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# THE NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY

Founded in 1921 for the Application of Psychology and  
Physiology to Industry and Commerce



## A Vocational Guidance Research in Fife

By F. M. EARLE, M.ED., D.SC.

AND

J. KILGOUR, M.A., B.ED.

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# Studies in Vocational Guidance

## V. A Vocational Guidance Research in Fife

BY F. M. EARLE, M.ED., D.SC., AND J. KILGOUR, M.A., B.ED.

A...A Comparison of Urban and Rural Vocational Conditions

B...The Age at which Vocational Guidance Studies should begin

C...Minimal Standards of Ability and Temperament for Various  
Occupations

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## PREFACE

**I**N this Report the reader will find a systematic account of the results, and the conclusions derived from them, of the Vocational Guidance experiment conducted during the years 1928-32 by the National Institute of Industrial Psychology in the County of Fife, Scotland. This investigation was planned to compare the conditions affecting the vocational guidance of a rural and an urban area, and to throw light upon the constancy of the measures given by psychological and other tests, when applied to the same individual at different ages, as well as to examine further the value of the Institute's general procedure in vocational guidance.

As might be expected, difficulties arose which it was not easy to overcome. It would be indeed remarkable if, in an investigation such as this, every contingency could have been foreseen and provided for. The larger the scope of a psychological experiment, it is safe to say, the less is it possible to control all the factors in the situation. Invariably, some have to be taken as they are found ; and any necessary allowances must be made *after*, instead of before, the event. So, in this case. The selection of schools in town and country was made with great care after consultation with officials and headmasters. But the choice depended mainly upon the occupations of the district (urban or rural), and the 'suitability' of the children attending the schools chosen had to be left to take care of itself. For it would have been impossible to undertake the measurement of the abilities of children in a number of different schools in order to select those which would give the most homogeneous or most directly comparable groups. That would have been a considerable investigation in itself. Consequently, we had instead to study the abilities of the separate school groups from the data yielded by the experiment and to determine *from these results* to what extent it is permissible to condense and summarize our analyses. And some of the results which have emerged have made it necessary to present our conclusions in rather more detail than would otherwise have been necessary. Further, the follow-up data suffer from the fact that employment conditions for juveniles have been very difficult in the abnormal times through which the country has been passing. Disturbing effects of this kind can seldom be foreseen ; their influence must therefore be estimated in the best way possible.

Yet, in spite of these and similar difficulties, much valuable information has been gained. The analyses set out in Chapters II, III, and IV



should be of great help to all who are attempting to use psychological methods in vocational guidance. The results are not always what we had expected them to be ; indeed, our experience has been that impressions formed during the work of examination were often the creation of prejudices having for their justification only the casual observations of the moment rather than the logic of science and mathematics. Accordingly, an appeal to the latter, as in this Report, seems all the more necessary.

At the same time, mathematical comparisons may be pushed too far. This is particularly true in the present instance of our follow-up data. If we omit those children who are still at school, those who have left the district, those who have never been employed, and those who have only found employment within the last year or so, it is apparent that the remainder do not constitute a sufficiently promising group for *numerical* comparisons of posts taken and relinquished, classified according to their agreement with the advice given. The effect of the disturbing influences must have been so great in relation to the number of cases under examination that it would be unwise to attach undue significance to mere numerical comparisons. In this connection it is necessary to remember the number of cases (*cf.* p. 21) in which the length of time spent in employment is less than two years ; so that even if work has been found which agrees with the advice given, the time required to prove its suitability is not very long.

With these facts in mind we have tried to present our conclusions in a way most useful to the vocational investigator and teacher. We have not sought primarily to demonstrate once again how valuable a psychological examination is in vocational guidance, although we do consider it (p. 49). As a *main* aim of investigation, this has received sufficient attention in the Institute's previous inquiries. Moreover, the general principle that a fuller examination of the individual contributes to better vocational guidance is now generally accepted.<sup>1</sup> In the present investigation it has seemed more desirable to show how the *detailed* procedure of examination is related to the advising of the individual boy or girl and to his or her success at his work. We have attempted to do this by grouping together the facts regarding boys and girls recommended for similar kinds of work, and by studying the

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<sup>1</sup> *Occupations, The Vocational Guidance Magazine*, Symposium Number, April 1934.



relation between these facts and the occupational success achieved. Such studies lead us to suggest certain ' minimum ' standards of performance for different classes of work which should be useful in the practical work of vocational guidance.<sup>1</sup> Moreover, these studies incidentally reveal the validity of the procedure adopted in arriving at the recommendations, for they enable one to see quite clearly that there is often a direct relation between the psychological make-up of the individual and his occupational choice (Chapter IV).

Other questions of equal interest have also arisen and we have attempted to answer them. Perhaps the most important from the research point of view is the problem of the age at which vocational guidance can be satisfactorily begun. As has been already said, this experiment was planned with this problem in mind ; and although the number of children who were several times examined was eventually fewer than was anticipated, some useful information has been obtained (see Chapter III).

Then, too, the vocational problems of a rural community in contrast with those of a town present an interesting field of study. It was indeed during our study of the differences between town and country children that the necessity for separate group studies became apparent. Accordingly, after describing the procedure of examination (Chapter I), we begin the analysis of our data with the study of this problem (Chapter II) in which incidentally some important points of general application are made clear. After that, the consideration of the validity of the psychological examinations and of the procedure of advising (Chapters III and IV) will be more easily understood.

*January, 1935.*

<sup>1</sup> Pp. 51 *et seq.*



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## I. THE EXPERIMENT DESCRIBED

### (1) *First Plans for the Experiment.*

**T**HIS Fife experiment is in some aspects a continuation of the investigations carried out in London by the National Institute of Industrial Psychology between the years 1925 and 1929. In other important respects, however, it breaks new ground, although many of the methods and procedures were those of the former experiment with such modifications as our increased experience suggested.<sup>1</sup>

The experiment was first suggested, to the Trustees of the Carnegie Dunfermline Trust, in 1926, by the Rev. W. A. Hutchison, a Life Member of the Trust, who was then Chairman of the Fife Education Authority. The Trustees at once approached Mr. Gregor MacGregor, Director of Education for Fife, who was asked to give his views as to the lines upon which he thought such an experiment, if advisable, might be carried out, and the Fife Education Authority for their agreement in principle to the conduct of the experiment. At that time it was thought that the Fife Education Authority<sup>2</sup> might also be able to assist, either by direct grants of money or by making available the services of some of their staff; but it was discovered later that the Education Acts did not permit such help to be given. When this became known, the responsibility for promoting the investigation fell directly upon the National Institute of Industrial Psychology, whose co-operation Mr. MacGregor had in the meantime invited.

The Institute, from the very first, had promised all the expert assistance it could possibly give; but its financial resources were not large, and accordingly much depended upon the extent to which local help could be secured. During these preliminary discussions the inclusion of rural areas was considered. The problems of choosing a career were probably as difficult, if not more difficult, to solve wisely in a country district than in a town. But as the Carnegie Dunfermline Trust could only help researches within the Borough of Dunfermline itself, it seemed as though the wider investigation would have to be abandoned.

At this point, early in 1928, the Council of the National Institute of Industrial Psychology decided that it could undertake financial responsibility for some part of the inquiry and agreed to set aside from

<sup>1</sup> *Methods of Choosing a Career*, by F. M. Earle and others. (London: Harrap, 1931.)

<sup>2</sup> Now the Education Committee of the Fife County Council.



its Rockefeller grant a sufficient sum to pay for an investigation in a rural area. This was estimated to amount approximately to one-third of the total cost of the investigation proposed, in which were to be included the Borough of Dunfermline (representing the urban problem) and three villages in the eastern part of Fife (representing the agricultural area). A scheme of inquiry on these lines was then prepared in detail. The Carnegie Dunfermline Trust agreed to support it, and arrangements were immediately made for starting the investigation after the summer vacation of 1928.

### (2) *General Scheme of Inquiry.*

It was planned to examine by suitable psychological methods a selected number of pupils and to repeat this examination, in whole or in part, at intervals, so long as these pupils remained at school. Then, at the time of leaving, it was intended to give advice to each one, based upon the data that had been accumulated, and, after the pupil had left school, to follow up his (or her) occupational career for as long a period as possible.

The first examination was to take place in most cases between the age of eleven and twelve, so that where the school life was prolonged beyond fourteen there would be two, or even three, opportunities for re-examination. This part of the inquiry was considered to be very important, as it was thought that a comparison between the performances of children at various stages of growth might be extremely helpful from the research point of view. In the same way a comparison between the performances of rural children and town children under similar examination conditions was expected to yield valuable results. But while the research aspects of this inquiry were kept prominently before us, the child's need for sound advice was not lost sight of. The Institute's usual methods, which included, of course, due attention to the results of the school medical examination, were to be followed in this part of the work, and any recommendations that might be made were to take account of local conditions of employment.

After the pupil had left school, arrangements were to be made for keeping in touch with him (or her), in the hope that by this means further evidence of the value of vocational advising would be obtained.



### (3) *General Course of the Experiment in the Schools.*

In Dunfermline there were three schools, which will be called X, Y and Z, very suitable for our purpose. They contained about three hundred and sixty children of the age of eleven and over. Three similar schools in the villages, A, B and C, contained about one hundred and twenty children of the same age. After visiting various other schools it was decided to confine the investigation to these six schools and to all the children attending them who had passed their eleventh birthday. The groups eventually examined were, however, those formed by the school's classification according to attainment, and consequently a few superior ten-year children had to be included.

The choice of these schools was determined partly by the nature of the occupations available in the district and partly by the suitability of the schools for purposes of a psychological investigation. The parents of the children in Dunfermline were mainly employed in linen-weaving, mining, engineering, building and general trades. In one of the Dunfermline schools (Z), the parents of a considerable proportion of the children belonged to the business and professional classes ; and these, it was expected, would remain longer at school than those attending the X and Y schools. In the three villages the parents of a great majority of the pupils were engaged in farm work, but at B and C employment was also found in linen mills. The Z school was included partly because we did not want to lose all the children at the age of fourteen. A sufficiently large group was needed, representative of those who would continue their education to sixteen or seventeen, and only thus could it be obtained. But, as appears later, the inclusion of this school made it necessary to study the data from each school separately, for any superiority of the town group over the country group disclosed by group comparisons might have been due solely to the pupils of this one school. Further discussion of this must, however, be deferred to a later stage of this Report (p. 26).

The work was begun in August 1928 by two full-time investigators of the Institute, who by June 1929 had examined 472 children, 245 boys and 227 girls. During this session 86 children left school and were advised as to choice of occupation. Both of the investigators were of Scottish parentage and education—a point of some importance



in the work of individual examination. One of them belonged to the county of Fife and knew the Dunfermline district intimately.

In the second year one of the investigators was withdrawn. The other was now wholly occupied in re-examining the older half of the remaining children, 180 in number, and in advising those about to leave. In order to maintain some record of the progress of the younger group, whose turn to be examined in detail would not come until the third year of the investigation, all the tests that could be given in group form were given to them at the same time as they were given to the older children. During this session 95 children were advised.

The third year of the investigation (September 1930 to June 1931) was devoted mainly to the individual re-examination of the younger half of the original group. In addition, however, so as to extend the available data, an effort was made to re-test as many as possible of the older half. Accordingly, by the end of this year's work, all the children still at school had been tested twice, while a fair number had been examined in detail three times. The total number advised up to the end of this session was 299, which meant that nearly two-thirds of the original group had now reached school-leaving age.

This, of course, had been expected, and from the summer of 1931 the investigation ceased to be a full-time one. The latter part of that year was spent in re-examining all the children still at school, 152 in all, who were now almost entirely attending secondary and post-primary schools. From that time the investigation continued on a part-time basis only.

The success of the work in these schools owed much to the headmasters and teachers for their ready help. Arrangements had first to be made with them for the provision of the necessary accommodation (i) for about six hours, suitably spaced, during which the group tests would be given to all the pupils of the school who were to be included in the experiment, and (ii) for the much longer period required for examining each pupil individually. This was done in whatever way best fitted in with the school organization. We were always able to give the group tests in a suitable class-room, while the individual examinations took place either in a staff room, storeroom, small laboratory or medical inspection room. A satisfactory degree of privacy and freedom from interruption was thus obtained. As far as possible, the group tests were given first, so that some at least of the results would always be available at the time of the individual examination and interview.



#### 4. Tests used

The following is the list of the tests used at the first examination of each pupil. Most of them were used again at the second examination; in certain cases it was found necessary to add more difficult items.

##### *Group Tests*

- A. Group Test of Intelligence (Series 34).<sup>1</sup>
- B. Group Tests for Recognition of Form Relations and Memory of Designs.<sup>2</sup>
- C. Memory :
  - (i) Visual (faces).<sup>3</sup>
  - (ii) Verbal (names).<sup>3</sup>
  - (iii) Oral instructions.<sup>4</sup>
- D. Pursuit.<sup>3</sup>
- E. Tracing.<sup>3</sup>
- F. English Attainments (Burt's Northumberland 1925 Series).
- G. Arithmetic Attainments (Burt's Northumberland 1925 Series).

##### *Individual Tests*

- A. Performance Tests of Intelligence.<sup>5</sup>
  - (i) Picture-completion Test II (Healy).
  - (ii) Cube-construction Test.
  - (iii) Cube-imitation Test (Knox).
  - (iv) Substitution Test (Woodworth and Wells).
  - (v) Maze Test (Porteous).

<sup>1</sup> *Methods of Choosing a Career*, p. 299.

<sup>2</sup> *Ibid.*, p. 317.

<sup>3</sup> These short tests had not been used in the London experiment. The Pursuit Test consists in following, *by eye*, a series of lines through a complicated criss-cross of other lines. The starting-point of each line is located by a number (or letter). The examinee is required to write the same numbers (or letters) at the correct terminal points. The score is the number of lines correctly located.

The Tracing Test consists in tracing, by pencil line, a zigzag path through a series of narrow openings in a set of straight lines. The line traced should not touch the margins of the openings, and should be continuous. The score is the number of openings traversed in a given time.

<sup>4</sup> *Methods of Choosing a Career*, p. 310.

<sup>5</sup> These tests are described in *The Use of Performance Tests in Vocational Guidance*, Report No. 53 of the Industrial Health Research Board.



- B. Quality of Handwriting.<sup>1</sup>
  - Speed of Handwriting.<sup>1</sup>
  - Drawing.<sup>2</sup>
- C. Mechanical Ability Test.<sup>3</sup>
  - Pegboard.<sup>4</sup>
  - Nuts and Bolts Assembling.<sup>4</sup>
  - Disc-placing.<sup>4</sup>
  - Screw-twisting.<sup>4</sup>
  - Aiming.<sup>4</sup>
  - Parallel Lines.<sup>4</sup>
  - Tapping.<sup>4</sup>
  - Bead-threading.<sup>4</sup>
  - Wool-knotting.<sup>4</sup>

It seems unnecessary to explain in detail why these particular tests were used. The reader may be referred to the account of the London experiment (*op. cit.*) for the principles upon which vocational advice should be based. The inclusion of tests of various kinds, abstract and practical, mental and manual, was in accordance with the Institute's general principles of procedure. Some of the tests were included, however, not so much because of their contribution to the general body of information used in vocationally guiding the boys and girls of this experiment, but rather in order to provide further opportunities of studying their reliability and validity. Others, again, were chosen because they fitted easily into the scheme of examination. It should be mentioned that one of our aims was definitely to secure a shorter examination. We did not think that we could depend entirely on tests that could be given in group form, but we introduced a larger proportion of group tests than in the London experiment. By arranging the test programme in such a way that children could be examined two at a time, a further reduction in the total time required was obtained ; this arrangement is described in the next paragraph.

<sup>1</sup> See Burt, *Mental and Scholastic Tests*, p. 308.

<sup>2</sup> *Ibid.*, p. 317.

<sup>3</sup> See *Tests of Mechanical Ability*, N.I.I.P. Report No. 3.

<sup>4</sup> See *The Measurement of Manual Dexterities*, N.I.I.P. Report No. 4.



### 5. *Plan of Testing and Duration of the Examination*

The individual tests were specially selected and grouped so that it was possible for two children to be tested at the same time by one examiner. The arrangement was as follows and it worked out very well.

*First Session.* One of the pupils performed the picture-completion test in a distant part of the room with his or her back to the examiner's table. The other pupil sat by the examiner and performed the cube-construction and cube-imitation tests under direct observation. After the tests had been scored and reset, the children changed places. When this stage was completed, the substitution, drawing, writing and maze tests (or as many of these as could be completed during the 45-minute school period which was usually taken for this group of tests) were given to both children together. With slower children, several of the tests were necessarily held over until a later day.

*Second Session.* On another day one pupil worked alone at the mechanical ability test, while the other was taking the pegboard, nuts and bolts, disc-placing and screw-twisting tests. After the completed tests had been scored and reset, the children changed over as before. In the next stage both children together did the aiming, parallel lines, tapping, bead-threading and wool-knotting tests. This group of tests was usually completed during two school periods (*i.e.* in from 80 to 90 minutes). But again, if one of the children worked slowly, it was necessary to keep back one or more of the tests to the third session.

*Third Session.* The concluding part of the examination was the Stanford revision of the Binet-Simon scale of intelligence tests as adapted for use in London. There was, of course, no possibility here of examining more than one pupil at a time. During this part of the examination, opportunity was taken to complete notes of the observations made upon temperament, character and behaviour in so far as they had revealed themselves during the various stages of the examination. Incidentally, also, the examiner would discuss with the boy or girl his or her interests, hobbies, strong and weak school subjects, likes and dislikes, and occupational ambitions. The time required for this part of the examination varied considerably from child to child, but was seldom less than one hour.

During these intensive examinations by the investigator, the



headmaster and his staff were also occupied in preparing reports on the children from three aspects : (i) out-of-school environment and interests, so far as these were known, (ii) temperamental traits, and (iii) attainments in the various school subjects. These particulars were entered upon the special forms provided (see pp. 15-18), and were used by the investigator when making a recommendation as to choice of employment.

The time spent in the individual examination was made up of (i)  $2-2\frac{1}{4}$  hours, during which two pupils were examined together, and (ii) one hour devoted to the Stanford-Binet examination and the interview of each pupil separately. Thus the whole of the individual sections of the examination occupied not less than two hours per pupil, and in the case of the slower ones probably half an hour more. To this must be added the amount of time per pupil spent upon the giving of the group tests and their correction. It is not easy to give an over-all estimate of the time spent on these, but, for the first year, half an hour per pupil may be taken as the average.

In the following years some children left school to start work, and the remainder were now distributed over a larger number of schools, since, after qualifying, they were transferred to secondary and other post-primary schools.<sup>1</sup> The unqualified pupils remained in the primary schools. Towards the end of the experiment, therefore, the numbers to be examined fell in some schools to 12 or 10. Accordingly, it is estimated that the time spent per pupil on each complete examination varied from approximately  $2\frac{1}{2}$  hours with large groups, to three hours with smaller groups. To this must be added the time required for each re-examination which, as already mentioned, was included in order to obtain information regarding the growth of the abilities measured by various tests, and also the extra time required to complete the examination of the slower pupils. So, for the guidance of those who wish to know what expenditure of time by the school pupil such a psychological examination entailed, even when group tests could be used, we feel obliged to say that  $2\frac{1}{2}$  hours represents a bare minimum. The examination of a single individual by the same procedure would, of course, take much longer—eight or nine hours at least. It should also be

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<sup>1</sup> The qualifying examination marked the termination of the primary school course. Further reference to this will be found on p. 24.



# National Institute of Industrial Psychology.

(Vocational Guidance and Research).

## INTERVIEWER'S REPORT.

(From observations and questions during individual examinations and in Consultation with teachers).

Name .....

Number .....

Dates of Interviews.			
Father's occupation .. ..			
Mother's occupation .. ..			
Other members of family living at home .. .. (age and occupation)			
Home influence on the child's Physique .. .. Mentality .. .. Ideals .. ..			
Notes .. ..			
General appearance Neatness .. .. Cleanliness .. .. Manner .. ..			
Notes .. ..			
Hobbies and recreation Social (clubs, etc.) .. .. Creative .. ..			
Vocational proposals Child's .. .. Parent's .. .. Teacher's .. ..			
Special opportunities .. ..			

Notes

Interviewer :

B



# National Institute of Industrial Psychology.

(Vocational Guidance and Research).

## REPORT ON TEMPERAMENT AND CHARACTER.

Name .....

Number .....

Date of report :

	a	b	c	d	e	
Tender .. ..						SOCIAL ABILITY
Sociable .. ..						
Co-operative .. ..						
Assertive (submissive) ..						EXECUTIVE ABILITY
Shows initiative .. ..						
Ambitious .. ..						
Self-display (modest) ..						
Self-reliant (dependent) ..						
Fearless (timid) .. ..						EFFICIENCY IN PRACTICAL ACTIVITIES
Calm under pressure .. ..						
Attentive to detail .. ..						
Persistent (soon gives up) ..						
Consistent (variable) .. ..						
Emotionally stable (unstable)						
Energetic (lethargic) .. ..						

Ideals :

Conduct :

Report by :



# National Institute of Industrial Psychology.

(Vocational Guidance and Research).

## SCHOOL RECORD.

Name .....

Number .....

