | 6         | 9         |
| Mental Handicap                     | 8                              | 5         | 13        | 6   | 4         | 10        |
| Emotional Disturbance               | 6                              | 8         | 14        | 3   | 1         | 4         |
| <b>Totals</b>                       | <b>20</b>                      | <b>18</b> | <b>38</b> | <b>12</b>                                   | <b>11</b> | <b>23</b> |

It was interesting to find that the teacher was much more reliable than the parent in reporting mental handicap, more reliable in reporting emotional disturbance and less reliable in reporting ear defects.

The use of questionnaires to teachers has been investigated by several workers. Barasi and Jeffreys (1958) used the questionnaire because "it would take less time than a personal discussion about all the children". Two types of questionnaire were prepared, one for use in primary schools to find out whether the child showed symptoms of extreme nervousness or aggression in his early weeks at school, and one for use in the junior and secondary schools to provide information on intelligence and attainment, on behaviour and somatic symptoms. The workers felt that there was a reluctance on the part of teachers to give written as distinct from verbal information and suggested this might be due to pressure of work, insufficient notice for the completion of questionnaires, unawareness of the purpose of the questionnaires or lack of sympathy. Nevertheless the authors held that teachers should be asked to continue to provide the school medical officer with answers to standard questions as a routine. Wright (1960) used the questionnaire to teachers based on that of Barasi and Jeffreys. He also felt that teachers were diffident at putting down on paper their thoughts, that there was a great difference between teachers in the degree of interest shown and that the use of teachers' questionnaires lost value since some teachers might only have been at the school for a short time.

The Report of the Chief Medical Officer of the Ministry of Education (1958) reports close co-operation between teacher and school medical officer in several areas in England and Wales. In Smethwick a conference is held each term between the school medical officer, the head teacher and the school nurse. The class registers of attendance are inspected at the conference, and children who have had irregular attendance at school or are causing the teacher concern are selected for medical investigation. In 1957 a sample of children who had not been selected previously at the conferences were examined for the presence of physical defect. No defect of importance was discovered. Wiltshire operates a scheme whereby children are examined routinely at five and 14 years and the school medical officer gives medical coverage between those years by frequent visits to schools and observation of the children in the school environment. West Suffolk operates an experimental scheme wherein the school medical officer and the headmaster meet monthly to select out children requiring medical investigation. Routine medical inspections are carried out only at five and 13 years. Buckinghamshire, Staffordshire, Devon and Essex are reported by the Chief Medical Officer to be operating experimental schemes whereby routine medical inspections of certain age groups are being replaced by arrangements for closer co-operation with the teaching staff (Chief Med. Off. Min. Ed. (1960)).

There is little doubt that the school health service should explore every means to obtain the fullest co-operation with teachers. For

example, additional information could be obtained at the moment by arranging for all medical certificates received by teachers to be passed to the service, by school medical officers making frequent visits to schools to discuss children with teachers, and by the completion of questionnaires by teachers in advance of the routine medical examination for every child who is educationally retarded, emotionally disturbed, who appears to be unwell or who has a bad attendance record. Such questionnaires could of course be used with benefit at any time for any child causing concern to his teacher. Much experiment is needed in Scotland to explore avenues of co-operation so that the unique experience of the teacher can be made use of by the school health service. Any co-operation must be obtained only with full co-operation of the teacher so that she will willingly help. Irvine (1959)<sup>b</sup> reports an advantage of his system of school medical officer/teacher co-operation to be that the teachers "feel they are having more support with sick children under their care and are taking a more active part in the medical care". This is one measure of success of any similar scheme.

#### Health visitors

The health visitor who also acts as school nurse has an established place in the school health service. Her work is invaluable to the school medical officer and particularly so when full use is made of her knowledge of the home background and of her clinical powers of

observation. MacQueen (1959)<sup>c</sup> describes the work of health visitors in carrying out health surveys in schools. These surveys, begun as hygiene inspections to detect infestation and cleanliness, and now extended to include the detection of emotional and physical disease, are detecting five cases of emotional or physical disease for every two cases of defects of hygiene.

This present study did not make use of her services to the full, partly because the circumstances of the study did not allow it, partly because she was used as a clinic nurse, which is not her true role, and partly because the study medical officers, being hospital doctors, were probably unaccustomed to this type of worker and unaware of the contribution she could make. A measure of this is that only one study medical examiner reported that information from the health visitor had been of material assistance in diagnosis, and that only for one defect.