Schools attended (*with dates*)

Attendance record

General report (if available)

Date of enquiry ..									
	Teacher	Exams.	Inst.	Teacher	Exams.	Inst.	Teacher	Exams.	Inst.
SOCIAL .. .. (games, friends, etc.)									
LEADERSHIP .. (prefect, etc.)									
READING .. ..									
COMPOSITION ..									
FRENCH .. ..									
GERMAN .. ..									
GRAMMAR .. ..									
LATIN .. ..									
LITERATURE ..									
HISTORY .. ..									
GEOGRAPHY ..									
SCIENCE .. ..									
PHYSICS .. ..									
CHEMISTRY ..									
BIOLOGY .. ..									
ARITHMETIC ..									
ALGEBRA .. ..									
GEOMETRY ..									
MATHEMATICS (Adv.)									
MECHANICS ..									
SPELLING .. ..									
WRITING .. ..									
DRAWING .. ..									
ART .. ..									
MUSIC .. ..									
MANUAL WORK ..									
DRILL—GAMES ..									
SPECIAL INTERESTS									
SPECIAL SKILLS ..									
SUCCESSSES Mental .. ..									
Physical .. ..									

Examiner :



# National Institute of Industrial Psychology.

(Vocational Guidance and Research).

## SPECIAL ABILITIES RECORD.

Name .....

Number .....

Date of enquiry					
Age of child (at date)					
Occupation					
1. SOCIAL ABILITY (sympathy and tact)	Tchr.				
	Inst.	Estimate			
2. EXECUTIVE ABILITY (leadership and tact)	Tchr.				
	Inst.	Estimate			
3. LINGUISTIC ABILITIES (a) Vernacular Prose Poetry (b) Foreign languages Classics Modern	Tchr.				
	Inst.	Records			
		Tests			
	Tchr.				
	Inst.	Records			
		Tests			
4. SCIENTIFIC AND MATHEMATICAL ABILITIES	Tchr.				
	Inst.	Records Tests			
5. MECHANICAL ABILITIES	Tchr.				
	Inst.	Tests			
6. ARTISTIC ABILITIES	Tchr.				
	Inst.	Records Tests			
		Emplr.			
7. PRACTICAL ABILITIES	Inst.	Accuracy			
		Speed			
		Strength			

Examiner :



noted that the time required to study the data in order to recommend an occupation is not included in these estimates.

#### (6) *Recommending Suitable Occupations*

Advice as to choice of occupation was given in a letter sent to the parents during the child's last term at school. This was the only means adopted in rural areas. In Dunfermline, however, with the co-operation of the Juvenile Advisory Committee at the Employment Exchange, by further discussion with the child and parents at the Committee's advisory meetings it was possible to supplement the advice contained in the letter. It should be explained that the children eligible to leave school at any given school-leaving date are always invited to attend, with their parents, at the Employment Exchange, when two or more members of the Juvenile Advisory Committee with its secretary meet to discuss with them the choice of a suitable occupation. Those boys and girls of our experiment who came to the Exchange found that the investigator present was often able to explain in greater detail the reasons underlying the recommendations contained in the letters. Copies of these letters were always sent to the Juvenile Advisory Committee Secretary; and whenever one of these children registered at the Exchange for work, the letter was attached to the School-leaving card. The Committee endeavoured to submit to the employers those boys and girls who, on the basis of the Institute's recommendation, were thought *best* fitted for the kind of work to be done.

In collaboration with the Juvenile Advisory Committee, a circular letter was sent to four hundred employers inviting their help and offering to submit suitable candidates for any vacancy they might have. Owing to the general depression, however, not many employers were in a position to consider recruiting extra staff; and it was discovered that the majority had very long waiting lists. Consequently, this particular procedure affected the placing of the boys and girls very little, if at all.

#### (7) *Follow-up*

The follow-up of the boys and girls after they had begun work was carried out in various ways.

(1) Visits were paid to the homes and personal inquiries were made.



(2) The headmasters and class teachers were frequently able to say where a former pupil had found employment. Sometimes contacts were established through brothers and sisters still at school.

(3) Letters were sent with a request for information to be supplied on an enclosed form.

(4) Where the boy or girl had registered for work at the juvenile section of the Employment Exchange, the Juvenile Advisory Committee sent him or her an invitation to attend one of the "Industrial Supervision" meetings where the children reported their progress and were given any further assistance about employment, evening classes, etc. Close co-operation was also maintained with the Juvenile Advisory Committee in the paying of visits to the home or place of employment of placed boys and girls. Overlapping was avoided, and information about the industrial history of boys and girls was passed on for record purposes.

(5) Information was collected from employers directly by means of letters and personal inquiries.

The general position regarding the follow-up data is sufficiently expressed in the two following tables, showing the conditions at the close of the investigation :

BOYS AND GIRLS WHO HAVE FOUND EMPLOYMENT

—	Boys	Per Cent.	Girls	Per Cent.
Number whose record of employment is known -	159	65	140	62
„ who are (or were) still attending school -	47	19	45	20
„ „ have never been employed -	9	4	13	6
„ „ „ left district or are untraced -	30	12	29	12
Total - -	<u>245</u>		<u>227</u>	

From the above table we see that 4 per cent. of the boys and 6 per cent. of the girls have never been employed since leaving school. About one-fifth remained at school to continue their education, a fact which is only slightly influenced by the difficulty of finding suitable employment at the present time. Secondary pupils do not usually seek employment until they have reached the third year of their course ; if it is not obtained they return for a fourth year.



The possible duration of occupational life of those no longer attending school is shown in the following table :

Schools Session	Number Leaving School	Possible Length of Employment
1928-1929	86	4½ years
1929-1930	95	3½ "
1930-1931	118	2½ "
1931-1932	79	1½ "

From this table it will be seen that not much more than half of them can have been in employment for a longer period than about two years. For this reason the interpretation of the follow-up data presents certain difficulties, since the number of cases in which there has been a clear opportunity to demonstrate suitability (or unsuitability) for particular kinds of work is not very large. It will be apparent that a generalized statistical treatment is applicable only to a limited extent. Moreover, in the detailed studies, such as the comparison of town and country children, it was found that there were differences from school to school which made it desirable to keep them separate. Hence, with such reduced numbers, our conclusions must be established in ways somewhat different from those suitable for large groups.

We decided, therefore, not to present our data and conclusions in the tabular form adopted in the report of the London experiment. Besides, to attempt direct comparison with the London results would be useless, since the examination arrangements were quite different in Fife and there was no control group. This latter fact alone would have prevented us from attempting to demonstrate the value of our methods by procedure similar to that adopted in London, even if such demonstration were not considered superfluous in the light of the Institute's previous investigations.<sup>1</sup>

For these reasons we concern ourselves primarily with the differences between town and country, with the question of when vocational guidance studies should begin and with the minimum standards of ability and temperament which appear to be required for various occupations.

<sup>1</sup> Cf. "Recent Evidence of the Value of Vocational Guidance," *The Human Factor*, 1932, vol. vi, pp. 438-450.



## II. A COMPARISON OF URBAN AND RURAL VOCATIONAL CONDITIONS

### (1) *Restricted Opportunities in Rural Areas*

One of the major differences between urban and rural areas in the problems of vocational guidance lies in the comparatively restricted range of occupations open to the country boy or girl. Even in a small town there are always some occupations which arise directly from the closer settlement of the people, the distribution of goods, the transport of passengers and goods, the provision of power and light, the repair and maintenance of buildings, vehicles and the like. All these provide employment for considerable numbers, quite apart from any factories, mines, ships, or basic industries which may have produced a concentration of people in or around that particular place. On the other hand, in the country village, where such a concentration of persons is very slight, little specialization occurs and the demand for skilled labour outside the work of the farm is comparatively small. In bygone times each village was in the main a self-contained and self-sufficing community of persons ; but in recent years, owing to the great improvement in modes of transport, the character of village life has changed. Many of the needs of the villagers are now supplied by vans from the nearest large town ; motor omnibuses provide facilities for shopping excursions or amusements ; and the inevitable result is that the avenues for employment open to the country boy or girl *in his own district* are comparatively few. The problem of the vocational adviser is therefore a difficult one, for although the country folk may recognize that the best chances of employment are to be found outside their own village, they may be unable to go far in search of them and may, through force of circumstances, be compelled to find what occupation they can—suitable or unsuitable—as near to their home as possible. On the other hand, when a village serves as a ‘dormitory’ for an adjacent town, the opportunities for employment are urban rather than rural.

Such a state of affairs actually existed in the areas in which this experiment was carried out. The three rural schools were all situated in areas which were predominantly agricultural. A is a village of a few hundred inhabitants supporting a blacksmith, a carpenter, and two or three small ‘food and general’ shops. A county town lies only four



miles away, but it is not an industrial town and so most of the parents of the children attending the school at A work on the land. B and C are both larger villages than A, but similar conditions prevail except that in both cases there is no town near. On the other hand, both villages have linen mills which provide employment for a number of girls. Agriculture is, however, the principal occupation of the inhabitants. In this connection, it should be noted that migration from farm to farm and from district to district is very common. It is customary to hire farm workers by the year, and in November there is frequently a considerable 'exchange' of tenants between one farm cottage and another. Such migrations of parents may take a child a considerable distance away to a district in which different methods of teaching and different standards of attainment exist. It is not surprising, therefore, that in some cases the child's progressive education suffers and that his attainments in school subjects occasionally fall short of what might be expected. Yet it would be unfair to the child to apply the standards of another town or district for purposes of vocational guidance ; for if employment must be found in a particular district, the employer's view of the suitability of an individual is determined, in part at least, by the competition which this individual has to meet there, even though his own abilities and qualities must have a considerable influence on the final result. The latter may determine the intrinsic quality of the work he does, but the former may decide the employer's satisfaction with the work done for him. Judging from the mental levels we have found, the difficulty of the work to be done and the standard of performance expected in many occupations do not make very high demands on the individual.

The vocational adviser must therefore consider two rather different problems : first, the suitability of the boy or girl for work of any kind ; and, second, his or her suitability for the work actually available in the district. If an outstanding ability is disclosed for a type of work not available in the district, this has to be set against the probability of useful work being done in the jobs that *are* available. In this experiment we found that the second consideration practically always outweighed the first. The recommendations were, therefore, sometimes of the 'second best' variety, and they were much restricted in scope.<sup>1</sup>

<sup>1</sup> Even in the urban area of this experiment, the number of possible recommendations was much fewer than in previous experiments. Compared with London and Birmingham, Dunfermline is not a highly industrialized town and has not much *variety* of employment to offer. Also, since the fine-linen trade declined, the *amount* of employment has been reduced.



Moreover, the question of standards had to be settled without any definite information as to the 'allowance,' if any, that ought to be made. Perhaps, on the whole, the investigators interpreted the performances of the country children rather more favourably than their abilities would warrant, but this was excusable in the circumstances ; in the light of the results given below, equal standards might very well have been applied in regard to some aspects of the examination. Yet, when we examine the kinds of work *found* by these children, this concession does not seem to have made any difference.

### (2) *Comparison by Age*

The first comparison between town and country children is that of age. This is necessary in order to ascertain whether other comparisons are likely to be affected by an age factor. The following table shows the distribution of the children by age at the time of their first psychological examination.

NUMBER OF BOYS (B.) AND GIRLS (G.) AT EACH AGE																
Country Schools										Town Schools						
School -	A		B		C		Total	Per Cent.	X		Y		Z		Total	Per Cent.
Sex - -	B.	G.	B.	G.	B.	G.			B.	G.	B.	G.	B.	G.		
Age																
Under 11	6	7	—	—	—	—	13	9	—	1	12	6	4	4	27	8
11-12	7	3	14	5	5	8	42	30	21	31	27	17	11	18	125	38
12-13	7	5	6	13	7	6	44	31	18	25	19	12	17	17	108	32
13-14	1	1	11	10	8	7	38	27	18	13	10	7	9	8	65	20
Over 14	—	—	3	—	1	1	5	3	—	—	3	1	—	1	5	2

Combining the three country schools into one group and the town schools into another, the percentages in the 12-13 year groups are approximately the same. Below that age-group there are more (7 per cent. more) in the town schools. Above that age group there are more (8 per cent. more) in the country schools.

In this connection it is necessary to say that, at the time this investigation began, the country schools B and C retained their 'qualified' pupils, whereas all the four other schools transferred them to Advanced Divison Centres. A 'qualified' pupil is a boy or girl aged eleven or twelve who has passed a qualifying examination in English and arith-



metic for admission to an Advanced Division Course of two or three years' duration. These Courses are usually of a practical nature (technical for boys, domestic for girls), and are intended to give an education which will have a bearing on the child's future occupational life.

The excess of older pupils in the country schools is thus explained, but this introduces a factor which must be remembered in later comparisons. For it will be apparent that the pupils of 'thirteen-plus' in the town schools (22 per cent. of the total) were still 'unqualified' at the time of examination. These may therefore be regarded as of inferior ability (or, at least, educationally backward, even if the backwardness is not in every case due to inferior ability), compared with the corresponding age-groups in the country schools. Any conclusions we may draw as to the differences between the town and country children of these higher ages must take this fact into account.

### (3) *Differences in General Ability (Individual Tests)*<sup>1</sup>

The Stanford-Binet Intelligence Scale serves very well as a measure of a child's capacity to profit from a systematic course of instruction such as is given in school. Expressing each child's mental age as a fraction of his actual age at the time of examination, we get an 'intelligence quotient' (or I.Q.) in which the age factor is allowed for. We can, therefore, compare directly the ability of children of different ages, as in the following table :

MEAN INTELLIGENCE QUOTIENT (I.Q.) OF CHILDREN OF DIFFERENT SCHOOLS  
(Stanford-Binet)

Country Schools										Town Schools							
School -	-	A		B		C		Average		X		Y		Z		Average	
Sex -	-	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																	
Under 11	-	99	93	118	—	136	—	107	93	92	116	108	109	117	115	109	112
11-12	-	94	108	97	98	91	100	95	101	100	97	103	100	112	115	104	103
12-13	-	80	89	84	102	104	97	89	98	88	90	96	99	105	105	95	96
13-14	-	93	65*	89	83	89	91	89	85	83	83	85	78	104	97	89	86
Over 14	-	—	—	95	—	—	75	95	75	—	—	72	72	—	77	72	75
Whole group	-	91	93	93	95	96	100	93	87	91	94	99	97	109	112	99	98

\* 1 case.

<sup>1</sup> As measured by the Stanford-Binet Intelligence Scale (London revision).



Taking the school groups as units (bottom line of table) it will be observed that schools A, B and X do not differ very much, the mean I.Q. for boys being roughly 91 or 92, while the mean I.Q. for girls is about 94.<sup>1</sup> Town school Y and country school C are also approximately equivalent, but town school Z is markedly superior to the others. This result was not unexpected (*cf.* p. 9), because in this school a selective factor was at work and the majority of the children would, in ordinary circumstances, elect to continue their education at a secondary school.

The arrangement of the I.Q.s in year-groups reduces very considerably the number of cases in each column and row of the table. It is, however, apparent that the retention of 'qualified' pupils in schools B and C (*cf.* p. 24) does not raise the mean intelligence of the 13-14 year groups of these schools to a higher level than that of the corresponding age-groups in other schools. It does seem, however, as if the inclusion of the 'qualified' pupils has raised the average mental level of the 12-13 and 13-14 year groups in these schools above what it would otherwise have been; for the falling-off in I.Q. which is seen in all the schools between the 11-12 year and the 13-14 year groups, is not so great in the case of schools B and C as it is in the other schools. In other words, although the level of mental ability among the 12-13 year and 13-14 year groups of the schools B and C is higher than it would have been if the conditions governing the transfer of pupils were the same as elsewhere, it is not so high as to cause a marked superiority in general ability of the country group over the town group. This is a fact of some importance in the comparisons which we shall make presently.

Meanwhile, two interesting points emerge. The first is the effect of the 'creaming' process of the qualifying examination on the average I.Q. of the year groups. In school Z this process is delayed somewhat by the fact that pupils remain after 'qualifying' to sit for the entrance examination (of a higher standard of difficulty) to the secondary school; but it is very noticeable in schools X and Y. Consequently, the older school groups are not representative samples of a school population. The second is the extent to which the I.Q. means for year 11-12 (excluding school Z) approximate to 100. Combining boys and girls, the actual mean I.Q. for the 11-12 year groups in the five schools

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<sup>1</sup> The probable errors of these means are approximately 1.5 for the smaller groups, and 1.0 for the larger ones.



is 99. This provides some indication of the reliability of the test results. The fact that there are so many low I.Q.s in both town and country schools might suggest to some the possibility of error in the measures used, for there are always those who prefer to blame the tests rather than the testees. Some errors will occur, of course, in individual cases, but the group result seems accurate enough.

The proportion of children at each level of mental ability is, however, more easily seen in the following table, where the percentage of children of low, average and high I.Q. is shown.

PERCENTAGE OF CHILDREN AT EACH INTELLIGENCE LEVEL

Country Schools										Town Schools								
School	-	-	A		B		C		Average		X		Y		Z		Average	
Sex	-	-	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
I.Q.																		
Below 86	-	-	33	25	39	19	24	14	33	18	39	29	17	21	2	7	21	20
86-95	-	-	39	38	23	28	24	49	28	37	31	30	23	21	7	15	22	23
96-105	-	-	14	20	20	28	29	19	21	23	12	20	21	26	23	11	19	19
106-115	-	-	5	11	15	25	19	14	13	18	14	10	33	24	45	36	30	21
Over 115	-	-	9	6	3	0	4	4	5	4	4	11	6	8	23	31	8	17

Another difference disclosed in the above tables is that the country boys do not appear to be as intelligent as the country girls, whereas the town boys and girls are approximately equal (except in the superior grades). There also appears to be a greater proportion of children of fairly high intelligence (I.Q. 106 and over) in the town schools—38 per cent. as compared with 18 per cent. (boys) and 38 per cent. against 22 per cent. (girls).

If we are justified in adopting minimum standards of ability for certain 'higher' occupations, it follows that the proportion of children in the country schools who could be advised to enter such occupations is very much less than in the town schools. On the other hand, there are comparatively few of these occupations available in country districts; and this raises the interesting question—how far is the distribution of intellectual (and other) abilities among the population related to the occupational requirements of the districts in which they live? Does a concentration of population in an urban area mean also a concentration of the individuals best fitted to cope successfully with the occupations



available in the town? Are those who remain in the rural areas better fitted for rural occupations than for urban ones? Is there a process of 'ability selection' going on, even in regard to occupations and those who follow them?

Of course, it would be very unwise to jump hastily to conclusions on the basis of figures such as those given above.<sup>1</sup> The Stanford-Binet Scale, however reliable it may be, is only one measure of general ability, and it may have a bias towards verbal processes, which may affect the conclusions that may legitimately be drawn. Before attempting further discussion, let us examine the results of other tests.

### *Differences in General Ability (Group Test)*<sup>2</sup>

The purpose of a group test in the practical procedure of vocational advising is to economize in administration time. Its value depends, therefore, partly upon the time saved, as well as, of course, upon the reliability of the measures it gives. The test used in this experiment (National Institute of Industrial Psychology Group Test 34) has definitely proved its value in previous investigations, and its reliability is fully equal to that of similar group tests. Its correlation with the Stanford-Binet Intelligence Scale given individually is of the order of 0.85. Scores in this test have been converted into mental ages by means of a table of norms obtained independently, and the corresponding intelligence quotients have been calculated. The distribution of these is shown in the following tables (p. 29), which are exactly comparable to those given above. The agreement between the two sets of figures (the Stanford-Binet and the Group test 34) is distinctly shown, especially in the second tables. Hence, if we take an Intelligence Quotient of  $100 \pm 5$  as representing the mean (or normal) level of intelligence of an unselected group, it appears that in the country schools over 50 per cent. fall below this level, while barely 20 per cent. rise above it. In the town schools X and Y there is a slight superiority over the country schools though the majority of the pupils still fall

<sup>1</sup> They are, however, confirmed by the results of other investigations. In certain types of rural areas, from which the brighter stocks have emigrated to the towns, the residual population shows a definite tendency towards an inferior intellectual capacity. (Cf. G. H. Thomson's investigation in Northumberland.)

<sup>2</sup> As measured by the Institute's Group Test of Intelligence (No. 34).



below the average. In the town school Z there is an excess of pupils of high intelligence quotient. Over all, the town children are more intelligent than the country children, but it is clear that our selection of schools has some bearing on this result.

## MEAN INTELLIGENCE QUOTIENT OF CHILDREN OF DIFFERENT SCHOOLS

(Group Test 34)

Country Schools										Town Schools								
School	-	-	A		B		C		Average		X		Y		Z		Average	
Sex	-	-	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																		
Under 11	-	-	96	87	—	—	—	—	96	87	—	121	105	109	116	125	107	115
11-12	-	-	86	106	101	93	95	105	96	101	99	104	100	100	116	110	102	105
12-13	-	-	86	89	78	98	91	98	86	96	91	91	91	92	100	101	94	95
13-14	-	-	89	55*	93	90	91	92	92	89	81	82	80	78	100	98	85	86
Over 14	-	-	—	—	92	—	85	73	90	73	—	—	75	77	—	85	75	81
Whole group	-	-	90	92	93	95	92	97	91	95	91	96	94	96	106	106	96	99

\* 1 case.

## PERCENTAGE OF CHILDREN AT EACH INTELLIGENCE LEVEL

(Group Test 34)

Country Schools										Town Schools							
School -	-	A		B		C		Average		X		Y		Z		Average	
Sex -	-	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
I.Q.																	
Below 86	-	30	44	32	26	39	23	33	29	40	35	30	31	13	13	29	27
86-95	-	39	13	18	19	30	23	26	18	25	22	20	10	10	13	19	16
96-105	-	24	25	35	37	10	32	25	32	13	19	27	31	15	13	19	20
106-115	-	5	13	9	19	19	14	11	15	13	9	11	24	33	37	19	21
Over 115	-	5	6	6	—	5	9	5	5	9	16	11	5	30	24	15	15

(4) *Differences in Scholastic Attainments*(1) *English*

Details are given in Table I of the Appendix. The town boys are superior at ages 10, 11 and 12 (by an amount equal to or greater than  $2\frac{1}{2}$  times the probable error of the difference). The country boys are superior at ages 13 and 14 (by an amount greater than 3 times the



probable error of the difference). The town girls are superior at age 10 ; there is no significant difference at age 11 (though the differences favour the country girls) but at ages 12 and 13 the country girls are definitely superior.

(2) *Arithmetic*<sup>1</sup>

The town boys are again superior at ages 10, 11 and 12 but inferior at age of 13. The town girls, however, obtained lower scores than the country girls at all ages, except 10, but the differences are not large enough to be significant.

These results are distinctly interesting when compared with the distribution of intelligence among the age groups. The town children, as a group, are more intelligent, as we have seen, than the country children up to the age of 12 ; normally, therefore, they may be expected to make better progress in their school work and to obtain higher scores in attainment tests. But, from the I.Q. values, the country children of 13 are not so much more intelligent than the town children that a similar superiority in attainment ought to be shown. In their case the explanation will lie rather in the fact that, as 'qualified' pupils, some of them will have done more advanced work in arithmetic and English than the others. This will undoubtedly give them some advantage in dealing with the same standard tests. Then, again, 'unqualified' pupils of 13 years of age are of a comparatively low intellectual level, and there is a larger proportion of these in the town school groups than in the country school groups. These facts sufficiently explain the differences in attainment which these standard tests disclose.

These results are interesting also from another point of view, for they seem to bear out the general principle that progress in school work and intelligence as measured by tests such as the Stanford-Binet are closely related. That progressive increase in power to read and write good English or to carry out numerical calculations is due in part to the quality of the instruction given will readily be granted ; but much of it is due to the development of innate abilities. Sometimes the natural growth of these abilities is hindered by an unsuitable environment ; on the other hand, if they are at all powerful, they will mature

<sup>1</sup> See Table I of Appendix.



naturally and in such a way as will enable the individual to cope more effectively with the varied situations he is called upon to face.

It has been common to decide a pupil's admission to a post-primary course of instruction by means of a qualifying examination in English and arithmetic. The value of an examination of a child's attainments in these subjects varies greatly; at its best it shows mainly the fitness of the individual for further work in English and arithmetic. Unless it gives also a measure of the individual's general ability (as it undoubtedly may do in certain cases), it cannot throw adequate light on his capacity to profit from advanced instruction in un-related subjects. Nor can it *alone* be of material help in the problems of vocational guidance. Moreover, at its worst, it will much reduce the efficiency of the subsequent class-work of the 'qualified' groups, since the requisite abilities of the individuals composing them will vary greatly in quality and kind. In short, a 'qualifying' examination is most helpful when it provides a reliable measure of those basic abilities which are necessary for further progress in school studies. If we could be sure that all or nearly all the essential components of these abilities are comprehended in the term 'general intelligence' a reliable test of this 'general intelligence' would be far more useful in determining fitness for further education than narrowly specific attainment tests, necessary as these may be in order to ensure a minimum knowledge for promotion and grading.<sup>1</sup>

So, too, in the problems of vocational guidance. The performances of the country children in English and arithmetic compare very favourably at certain ages with those of the town children. But their general ability does not appear to be so high. Moreover, if the facilities for an extended curriculum are few, there will be more time devoted to the English-arithmetic group of studies. The vocational counsellor, especially if he be a teacher, might easily attach too much significance to the child's attainments, and accordingly he might recommend work for which the child is not really suitable (though considering the occupations available in the country districts this is not very likely). That is an error to which all school counsellors are liable unless other sources of information are available; and, in vocational guidance especially, it is often these other pieces of information which are most valuable. This

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<sup>1</sup> The further question of the suitability and validity of existing intelligence tests is not here under discussion. Reference is made on pp. 38 *et seq.*



is shown in the difference given by the tests of practical abilities. As will be seen from the next paragraph and from the tables given in the Appendix, there are significant differences in ability between the town and country children in tests which are independent of school training ; but whereas the differences in scholastic processes generally favour the town children, the reverse is the case in regard to practical activities which are not specifically taught. Here no doubt we see the influence of growth or maturing of the innate abilities concerned, but there is no particular reason why the growth should be more rapid in country children than in town children.

#### (5) *Differences in Practical Abilities*<sup>1</sup>

In the test of Mechanical Ability country boys are superior to town boys at all ages, although the difference only becomes statistically significant at age 13. This test was also given to the girls, in spite of the fact that they seldom do it really well. The town girls are superior at ages 10 and 11, the country girls are superior at 12 and 13.

Differences of the same order are seen in the tests for Recognition of Form Relations and for Memory of Designs, which possess some elements in common with the Mechanical Ability tests. Similar differences are seen in the Cube-Construction and Maze tests. But in these tests there is not the same consistency in the differences.

In the Substitution test, the town boys are superior at ages 11 and 12, but the country boys are superior at age 13. The girls are equal except at age 13, when the country girls are superior. In the Picture-Completion test the table of scores corresponds to the table of I.Q.'s more closely than it does in the other practical tests, the children of the town school Z doing much better than any of the others.

In the tests for Manual Dexterity few differences are disclosed which are large enough to be significant ; but where these occur, the country children are on the whole superior, except as regards speed of movement.

#### (6) *Summary*

Taking the results together, it appears that the town children show superiority in processes which are predominantly verbal, whereas the

<sup>1</sup> See Tables II-VIII of Appendix.



country children are superior in non-verbal processes.<sup>1</sup> It is tempting to speculate as to the significance of this. Does urban life emphasize the abstract rather than the practical, and *vice versa* for the country? How far do these differences reflect the innate abilities of the individual, how far are they effects of environmental influences? Reviewing the opportunities for gaining practical experience which fall to the lot of the town child, it cannot be said that he is handicapped compared with the country child. The latter probably takes a more active part in the occupational life which goes on around him, but the former is often acquainted with hobbies and practical pursuits which the country child seldom encounters. Yet the country child is definitely more proficient in the practical activities covered by our examination, though he makes a relatively poorer show at intellectual pursuits.<sup>2</sup>

In connection with the latter, the question of efficiency of teaching arises. It is recognized that a fine grading of pupils cannot be attempted in a small school and that much of the work must necessarily be carried on under conditions which compare unfavourably with the larger schools of the towns. It is possible that the teaching is more intensive in the highly organized town school. If so, then pupils will 'qualify' sooner and the intellectual calibre of those who remain 'unqualified' to their thirteenth or fourteenth year must be very low indeed. Our results are quite compatible with such a state of affairs. In the country school, where progress is perhaps more leisurely, pupils will 'qualify' later; more will depend upon their natural ability than upon intensive coaching; and if this is not high (as it does not seem to be among the children of farm workers) they will take longer to reach the required standard of attainment. This time will in some cases be increased by the periodical removals already referred to. Conditions therefore do not favour the rapid advancement of the country child in school studies; and if we are to judge his ability by his comparative progress in these, we shall clearly do him a great injustice. Outside the activities of the class-room his potential abilities do not seem to be at all inferior to those of the

<sup>1</sup> Even allowing for the fact that the country children are slightly older and consequently more mature physically.

<sup>2</sup> This generalization does not rest solely on the data obtained in this experiment. We find exactly similar differences between 'qualified' pupils from the town and country schools who attend the same Advanced Division Centre. The country children, as a rule, qualify later and do relatively badly in the 'literary' part of their curriculum.



town child—a fact which is very important not only to the vocational adviser but to the educationist also. For there is here undeniable evidence, not only that a comparatively narrow training in the three R's only makes use of a limited range of abilities, but also that a great many children of school age are not of high intellectual capacity and so can only make slow progress in such abstract studies. It would clearly be an advantage to children of these particular levels of ability to provide opportunities for pursuits of a more practical nature, for not only would it give scope for the development of abilities that at present have only restricted means of outlet, but it would enable the true potential ability of the individual to be more accurately revealed. From the vocational guidance standpoint, this would be as valuable a result in its way as the obvious gain in power and self-confidence of the individual himself.

Reference has already been made to the differences between the problems of advising town and country children. The recommendations actually made by the investigators reflect the difficulty they experienced of suitably advising the country children. These are given in Tables XV–XXVI, which are referred to in Chapter IV.

### III. THE AGE AT WHICH VOCATIONAL GUIDANCE STUDIES SHOULD BEGIN

#### (1) *Method of Approach*

We may approach this problem in two ways. In the first, we ask at what age are the child's abilities sufficiently developed to justify an attempt to solve his vocational problem. In the second, we ask at what age are the data from psychological studies of the child reliable enough to warrant a forecast of his future progress, particularly in regard to the occupation chosen. Although each of these is an approach to the same problem, they involve different methods of attack.

The first line of approach requires a determination of the ages at which certain specific abilities appear and of the activities in which these are usually expressed. This would necessitate a systematic statement of the nature of the abilities to be considered and how they are related to each other and to vocational success.<sup>1</sup> Up to now, however, psycho-

<sup>1</sup> Cf. *Psychology and the Choice of a Career*, by F. M. Earle (London: Methuen, 1933), pp. 22–42.



logical research has provided only a preliminary survey of this field. For the present, therefore, it seems more profitable to take the alternative route.

Our second line of approach involves studies in the use of psychological tests at different ages, such as have been undertaken in this experiment. If it can be shown that the measure of any given ability obtained at one stage of the child's development remains approximately constant throughout later stages of his development, a forecast can be made with as much certainty after the first measurement as after the second or any subsequent measurement. The chief difficulty in establishing the constancy of such measures lies in the variability of the individual himself. His performance may fluctuate from day to day ; and if such variations are large, a later measurement might show apparently more or less ability than an earlier one. The only way out of this difficulty is, of course, to repeat the test a sufficient number of times on each occasion to eliminate the effects of the individual's variability. But, usually, repetitions of a test can be given only after sufficient lapse of time to justify the belief either that the details of the test have been forgotten or that the practice effects are negligible. Hence we are compelled either to depend upon the unsupported measures obtained from isolated single tests or else to construct *batteries* of allied tests whose combined scores will be more reliable than one of the single scores of the component parts. The difficulty in the latter case consists chiefly in finding tests sufficiently allied to each other to make up a suitable battery without introducing irrelevant factors which may affect the results. As no such batteries were available when the investigation began, we decided to depend upon the results of single trials of the tests selected. But, as the reliability of most of these was already known to be fairly high, we felt reasonably confident that useful results would accrue.

Of course the answers provided by our data to the question " When should vocational guidance studies begin ? " must be regarded as merely tentative. But the fact that our data do yield a fairly definite answer is in itself of considerable significance ; for it is unlikely that errors in the measurement of the individual from so many different tests would consistently operate in the one direction necessary for a positive result. If, on the other hand, our results had been negative—that is to say, if we had found that there were no bonds of connection



between our measures of the same individuals at different ages—we should have been in doubt as to the meaning of our result ; for it might have been due to the unsuitability of the measures used, rather than to a lack of consistency in the individuals themselves.

But, of course, there is every reason to expect that bonds of connection *will* be found between the abilities of the individual at different stages of his growth. If there were not, then common experience as well as scientific investigation would be seriously at fault ; for in everyday life we assume, rightly, as it appears from our data, that individuals are reasonably consistent in the quality of their performances and that, in view of this consistency, it should be possible to forecast the quality of their future actions. And to deny this is to deny entirely the possibility of any vocational guidance based upon a psychological study of the individual. Of course, successful guidance depends upon a clear understanding of the processes involved, and particularly upon a satisfactory distinction between those factors in ability and in personality which are stable and those which are unstable. The rapid development which is associated with puberty and the variability of the individual in early adolescence certainly demand careful study, but the fact that in some individuals change occurs does not alter the possibility of sound guidance. General intelligence, as customarily measured, remains fairly constant. Other abilities show a similar tendency, as might be expected in so far as general ability enters into them. Character qualities may seem to change far more than abilities do, but here the fundamental differences may not be so great as they seem. What appears to be development is often rather the outcome of the removal of discouraging or repressive influences—whether in school, home or elsewhere—and does not, usually, signify a *fundamental* change in the individual's temperament or character. Thus the results discussed in this chapter should help to establish quite definitely, not only the legitimacy of the principles upon which the new vocational guidance is founded, but the degree of reliance that may be placed upon our present-day procedure and methods.

## (2) *Consistency of the Test Results from Year to Year*

In the previous chapters it has been explained that many of the children in this experiment were examined, both individually and by



means of group tests, at least twice, and that some of them received the tests three times, in the course of their school career. But a scrutiny of the table showing the distribution of the children by age at the time of the first examination (p. 24) shows that the number available for re-examination at the end of one year was only about 70 per cent. of the original number. And since, according to the plan of the investigation, only one-half of these could be examined individually during the year, it follows that the number of instances of second and third trials of the individual tests is much less than the corresponding number for the group tests. Nevertheless, by combining the town and country schools, we can obtain data relating to groups of quite considerable size, even if we keep the sexes separate—a necessary proceeding when the mean scores differ so much as they do. The fact that the town and country groups differ in ability will not necessarily invalidate our results; since we shall be examining the performances of the *same* group on two or more different occasions, and since we shall keep the heterogeneity of our groups within reasonable limits by taking the age groups separately.

The data obtained from these repeated trials of the same tests may be examined in two ways :

(1) We may rank the individuals in the group according to their ability in the test and compare the ranking at the first trial with corresponding rankings at subsequent trials. This can most conveniently be expressed in terms of correlation coefficients.

(2) We may note the improvement in the individual's performance in the test (as shown by the increase in his score) and compare his improvement with that of others in the group. If the increase in score for the individual approximates to that which might be expected from the growth or maturing of the ability during the time that has elapsed since the first measurement, it may be presumed that the test is maintaining a satisfactory consistency.<sup>1</sup>

Applying the first method of analysis to our data, we obtain the results shown in Tables IX–XIV of the Appendix, where the abilities have been arranged under heads convenient for vocational prognosis. We shall discuss them in that order, but it will be necessary to remember

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<sup>1</sup> We do not propose to report the results of this method in detail, since we are unable at present to say definitely what the normal increase in score *should* be (except for the intelligence tests, the consistency of which is amply demonstrated by the first method).



that the number of cases tested after an interval of two years was much fewer among those children who were 12 or 13 years old at the first examination than among the younger ones.

*(a) Measures of General Ability*

(1) The mental age of the children as determined by the Stanford-Binet Scale of tests shows a very high consistency from year to year (see Table IX of the Appendix). The consistency is almost as great for an interval of two years as it is for one year. The correlation, for example, between the mental ages taken at 11 and again at 13 for the same group of children is 0.89 (boys) and 0.87 (girls), whereas at ages 11 and 12 it is 0.97 (boys) and 0.99 (girls), and at ages 12 and 13 it is 0.91 (boys) and 0.93 (girls) respectively.

Taking the figures of Table IX at their face value, it would seem as if prognosis at age 10 would be more liable to error than at ages 11, 12 or 13. But in view of the small number of our cases, this result can hardly be regarded as opposed to the general findings of other investigators, viz. that measures of mental age by various revisions of the Stanford-Binet Scale are highly consistent, at any rate up to the age of 13 or 14.

(2) We have, moreover, a check on this conclusion in the figures for Group Test 34, if the underlying assumption that the two tests measure the same thing is a correct one. Even if this assumption is only partially true, the consistency of the group test data still provides some confirmation of current belief in the validity of such tests. The figures in Table IX show that Group Test 34 gives consistent measures—highly consistent, considering the extent to which a group test is subject to error compared with an individual test such as the Stanford-Binet.

Moreover, the consistency of the measures given by the component parts of this group test is of a very satisfactory order (Table X). Only three of the sub-tests within this test fall short of what may be regarded as a 'high' consistency level, considering the small number of items included in each sub-test. These are the picture-completion test (which was intended partly as a 'shock absorber'), the classification test (which is easy to complete in the time allowed), and the mixed sentences test (which is too difficult for the slower minds). The value of this result lies chiefly in this: that if the aggregate score in the



group test turns out to be less significant in connection with occupational performance than the score in one or more of the sub-tests, it will be more profitable to develop selected sub-tests to their highest degree of usefulness than to work with the aggregate scores of them all.

Taking this test as a whole, then, we may reasonably conclude that group tests of this kind can be constructed to give a measure of ability which is highly reliable in the sense that future measures of the same ability in the same individual will not differ from it very much. This had previously been demonstrated for Group Test 34 over much shorter periods of time, viz. from three to six months. These newer figures show that (whatever the ability may be that is being measured by this test) the growth of the individual in this ability takes place in a more or less constant manner during the years under review. Inasmuch as this is true, it follows that the ability in question is not much affected by accidents of environment or instruction—in other words, that it expresses innate aptitude rather than attainment.

It should be noted that this result does not prove that future measures of the ability of the individual at ages beyond 14 will have the same prognostic value as the present measures have. That will have to be demonstrated independently. Nor does it mean that the same test material will give consistent results over a wide range of ages. This group test was designed mainly for ages 12 to 14, and it is encouraging to find that between the ages of 11 and 14 its prognostic value approaches very closely to that of the Stanford-Binet test.

It is important, therefore, to consider exactly what significance attaches to results such as these, since so much of our work depends upon similar facts. To discover that a test gives consistent measures in the same individual over a few years is of most value when we know precisely what ability it is measuring; for if the ability changes—becoming perhaps more specific and less general—immediately beyond the range of years investigated, a forecast in regard to the future may soon become invalid. On the other hand, if it can be shown to continue unchanged over a long period, the value of the first measure is correspondingly increased. Now the Stanford-Binet test has been shown to be consistent during the important period of growth from 6 to 12 years of age. Moreover, there is good reason to believe that the mental age derived from it represents something which is as near to a basic 'general ability' as we have hitherto been able to get. It may be that in some



aspects it reflects the influence of schooling ; it may be that in others it introduces specific abilities and that the result is an average or composite of a selection of specific abilities. Even so, we have not yet succeeded in devising a measure of ability which is at the same time so general in its application and so consistent in its results over such a wide range of ages. Until we have done so, we are entitled to regard the Stanford-Binet Scale as the best *single* measure of what we must call here an 'ability of fairly wide generality,'<sup>1</sup> and to point to its consistency as our justification for attempting to forecast the performance of an individual in those everyday life situations in which such an ability is thought to be advantageous. At present, no doubt, the number of such situations brought under review by the vocational guidance expert depends upon his skill and experience ; but eventually, we may hope, these will be classified according to the extent to which any given ability is dominant, and will be made available by them for less experienced advisers to use. But inasmuch as such a classification must rest upon experimental inquiries rather than upon personal opinions, we shall have to wait some time yet before it appears. In the meantime, the Institute's procedure in using the Stanford-Binet tests for children under 14 is seen to be amply justified.

A similar conclusion applies to Group Test 34 within the range of ages for which it is most suitable. But here arises another point. Equally consistent data have been secured for a more difficult group test (the Institute's Group Test 33), for the age period 14 to 18 ; and when these two tests are given to the same children, the results obtained are in high agreement with each other. Can we assume that the two tests are measures of the same basic ability and that a measure obtained by the one at the age, say, of 12 will be a reliable indication of the measure given by the other at the age, say, of 16 ? Experience in the use of such tests gives an affirmative answer ; and as most of these 'group tests of intelligence' (so called) do give high correlations with the Stanford-Binet individual measure, there is good reason to believe that they all measure substantially the same basic ability. Hence, if

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<sup>1</sup> This is not the place to discuss in detail the complex problem of differentiating abilities. One of us (F. M. Earle) proposes to deal with it in a subsequent publication. Here we are concerned only with the suitability of the Stanford-Binet Scale for children at the primary school stage.



we accept the prognostic value of the Stanford-Binet test over a wide age range, we are entitled to do so for group tests of established reliability and validity (as shown by the correlations with Binet and with each other after intervals of varying duration).<sup>1</sup>

(b) *Measures of Attainment in English and Arithmetic*

The above discussion has, it is hoped, prepared the way for a corresponding examination of the figures in Tables XI (1) and XI (2). The most interesting feature of the results in the various school subjects is that, while these tests appear to give quite consistent measures after an interval of one year, comparable indeed with those obtained from tests of 'general ability,' the consistency is more apparent than real, for it falls off rapidly over a period of two years. The changes reflected in the figures must obviously be taking place gradually—that is to say, the attainments of the children are steadily changing relative to each other. The only appreciable exception is that of the 12-year-old girls in English.

This result is not really surprising when the attendant circumstances are considered. Growth in any one attainment is much more subject to the influence of accidents than is the growth or maturing of the underlying ability which makes an increase in that attainment possible. Teachers know that there can be considerable change in the order of merit in a class group during one year, even though there is, at the same time, a not inconsiderable degree of consistency in the progress of the group as a whole. Yet no teacher would assert that the innate aptitudes of these children were altering very appreciably. Whether these changes are large or small will depend upon factors quite outside the teacher's control, such as the degree of homogeneity of ability among the children, the nature of their previous instruction, and the like. It is therefore perhaps impossible to say at what ages tests of scholastic attainments should show the highest consistency.<sup>2</sup> But we can say quite definitely

<sup>1</sup> We have not lost sight of the fact that group tests were devised as substitutes for the more laborious individual scale; but we have not thought it desirable to assume that all group tests are *effective* substitutes.