#### Medical Record Cards

The form of school medical record card at present in use throughout Scotland has remained unchanged except in minor detail since 1938 when the Department of Health for Scotland issued a circular setting out the form (D.H.S. N.M. & C. Circ. 60/1938, Appendix). The card is used for the recording of defects found at routine medical inspections and is so designed that it allows extraction of material for statistical purposes. It is not clear whether the form was laid down to enable proper clinical recording to be made, or to allow easy extraction of material for

statistical purposes. The card as a record of health appraisal allows for the recording of defects only, and this within the detail allowed by 16 broad groups, some with sub-divisions. There is no space for the recording of a general health appraisal or of any deviation from normal which might be important when the child is examined later by another doctor and yet not definite enough to be given a precise diagnosis. Some areas use an additional "special defects card" to enter details of any serious defect and in particular a defect which is one of the statutory handicaps for which special educational treatment is required (Statutory Instrument 1954:1239). Some areas such as the County of Lanark, in which the present study was carried out, use special cards only for use by specialist clinics such as eye, ear, nose and throat and skin. The use of those cards by several areas suggests that the present routine medical card is not accepted as being suitable for clinical recording of deviations from normal health and that its main use probably lies in the provision of the statistical material. The Department asks for annual statistics from the areas in a form which mirrors the contents of the routine medical card (D.H.S. Circ. 71/1959). This close relationship between the statistics asked for and the form of routine medical card controls the latter in a rigid and set form. It is believed that the form of clinical recording should not be restricted by any need for statistical analysis and that the form should have one aim only and that to allow and encourage full clinical reporting.

The form of the medical record card used in the present study has already been described (page 16) and was planned to allow full clinical reporting uninhibited by any need for statistical analysis. The medical report card was prepared for use in this restricted study of some 500 odd children and is not intended to be a model for national use. The medical reports of the study medical examiners contained much more detail than was contained in the school health service routine medical cards but since the two sets of records were completed by different doctors this has little validity in relation to the superiority of one form of record over the other. It seemed possible to the author that a form of routine medical card could be prepared which would allow much greater freedom of recording to the examining school medical officer than the routine card at present in use and which would incorporate some statistical method of recording which would not interfere at all with the clinical recording. A card was prepared and the co-operation of the Senior School Medical Officer of the City of Edinburgh, Dr Boog Watson, was obtained for a field trial. Dr Boog Watson arranged for fifty of the cards to be distributed among four school medical officers with a request that the cards should be completed for each child found at the routine medical inspection to have a defect. The medical officer conducted his medical inspection, completed his routine medical card and, in this particular city, a special defects card in the usual way and then completed the special trial card.

The medical officers who took part in the exercise agreed that the simpler form of the special trial card allowed greater freedom of clinical reporting than the more stylised form of the routine medical card.

An examination of the contents of the completed cards confirmed this view.

There are set out below the three records, prepared by one of the doctors following his examination of a boy at routine medical inspection. The first record is that entered on the special trial card, the second is that entered on the school medical card at present in use, and the third is that entered on the "follow up card" which, in this area, is used to allow fuller reporting of defects entered in the school medical card.

SPECIAL TRIAL CARD

FINDINGS AT ROUTINE AND OTHER MEDICAL EXAMINATIONS (TO INCLUDE ASSESSMENT OF GENERAL CONDITION, NUTRITION AND MATURITY)

17.2.60 Appendicectomy and lung abscess at 5 years. Off school for almost 7 months. Later pelvic abscess and peritonitis at 7 years. Since then health has been good.

Nutrition defective: small and physique rather poor. Immature emotionally and physically.

Vision defective (R/36 6/9

L/36 6/12)

Tonsils small, healthy.

Chest movement reduced at left base and empyema scar.

B.S. vesicular except over empyema scar where there is no air entry.

Heart sounds regular and closed.

Intelligence, 12 years, I.Q.96.

Diagnosis

Defective vision

Poor physique

Under weight

Immaturity

Area of fibrosis and scar

tissue over old lung

abscess scar at left lung

base.

ROUTINE MEDICAL CARD

17.2.60

1. CLOTHING UNSATISFACTORY .....

2. FOOTWEAR UNSATISFACTORY .....

3. CLEANLINESS .....

4. SKIN: HEAD .....

BODY .....