<sup>2</sup> Generally, owing to the successive eliminations of the unfit, the higher classes of a secondary school may be expected to show most consistent results. For, although the resultant groups are homogeneous, the individuals composing them have 'stabilised' their performances and their variability is comparatively slight.



that it will be unwise to attempt anything more than a 'short range' prophecy on the results of tests of attainment in English and arithmetic. By this we mean that we may forecast the individual's progress and achievement one term hence, or even one year hence, with a reasonable degree of certainty, but that if we attempt to go further the risk of error is much larger. This is not by any means a new idea. It is what critics of scholarship entrance examinations for admission to secondary schools have been saying for years. The question has recently been submitted to statistical analysis,<sup>1</sup> and it has been clearly shown that such measures of a child's *attainments* at the age of 11 or 12 give no reliable guide to his probable achievements at the age of 14, 15 or 16. Yet in criticizing scholarship entrance examinations it should not be forgotten that it is the *content* of the examination that matters. When the papers set are of such a kind as to make severe demands upon the child's *ability* as well as upon his knowledge, the results are much more satisfactory.<sup>2</sup>

It is necessary, of course, to ensure that the child possesses a knowledge of arithmetic and of English sufficient for the more advanced work of the secondary school. But it frequently happens, when the examination is *competitive*, that the questions set are more difficult than much of the work to be attempted during the following year. Unfortunately, this increase in difficulty is most easily secured by introducing some of the more complex processes which in their turn depend on added knowledge and require more skilful (and perhaps more advanced) instruction. The object presumably is to discover the more able pupils who, because of their ability, have been able to master these more complex processes; but although more instruction is needed in order to secure this result, it does not follow that *all* the able pupils will have received it. It would be better to try to find the abler pupils by questions which involve complex thinking but without requiring special knowledge or instruction. Those examinations which include intelligence measures in one form or another are, of course, applying this principle; but it is very important to ensure that the subject matter employed in such measures does not prejudice the result. Probably

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<sup>1</sup> *The Reliability of Examinations*, by C. W. Valentine.

<sup>2</sup> Examples of question papers which are severe tests of ability will be found in *The Technique of Examinations*, by B. C. Wallis.



much of the uncertainty as to the real value of 'intelligence' tests arises from the use of tests in which the essential differences between the effects of ability and of instruction have not been sufficiently observed.

(c) *Measures of Mechanical Ability*

Under this general head we have placed the tests for Recognition of Form Relations and for Memory of Designs given in group form and the Mechanical Ability and Cube-construction tests given individually. The two latter tests involve manipulation of objects, whereas the paper and pencil tests do not. The reasons for this grouping are to be found in the results of our earlier investigations<sup>1</sup>; ability in dealing with the practical problems of mechanisms is a complex ability which involves both form perception and manual dexterity factors.

It will be observed that the correlations between successive trials of these tests at different ages are neither so high nor so uniform as they are for the tests of 'intelligence.' Here we encounter the complex problems of specific abilities.

It is not to be expected that all these special tests will give equally consistent results at all ages. If, as we suppose, specific abilities are the product of particular innate aptitudes developed by special training and practice, much will depend upon the nature of the training necessary and upon the way in which it is normally gained (whether incidentally during the activities of everyday life or as the result of instruction designed for the purpose). None of the children examined in this experiment could be said to have had special training in the activities employed in these tests; the differences that are disclosed may therefore be used as evidence of the appropriateness of the tests at these particular ages. For if we find, as we do in nearly all the tests of this group, that the consistency of the measures over a period of two years, beginning at the age of 10 or 11, is not so high as over a corresponding period beginning at 12 or 13, we may reasonably conclude that the specific abilities in question can be measured with greater accuracy from 12 to 14 than from 10 to 12. This will have an important bearing upon our answer to the main question of when vocational guidance studies should begin.

<sup>1</sup> F. M. Earle and A. Macrae, *Tests of Mechanical Ability*, Report No. 3 of the N.I.I.P. London, 1929.



The best results for the Cube-construction test are found at year 12 for both boys and girls, the correlations after an interval of two years being higher than after one year. It has already been suggested<sup>1</sup> that at the age of 14 this test, in common with other tests of the performance type, is so much influenced by specific factors that its value as a measure of 'general' ability cannot be very high. The figures in Table XII throw further light on this question. They show that we cannot assume that, no matter what be the ability mainly measured by the test at the age of 10 or 11, the same ability will be mainly measured by it two years later, unless it is that the test scores are affected by casual and accidental influences (which, of course, reduce its practical usefulness just as effectively as a change in the nature of the abilities it measures). Actually we have recognized for some time that some of the weaknesses of this particular test lie in the fact that dexterity in handling the blocks, as well as an element of chance in the positions they occupy at the commencement of the test, affects the score obtained. The variability in the performance of the individual due to *these causes alone* may sometimes be considerable. Yet the test has its value. It repeatedly yields correlations of appreciable size with the other tests of this group, showing that there is some factor, general or specific, which is being measured, partially or wholly, by them all. That it is an ability which is best measured after the age of 12 seems to be indicated by the fact that in all the tables for the boys in this group the best set of correlation coefficients is shown at that age. The tables for the girls show rather different results. In the Mechanical Ability test, for example, the best figures are at years 10 and 11, while in the Form Relations group test the best figures are at year 10 (though it must be remembered that the number of cases is small). If, as we have already suggested elsewhere,<sup>2</sup> a specific form-perception factor makes its appearance later in the case of girls and operates in a less definite form than it does in boys, we need look no further for an explanation of our results. What we have got is probably a measure of general ability more or less obscured by the operation of the appropriate specific aptitudes in some of the individuals. It is only when a test effectively prescribes a situation

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<sup>1</sup> *The Use of Performance Tests in Vocational Guidance*, by F. M. Earle and M. Milner, Report No. 53 of the Industrial Fatigue Research Board. H.M. Stationery Office, 1929.

<sup>2</sup> F. M. Earle and A. Macrae, *op. cit.*



that adequately evokes the exercise of the ability which it is desired to measure that the results it gives are of any real value. This seems to be generally the case with boys when a practical situation like the Mechanical Ability test is presented to them. The specific factors seem to be expressing themselves quite consistently from 12 years of age onwards. This is not surprising seeing that the test was originally designed and standardized for boys of 14 to 15. Similar remarks apply to the tests for the Recognition of Form Relations and for Memory of Designs. Exactly how much influence is to be attributed to accidental circumstances it is, of course, impossible to say ; but it is interesting to note that the Memory test gives a set of higher coefficients than the Form Relations test. This may or may not be associated with the fact that there is a slight element of chance in the latter test which is not present in the former ; but the coincidence is worthy of note.

#### (d) *Measures of Manual Dexterity*

It has always been understood that measures of dexterity sufficiently reliable for diagnostic purposes necessitate the expenditure of considerable time and care. The nuts and bolts assembling test, for instance, was found at the Institute to give best results when sufficient trials were taken to reduce the influence of practice and accidents (such as dropped nuts) to a negligible quantity. But some of the tests used in this experiment had not been investigated in detail from this point of view, and their consistency over a period of time was therefore unknown. For this reason the results given in Tables XIII to XIV are of great interest. It would appear from the coefficients of correlation that, although in a few cases there is a very satisfactory degree of consistency in the measures obtained, measures of manual dexterity must, in general, play a rather minor part in vocational guidance. Indeed, when we remember that it is the probable ability of the individual in the remote rather than in the near future which we desire to forecast, we realize that tests which are valuable in vocational *selection* (as accurate measures of the individual's present abilities) may be much less serviceable in vocational *guidance*. Quite a number of the tests under consideration here have been found very useful in vocational selection ; but it is now apparent that the information they give is not nearly so dependable for guidance purposes, partly perhaps because we have to



begin considering our problems much sooner in guidance than in selection.

Of the tests enumerated on p. 12, the nuts and bolts assembling test shows a consistency which compares very favourably with that given by tests which are founded on mental, rather than on manual processes. Clearly for boys this test gives reasonably dependable measures. Of the others, two of the peg-placing tests, the tapping and the speed tests, give the best results. The disc-placing and aiming tests are useless in their present form, and the remainder are not much better. No doubt the value of some of these tests could be increased by multiplying the number of trials or measures taken, but the extra time required for this and the possible fatigue and loss of interest of the individual have also to be considered.

In other cases, the apparent lack of consistency may be due to the unsuitability of the test for the ages under consideration. The bead-threading and wool-knotting tests, for instance, were originally used for selecting dressmaker apprentices of 14 to 16 years of age. The dexterities involved may not be sufficiently stabilized at 11 or 12 to allow the individual's basic (or average) level of skill to emerge from those large variations in performance which are characteristic of all beginners in dexterous operations. Indeed, when we consider the variable performances of school children in their use of pen and pencil in writing and drawing, it is probable that something of this kind actually occurs. But the co-ordinations required in rapid and skilful writing are considerably more complex than those introduced into these dexterity tests; hence perhaps the latter should become stabilized several years before 16 or 17, by which age writing may be expected to have become more or less 'fixed.'

#### *(e) Other Measures of General Ability*

We have grouped under this head a number of tests whose special value in vocational guidance was under investigation. They comprise certain performance tests which were used (a) to throw light on the individual's ability in a practical problem which requires no special knowledge; (b) to provide opportunities for the study of his 'personality' in action.

*Cube-imitation*—a performance test from the original series. Intended as a test of intelligence, it requires the child to observe four or five simple



movements of the examiner's hand and to remember them correctly for the few seconds required to reproduce them immediately the examiner has finished.

The consistency of the results is fairly high, but not so high as to justify conclusions from the test alone. Part of the inconsistency may be due to the inherent nature of the test situation. A momentary loss of attention may lead to an error, and the number of trials is relatively so few that the effect of a single error on the total score is considerable.

*Picture-completion.*—The consistency of the results of this test seems highest between the years 12 and 14, with 13 as the age of greatest value both for boys and for girls. It will be noticed that some of the correlations after an interval of two years are larger than those after an interval of one year.

*Mazes.*—The procedure employed in giving this test<sup>1</sup> may have had an influence upon the results. The test is most consistent from 12 to 14; but the coefficients are not very high and one would not care to attach much significance to any single measure taken alone.

*Substitution.*—This is partly a test of speed in a relatively simple process of association (mental), but the scores are liable to be affected by the child's normal speed of writing or drawing. If he is accustomed to slow working, his score will reflect his deliberate procedure rather than his speed of mental process; and in so far as this attitude may change considerably from one year to another (with change of teacher, for instance), there is likely to be inconsistency in the measures. This is one of the few tests used in this experiment which has given much lower coefficients after the lapse of two years than after the lapse of one. It is therefore a test which can chiefly be of value either—

- (a) in relation to a forecast of the near future, since the coefficients after one year are fairly high; or
- (b) as a component in some battery of tests, serving the purpose of checking or supplementing another more reliable measure of the same ability.

In general, these results support the hypothesis put forward in connection with the data obtained in the London experiment. We found, there,<sup>2</sup> that while the tests of the Performance Scale might be

<sup>1</sup> In that it was given rather as a 'group' test than as an 'individual' test.

<sup>2</sup> F. M. Earle and M. Milner, *op. cit.*



good measures of general ability with young children, they were not such good measures, owing to the intrusion of specific factors, at the age of 14. The age of transition might very well be between 12 and 13.

### (3) *Summary*

The following statements summarize the results considered above :

- (a) Tests of general ability are available which are reliable between the ages of 10 and 16 and which enable long-range forecasts to be confidently made.
- (b) Tests of scholastic attainment, such as were used in this experiment, appear to be reliable for a short period only, and can therefore be depended upon in classifying for the *immediate*, rather than for the remote, future. It should be added, however, that a school record (which over an extended period should reflect the basic level of the child's ability) has the potentiality of being far more dependable than an attainments test, but it does not follow that it is so. (Frequently the term marks represent performance in a single examination in which the variable factors may be far more numerous than in a properly constructed attainments test.)
- (c) Mechanical abilities appear to be of late development. They cannot be measured *by these tests* with high reliability before the age of 12 or 13.
- (d) Manual dexterities are measurable at any age ; but owing to the variation introduced by physical and physiological factors, the measures are probably reliable for short periods only.
- (e) Practical abilities such as those explored by our tests involve specific factors which develop relatively late. It will, therefore, be unsafe to use measures obtained in early years as a basis for prediction in later years. Apart from the use of these tests as part of a ' psychological examination ' in which the observer notes behaviour, unless the abilities measured by them after the age of 12 or 13 are definitely related to some occupational requirement, there is nothing to be gained by including them in the scheme of examination. It would be better to spend the time in other ways.



(4) *Conclusions*

We may now attempt to answer the question raised at the beginning of this chapter, for it is clear that the statements we have just made go a long way towards providing the solution. We can see what is required even if we do not seem to be very near, as yet, to a practical system in which the ideal is expressed at its highest efficiency. But that we are on the way to it there can be no doubt whatever.

Our general conclusion is that the 'vocational' study (in its widest sense) of a boy or girl should begin as soon as he or she reaches the senior stages of the primary school (terminating nowadays at 11 *plus*), and that it should take place from two points of view, educational and occupational. Moreover, the methods of study should be such as to bring out the essential connection between these two problems. This will not be difficult if it be realized that a measure of the child's ability to profit from further 'general education' can be obtained quite early, certainly by, if not before, the age of 10. Two methods of securing this may be employed, viz. the use of standard tests of general ability and the careful study of the child's school progress. It is probable that the latter will be more revealing at this early stage than it will ever be later when there is a larger mass of acquired knowledge to obscure the issues.<sup>1</sup> The result of such a study will be to determine the child's 'general educable capacity' relative to his fellows. It will indicate the extent to which he can profit from more advanced work *of the same kind*. We are not prepared, at present, to say whether anything else which might assist in the vocational problem is likely to emerge from such a study. It is possible that useful information might be got if we knew exactly what to look for.<sup>2</sup> At present, however, we do not; and the only practical purpose served by a detailed record of the child's progress in arithmetic, reading, composition and the like is to show what sort of further progress in the *same* subjects may be expected. We can forecast progress in *other* subjects on the basis of such a record only if we are sure that the abilities required in the new subjects are substantially the same as those employed in the old ones. This actually occurs in

<sup>1</sup> *Psychology and the Choice of a Career*, by F. M. Earle, pp. 8-14.

<sup>2</sup> It is quite possible that *some* of the factors contributing to the formation of special abilities at twelve and later are capable of detection at the age of eight or ten.



practice whenever 'general ability' (as measured either by special tests or by school record) chiefly determines success. When, however, more specialized abilities are required, forecasts will tend to go astray.

It is for this reason that we must delay fuller consideration of the vocational problem until the child reaches a more advanced age. Actually, of course, there is no need to arrive at a definite decision until the boy or girl approaches 14 years of age, at least so far as a choice of occupation is concerned. But it will be a great mistake to defer consideration of the problem until that time comes, if only because the development that is taking place in the meantime is likely to be an important factor in the problem. This development *may* be largely natural growth and *may* be independent of the schooling received ; but it can be, and usually is, much influenced by the instruction and training given. Consequently, there should be some general idea of what the vocational goal is likely to be, so that the training may have some bearing upon it.

Accordingly, we suggest that the problem should be dealt with at two stages, viz. :

First, between the ages of 11 and 12—when the choice of an advanced course of studies will be made, having regard to

- (a) the level of general ability already shown,
- (b) the special interests and aptitudes (if any) already shown, and
- (c) the age at which it is the declared wish or intention of the child and his parents to attempt to find employment ;

second, either between the ages of 13 and 15—when the exploration of vocational aptitudes will be made by

- (a) examination of the pupil's progress in the more advanced or recently introduced subjects of study,
- (b) tests of such specific aptitudes as are involved in mechanics, mathematics, science, language, literature, art, etc., and
- (c) tests of the abilities or attainments necessary in particular occupations for which the course of study is a suitable preparation, *e.g.* for office clerks, arithmetic, book-keeping, composition and the like ;

or between the ages of 13 and 17—when a similar procedure extended over a longer period and designed for a different group of careers will be employed.



This, in outline, seems to be the most desirable and practicable procedure. Its value will depend, of course, upon the way in which it is worked out in detail ; but that will require the consideration of matters other than those contributed by this experiment. In particular, the *differentiation of abilities* between the ages of 12 and 15 requires careful examination.

#### IV. MINIMAL QUALIFICATIONS DESIRABLE IN VARIOUS KINDS OF WORK

In this part of the inquiry we are concerned with the relations which exist between the various types of individual studied—the ‘ pictures ’ given by our psychological studies—and the nature of the occupational success subsequently achieved. As was the case in the London experiment, we exercised no appreciable influence upon the choice of occupation or upon the adjustment of the individual to the work he obtained. We have been merely recorders of events. There will have been some cases in which the investigator’s personal interest has created a disposition towards accepting his advice ; but it is quite certain that the difficulties of finding employment will have permitted this to affect the choice of occupation in very few cases. Our problem, therefore, is largely one of classification. We have to discover the main tendencies in the data at our disposal so that our cases may be suitably grouped.

In the London experiment the children were classified according to the kind of work recommended to them, because it was understood that in general a recommendation for a particular kind of employment meant that the individual boy or girl possessed a characteristic set of abilities and qualities. Actually, of course, in deciding what to advise the circumstances varied greatly from case to case ; the investigator had to attach different weights to the various aspects of the individual brought under review. Hence the psychological summaries of the children studied in London could hardly be expected to present a very constant or consistent ‘ picture,’ and it was difficult to obtain neat and distinctive classifications. (Perhaps, in seeking to classify human beings into occupational ‘ types ’ we must be content to use only the more general characteristics ; perhaps a high degree of precision in classification can never be secured because the complete individual is never typical.)



Be that as it may, the guidance of the individual, vocationally as well as educationally, socially, or in any other way, must always rest on similarities ; what is known to be appropriate for the majority of persons may be proposed with some confidence for each individual. If we may not act on this principle, vocational guidance becomes an unpractical dream.

In the present instance we have decided to give as much information as is possible in a condensed form about each person studied, and to reduce the number of classes to a minimum. The types of work actually recommended were fewer in Fife than in London because of the restricted opportunities in this area ; thus they lend themselves readily to a more condensed treatment. In Tables XV-XXVI will be found the chief abilities and qualities of the children expressed as a rating on a five-point scale. A represents a 'superior,' B an 'above average,' C an 'average,' D a 'below average,' and E an 'inferior' ability or temperamental trait. The individuals have been arranged in an order which shows (as clearly as it is possible to show it) what characteristics are present most frequently among those who may be judged to have found the work suitable, and (conversely) are absent most frequently from those who may be considered to have found the work unsuitable (wholly or partly). Of course, the personality factors cannot be adequately expressed in summary tables such as these, so that there are exceptions to the general trends which cannot be explained solely in terms of the data given. Some of them have been dealt with separately. These apart, however, the tables show quite definitely that there are *desirable* minimum qualifications for almost every class of work and that the Institute's methods of examination are giving suitable measures of these.

When these tables were first compiled, the names were taken as they occurred in the files, viz. in order of school ; afterwards they were re-arranged. It was soon apparent that the investigators had not used any particular test or group of tests as the *main* factor in arriving at a recommendation. The grades of ability in almost every test were widely distributed. In the clerical and shop classes, of course, there was a selection based upon intelligence and school records ; but in the manual classes (the great majority) this was clearly not the case. Here, however, we have to include those children whom the investigator cannot really advise at all. Their abilities may be too low even for an ordinary manual occupation, and the fact that this is 'recommended'



does not mean that the investigator regards it as a happy choice. There are, as the tables show, quite a number of children in this area who belong to that unfortunate class that can do successful work only when the conditions of employment are simple and the employer's expectations are low. When there is pressure of competition or when adaptability and responsibility are required, such an employee fails to give satisfaction and may eventually become unemployable. These cases are found to have E ratings in practically every ability. It should be added that these ratings are based upon the marks obtained relative to the other members of *this* group. They have not been compared directly with groups in other areas, although this can be done if necessary by means of the test scores. The Intelligence measures are, of course, directly comparable with any group.

(1) *Minimal Qualifications desirable for Work in Offices and Shops*  
(Tables XV, XVI, XVII, XVIII, XIX)

The requirements of offices are fairly well defined. A girl who is to be successful must have the capacity to become efficient in shorthand and typewriting or in book-keeping. She must be what the employer calls 'intelligent,' resourceful, and adaptable. She must possess sufficient scholastic attainment to write, spell, and calculate accurately and speedily.

The standards set by the investigators are clearly seen in Tables XV-XVI. The lowest Intelligence Quotient is 100, the scholastic attainments are never worse than C (average), while the ratings for temperament are C (plus) or better. Yet, from the results shown, these relatively high standards do not seem high enough. Those who have succeeded in making an *unqualified* success of this occupation possess much better abilities than these. Accordingly, the following qualifications are suggested as desirable :

- (a) An Intelligence Quotient of at least 105.
- (b) B ratings in English and Arithmetic. These should be derived from scores in standardized tests and not from teachers' marks.
- (c) B ratings in Temperamental Qualities (A ratings from teachers).
- (d) B ratings in Memory for items or similar tests.

In the case of boys, office work does not usually entail proficiency in shorthand and typewriting, but requires a more general equipment



and, since promotion is a more vital matter for the boy than for the girl, a higher general level of ability. For this reason an Intelligence Quotient of 110 is suggested, though it may be admitted that for some offices boys of rather lower ability may prove suitable.

It may be useful to compare these results with some data obtained in another part of Fife in connection with the Day School Certificate (Higher). This certificate is being demanded more and more by employers as a necessary qualification for junior clerks. We have found that the mean Intelligence Quotient of the successful candidates from a large secondary school was 112, while the mean Intelligence Quotient of those who failed in the examination was 105. The mean Intelligence Quotient of others of the same age who were not sufficiently advanced to be put forward for examination was 100. Clearly office work demands an 'above average' type of boy and girl.<sup>1</sup>

Work in shops is more varied than in offices and in some cases abilities of a much lower level may prove satisfactory. The following qualifications are suggested for both boys and girls :

- (a) an Intelligence Quotient of at least 95.
- (b) a B rating in Arithmetic and a C rating in English.
- (c) B ratings for sociability and co-operativeness combined with C ratings for efficiency in practical affairs.
- (d) B ratings in Memory for items or in similar tests.

It is not easy to compare the above figures directly with the standards set by the Institute in its more specialized work of staff selection ; but there is a considerable degree of resemblance, and where staff recruits have been obtained from the highest classes of elementary schools the standards must be very similar.

## (2) *Minimal Qualifications desirable in Skilled Manual Work*

(Tables XX and XXIII)

Variety in manual work is extremely great, even in a small town, and there can be no doubt that where highly specialized abilities are

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<sup>1</sup> It may be useful to mention that the minimal qualifications proposed in this chapter are not derived solely from the data of this experiment. F. M. Earle, in particular, is using experience gained in school administration to modify the 'raw' figures provided by the experiment, wherever such modification seems desirable.



required recruitment must be by special selection methods which lie quite beyond the scope of the vocational adviser. It may be that, in time, the psychological studies made by the latter will be full enough to enable him to include highly specialized manual occupations in his survey. For the present, however, he must be content with the broader and more general differences disclosed by his simpler measures. One reason lies in the fact, discussed in Chapter III, that many of his manual tests do not give measures which can be depended upon over a long interval of time. Perhaps, underlying this, the psychological processes connected with skills may be such that forecasts of the future quality of a skill can never be made with high reliability. In that case measures of skill will have to be taken periodically and the forecasts revised when necessary. Vocational advising in regard to a manual occupation may therefore require a continuous survey rather than a single examination prior to its commencement. This is a problem for the future.

The assistance that can be given to a boy or girl at fourteen choosing a manual occupation is, however, extremely important. There is a vast difference between work of the simple, repetitive type, and work which involves an understanding of machinery. The former may be successfully performed by boys and girls of quite dull wits provided they have the necessary strength of body and power of quick movement. The latter usually requires intelligence, although it may be expressed in practical rather than in abstract ways. The boy who can adjust a piece of machinery, even though he cannot write a decent letter or do a simple sum in arithmetic, is not so common as is supposed, but he is to be found in most schools. The Institute's procedure in these cases does disclose the boys and girls who have the necessary 'practical' abilities for the more difficult types of manual work. The following requirements are suggested :

- (a) An Intelligence Quotient of 90 or more. It should not fall below this, unless the special abilities are very marked. In other words, those whose intelligence is definitely 'below average' should be excluded.
- (b) B ratings (above average) in measures of mechanical ability, including the perception of form relations.
- (c) B ratings in measures of speed in simple repetitive operations. These measures do not necessarily mean that the boy or girl will be expected to do work in which these movements occur. They



signify rather a temperamental attitude to 'speed,' as well as providing some evidence (for what it is worth) that the child is capable of rapid muscular adjustments.

(d) C ratings for efficiency in practical affairs (temperament).

It should be noted that the scholastic attainments and school record (except in handicrafts) may be ignored altogether. There appears to be no connection between the ability of the child in the abstract school subjects and his efficiency in a practical task.

For ordinary manual occupations (Tables XXI and XXIV) similar qualities at a somewhat lower level are desirable. The Intelligence Quotient might be anything, depending upon the nature of the work. Simple repetitive operations which, once learnt, do not require to be modified can apparently be done by persons whose intelligence (as measured by the usual tests) is very low. But those cases in which the Intelligence Quotient falls below 80 should receive special consideration, as they are not likely to emerge successfully from the ordinary 'rough and tumble' of industrial life. This is partly because of their low mental power and partly because of the inferior perseverance and reliability which so frequently accompanies it. Average ratings in the mechanical ability and speed groups of tests should, however, normally be looked for.

### (3) *Minimal Qualifications desirable in Domestic Work* (Table XXII)

Domestic work is, of course, a manual occupation, but it differs from many manual occupations open to girls (in factories, for instance) in that it does not involve complicated machinery. It belongs to the class of ordinary manual work rather than to the class of skilled manual work. And yet it ought to be regarded as more than a manual occupation, because the girls who are most successful are those who can apply intelligence as well as energy to their work.

In recommending domestic work to girls of fourteen, the investigators have usually been thinking more of the personality factors than of the mental or physical ones. A sociable and co-operative temperament is not merely an asset ; it is an essential. So far as dexterities are concerned, it would seem probable that those girls who fail to secure B ratings for mechanical ability, but who are 'average' or 'better than average' in speed and accuracy of movement, should be able to give a



good account of themselves in domestic service. This is supported by the data. Nearly all the girls who have taken up domestic work (apparently successfully) have good ratings for speed of movement and C (plus), or better, for co-operativeness, etc. But one would think that the intelligence level should be as high as for the skilled trades, 90 at least. This is not the case in our data.

But in this connection it has to be remembered that, but for the temperamental factors, some of these girls might have been advised to seek factory work. Others again, in the country districts, would be advised to seek domestic work instead of factory work because it would be easier to obtain. And there are a few, poor 'all round,' who do not reach the minimum standards for any kind of work and for whom domestic work with a sympathetic employer is the only possible solution of the investigator's problem.

(4) *Minimal Qualifications desirable for Continued Education at Secondary Schools* (Tables XXV and XXVI)

The intention of a pupil to qualify for admission to a secondary school did not arise through anything done or said by the Institute's investigators. This decision was mostly the outcome of the home circumstances and the parents' desire for the advantages to be derived from a more advanced education. But, of course, transfer to a secondary school could not take place until the child had passed the entrance examination prescribed by the Education Committee (uniform throughout the county). Tables XXV and XXVI contain the names of all those who qualified for admission to Dunfermline High School and the corresponding secondary school at Cupar. But since the latter is also a centre for the Advanced Division Technical and Domestic pupils, the names near the bottom of the list include a few who did not embark upon a secondary course of studies, but who were still at school at the last inquiry.<sup>1</sup>

As might be expected the most obvious characteristics of this group are :

- (a) High general intelligence. Few whose Intelligence Quotient is below 110 complete successfully a three years' course.

<sup>1</sup> This school did not, however, become a centre for qualified pupils until the experiment had been in progress for some years.



- (b) High ratings (A and B) in school subjects.
- (c) Superior ratings for temperamental qualities.

It does not follow, however, that all these boys and girls were very well suited by the type of secondary education they have been given. Many of them also possess the abilities mentioned in connection with skilled manual occupations ; and it might have been better for them if their further education had had a technical or commercial, rather than a linguistic, bias. But these are questions rather beyond the scope of our present inquiry. Perhaps the most important fact which emerges is that the level of intellectual ability which is necessary for the satisfactory completion of a secondary school course is far beyond that required for most of the occupations of the community. If we take the School-leaving Certificate as proof that such a course has been successfully completed we find that the following quotients are desirable.<sup>1</sup>

Pupils of Intelligence Quotient 120 (and over) have a 62 per cent. chance of success in their fifth year and a 96 per cent. chance in their sixth year. Pupils of Intelligence Quotient 112 to 119 have a 30 per cent. chance of success in their fifth year and an 83 per cent. chance of success in their sixth year. Pupils of Intelligence Quotient less than 112 have a 9 per cent. chance of success in their fifth year, a 17 per cent. chance in their sixth year and a 50 per cent. chance in their seventh year. (Of course, normally efficient teaching is here assumed ; there are no reasons for supposing that these candidates were less skilfully, or more skilfully, taught than any others.)

If we take the Day School Certificate (Higher) after a three years' course as our criterion the intellectual levels, as stated above, are almost identical (Intelligence Quotient 112 representing the 'norm' for success at this stage).

If these results be compared with the findings of the Mental Survey Committee regarding the intelligence of Scottish children, in which the proportion of children of Intelligence Quotient over 110 was calculated to be about 27 per cent., it is apparent that the aims and methods of secondary education should not be determined solely by School-leaving Certificates.

The number of girls in Table XXV is 45. Of these five attended

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<sup>1</sup> Obtained by F. M. Earle at Kirkcaldy High School from data collected between 1930 and 1934.



country schools, so that only 8 per cent. of girls from the country elected to continue their education to an advanced stage. On Table XXVI there are 48 boys, of whom seven attended country schools. There are thus 9 per cent. of boys from country schools continuing their education. The corresponding percentages for the town schools are 24 and 25 respectively. If we take the total of those who *attempted* a secondary course the percentages work out at 19 and 20 respectively for boys and girls.

It will have been noticed in Tables XV to XXIV that there are boys and girls whose general capacity would have been sufficient for them to attempt a secondary course. Altogether, therefore, the total number of those who may be considered fit for secondary education approaches the figure given by the Mental Survey Committee (p. 58) for the proportion of children of Intelligence Quotients over 110. On the other hand, there are among those in Tables XXV and XXVI a number of persons who were ill advised to attempt this more advanced work. Usually when a boy or girl leaves a secondary school in the second year without completing the third year, it is because the progress made is not sufficient. The number of cases falling in this group in Table XXV is 12 and in Table XXVI is 9.

The occupational qualifications of the boys and girls in these two tables may be summarized as follows :

PERCENTAGE OF CHILDREN WHO MAY BE CONSIDERED CAPABLE OF

—		a Profession	Clerical or Shop Work	Skilled Manual Work	Ordinary Manual Work	Domestic Work
Boys	- -	67	83	73	27	—
Girls	- -	70	73	47	84	75

Thus, approximately 70 per cent. of the boys and girls of this experiment who entered the secondary schools appear suitable for a professional career, while a slightly higher proportion appear suitable for a business occupation. The advice actually offered would of course depend upon the individual circumstances.



## V. GENERAL SUMMARY AND CONCLUSIONS

This experiment has produced a number of interesting and valuable results which should help to clarify considerably the fundamental issues not only in vocational guidance but in school problems also. Samples of urban and rural school communities have been surveyed. By this procedure, and by not restricting our inquiry to one age-group (as in London), we have been able to obtain not only the opportunities for continued observation which we desired, but also groups of cases which together make up a fairly complete picture of the school community. Only the certified mentally defective children are missing from our survey. The inclusion of school Z (*cf.* p. 26) does not seem to have increased unduly the total number of cases of high intelligence ; on the other hand, it has given us a much better insight into the true nature of our problem than the London experiment was able to do. There the average Intelligence Quotient of the age groups examined was not higher than 92, indicating that the school leavers at 14 years of age had been very effectively 'creamed' of their brightest members. Here, although the investigators have not been called upon to advise vocationally those who continued their education, we can see what has happened to them and in what direction their future career will probably lie.

If, then, we think of vocational advising in terms of the occupations available in a community, it follows that the levels of ability necessary in many of these occupations, as well as the standards of performance that are acceptable, are not nearly so high as are the demands of the secondary schools. It also follows that the preparation for life which any secondary (or central) school gives must be examined from a fresh standpoint. If we wish a larger proportion (less than 20 per cent. at present) to be educated in these schools, we shall have to revise our standards of expectation as well as our aims and methods. This is not the place to discuss this question ; the implications, however, are obvious.

But the experiment has done more than give us a set of data which reflect the varying abilities of the children of a typical community. It has shown that there is a consistency in the measures given by these



methods of examination which is of the greatest significance to the vocational adviser. It is true that some of the observations are more consistent than others ; but, on the whole, those which are required *most* in the differentiation of individuals have proved themselves reliable and consistent enough for the purposes to which they are being put. They disclose differences between individuals which are not the effect of chance circumstances but of something more fundamental. The child who does badly in a school examination may excuse his failure on the ground that he was absent from school at a critical stage in the instruction, that he neglected to prepare adequately, or the like. So long as these explanations are applicable, there must remain considerable doubt as to the child's real ability. In the majority of tests such as were used in this experiment, doubts cannot arise to anything like the same extent. If we are in doubt at all, it is as to the possibility of developing an ability which, according to our tests, seems totally lacking. But when, as our data show, the lack of an ability (verbal, mechanical or manual) at the age of 13 follows the lack of it at the age of 11 and 12, we are justified in assuming that for the majority of cases the two facts are connected. In other words, we may assume that the child has failed to develop the ability between the ages of 11 and 13 because he lacks the fundamental aptitudes, attitudes, temperamental qualities (whatever they are) which make this development possible. Moreover, from the point of view of proficiency in an occupation, it is generally beside the point to say that the child could have developed the ability if he had been so minded (or made, or encouraged, or persuaded, etc.) ; the fact is that he does not possess it.

Our difficulty in the past has been to know what abilities to expect or to look for in the apprentice to an occupation at the commencement of his apprenticeship. Certain of these difficulties have now been removed.

### *Summary of Results*

1. On the whole, the children attending the rural schools examined in this inquiry are found to be rather less proficient in abstract school subjects than the children attending the town schools. On the other hand, they appear to be rather more competent in dealing with practical problems. The superiority of the town children in school subjects is also associated with a superior performance in tests of intelligence.



A superior performance in tests of practical ability—mechanical and manual—does not necessarily accompany a superior performance either in scholastic work or in tests of intelligence, although frequently it accompanies both. Hence the superiority of the country children in some of the practical tests is quite consistent with the other results.

2. The consistency of the measures given by tests of *intelligence* applied to the same individuals after a prolonged interval of time is sufficiently high to justify what may be called 'long range' forecasts. A successful performance in those activities which are known to require the abilities associated with a successful performance in 'intelligence tests' may be predicted with a considerable degree of confidence, provided that the test measures are sufficiently reliable. The tests must be chosen with care, and their reliability and validity established.

An equally high consistency of the measures given by the tests of *scholastic attainments* used by us is, however, not maintained over periods longer than one year. It is not possible, therefore, to predict the quality of a child's performance in his future school work, when the data to be used consist solely of marks in such tests of scholastic attainment, with the same degree of confidence as when the data consist of or include a reliable measure of general intelligence. We may predict the child's performance in school work a year hence, or even two years hence, with fair confidence, but (unless we have supplementary information at intermediate stages, which, of course, alters the situation altogether) we cannot look much further ahead.

3. The consistency of the measures of mechanical ability applied to the same individual over an extended period is sufficiently high to warrant forecasts from the age of 13, perhaps even from the age of 12. But in regard to manual dexterity some of the measures can be depended upon only for what we may call 'short-range' forecasts, at all events until the ability has become stabilized. The age at which this occurs varies from one individual to another.

4. The general procedure of the psychological examination in vocational guidance is found to be both valid and reliable. The importance of particular abilities in relation to particular occupations is clearly shown.

5. Minimum standards of proficiency in important aspects of the individual's aptitude, experience and temperament are proposed for each of the main occupations studied.



## APPENDIX

TABLE I<sup>1</sup>

COMPARISON OF TOWN AND COUNTRY CHILDREN IN SCHOOL ATTAINMENTS  
(Mean Scores in English Test)

Country Schools								Town Schools								
School -	A		B		C		Total		X		Y		Z		Total	
Sex -	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																
Under 11	194	163	—	—	—	—	194	163	—	—	238	243	279	285	249	260
11-12	157	274	225	254	230	248	203	255	211	237	245	236	272	273	236	249
12-13	173	192	184	283	229	271	199	263	203	217	237	240	261	264	231	239
13-14	—	—	264	230	267	270	257	243	202	200	213	172	288	271	222	210
Over 14	—	—	304	—	—	256	304	256	—	—	239	188	—	232	239	210

(Mean Scores in Arithmetic Test)

Country Schools								Town Schools								
School -	A		B		C		Total		X		Y		Z		Total	
Sex -	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																
Under 11	112	116	—	—	—	—	112	116	—	—	179	168	263	217	184	198
11-12	108	157	166	194	177	218	148	201	162	173	178	193	214	209	181	190
12-13	118	127	134	206	179	222	152	197	155	169	190	208	209	217	183	192
13-14	—	—	193	179	229	228	202	193	141	156	170	174	228	223	168	180
Over 14	—	—	181	—	185	—	182	—	—	—	165	163	—	202	165	182

<sup>1</sup> In these and Tables II to VIII the figures in the rows are the mean or average scores for the children of each age group (first testing). The differences between town and country children as a whole are obtained by comparing the figures in the 'totals' columns.

In some tests the scores are 'credit marks' and the highest figure is best; in other tests the score is a 'time score' and the lowest figure is best. The tables in which the lowest score is best are marked \*.



TABLE II

*(Mean Scores in Tests of Mechanical Ability)*

## (1) Mechanical Ability

Country Schools										Town Schools									
School	-	-	A		B		C		Total		X		Y		Z		Total		
Sex	-	-	-	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																			
Under 11	-	-	23	5	—	—	—	—	23	5	—	—	20	11	19	13	20	12	
11-12	-	-	28	7	29	3	29	9	26	6	17	8	19	12	39	15	23	11	
12-13	-	-	36	15	21	14	40	16	32	15	25	12	20	7	43	17	27	10	
13-14	-	-	69	—	37	20	43	19	42	18	26	9	23	11	51	17	33	11	
Over 14	-	-	—	—	43	—	—	34	43	34	—	—	19	2	—	8	19	5	

## (2) Cube-construction

Under 11	-	-	10	8	—	—	—	—	10 8	—	—	10	8	12	13	11 10
11-12	-	-	12	12	12	10	12	14	12 11	11	10	10	10	14	12	11 11
12-13	-	-	12	11	12	13	13	13	12 12	11	11	11	8	13	13	12 11
13-14	-	-	8	2	13	10	12	15	11 11	10	10	9	8	13	12	11 10
Over 14	-	-	—	—	11	—	—	13	11 13	—	—	11	6	—	9	11 8

## (3) Form Relations

Under 11	-	-	13	9	—	—	—	—	13 9	—	—	17	14	13	22	15 16
11-12	-	-	14	13	16	17	16	17	15 16	16	15	15	13	21	19	17 16
12-13	-	-	13	12	10	18	19	18	14 17	15	15	18	13	23	20	18 16
13-14	-	-	23	—	16	19	22	18	20 18	17	18	15	11	23	19	18 16
Over 14	-	-	—	—	20	—	—	11	20 11	—	—	25	11	—	16	25 13.5

## (4) Memory for Designs

Under 11	-	-	16	19	—	—	—	—	16 19	—	—	19	20	24	26	20 22
11-12	-	-	21	24	19	21	22	22	20 22	19	18	18	18	28	26	20 21
12-13	-	-	21	10	17	24	24	20	20 22	17	18	19	16	29	26	21 20
13-14	-	-	28	10	21	23	27	23	26 23	19	16	15	13	31	27	21 18
Over 14	-	-	—	—	23	—	—	18	23 18	—	—	22	5	—	21	22 13



TABLE III

COMPARISON OF TOWN AND COUNTRY CHILDREN IN TESTS OF PRACTICAL ABILITY

(Mean Scores)

(1) Picture Completion

Country Schools										Town Schools							
School -	A		B		C		Total		X		Y		Z		Total		
Sex -	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	
Age																	
Under 11	44	32	—	—	—	—	44	32	—	—	52	56	47	56	51	59	
11-12	49	54	50	31	42	47	47	43	48	49	55	52	66	60	57	53	
12-13	39	46	40	56	49	59	39	57	49	52	53	43	71	69	57	56	
13-14	43	13	55	59	48	70	53	61	54	46	53	51	85	69	63	53	
Over 14	—	—	64	—	—	60	64	60	—	—	65	53	—	47	65	50	

(2) Mazes

Under 11	132	131	—	—	—	—	132	131	—	—	150	140	134	143	147	140
11-12	144	148	139	133	143	148	140	143	140	138	143	142	144	142	142	140
12-13	141	134	142	147	151	151	144	144	140	138	144	147	147	142	143	140
13-14	156	126	146	140	150	146	148	143	139	134	142	129	152	147	146	154
Over 14	—	—	160	—	—	96	160	96	—	—	140	138	—	132	140	135

(3) Cube Imitation

Under 11	6	7	—	—	—	—	6	7	—	7	7	9	8	7	8	8
11-12	7	7	6	8	7	9	6	8	7	7	8	7	8	7	7	7
12-13	7	7	6	7	7	8	7	7	6	7	7	7	8	7	7	7
13-14	—	—	—	—	—	—	—	—	7	8	5	—	7	9	7	8
Over 14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(4) Substitution \*

Under 11	127	130	—	—	—	—	127	130	—	—	121	105	97	104	115	101
11-12	153	123	142	102	137	103	146	106	113	112	112	104	107	93	109	104
12-13	144	124	154	110	98	97	133	109	128	99	117	118	100	91	118	104
13-14	125	194	97	117	99	97	100	109	121	122	129	131	107	102	118	119
Over 14	—	—	87	—	—	102	87	102	—	—	107	134	—	99	107	116

\* Lowest score is best



TABLE IV

COMPARISON OF TOWN AND COUNTRY CHILDREN IN SOME MEMORY TESTS  
(Mean Scores)

## (1) Items

Country Schools										Town Schools							
School	-	-	A		B		C		Total	X		Y		Z		Total	
Sex	-	-	B.	G.	B.	G.	B.	G.	B. G.	B.	G.	B.	G.	B.	G.	B. G.	B. G.
Age																	
Under 11	-	-	9	6	—	—	—	—	9 6	—	21	11	13	15	12	12	13
11-12	-	-	10	15	12	14	10	13	11 14	14	15	12	12	15	16	13	14
12-13	-	-	9	9	11	14	10	12	10 12	12	14	11	13	13	18	12	15
13-14	-	-	—	—	—	—	—	—	— —	18	14	5	—	13	19	11	17