5. NUTRITIONAL STATE

SLIGHTLY DEFECTIVE .....

BAD .....

6. MOUTH AND TEETH UNHEALTHY ...

7. NASOPHARYNX .....

8. EYES

(a) EXTERNAL .....

(b) VISUAL ACUITY R/36 (6/9)

L/36 (6/12)

9. EARS .....

10. SPEECH .....

11. MENTAL AND NERVOUS CONDITION.

12. CIRCULATORY SYSTEM .....

13. LUNGS

Chronic Bronchitis .....

Suspected Tuberculosis .....

Other Diseases .X Emphyema Scar

14. DEFORMITIES .....

15. INFECTIOUS DISEASE .....

16. OTHER DISEASES OR DEFECTS

X Old chest and abdomen

operation.

FOLLOW-UP CARD  
(SPECIAL DEFECTS CARD)

17.2.60 R/6/9 L/6/12 (R/6/36 L/6/36)

Nutrition defective. Keeps well.

Pelvic appendix with appendix

abscess and peritonitis at 6 years.

Empyema drained at 7 years. Has

kept well since. Throat nil.

Chest clear. Heart sounds regular

and closed.

## Audiometry

Audiometry was used in the study investigation because it is believed to be an essential part of a school health service programme. The purpose is to select from the children those with a hearing defect, slight in intensity, but serious to the education of the child. A child with a slight hearing loss, sitting at the back of the class may not hear the teacher properly, may not be aware that he has defective hearing, and may be regarded by the teacher as lazy, uninterested or even mentally dull. Routine screening by audiometry is not used for nor intended to seek out the children with serious hearing loss. Those children should have been observed by the teacher, known to the mother and discovered by the school medical officer at an ordinary clinical routine medical examination. If those severe cases are discovered for the first time by audiometry then there has been an error of observation or an inaccurate system of health supervision. Since the purpose of the audiometric investigation was to uncover very slight hearing loss it was essential that the audiometers used should be very accurate. The findings of the Scottish Audiometer Calibration Service of the Western Regional Hospital Board Regional Physics Laboratory (Lenihan (1959)) showed that many hospital audiometers examined for the first time were very inaccurate. The two pure-tone audiometers given by the school health service for use in the study and which had been used routinely for the examination of school children had not been tested for some time

and the Director of the Regional Physics Laboratory agreed to check them. One audiometer had to be discarded because of inaccuracy. The audiometric investigation of the children in the study group revealed 10 boys and 14 girls with Grade 1 deafness and three boys and six girls with Grade 2(a) deafness who had not been discovered by the study medical examiners and had not been recorded by the school health service. Those 33 children would have been missed if the audiometric investigation of hearing had not been carried out. The audiometricians also found seven boys and nine girls with Grade 1 deafness and seven boys and seven girls with Grade 2 deafness, all of whom had been found by the study medical examiners to have some organic defect of the ear. The finding at school medical inspection of an organic defect of the ear seems therefore to be an indication for audiometric investigation of hearing.

The findings of the study demonstrate the importance of audiometry as a routine procedure for the detection of hearing defects in school children and that minor degrees of deafness are likely to be missed where reliance is placed on clinical examination alone.

Most areas in Scotland carrying out a sweep audiometry in school children do so at age eight or nine years and more recently at five years in some areas following the issue of a Department of Health Circular on ascertainment of deafness in young children (D.H.S. Circ. 6/1960). The findings of the survey suggest the advisability of extending arrangements for audiometry to cover the senior age groups. It would probably be of greatest advantage if this screening of senior children was conducted

just before the 13 year old routine medical inspection. This will allow some time for the special treatment of any educational handicap which might have resulted from deafness.

### Colour Vision Examination

The routine examination of colour vision was incorporated in the study to test its use in the circumstances of routine examination. The advantage of colour vision testing is accepted. Any boy with defect of this nature should be known, not only to his teacher but also to those responsible for planning his training for future employment. The problem is not the question of the need for routine colour vision testing of boys but how and when the tests should be incorporated in a school health programme.