## (2) Faces

Under 11	-	-	4	4	—	—	—	—	4 4	—	8	8	7	9	8	9	9
11-12	-	-	5	7	6	8	6	5	6 7	7	7	8	8	9	8	8	8
12-13	-	-	6	5	4	6	5	7	5 6	8	8	8	9	8	9	8	8
13-14	-	-	—	—	—	—	—	—	— —	8	9	—	—	9	7	9	8

## (3) Names

Under 11	-	-	6	8	—	—	—	—	6 8	—	10	9	9	8	9	9	9
11-12	-	-	7	7	9	10	10	8	9 8	9	9	9	9	10	9	9	9
12-13	-	-	9	8	9	9	7	9	8 9	8	10	9	9	9	9	8	9
13-14	-	-	—	—	—	—	—	—	— —	8	10	9	—	10	10	9	10



TABLE V

## COMPARISON OF TOWN AND COUNTRY CHILDREN IN DEXTERITY TESTS

(Mean Scores)

## (1) Peg Placing Test (i) \*

School -	Country Schools								Town Schools							
	A		B		C		Total		X		Y		Z		Total	
Sex -	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																
Under 11	58	61	—	—	—	—	58	61	—	53	59	53	49	52	58	53
11-12	60	61	60	52	54	53	59	54	56	55	55	52	51	54	54	54
12-13	55	54	55	52	55	54	55	53	55	53	54	50	51	48	53	51
13-14	—	—	—	—	—	—	—	—	50	51	53	—	46	49	48	50

## (2) Peg Placing Test (ii) \*

Under 11	171	150	—	—	—	—	171	150	—	102	133	131	107	110	128	201
11-12	169	156	137	166	119	119	141	126	121	114	130	113	118	118	124	115
12-13	155	118	133	102	114	118	135	110	127	117	111	132	127	106	122	113
13-14	—	—	—	—	—	—	—	—	103	114	186	—	107	104	110	108

## (3) Peg Placing Test (iv) \*

Under 11	55	52	—	—	—	—	55	52	—	61	53	52	49	52	52	53
11-12	57	56	55	51	53	50	55	52	53	52	52	49	45	49	51	50
12-13	54	51	49	49	49	48	51	50	52	49	50	47	51	41	51	48
13-14	—	—	—	—	—	—	—	—	48	48	54	—	45	48	48	48

## (4) Peg Placing Test (iv) \*

Under 11	150	129	—	—	—	—	150	129	—	128	122	111	105	99	119	109
11-12	146	172	122	104	117	139	127	136	113	111	123	111	107	118	116	113
12-13	141	103	124	112	108	113	125	110	116	111	105	109	113	97	112	106
13-14	—	—	—	—	—	—	—	—	104	122	111	—	106	151	107	109

\* Lowest score is best



TABLE VI

COMPARISON OF TOWN AND COUNTRY CHILDREN IN DEXTERITY TESTS  
(Mean Scores)

## (1) Beads

				Country Schools				Town Schools							
School	-	-	-	A	B	C	Total	X	Y	Z	Total				
Sex	-	-	-	B. G.	B. G.	B. G.	B. G.	B. G.	B. G.	B. G.	B. G.	B. G.	B. G.	B. G.	B. G.
Age															
Under 11	-	-	-	24 27	— —	— —	24 27	— —	25 32	31 40	26 34				
11-12	-	-	-	26 32	31 30	31 35	29 33	33 31	29 37	29 31	30 32				
12-13	-	-	-	31 30	30 37	33 33	31 34	30 33	29 32	26 30	29 32				
13-14	-	-	-	— —	— —	— —	— —	20 35	33 —	32 29	31 31				

## (2) Wool Knotting

Under 11	-	-	-	25 29	— —	— —	25 29	— —	25 27	27 32	19 29				
11-12	-	-	-	24 27	27 28	22 21	25 24	30 28	28 32	31 35	29 31				
12-13	-	-	-	28 36	23 31	22 27	24 31	28 31	28 31	29 31	29 31				
13-14	-	-	-	— —	— —	— —	— —	24 31	29 —	30 31	29 31				

## (3) Disc Placing

Under 11	-	-	-	29 26	— —	— —	29 26	— 32	35 33	34 33	34 33				
11-12	-	-	-	26 25	37 26	38 28	34 27	28 26	31 32	40 32	31 32				
12-13	-	-	-	24 21	37 28	40 29	33 27	30 31	31 31	36 37	30 33				
13-14	-	-	-	— —	— —	— —	— —	35 33	30 —	44 45	39 40				

## (4) Aiming Pencil (1)

Under 11	-	-	-	13 19	— —	— —	13 19	— 16	21 22	20 22	21 21				
11-12	-	-	-	18 20	21 20	15 19	19 20	20 20	21 23	22 21	21 21				
12-13	-	-	-	20 24	18 21	15 21	18 22	19 20	20 20	21 21	20 20				
13-14	-	-	-	— —	— —	— —	— —	22 20	20 —	20 24	20 22				

## (5) Aiming Needle (2)

Under 11	-	-	-	2 4	— —	— —	2 4	— 4	6 5	5 7	6 5				
11-12	-	-	-	2 6	5 7	5 7	4 7	5 7	5 9	6 9	5 8				
12-13	-	-	-	4 5	3 9	5 9	4 8	6 8	6 9	4 11	5 9				
13-14	-	-	-	— —	— —	— —	— —	3 10	4 —	6 9	5 9				



TABLE VII

## COMPARISON OF TOWN AND COUNTRY CHILDREN IN SPEED TESTS

(Mean Scores)

(1) Nuts and Bolts \*

Country Schools								Town Schools								
School -	A		B		C		Total		X		Y		Z		Total	
Sex -	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																
Under 11	313	323	—	—	—	—	313	323	—	—	271	272	263	287	279	273
11-12	257	329	222	271	213	313	239	304	248	341	252	274	219	274	245	310
12-13	255	256	245	238	179	267	230	261	238	283	265	312	197	255	240	280
13-14	228	411	192	233	210	242	197	251	233	271	226	300	197	222	218	215
Over 14	—	—	168	—	—	142	168	142	—	—	194	178	—	229	194	204

(2) Tapping

Under 11	227	210	—	—	—	—	227	210	—	225	215	244	240	241	221	241
11-12	229	221	202	201	259	217	221	213	221	224	222	228	251	245	226	231
12-13	238	254	171	227	226	231	216	235	224	220	240	240	253	273	233	241
13-14	—	—	—	—	—	—	—	—	272	225	171	—	292	313	258	278

(3) Speed (1)

Under 11	130	123	—	—	—	—	130	123	—	133	116	145	137	178	121	154
11-12	124	162	112	120	125	125	118	131	114	107	119	128	131	113	119	114
12-13	122	132	102	127	128	144	118	133	110	121	112	118	110	115	111	119
13-14	—	—	—	—	—	—	—	—	134	100	82	—	126	143	116	126

(4) Speed (2)

Under 11	151	162	—	—	—	—	151	162	—	149	160	197	182	199	165	193
11-12	151	168	163	185	161	159	160	168	153	146	162	164	187	163	163	155
12-13	165	177	157	180	188	178	170	178	158	166	156	164	160	169	158	169
13-14	—	—	—	—	—	—	—	—	175	134	121	—	205	195	179	170

(5) Screw Twisting \*

Under 11	76	96	—	—	—	—	76	96	—	74	49	62	60	55	52	61
11-12	77	81	57	78	54	69	61	74	58	67	64	54	55	56	60	60
12-13	71	71	74	66	60	63	68	67	56	61	59	59	51	59	56	60
13-14	—	—	—	—	—	—	—	—	69	60	73	—	48	54	66	56

\* Lowest score is best



TABLE VIII  
COMPARISON OF TOWN AND COUNTRY CHILDREN IN PERCEPTION TESTS  
(Mean Scores)

(1) Tracing																			
Country Schools										Town Schools									
School	-	-	A		B		C		Total		X		Y		Z		Total		
Sex	-	-	-	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.
Age																			
Under 11	-	-	34	32	—	—	—	—	34	22	—	14	10	10	9	13	10	11	
11-12	-	-	34	30	8	10	9	13	15	16	12	9	10	11	10	10	10	10	
12-13	-	-	41	31	12	16	14	20	24	21	9	7	13	9	13	11	12	9	
13-14	-	-	—	—	—	—	—	—	—	—	6	15	9	—	16	12	13	13	
(2) Parallel Lines																			
Under 11	-	-	4	3	—	—	—	—	4	3	—	5	.82	2	2	1	1	2	
11-12	-	-	$\frac{1}{2}$	5	2	1	6	3	2	3	1	4	4	3	5	3	3	3	
12-13	-	-	3	—4	3	3	4	4	4	2	1	4	3	4	6	6	3	4	
13-14	-	-	—	—	—	—	—	—	—	—	7	2	.1	—	6	8	5	5	
(3) Pursuit																			
Under 11	-	-	18	9	—	—	—	—	18	9	—	17	24	23	24	25	24	23	
11-12	-	-	14	22	21	21	20	23	20	22	22	19	22	23	26	25	23	22	
12-13	-	-	19	.19	20	24	15	23	18	22	19	21	25	24	25	22	26	22	
13-14	-	-	—	—	—	—	—	—	—	—	23	25	12	—	25	28	21	27	

TABLE IX  
CONSISTENCY OF MEASURES OF INTELLIGENCE  
(As shown by the Agreement between Scores in Different Age Groups (and Sexes) obtained from the same Individuals after Intervals of One Year and Two Years respectively)

(1) Revised Stanford-Binet Individual Test						
Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	—	—	.78 ± .059	—	—	.93 ± .023
11	.97 ± .012	.95 ± .018	.89 ± .018	.99 ± .006	.89 ± .034	.87 ± .024
12	.91 ± .018	1.00 ± .006	.96 ± .012	.93 ± .013	.95 ± .018	.80 ± .054
13	.98 ± .006	—	—	1.00 ± .006	—	—
(2) N.I.I.P. Group Test No. 34						
10	.82 ± .049	.83 ± .049	.88 ± .034	.89 ± .034	.95 ± .018	.95 ± .018
11	.92 ± .012	.93 ± .013	.86 ± .022	.81 ± .029	.93 ± .013	.89 ± .019
12	.89 ± .019	.95 ± .018	.95 ± .018	.82 ± .030	.88 ± .034	.79 ± .059
13	.69 ± .081	.99 ± .006	.51 ± .113	.95 ± .016	1.00 ± .006	1.00 ± .006

$r_{12}$  } = Correlation between measures taken in successive years.

$r_{23}$  }

$r_{13}$  = Correlation between measures taken after a two-year interval.  
(Correlations calculated by product-moment formula.)



TABLE X  
COMPONENT PARTS OF GROUP TEST 34  
(1) Picture-completion

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	$\cdot 26 \pm \cdot 141$	$\cdot 39 \pm \cdot 129$	$\cdot 21 \pm \cdot 145$	$\cdot 32 \pm \cdot 135$	$\cdot 80 \pm \cdot 054$	$\cdot 43 \pm \cdot 124$
11	$\cdot 55 \pm \cdot 057$	$\cdot 37 \pm \cdot 076$	$\cdot 24 \pm \cdot 079$	$\cdot 32 \pm \cdot 072$	$\cdot 65 \pm \cdot 051$	$\cdot 21 \pm \cdot 079$
12	$\cdot 59 \pm \cdot 056$	$\cdot 58 \pm \cdot 100$	$\cdot 68 \pm \cdot 081$	$\cdot 60 \pm \cdot 058$	$\cdot 47 \pm \cdot 119$	$\cdot 30 \pm \cdot 137$
13	$\cdot 44 \pm \cdot 122$	$\cdot 95 \pm \cdot 018$	$\cdot 42 \pm \cdot 124$	$\cdot 92 \pm \cdot 023$	$\cdot 88 \pm \cdot 034$	$\cdot 26 \pm \cdot 141$

## (2) Comprehension

10	$\cdot 52 \pm \cdot 110$	$\cdot 81 \pm \cdot 054$	$\cdot 48 \pm \cdot 116$	$\cdot 71 \pm \cdot 077$	$\cdot 72 \pm \cdot 073$	$\cdot 85 \pm \cdot 044$
11	$\cdot 62 \pm \cdot 050$	$\cdot 79 \pm \cdot 034$	$\cdot 55 \pm \cdot 059$	$\cdot 58 \pm \cdot 054$	$\cdot 80 \pm \cdot 031$	$\cdot 69 \pm \cdot 045$
12	$\cdot 75 \pm \cdot 038$	$\cdot 78 \pm \cdot 059$	$\cdot 83 \pm \cdot 049$	$\cdot 63 \pm \cdot 056$	$\cdot 76 \pm \cdot 064$	$\cdot 33 \pm \cdot 135$
13	$\cdot 39 \pm \cdot 129$	$\cdot 91 \pm \cdot 029$	$\cdot 21 \pm \cdot 145$	$\cdot 56 \pm \cdot 104$	$\cdot 52 \pm \cdot 110$	$\cdot 26 \pm \cdot 141$

## (3) Logical Order

10	$\cdot 54 \pm \cdot 107$	$\cdot 70 \pm \cdot 077$	$\cdot 30 \pm \cdot 137$	$\cdot 85 \pm \cdot 044$	$\cdot 81 \pm \cdot 054$	$\cdot 80 \pm \cdot 054$
11	$\cdot 71 \pm \cdot 041$	$\cdot 62 \pm \cdot 054$	$\cdot 58 \pm \cdot 056$	$\cdot 67 \pm \cdot 046$	$\cdot 79 \pm \cdot 034$	$\cdot 64 \pm \cdot 049$
12	$\cdot 68 \pm \cdot 045$	$\cdot 74 \pm \cdot 068$	$\cdot 67 \pm \cdot 085$	$\cdot 63 \pm \cdot 056$	$\cdot 54 \pm \cdot 107$	$\cdot 45 \pm \cdot 122$
13	$\cdot 74 \pm \cdot 068$	$\cdot 42 \pm \cdot 124$	$\cdot 21 \pm \cdot 145$	$\cdot 78 \pm \cdot 059$	$\cdot 52 \pm \cdot 110$	$\cdot 52 \pm \cdot 110$

## (4) Information (particular instances of general rule)

10	$\cdot 62 \pm \cdot 093$	$\cdot 86 \pm \cdot 039$	$\cdot 66 \pm \cdot 085$	$\cdot 84 \pm \cdot 044$	$\cdot 70 \pm \cdot 077$	$\cdot 70 \pm \cdot 077$
11	$\cdot 82 \pm \cdot 026$	$\cdot 75 \pm \cdot 039$	$\cdot 71 \pm \cdot 043$	$\cdot 60 \pm \cdot 052$	$\cdot 70 \pm \cdot 044$	$\cdot 60 \pm \cdot 054$
12	$\cdot 73 \pm \cdot 040$	$\cdot 91 \pm \cdot 029$	$\cdot 93 \pm \cdot 023$	$\cdot 77 \pm \cdot 038$	$\cdot 48 \pm \cdot 116$	$\cdot 67 \pm \cdot 085$
13	$\cdot 38 \pm \cdot 129$	$\cdot 62 \pm \cdot 093$	$\cdot 62 \pm \cdot 093$	$\cdot 32 \pm \cdot 135$	$1\cdot 00 \pm \cdot 006$	$\cdot 52 \pm \cdot 110$

## (5) Classification

10	$\cdot 34 \pm \cdot 133$	$\cdot 20 \pm \cdot 145$	$\cdot 14 \pm \cdot 148$	$\cdot 55 \pm \cdot 107$	$\cdot 75 \pm \cdot 068$	$\cdot 54 \pm \cdot 107$
11	$\cdot 58 \pm \cdot 054$	$\cdot 61 \pm \cdot 056$	$\cdot 36 \pm \cdot 073$	$\cdot 42 \pm \cdot 066$	$\cdot 65 \pm \cdot 051$	$\cdot 42 \pm \cdot 069$
12	$\cdot 52 \pm \cdot 061$	$\cdot 53 \pm \cdot 110$	$\cdot 50 \pm \cdot 113$	$\cdot 33 \pm \cdot 032$	$\cdot 56 \pm \cdot 107$	$\cdot 51 \pm \cdot 113$
13	$\cdot 68 \pm \cdot 081$	$\cdot 50 \pm \cdot 113$	$\cdot 40 \pm \cdot 127$	$\cdot 08 \pm \cdot 150$	$\cdot 26 \pm \cdot 141$	$\cdot 00$

## (6) Analogies

10	$\cdot 65 \pm \cdot 089$	$\cdot 77 \pm \cdot 064$	$\cdot 77 \pm \cdot 064$	$\cdot 63 \pm \cdot 093$	$\cdot 82 \pm \cdot 049$	$\cdot 72 \pm \cdot 073$
11	$\cdot 70 \pm \cdot 041$	$\cdot 58 \pm \cdot 058$	$\cdot 66 \pm \cdot 047$	$\cdot 60 \pm \cdot 052$	$\cdot 75 \pm \cdot 039$	$\cdot 58 \pm \cdot 056$
12	$\cdot 77 \pm \cdot 035$	$\cdot 74 \pm \cdot 068$	$\cdot 56 \pm \cdot 104$	$\cdot 61 \pm \cdot 058$	$\cdot 72 \pm \cdot 073$	$\cdot 68 \pm \cdot 081$
13	$\cdot 39 \pm \cdot 129$	$\cdot 42 \pm \cdot 124$	$\cdot 72 \pm \cdot 073$	$\cdot 06 \pm \cdot 150$	$\cdot 00$	$\cdot 88 \pm \cdot 034$



TABLE X—*continued*

## (7) Mixed Sentences

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	.44 ± .122	.68 ± .081	.32 ± .135	.57 ± .104	.51 ± .113	.59 ± .100
11	.41 ± .068	.60 ± .056	.39 ± .072	.42 ± .066	.71 ± .044	.53 ± .061
12	.43 ± .069	.77 ± .064	.69 ± .081	.30 ± .083	.77 ± .064	.67 ± .085
13	.38 ± .129	— .31 ± .137	1.00 ± .006	— .11 ± .149	.26 ± .141	.52 ± .110

## (8) Word Meaning

10	.47 ± .119	.64 ± .089	.61 ± .097	.79 ± .059	.56 ± .104	.58 ± .100
11	.66 ± .046	.70 ± .044	.57 ± .057	.63 ± .050	.74 ± .039	.53 ± .061
12	.63 ± .052	.91 ± .029	.77 ± .064	.56 ± .062	.64 ± .089	.50 ± .113
13	.89 ± .034	.91 ± .029	1.00 ± .006	.18 ± .146	— .52 ± .110	1.00 ± .006

## (9) Reasoning

10	.75 ± .068	.63 ± .093	.64 ± .089	.90 ± .029	.76 ± .064	.83 ± .049
11	.69 ± .043	.82 ± .029	.73 ± .040	.76 ± .034	.79 ± .034	.74 ± .038
12	.79 ± .033	.70 ± .077	.73 ± .072	.61 ± .058	.83 ± .049	.68 ± .081
13	.67 ± .085	.81 ± .054	.81 ± .054	.97 ± .012	— .52 ± .110	— .52 ± .110

TABLE XI

## CONSISTENCY OF MEASURES OF SCHOLASTIC ATTAINMENT

## (1) English—Burt's Northumberland Test

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	.90 ± .028	.86 ± .039	.78 ± .059	.77 ± .064	.59 ± .100	.47 ± .119
11	.95 ± .009	.55 ± .076	.46 ± .079	.94 ± .009	.88 ± .023	.85 ± .030
12	.94 ± .010	.61 ± .097	.65 ± .089	.87 ± .024	.78 ± .059	.88 ± .034
13	.89 ± .034	.21 ± .144	.81 ± .054	.68 ± .081	1.00 ± .006	1.00 ± .006

## (2) Arithmetic—Burt's Northumberland Test

10	.92 ± .023	.69 ± .081	.73 ± .073	.75 ± .068	.58 ± .100	.66 ± .085
11	.88 ± .019	.77 ± .045	.68 ± .054	.90 ± .016	.76 ± .043	.77 ± .040
12	.88 ± .021	.56 ± .103	.70 ± .077	.84 ± .030	.42 ± .124	.51 ± .113
13	.90 ± .029	.52 ± .110	.62 ± .093	.68 ± .081	.52 ± .110	.52 ± .110



TABLE XII

## CONSISTENCY OF MEASURES OF MECHANICAL ABILITY

## (1) Form Relations Group Test

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	$.88 \pm .034$	$.55 \pm .107$	$.57 \pm .104$	$.71 \pm .077$	$.78 \pm .059$	$.61 \pm .097$
11	$.65 \pm .048$	$.66 \pm .049$	$.51 \pm .063$	$.58 \pm .054$	$.48 \pm .067$	$.54 \pm .059$
12	$.64 \pm .051$	$.66 \pm .085$	$.71 \pm .077$	$.52 \pm .066$	$.48 \pm .116$	$.68 \pm .081$
13	$.80 \pm .054$	$.42 \pm .124$	$.21 \pm .145$	$.11 \pm .149$	$.89 \pm .034$	$.52 \pm .110$