The findings of the study were that 3.3. per cent of the 276 boys had some defect. This figure is probably too low. The Ishihara test for colour vision defect is given to boys in the third (13 years) and fourth (16 years) age groups attending schools in Dundee. The medical officer reports that 5.85 per cent of the boys were found to have a defect (Weir (1958)<sup>c</sup>). It is believed that the study findings were probably inaccurate. One major factor operating was the lack of sufficient training of the health visitors in the Ishihara method. There appears to be a need for the investigation of this and other methods so that a reliable form of test could be recommended to the school health service for use as a screening method to be applied possibly by nurses or teachers and which would select out all defects with a minimum of normals. The cases selected out could then be referred for fuller investigation.

## Examination of Urine

The inclusion of a urine test on every child examined at routine medical inspection in school would be a formidable undertaking having in mind the numbers of inspections carried out in a school year. It would only be possible to advise routine testing under present arrangements where there is good evidence that such a procedure would reveal conditions which could not be screened out in the school child community in some other less time-consuming way. The situation is quite different when a child is examined as a special case.

The findings of this study, 5.3 per cent of the study group of children, suggest that the presence of albumin in the urine of the school child population is not uncommon. Few of the children in the study group required further investigation because of the albumin and in those cases where there appeared to be concern over the seriousness of the defect, the children had other conditions which should have selected them out for special medical investigation. On the basis of these findings there is insufficient evidence from the study to recommend the inclusion of routine urine examination in the present form of routine medical inspections of school children and further study of this problem is required. It may however be advisable to conduct the test on any child found at routine medical inspection to be in poor health.

## Blood Pressure Estimation

Routine blood pressure estimation is not carried out by the school health service. Five children were reported by the study examiners to

have high blood pressure requiring further investigation. Three would probably have been selected out in any case because of suspicious history (blurred vision) or clinical findings (abnormal heart sounds, obesity). One case with albuminuria and referred to the family doctor was reported later by him to be fit. The remaining case with high blood pressure only had a systolic/diastolic level of  $\frac{125}{85}$ . This recording and those of the other four cases ( $\frac{160}{80}$ ,  $\frac{140}{80}$ ,  $\frac{130}{90}$ ,  $\frac{150}{90}$ ) would not necessarily have been selected out from the total recordings on blood pressure alone, since higher levels were reported in several children in whom high blood pressure was not diagnosed.

Blood Pressure Recordings

Total recordings 514: Boys 247: Girls 267

(1) SYSTOLIC

Mean: Boys 124.1: Girls 122.9

| mm/Hg | 90- | 100- | 110- | 120- | 130- | 140- | 150- | 160- | 170- | 180- | 190- | Total |
|-------|-----|------|------|------|------|------|------|------|------|------|------|-------|
| BOYS  | 7   | 28   | 63   | 85   | 40   | 11   | 4    | 6    | -    | 1    | 2    | 247   |
| GIRLS | 7   | 34   | 30   | 85   | 38   | 11   | 4    | 3    | 3    | -    | 2    | 267   |

(2) DIASTOLIC

Mean: Boys 76.5: Girls 77.1

| mm/Hg | 40- | 50- | 60- | 70- | 80- | 90- | 100- | 110- | 120- | Total |
|-------|-----|-----|-----|-----|-----|-----|------|------|------|-------|
| BOYS  | -   | 11  | 44  | 116 | 58  | 11  | 6    | 1    | -    | 247   |
| GIRLS | 1   | 9   | 45  | 123 | 71  | 9   | 6    | 1    | 2    | 267   |

The study gave insufficient evidence to justify a recommendation that blood pressure estimation should be incorporated in the routine medical inspection as a routine procedure for screening purposes. Further investigation of this aspect is required.

## CURRENT PRACTICE OUTSIDE SCOTLAND

### England and Wales

Most authorities conduct schemes of examination based, as in Scotland, on the routine medical inspection carried out three times in the school life of the child who leaves school at 15 years. There are the same difficulties of time, of place, of history and lack of continuity and there is no reason to believe that the standard schemes of examination are any more or any less accurate than those in Scotland. All authorities, as in Scotland, have the permission of the central authority (Statutory Instrument 1953/1156) to experiment with less than three routine medical inspections. Several authorities in England and Wales have conducted experiments. The Chief Medical Officer of the Ministry of Education said in his 1960 report that experiments had been conducted in several county boroughs and counties and mentioned particularly Bournemouth, Gloucester, Smethwick, Hampshire, Buckinghamshire, Devon, Essex, Staffordshire, Wiltshire, Yorkshire, Somerset and Radnorshire. Experimental schemes have been planned for Cambridge, Eastbourne and Warwickshire. The basis of most of the schemes is the dropping of the intermediate (nine year old) routine inspection and replacing it by frequent visits by medical officers and school nurses to schools at least once each term where children are presented for examination by teacher, headmaster, nurse or parent. The children may be presented because of lack of progress in education in school work, frequent absences from school, failure to pass screening

tests or the appearance of ill-health. One or two areas are experimenting with the use of questionnaires to parents. Others arrange for all medical certificates received by teachers from family doctors to be passed on to the school health service.

### Europe

The schemes in Europe and America appear to have the routine medical inspection as the basis of health examination but it is difficult to assess the value of those schemes since reports provide information on general policy but little on the quality of the work performed. Annual routine examinations are conducted in France, Spain, Italy and Yugoslavia but it is not clear whether all children receive these annual examinations or the clinical level of each examination. Holland, Belgium, Switzerland, Norway, Austria and Eire have routine examinations three times in the school life of the child (Graham (1957)).

A report on the situation in France made by one British observer (Graham (1957)) said that routine examination is annual, with a possibility of two examinations yearly for high school pupils and three for apprentices in technical schools. The speed of examination was about 12 children per hour; there was little mention of special examinations. The observer reported that the responsibility of the teacher did not seem to go further than the imparting of knowledge to the class and that the health visitor is relied upon to find out what physical, mental and social handicaps or disturbances may be retarding

the child's progress or affecting his behaviour. The school health work was considered to be unattractive to the doctor because of its monotony due particularly to the very rapid annual examination of large numbers of children.

Another British observer (Sinclair (1959)) reported on the school health service of Holland, Belgium, Denmark and Sweden. Arrangements in Holland are not quite comparable since medical examination of school children is not compulsory and school health supervision is extended in the main only to infant and elementary schools. School children in Belgium are reported to be medically examined each year between the ages of six and 16 years. The school doctors used for the purpose are either general medical practitioners or, in the larger towns, full-time school physicians. Children are examined at health centres. The employment of part-time general medical practitioners is not regarded as satisfactory because examination of the children is often perfunctory. The observer reported that in Denmark children are examined as soon as possible after entry to school and each year thereafter until they leave school. The examination is compulsory unless a medical certificate is produced indicating that the child has already had an equivalent form of examination. Sight and hearing tests and urine analysis are carried out each year. The school nurse maintains close liaison with the home and with the teacher. School doctors work part-time in the school health service and each doctor is responsible for the supervision of not more than 2,500 children. No school doctor is

appointed without special experience of children's diseases. A Swedish school medical inspection session is carried out in alternate years from school entry at seven to school leaving age which may be 19 years. The observer reports on one school medical inspection session seen by him. The inspection was done in very well equipped and modern accommodation, conducted on the usual lines but was done without haste and there was ample time to examine each child properly. A urine examination was made on each child. A school nurse was in attendance. The school doctor in the instance observed was a paediatrician with a private practice and consulting rooms in the city. He undertook the school health care of approximately 1,500 school children. No doctor is permitted to have more than that number under his supervision. The observer reported that the Swedish idea that a school doctor should also be a practising physician in the therapeutic field seems to have much to commend it and the school doctor seems to be more intellectually satisfied with his dual role. He felt that the Swedish system of using paediatricians in private practice as part-time school physicians resulted in high standards of school medical care.

#### U.S.A.

Wilson (1952) reported that the routine medical inspection is recommended practice and is conducted twice in the elementary and twice in the secondary grades. Emphasis is placed on screening procedures for vision and hearing but these are generally performed by teachers who also

do the weighing and measuring. Generally speaking the teacher seems to occupy a more important role in health appraisal than she does in the United Kingdom. Wilson doubted if the contributions possible from teachers, parents, private practitioners and voluntary agencies were being fully utilised. Sharp (1959), reporting on the changing role of the school physician in America, thought that health examination should be more thorough and less frequent and should be performed by the family physician: that a nurse-sponsored follow-up was necessary: and that teacher-nurse conferences should seek out those children who need special attention. He felt that those recommendations had been gradually accepted in most areas. Nemir (1959) in a comprehensive report on the school health programme in America conveyed the impression of lack of a common pattern of practice throughout the country. She saw the objective of a school health examination to be, in order of importance, an educational experience to the child, a positive appraisal of health status (physical and emotional), the detection of defects and of communicable diseases, the adjustments of the physical education programme and the use of the findings as a basis for individual counselling and for instruction in health education classes. Several avenues may be used in the planning of health examinations, for example, all children may be seen by private physicians in their offices. The writer thought that this allowed a more thorough health appraisal and that one or both parents would usually be present. Also with the private physician probably being the family physician and familiar with the medical history, follow-up can be immediate and direct. The atmosphere of