## (2) Memory for Designs Group Test

10	$.52 \pm .110$	$.72 \pm .073$	$.57 \pm .104$	$.56 \pm .104$	$.85 \pm .044$	$.35 \pm .133$
11	$.67 \pm .046$	$.67 \pm .049$	$.62 \pm .052$	$.59 \pm .054$	$.83 \pm .029$	$.62 \pm .052$
12	$.78 \pm .034$	$.77 \pm .064$	$.89 \pm .034$	$.71 \pm .046$	$.83 \pm .049$	$.81 \pm .054$
13	$.86 \pm .039$	$1.00 \pm .006$	$.42 \pm .124$	$1.00 \pm .006$	$1.00 \pm .006$	$1.00 \pm .006$

## (3) Mechanical Ability (Revised Stenquist) Test

10	—	—	$.47 \pm .119$	—	—	$.73 \pm .073$
11	$.76 \pm .064$	$.15 \pm .148$	$.67 \pm .046$	$.67 \pm .085$	$.93 \pm .023$	$.65 \pm .054$
12	$.69 \pm .049$	$.91 \pm .029$	$.81 \pm .054$	$.60 \pm .056$	$.94 \pm .018$	$.46 \pm .119$
13	$.70 \pm .077$	—	—	$1.00 \pm .006$	—	—

## (4) Cube-construction Test

10	—	—	$.44 \pm .122$	—	—	$.20 \pm .145$
11	$.42 \pm .124$	$.66 \pm .085$	$.52 \pm .059$	$.46 \pm .119$	$.51 \pm .113$	$.42 \pm .075$
12	$.53 \pm .066$	$.91 \pm .029$	$.89 \pm .034$	$.56 \pm .060$	$.66 \pm .085$	$.74 \pm .068$
13	$.61 \pm .097$	—	—	$.95 \pm .018$	—	—

TABLE XIII

## CONSISTENCY OF MEASURES OF MANUAL DEXTERITY

## (1) Nuts and Bolts Assembling

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	—	—	$.82 \pm .049$	—	—	$.56 \pm .104$
11	$.88 \pm .034$	$.78 \pm .059$	$.64 \pm .048$	$.78 \pm .059$	$.62 \pm .093$	$.53 \pm .066$
12	$.76 \pm .038$	$1.00 \pm .006$	$.58 \pm .100$	$.61 \pm .056$	$.63 \pm .093$	$.84 \pm .044$
13	$.84 \pm .044$	—	—	$.72 \pm .073$	—	—



TABLE XIII—*continued*

## (2) Screw-twisting

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	—	—	$.49 \pm .116$	—	—	$.51 \pm .113$
11	$.77 \pm .064$	$.35 \pm .133$	$.36 \pm .070$	$.81 \pm .054$	$.57 \pm .104$	$.47 \pm .069$
12	$.38 \pm .078$	$.31 \pm .137$	$.63 \pm .093$	$.43 \pm .072$	$.33 \pm .135$	$.09 \pm .150$
13	$.65 \pm .089$	—	—	$.91 \pm .029$	—	—

## (3) Speed Test (writing)

10	—	—	$.25 \pm .142$	—	—	$.33 \pm .135$
11	$-.09 \pm .150$	$.49 \pm .116$	$.38 \pm .069$	$.67 \pm .085$	$.61 \pm .097$	$.28 \pm .139$
12	$.42 \pm .075$	$.91 \pm .029$	$.35 \pm .133$	$.38 \pm .075$	$.70 \pm .077$	$.31 \pm .137$
13	$.72 \pm .073$	—	—	$.31 \pm .137$	—	—

## (4) Speed Test (writing)

10	—	—	$.69 \pm .081$	—	—	$.32 \pm .135$
11	$.33 \pm .135$	$.36 \pm .131$	$.45 \pm .065$	$.70 \pm .077$	$.87 \pm .039$	$.31 \pm .083$
12	$.50 \pm .068$	$.91 \pm .029$	$.54 \pm .107$	$.43 \pm .072$	$.48 \pm .116$	$.45 \pm .122$
13	$.88 \pm .034$	—	—	$1.00 \pm .006$	—	—

## (5) Tapping

10	—	—	$.60 \pm .097$	—	—	$.69 \pm .081$
11	$.49 \pm .116$	$.47 \pm .119$	$.53 \pm .059$	$.30 \pm .137$	$.83 \pm .049$	$.31 \pm .083$
12	$.58 \pm .060$	$.72 \pm .073$	$.74 \pm .068$	$.37 \pm .076$	$.33 \pm .135$	$.72 \pm .073$
13	$.85 \pm .044$	—	—	$.52 \pm .110$	—	—

## (6) Tracing (by hand).

10	$.12 \pm .149$	$.50 \pm .113$	$-.09 \pm .150$	$-.10 \pm .149$	$.72 \pm .073$	$-.30 \pm .137$
11	$.38 \pm .075$	$.29 \pm .080$	$.04 \pm .087$	$.34 \pm .074$	$.59 \pm .058$	$.004 \pm .091$
12	$.54 \pm .062$	$.48 \pm .116$	$.28 \pm .139$	$.15 \pm .085$	$.36 \pm .131$	$.47 \pm .119$
13	$.54 \pm .107$	$.52 \pm .110$	$.13 \pm .147$	$.21 \pm .145$	$.52 \pm .110$	$-.52 \pm .110$

## (7) Tracing (by eye) [Pursuit Test]

10	$.09 \pm .150$	$.11 \pm .149$	$.62 \pm .093$	$.78 \pm .059$	$.88 \pm .034$	$.83 \pm .049$
11	$.52 \pm .064$	$.35 \pm .077$	$.57 \pm .060$	$.54 \pm .059$	$.36 \pm .076$	$.57 \pm .062$
12	$.64 \pm .051$	$.54 \pm .107$	$.65 \pm .089$	$.41 \pm .076$	$.31 \pm .137$	$.31 \pm .137$
13	$.83 \pm .049$	$.52 \pm .110$	$.37 \pm .131$	$.91 \pm .029$	$.26 \pm .141$	$.52 \pm .110$

## (8) Peg-placing (1)

10	—	—	$.43 \pm .124$	—	—	$.45 \pm .122$
11	$.61 \pm .097$	$.45 \pm .122$	$.31 \pm .135$	$.25 \pm .142$	$.83 \pm .049$	$.31 \pm .135$
12	$.35 \pm .080$	$.21 \pm .145$	$.80 \pm .054$	$.43 \pm .072$	$.61 \pm .097$	$.78 \pm .059$
13	$.25 \pm .142$	—	—	$-.10 \pm .148$	—	—



TABLE XIII—*continued*

## (9) Peg-placing (2)

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	—	—	$.77 \pm .064$	—	—	$.56 \pm .104$
11	$.69 \pm .081$	$.66 \pm .085$	$.83 \pm .026$	$.37 \pm .131$	$.80 \pm .054$	$.58 \pm .060$
12	$.52 \pm .066$	$.81 \pm .054$	$.26 \pm .141$	$.28 \pm .080$	$.26 \pm .141$	$.32 \pm .135$
13	$.68 \pm .081$	—	—	$.72 \pm .073$	—	—

## (10) Peg-placing (3)

10	—	—	$.42 \pm .124$	—	—	$.51 \pm .113$
11	$.77 \pm .064$	$.78 \pm .059$	$.49 \pm .062$	$.63 \pm .093$	$.73 \pm .073$	$.44 \pm .073$
12	$.66 \pm .051$	$.31 \pm .137$	$.57 \pm .104$	$.45 \pm .070$	$.48 \pm .116$	$.29 \pm .139$
13	$.65 \pm .089$	—	—	.00	—	—

## (11) Peg-placing (4)

10	—	—	$.56 \pm .104$	—	—	$.29 \pm .139$
11	$.92 \pm .023$	$.59 \pm .100$	$.45 \pm .065$	$.58 \pm .100$	$.91 \pm .029$	$.55 \pm .064$
12	$.50 \pm .068$	$.72 \pm .073$	$.61 \pm .097$	$.53 \pm .064$	$.68 \pm .081$	$.68 \pm .081$
13	$.74 \pm .068$	—	—	$.81 \pm .054$	—	—

## (12) Wool-knotting

10	—	—	$.77 \pm .064$	—	—	$.65 \pm .089$
11	$.53 \pm .110$	$.13 \pm .149$	$.44 \pm .068$	$.64 \pm .089$	$.39 \pm .129$	$.39 \pm .082$
12	$.35 \pm .084$	$1.00 \pm .006$	$.43 \pm .124$	$.29 \pm .084$	$.21 \pm .145$	$.16 \pm .147$
13	$.59 \pm .100$	—	—	$.62 \pm .093$	—	—

## (13) Bead-threading

10	—	—	$.45 \pm .122$	—	—	$.10 \pm .149$
11	$.04 \pm .151$	.00	$.16 \pm .082$	$.70 \pm .077$	.00	$.38 \pm .082$
12	$.14 \pm .094$	$.72 \pm .073$	$.71 \pm .077$	$.40 \pm .076$	$.70 \pm .077$	$.34 \pm .133$
13	$.73 \pm .073$	—	—	$.72 \pm .073$	—	—

## (14) Disc-placing

10	—	—	$.25 \pm .142$	—	—	$.14 \pm .148$
11	$.49 \pm .116$	$.60 \pm .097$	$.39 \pm .069$	$.20 \pm .145$	$.59 \pm .100$	$.03 \pm .091$
12	$.40 \pm .076$	$.31 \pm .137$	$.41 \pm .127$	$.18 \pm .084$	$.59 \pm .100$	$.03 \pm .151$
13	$.33 \pm .135$	—	—	$.42 \pm .124$	—	—

## (15) Aiming (1) (Pencil)

10	—	—	$.33 \pm .135$	—	—	$.19 \pm .146$
11	$.58 \pm .100$	$.45 \pm .122$	$.25 \pm .076$	$.50 \pm .113$	$.16 \pm .147$	$.23 \pm .087$
12	$.29 \pm .084$	$.57 \pm .104$	$.02 \pm .151$	$.21 \pm .084$	$.88 \pm .034$	$.51 \pm .113$
13	$.38 \pm .129$	—	—	$.31 \pm .137$	—	—



TABLE XIII—*continued*

(16) Aiming (2) (Needle)

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	—	—	$.39 \pm .129$	—	—	$-.51 \pm .113$
11	$.04 \pm .151$	$.30 \pm .137$	$.16 \pm .079$	$.24 \pm .142$	$.02 \pm .151$	$.36 \pm .071$
12	$-.02 \pm .091$	$.16 \pm .147$	$.50 \pm .113$	$.19 \pm .084$	$.56 \pm .104$	$-.02 \pm .151$
13	$.30 \pm .137$	—	—	.00	—	—

(17) Discrimination of Parallel Lines

10	—	—	$.03 \pm .151$	—	—	$-.03 \pm .151$
11	$.67 \pm .085$	$.39 \pm .129$	$.20 \pm .077$	$.65 \pm .089$	$.70 \pm .077$	$.10 \pm .090$
12	$.46 \pm .072$	$.16 \pm .147$	$.11 \pm .149$	$.14 \pm .085$	$.73 \pm .073$	$.58 \pm .100$
13	$-.03 \pm .151$	—	—	$.86 \pm .039$	—	—

TABLE XIV

CONSISTENCY OF OTHER MEASURES OF GENERAL ABILITY

(1) Cube-imitation

Age at First Test	Boys			Girls		
	$r_{12}$	$r_{23}$	$r_{13}$	$r_{12}$	$r_{23}$	$r_{13}$
10	—	—	$.83 \pm .049$	—	—	$.56 \pm .104$
11	$.75 \pm .068$	$.61 \pm .097$	$.65 \pm .048$	$.63 \pm .093$	$.80 \pm .054$	$.57 \pm .062$
12	$.48 \pm .070$	$.91 \pm .029$	$.63 \pm .093$	$.54 \pm .062$	$.54 \pm .107$	$.67 \pm .085$
13	$.65 \pm .089$	—	—	$.72 \pm .073$	—	—

(2) Substitution

10	—	—	$.59 \pm .100$	—	—	$.64 \pm .089$
11	$.78 \pm .059$	$.93 \pm .023$	$.48 \pm .062$	$.75 \pm .068$	$.80 \pm .054$	$.59 \pm .060$
12	$.75 \pm .043$	$.62 \pm .093$	$.57 \pm .104$	$.58 \pm .058$	$.38 \pm .129$	$-.07 \pm .150$
13	$.85 \pm .044$	—	—	$.21 \pm .145$	—	—

(3) Picture-completion

10	—	—	$.49 \pm .116$	—	—	$.68 \pm .081$
11	$.47 \pm .119$	$.67 \pm .085$	$.52 \pm .059$	$.47 \pm .119$	$.85 \pm .044$	$.50 \pm .065$
12	$.76 \pm .040$	$.81 \pm .054$	$.87 \pm .039$	$.72 \pm .042$	$.70 \pm .077$	$.50 \pm .113$
13	$.82 \pm .049$	—	—	$.72 \pm .073$	—	—

(4) Mazes

10	—	—	$.29 \pm .139$	—	—	$.69 \pm .081$
11	$.61 \pm .097$	$.46 \pm .119$	$.39 \pm .069$	$.43 \pm .124$	$.64 \pm .089$	$.56 \pm .062$
12	$.56 \pm .066$	$1.00 \pm .006$	$.64 \pm .089$	$.55 \pm .062$	$.41 \pm .127$	$.72 \pm .073$
13	$.67 \pm .085$	—	—	$.62 \pm .093$	—	—



*Interpretation of Tables XV to XXVI*

In the following tables the individual cases have been arranged in groups as follows :

- (A) Those whose abilities approximate to the minimum requirements for the class of work recommended and who may be considered to have given satisfactory service in it.
- (B) Those whose abilities approximate to the minimum requirements both for the class of work recommended and for the class of work in which they appear to be giving satisfaction.
- (C) Those whose abilities approximate to the minimum requirements for the class of work recommended but who do not seem to be giving satisfaction in the work they have obtained.
- (D) Those whose abilities approximate to the minimum requirements for the class of work recommended but who, through lack of suitable employment, have had no opportunity of showing what they can do.
- (E) Those whose abilities do *not* reach the minimum requirements of the work recommended to them and who seem more suitable for the work they have obtained—if any.
- (F) Those whose abilities do *not* reach the minimum requirements of the work recommended to them though they seem to be giving satisfactory service in it.
- (G) Those whose abilities do *not* reach the minimum requirements either of the work recommended to them or of the work in which they are engaged.

It will be realized that these minimum requirements were not definitely in the investigators' minds during the work of advising ; they have been developed since advising ceased. Consequently the cases which fall into categories *E*, *F* and *G* do not necessarily represent inconsistencies in the investigators' standards of judgment. But they do represent cases which in the light of present knowledge could have been better advised.



## NOTES ON TABLE XV

Ten cases have been placed in category A, although numbers 7-10 might have been placed in category B. But the work of shop assistant resembles clerical work more than factory work, in which most of those in category B are engaged.

It will be observed that in the case of numbers 6, 9, and 10 the minimum standards are not quite reached. No. 6 (according to the other ratings) could have attempted skilled manual work, but the balance is in favour of office work. No. 9 has no 'mechanical ability'; in spite of the relatively high intelligence quotient, shop work is probably a better choice than office work. No. 10, in spite of low ratings for memory for items and for arithmetic, conforms to the office 'type' more than to any other except domestic work. It will be interesting to see what happens later on and, if success in this work is maintained, to discover why.

No. 21 was probably advised to attempt clerical work by reason of a good school record; but the combination of temperamental ratings and manual dexterities rather suggests the 'domestic' type.

No. 22 was not well advised to seek an office post.

TABLE XV

GIRLS TO WHOM CLERICAL WORK WAS RECOMMENDED<sup>1</sup>

Reference No.	School	Measures of Intelligence			School Subjects		Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability					Tempera-ment <sup>2</sup>			Occupation found																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		1	2	3	Eng.	Arith.	M.Ab.	C.C.	F.R.	Des.	1. Dexterity			3. Perception	Trac.	Pict.-comp.	Mazes	Cub. Im.	Items	Faces	1	2		3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
											1	2	3												4	B.	W.	N.B.	Tap.	Sp. 2, 1	Ser.	Par.	Pur.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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15	53	B	108	115	—	A	B	B	B	A	D	A	C	C	A	D	C	A	C	B	C	D	A	D	C	B	B	B—C+B—	(1) Domestic; (2) machinist (3) children's nurse.
16	66	B	104	—	—	A	A	C	A	A	C	C	A	C	C	A	E	B	A	E	C	B	A	E	C	C	C	C	(1) Weaver.
17	40	B	102	—	—	B	B	A	A	B	A	C	D	B	B	A	B	C	A	B	C	B	A	A	A	B	B	C+C	(1) Shop assistant; (2) weaver.
18	39	B	113	115	109	B	A	B	A	A	B	C	A	C	A	A	A	D	B	B	B	B	B	D	A	C	B	D+C—	(1) Home domestic service (mother invalid).
19	137	Y	109	108	107	C	C	C	B	C	B	B	C	A	C	D	A	A	B	C	A	B	B	A	B	B	C	C	(1) Unemployed.
20	166	Y	103	107	104	B	C	C	D	B	B	B	B	B	A	B	B	C	C	B	B	D	C	B	B	B	C	C—C	(1) Unemployed.
21	22	C	100	—	—	A	A	A	B	A	C	C	A	B	B	B	C	B	A	A	B	D	C	B	B	B	C	C	(1) Domestic; (2) machinist; (3) domestic.
22	147	Y	94	107	99	D	D	A	B	E	E	C	C	B	B	C	D	B	B	B	C	C	E	D	A	C	D	C	(1) Dressmaker's assistant (cr-rands).

<sup>1</sup> In tables XV-XXIV heavy type is used to mark those values which equal or exceed the minima prescribed, but only in regard to those abilities or traits which dominate the situation. The temperament ratings are grouped 1, 2, 3 corresponding to the classification on p. 16.

## NOTES ON TABLE XVI

The abilities of No. 5 are definitely more suitable for office work than for the work he has obtained. His 'mechanical ability' is poor, but his dexterities are good, so we may expect success in the work found.

No. 7 does not quite reach the standards we now think desirable for office work. A skilled trade would be more suitable.

No. 8 can hardly expect to rise beyond the simpler routine of office work.

TABLE XVI

BOYS TO WHOM CLERICAL WORK WAS SUGGESTED

Refer- ence No.	School	Measures of Intelligence			School Subjects	Measures of Mech. Ability			Measures of Manual Dexterity							Other Measures of Ability					Occupation found											
		Measures of Intelligence				M.A.B.	C.C.	F.R.	Des.	1. Dexterity		2. Speed		3. Perception			Sub.	Pict.-comp.	Mazes	Cub. Im.		Items	Faces									
		1	2	3						1	2	3	4	B.	W.	N.B.								Tap.	Sp. p. 1	Scr.	Pa. 1.	Put.	Trac.			
A 1 404	X	120	—	121	B	C	D	A	C	C	D	A	—	E	A	E	C	A	C	D	A	A	B	C	A	A	B	C	+ C	(1) Junior clerk.		
B 2 468	Y	116	114	112	A	A	C	C	B	D	C	A	A	B	E	C	B	B	C	C	C	A	D	C	A	A	B	— C	+ (1) Apprentice butcher.			
3 441	Y	115	113	114	B	B	C	D	A	B	D	C	A	A	C	C	B	C	C	A	A	C	C	A	B	E	C	+ B	C	+ (1) Shop assistant (errands); (2) ditto (chemist and photographer).		
4 449	Y	106	108	111	B	B	C	C	A	A	C	B	D	B	D	B	A	A	D	C	A	A	C	A	C	A	B	+ C	+ C	+ (1) Learning rose-gardening with father.		
5 463	Y	121	118	115	A	A	D	D	B	C	A	A	C	A	A	B	C	B	D	A	A	B	A	A	A	A	—	B	C	C	+ (1) Errands; (2) warehouse work (packing department).	
D 6 479	Y	110	123	114	B	D	E	C	D	D	A	C	D	B	B	B	D	A	E	C	C	B	A	A	E	B	C	B	— C	— D	No information.	
E 7 338	C	103	—	—	A	A	B	D	A	C	A	E	A	B	B	C	A	B	C	D	A	B	D	A	B	A	C	B	— B	B	B	(1) Farm worker.
8 469	Y	93	97	—	C	C	B	B	A	C	A	B	A	D	B	A	D	A	E	C	B	C	A	B	B	D	C	C	— C	— C	+ (1) Office work; (2) office boy	







10	107	X	93	92	—	D	B	B	C	B	E	E	D	D	C	D	A	A	C	C	D	C	D	A	C	C	B—C+G	(1) Shop assistant (drapery).				
11	110	X	92	94	—	G	D	D	E	E	B	D	D	B	E	E	B	A	B	C	D	B	C	E	B	B	C+G	(1) Shop assistant; (2) shop-assistant.				
B	12	38	C	111	119	108	G	B	C	A	B	B	C	C	C	C	D	E	B	B	C	B	B	A	C	E	B—C+G+	(1) Factory (paper mill).				
13	139	Y	108	—	—	B	B	C	C	—	—	D	D	B	B	E	C	C	C	A	C	C	D	C	B	E	—	C+G+G+	(1) Factory; (2) incapacitated through illness (permanent).			
14	124	X	102	102	—	G	D	C	B	D	C	C	B	C	A	A	C	B	B	A	C	C	A	C	A	B	B	C—G+	(1) Factory; (2) machinist.			
15	64	B	103	105	—	B	B	E	C	D	D	C	B	C	C	D	C	A	E	C	D	C	D	A	B	D	D	G	C+G	(1) Weaver.		
16	160	X	100	112	105	C	C	A	B	C	D	B	C	D	A	A	A	B	—	—	B	A	C	C	D	B	B	C—G+	(1) Warehouse assistant.			
C	17	97	X	102	91	94	D	C	C	B	E	D	D	A	B	C	D	C	E	C	E	E	C	B	B	C	C	D	G—	(1) Machinist.		
18	81	X	100	101	92	D	C	C	E	B	C	C	A	B	D	C	E	E	D	B	D	C	A	E	D	B	B	E	G	C—G—	(1) Shop assistant; (2) factory work (linen), cutting out.	
19	27	C	101	109	103	B	B	C	B	B	D	C	C	E	E	D	E	D	B	C	B	D	A	C	A	C	C	C+G+G+	(1) Factory.			
20	79	X	99	98	—	A	B	E	E	D	C	C	C	B	E	E	C	B	B	—	—	E	C	B	D	—	—	C+G—G—	(1) Shop assistant (dyer's agents); (2) cash girl (grocer's); (3) lift girl; (4) factory; (5) receptionist, (6) unemployed.			
D	21	14	A	105	101	103	G	C	B	C	B	B	A	B	A	A	A	E	E	B	A	D	C	A	B	B	D	B	C	C+	(1) No record of employment.	
22	2	A	101	102	101	E	E	C	D	D	D	C	E	B	B	B	C	E	B	E	C	C	C	C	D	C	C	B	B—G+	(1) No record of employment.		
23	222	Z	89	94	99	E	C	A	C	C	D	A	C	C	A	B	D	C	A	E	D	C	C	D	D	C	C	G	D	G—	(1) Domestic work at home, takes commercial classes.	
E	24	95	X	90	—	—	G	C	B	B	B	C	E	E	B	B	E	E	B	B	D	D	C	A	A	B	B	B	G	D	G	(1) Waitress; (2) factory work (rubber).
25	23	C	88	103	98	E	E	D	B	E	E	C	E	C	E	E	D	C	C	B	E	C	D	D	C	B	D	C	G+G—G	(1) Domestic work.		
G	26	152	X	78	—	—	G	D	C	C	D	D	C	C	E	C	E	B	A	E	C	E	D	D	A	C	B	D	B	B—G	G	Seven temporary posts in a variety of shops; (8) shop assistant; (9) tram-conductress.
27	179	Y	77	—	—	D	D	B	B	C	C	D	D	E	C	C	D	D	E	E	D	E	D	D	E	C	D	—	G+G	G	Six temporary posts as shop assistant; (8) house-table-maid; (7) domestic (maid).	