a physician's office supplied a more educational and medical environment than can be offered with a similar experience at school. The disadvantages appear to be that not all children attended either because their parents have no money to pay for the examination or they have no physician or are indifferent. Another plan is where all children are examined at school. The school district pays an agreed fee: the advantages are that all children are examined and that all of the objectives of the health examinations can be applied to each child. The author felt, however, that the school examination is not a substitute for that carried out in a private physician's office. Nevertheless it can be more than a screening procedure with the teacher occupying an important position, either by her attendance at the examination or by physician-teacher conferences later. Generally speaking it is recommended that each pupil should be given at least four examinations during his school years: no rigid amount of time appears to be specified for routine examinations but "complaints that school examiners see too many students in one hour are valid. A few minutes devoted to each child will not be sufficient for a satisfactory appraisal." It appears to be the policy that school medical examiners conducting those routine examinations should note common defects and questionable conditions, and must refer such cases to the private physician for more detailed diagnosis. While the opinion is given that "the examination at schools should be conducted quietly and leisurely in an atmosphere of seriousness and dignity", it appears that many older buildings have no facilities for medical consultations and that use is made of basement rooms, staff rooms and dressing rooms.

The variety of systems of school medical examination which appeared to exist in the United States makes it difficult to compare their methods with the more standardised forms used throughout the United Kingdom. Nevertheless there appeared to be the common problem of sufficient time, suitable accommodation, presence of parents, use of teacher's knowledge and continuity of health supervision.

## CONCLUSIONS

The system of school medical examination operating in the study area is inaccurate.

The inaccuracy is serious because the school health service had no records of 62 per cent of the defects found in a group of children about to leave school.

The inaccuracy arises in part from the restrictive circumstances under which the school medical inspection is conducted.

The findings in the study area are important because the system of school medical examination operating in the study area is common throughout Scotland.

The true role of the routine medical inspection should be decided. If its purpose is diagnostic in character then it must be elevated to a clinical level at which precise diagnosis is possible. Similarly, if its purpose is the screening out of children with defects from the school child community for fuller investigation at a later date, then it must be planned as a screening procedure. In its present form it meets neither of those requirements.

## SUMMARY

The present system of school health administration places most emphasis on health supervision: the present basis of health supervision is the routine medical inspection.

The routine medical inspection is used primarily for the detection of defects and its efficiency in this role requires assessment.

The effectiveness of the inspection has frequently been criticised but there is little factual evidence from within the school health service that the inspection is seriously inaccurate. The purpose of the present study is to demonstrate this inaccuracy. A further purpose is to demonstrate the presence of certain restricting factors in the circumstances of the inspection which may be in part responsible for the inaccuracy.

The parents of 580 children about to leave school were invited to submit their children for special medical examination under school health service arrangements. 562 children attended and were examined.

The examinations were conducted in circumstances which were the best the school health service could provide. Ample time was given, satisfactory accommodation provided, special efforts made to obtain attendance of parents and full use made of all special diagnostic and screening techniques, including the use of questionnaires, which could be made available by the service. Physicians of consultant status carried out examinations. The examinations revealed 497 defects in the 562 children.

The findings were compared with the contents of the school health service medical records of the children. 189 of the defects found at the special medical examination had been recorded by the school health service but 13 of these had been recorded under a different diagnosis. The service had no record of 308 of the defects found at the special medical examination.

The findings demonstrate the importance of close co-operation with parent and teacher, and the importance of the screening techniques of audiometry and colour vision testing. The study suggests the inadequacy of time and of medical examination rooms as possible causes of inaccurate inspection, and the unsatisfactory form of medical record card at present in use as a cause of inadequate recording. The findings lead to the recommendation that further study is required of the value of urine testing and blood pressure estimation as screening procedures for routine use by the service.

The true role of the routine medical inspection should be decided. If its purpose is the discovery of defects then it should be planned either as a diagnostic exercise or a screening procedure. In its present form, it is neither of these.

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