## NOTES ON TABLE XVIII

No. 4 does not quite reach the standards we propose. But, although a skilled manual occupation would probably suit him better, it must be remembered that he lives in a country village. Hence the work found may prove quite suitable.

Nos. 12 to 15 were not well advised to seek shop work, for their attainments in school subjects tend to correspond with their intelligence quotients. No. 13 has certain finger dexterities which with sociability may be of help to him in the trade of hairdressing, and this seems a happy solution of his problem.

No. 15 resembles the skilled manual rather than the shop assistant type, and if his present occupation requires him to be a "handy man" he will no doubt give satisfaction.

On the whole Nos. 16 to 23 were not well advised to seek shop work, although in some cases there is no very suitable alternative to propose. No. 20 might do reasonably well in a skilled trade, but No. 19 has no manual skills of any sort.

TABLE XVIII

## BOYS TO WHOM WORK AS SHOP ASSISTANTS WAS RECOMMENDED

Refer- ence No.	School	Measures of Intelligence			School Subjects		Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability					Tempera- ment			Occupation found																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		1	2	3	Eng.	Arith.	M. Ab.	C. C.	F. R.	Des.	1. Dexterity		2. Speed			Scr.	Par.	Pur.	Trac.	Sub.	Pict.-comp.	Mazes		Cub. Im.	Items	Faces																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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8	482	Y	102	102	102	C	C	D	E	C	E	A	D	C	B	B	A	B	A	C	C	C	A	B	C	E	C	C	B	D	D	D	(1) Van boy (city bakeries).		
9	438	Y	104	97	—	C	C	B	C	B	E	C	D	C	B	E	C	B	C	—	—	C	D	D	C	—	C	C	+	C	+	(1) Errands (grocer); (2) errands (butcher); (3) idle; "did not like work."			
10	539	Z	93	107	—	C	D	C	D	C	A	C	C	E	C	E	C	D	B	D	A	C	D	A	C	D	B	—	C	+	C	+	(1) Errands; (2) errands; (3) errands.		
11	445	Y	95	94	—	A	C	C	D	B	B	C	D	A	B	C	C	B	C	D	C	B	C	C	C	B	B	A	B	C	—	C	+	(1) Apprentice painter.	
12	440	Y	102	100	102	D	D	C	D	—	—	A	B	C	A	C	D	D	B	D	D	B	A	D	C	—	B	C	—	C	+	(1) Apprentice painter.			
13	410	X	90	98	—	E	D	C	C	B	E	C	C	E	A	C	E	C	A	C	E	D	E	D	C	B	D	B	B	C	D	+	(1) Hairdresser.		
14	342	C	81	81	—	E	D	C	E	B	B	C	A	D	D	B	C	B	D	D	C	B	B	E	B	B	E	E	C	+	C	C	(1) Machine-work (paper mills).		
15	425	X	89	84	—	D	D	B	C	C	B	C	B	C	E	C	C	A	B	E	A	D	D	C	B	D	B	A	C	C	+	C	—	(1) Upholsterer's apprentice; (2) unemployed; (3) cinema attendant.	
16	401	X	99	110	99	C	D	E	C	C	C	A	A	—	—	B	E	C	B	C	D	A	A	B	A	D	D	B	C	+	B	C	+	(1) Errands; (2) papers; (3) van boy; (4) milk boy.	
17	301	A	89	91	89	C	D	D	E	D	E	C	D	E	E	E	C	B	E	D	E	A	B	E	C	E	B	C	C	+	C	+	No record of employment.		
18	318	A	90	96	100	D	D	E	A	D	B	C	C	C	C	B	D	C	E	A	D	A	D	C	A	B	E	D	B	C	—	B	C	No post—unemployed March 1934; trying to get junior clerkship.	
19	495	Y	86	88	—	—	—	E	E	—	—	E	E	E	E	E	E	D	E	—	—	E	E	E	C	—	—	C	+	D	+	C	—	No record of employment.	
20	426	X	90	92	—	C	D	A	C	C	C	C	C	C	A	A	E	C	E	B	B	C	D	C	C	D	B	C	C	—	C	+	(1) Idle; (2) errands; (3) butcher.		
21	529	Z	86	91	97	D	C	C	C	C	A	B	E	C	E	C	B	D	C	E	B	E	C	D	E	D	C	A	D	D	B	—	C	+	No record of employment.
22	395	X	74	—	—	D	E	D	B	D	D	D	A	A	A	E	A	C	E	E	—	E	C	D	C	—	—	C	+	C	—	D	+	No record of employment.	
23	439	Y	80	86	88	D	D	E	D	C	D	A	E	A	A	C	B	D	A	C	C	B	D	E	E	C	E	E	C	+	C	—	C	+	(1) Errands (fishmonger); (2) van boy; (3) errands.



TABLE XIX  
BOYS TO WHOM ERRAND WORK WAS RECOMMENDED

Refer- ence No.	School	Measures of Intelligence			School Subjects	Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability					Tempera- ment			Occupation found										
		1	2	3		Eng.	Arith.	M. Ab.	C. C.	F. R.	D. S.	1. Dexterity		2. Speed		3. Perception	Sub.	Pict.-comp.	Mazes	Cub. Im.	Items		Faces	1	2	3						
												1	2	3	4												B. W.	N. B.	Tap.	Sp. 2, 1	Scr.	Par.
A 1	306	A	83	85	88	E	E	A	A	D	C	B	D	C	D	A	C	A	C	D	B	A	D	E	C	+	C	+	C	+	(1) Errands; (2) ironmonger's assistant.	
2	460	Y	82	86	92	D	C	E	D	C	D	E	B	C	A	D	E	D	E	D	D	B	D	B	C	+	D	+	C	+	(1) Apprentice grocer.	
3	504	Y	84	86	—	D	D	E	D	D	E	B	D	C	C	E	D	D	C	D	C	D	D	D	C	—	D	+	(1) Unskilled work in brick-yards.			
4	433	X	83	—	—	C	C	E	C	D	D	B	E	D	A	C	D	C	A	D	E	D	A	E	E	B	C	E	B	C	(1) Unemployed; (2) errands; (3) errands.	
5	421	X	87	73	85	E	D	D	D	E	E	D	C	B	E	D	C	B	A	A	D	C	C	B	C	C	C	—	C	(1) Errands; (2) brickworks; (3) errands.		
B 6	389	X	88	—	—	C	C	E	D	E	C	C	A	B	E	E	E	D	E	C	E	C	E	B	D	C	C	+	C	—	(1) Idle; (2) apprentice joiner; (3) lorry; (4) mechanic; (5) temporary porter.	
D 7	363	B	80	80	—	D	D	E	D	C	C	D	D	C	C	D	B	E	C	A	C	B	E	D	B	B	C	D	D	(1) Unemployed (broken leg).		
E 8	428	X	61	61	—	E	E	D	D	E	E	E	B	C	E	E	E	E	C	D	D	E	E	E	E	E	B	C	—	D	+	(1) Milk boy; (2) brickwork labourer.
G 9	387	X	75	73	—	D	E	C	D	C	E	D	C	B	E	D	D	C	C	A	E	D	E	D	E	C	B	C	C	—	(1) Errands; (2) apprentice motor mechanic.	

NOTES ON TABLE XX

No. 3 is rather slow in movement, which may account for the low rating in Cube-construction, but factory work involving the understanding of machinery is perhaps as suitable a choice as any. Apart from speed, dexterities are above average.

No. 10 was probably not well advised to seek skilled manual work since dexterities are relatively poor. The investigators were probably impressed by the high ratings in the performance tests (other measures of ability).

No. 13 seems more fitted for shop work (which has been tried once, unsuccessfully) than for manual work. Although she has a low rating for arithmetic she has a B rating for social qualities.

Nos. 14 to 19 are, on the whole, more suited to repetitive factory work than to the class of work suggested.

No. 16 could have been put in the ordinary manual group, but the domestic work she has found seems quite suitable.



TABLE XX

GIRLS TO WHOM SKILLED MANUAL WORK WAS RECOMMENDED

Refer- ence No.	School	Measures of Intelligence			School Subjects		Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability					Tempera- ment			Occupation found											
		1	2	3	Eng.	Arith.	M.A.B.	C.C.	F.R.	Des.	1. Dexterity			2. Speed	3. Perception			Sub.	Pict.-comp.	Mazes	Cub. Im.	Items		Faces	1	2	3							
											1	2	3		4	B. W.	N.B.											Tap.	Sp. 2, 1	Scr.	Par.	Par.	Trac.	
A 1	37	C	119	114	—	A	B	B	B	B	E	A	E	A	A	C	C	C	B	D	B	A	B	C	B	C + C	C	(1) Factory work (paper mills).						
2	171	Y	108	112	110	—	—	C	C	B	D	D	D	C	B	C	B	D	A	C	C	B	B	E	C	C	C + C	C	(1) Factory work (rubber).					
3	120	X	104	113	108	C	E	B	B	B	C	—	E	D	E	E	C	B	—	—	E	A	C	A	—	C	C	C	(1) Factory rubber works (pack- ing-room).					
4	215	Z	106	101	—	C	B	B	A	A	B	E	C	D	C	C	B	B	C	C	B	B	B	C	B	C + D	C + (1)	C	Apprentice tailress.					
5	173	Y	99	108	—	B	C	A	C	D	A	C	A	B	B	A	C	A	B	A	C	E	A	A	C	E	—	B	—	C	(1) Machinist (rubber works); (2) unemployed.			
6	31	C	101	—	—	A	A	B	A	A	B	A	A	A	A	A	A	B	A	C	A	A	B	B	B	B	B	B	B	B	(1) Weaver.			
7	146	Y	100	98	96	D	B	A	D	E	C	B	B	B	A	C	C	B	B	D	A	D	B	B	C	B	C	D	C	D	C	(1) Weaver; (2) rubber factory.		
8	89	X	89	92	—	E	C	A	B	C	A	A	A	B	A	B	A	A	C	C	B	C	C	D	C	B	C	C	D	C	C	(1) Errands (dressmaker); (2) wreath-making (florists).		
9	113	X	87	—	—	C	C	A	D	B	C	E	C	—	—	D	C	C	B	C	D	B	D	C	D	A	A	C + C	C	—	(1) Factory work (linen).			
B 10	201	Z	112	107	—	B	C	D	E	B	B	E	E	C	B	C	E	D	A	C	—	—	B	C	B	B	—	—	C	C	C	C	(1) Shop assistant; (2) co-opera- tive stores check office.	
11	56	B	97	95	—	D	E	C	D	C	B	B	E	B	C	C	C	B	C	C	D	B	D	C	C	D	C	D	B	C	C	C	(1) Shop assistant.	
12	189	Z	88	100	—	D	D	C	C	A	A	E	E	B	C	A	A	D	E	A	C	C	C	D	B	D	B	B	—	C	C	C	(1) Shop assistant and errands (dressmakers).	
E 13	109	X	106	111	103	C	D	D	E	D	C	C	B	A	C	D	B	D	D	C	D	C	B	C	C	C	C	C	C	C	C	C	(1) Laundry (packer); (2) unem- ployed.	
14	19	C	95	98	—	C	C	D	D	C	D	C	C	B	B	C	B	D	E	C	D	B	D	C	A	C	C	C	C	C	D	+	C	(1) Weaver.
15	158	Y	93	99	—	E	C	C	C	C	C	B	A	C	B	A	C	C	A	B	A	B	C	D	C	C	D	D	B	C	C	C	C	(1) French polishing (golf club factory); (2) unemployed; (3) laundry (calender).
16	32	C	89	—	—	B	C	D	D	A	D	A	C	B	A	B	B	B	D	B	A	B	A	B	C	B	C	C	+	C	+	(1) Domestic service; (2) domes- tic service.		
17	220	Z	87	—	—	C	C	C	D	—	B	B	C	C	B	D	C	C	C	—	—	A	B	E	C	—	—	C	+	C	—	C	—	(1) Shop assistant (baker); (2) machinist; (3) weaver (silk).
18	76	X	82	—	—	D	B	B	D	C	D	C	B	B	A	E	C	A	A	D	A	C	A	A	B	A	C	C	C	C	C	C	C	(1) Factory; (2) factory (rub- ber).
19	172	Y	82	79	87	E	D	D	C	D	E	C	C	A	C	B	B	A	B	D	E	C	E	E	E	E	C	B	—	C	—	(1) Weaver; (2) factory (rub- ber).		
G 20	83	X	84	—	—	D	D	E	C	C	D	A	C	A	D	C	E	E	E	D	C	D	C	D	D	C	E	B	C	+	C	+	(1) Laundry; (2) waitress; (3) machinist; (4) factory (rub- ber works).	



## NOTES ON TABLE XXI

As the girls in this group, with those in Table XXII, include those who, for one reason or another, are not really suitable for other occupations, it follows that some of the cases do not conform strictly to type.

No. 10 does not show up well in the dexterities but has a practical intelligence which may carry her through.

Nos. 11 and 12, however, are not well equipped in any aspect and their success will depend upon the demands the work eventually makes upon them.

No. 16 seems slow in movement but has intelligence and some practical abilities which may account for her success.

No. 23 seems well enough equipped for simple repetitive work but does not seem likely to succeed in work requiring intelligence.

No. 27 possesses very few qualifications for employment but seems to have found an appropriate occupation.

TABLE XXI

GIRLS TO WHOM ORDINARY MANUAL WORK WAS RECOMMENDED

Refer- ence School No.	Measures of Intelligence			School Subjects		Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability					Tempera- ment			Occupation found											
	1	2	3	Eng.	Arith.	M.Ab.	C.C.	F.R.	Des.	1. Dexterity			2. Speed		3. Perception			Sub.	Pict.-comp.	Mazes	Cub.-Im.		Items	Faces	1	2	3						
										1	2	4	B.	W.	N.B.	Tap.	Sp. 2											Scr.	Par.	Pur.	Trac.		
A 1 160	Y	100	112	105	C	C	A	B	C	D	B	C	D	D	A	A	A	A	B	B	C	B	A	C	C	D	B	B	C	C	+	(1) Warehouse Assistant.	
2 165	Y	97	118	—	C	D	A	D	C	C	B	B	C	B	B	A	A	A	C	B	B	C	E	A	C	A	E	C	C	—	C	—	(1) Factory; (2) domestic (tem- porary); (3) factory (rubber works).
3 51	B	95	94	—	C	C	C	C	B	D	C	D	—	—	D	C	E	D	D	A	B	E	D	B	B	C	E	C	+	C	+	(1) Idle; (2) linen factory (semi- skilled).	
4 94	X	92	97	90	D	C	C	B	D	D	C	A	—	—	D	A	B	B	D	C	B	C	E	B	D	C	E	C	D	C	—	(1) Idle; (2) domestic (temporary); (3) wreath-making; (4) weaver.	
5 28	C	86	88	93	C	C	E	C	C	D	B	B	C	D	C	B	C	B	C	E	E	E	D	D	D	E	E	E	C	+	C	+	(1) Linen factory (several posts promoted machinist).
6 92	X	88	82	85	E	D	C	D	C	D	E	B	A	A	D	E	C	E	C	C	E	C	E	E	E	E	C	E	C	+	C	—	(1) Factory (rubber shoemaking).
7 85	X	84	83	—	E	D	D	D	D	D	B	C	—	—	A	E	B	C	C	—	D	C	E	A	B	B	B	C	D	C	(1) Machinist.		
8 143	Y	84	—	—	D	D	D	C	D	E	E	C	A	D	C	D	D	B	E	D	D	C	E	E	C	E	C	C	C	C	C	(1) Factory (rubber); (2) unem- ployed (factory closed); (3) factory (rubber shoemaking).	
9 108	X	82	—	—	C	C	B	C	—	—	C	D	—	—	D	B	C	E	B	B	D	D	D	B	A	E	—	C	C	—	C	(1) Factory (rubber laying).	
10 67	X	77	76	77	E	E	E	E	D	D	E	C	D	D	D	D	D	D	E	D	D	E	E	B	E	E	C	B	D	C	(1) Laundry.		
11 86	X	74	67	76	E	E	B	C	—	—	C	B	E	D	E	C	D	C	B	—	—	E	D	D	B	—	—	C	D	D	(1) Unemployed; (2) factory (rub- ber shoemaking).		
12 21	C	73	—	—	C	C	A	B	D	C	B	E	D	C	B	C	C	—	B	D	B	D	B	B	C	D	C	C	C	—	C	—	(1) Weaver; (2) factory (paper mills).



B 13	60	B	105	118	108	A	B	E	C	B	C	B	C	B	D	E	E	E	D	B	B	D	C	E	B	C	C	+ C - B	(1) Domestic and dairy work.				
14	34	C	100	118	108	C	B	C	A	A	B	D	C	D	E	A	E	B	B	B	C	E	B	C	E	B	C	B	C	+ (1) Factory (semi-skilled); (2) domestic.			
15	148	Y	102	106	105	C	C	C	D	D	A	A	B	B	B	A	A	E	C	C	C	E	D	B	D	C	C	+ C	C	- (1) Domestic service.			
16	46	B	101	100	95	C	D	C	D	C	D	B	A	B	C	B	D	E	C	D	D	C	E	D	B	B	C	C	+ C + C	(1) Unemployed; (2) weaver.			
17	93	X	91	95	—	D	B	C	B	D	C	A	A	E	B	B	C	C	B	C	C	D	C	C	C	B	B	- C - C	(1) At home (mother ill); (2) unemployed; (3) domestic ("not able for work"); (4) unemployed.				
18	42	B	92	—	—	C	C	A	E	D	D	B	B	C	B	D	D	B	C	E	A	E	C	E	D	C	E	C	C	- (1) Weaver.			
19	106	X	93	87	92	B	D	C	C	C	E	C	A	A	B	B	E	C	D	C	C	C	B	E	D	E	B	C	D	+ D	(1) Machinist; (2) run away from home.		
20	174	Y	86	—	—	D	B	A	B	C	C	A	A	C	C	A	D	E	D	B	B	C	B	C	A	C	+ C - C	(1) Machinist (linen).					
21	49	B	83	—	—	B	B	B	C	B	A	C	C	D	C	C	A	B	D	B	E	D	A	A	C	D	D	B	B	C	C	- C	(1) Idle; (2) weaver; (3) unemployed.
22	70	X	85	79	—	D	E	C	C	E	E	C	B	A	B	A	D	E	A	C	E	C	A	E	B	B	B	B	- C + C	(1) Idle; (2) factory; (3) wreath-making.			
23	176	Y	74	—	—	D	D	E	D	E	C	C	C	—	—	A	A	C	A	E	—	D	C	C	E	—	E	C	- C - C	- (1) Weaving apprentice (linen); (2) unemployed.			
D 24	47	B	93	110	98	D	C	E	C	B	C	B	C	D	E	C	C	E	B	D	C	B	E	D	B	C	C	B	- C + B	- (1) Unemployed (at home).			
E 25	196	Z	89	100	105	E	D	B	C	D	C	E	D	C	E	D	B	D	C	E	E	D	E	E	D	E	D	C	+ C - C	+ (1) Domestic work (at home).			
26	98	X	99	98	—	C	C	D	E	B	D	E	C	E	B	D	E	D	A	B	D	E	C	E	D	B	B	E	B	- C - C	- (1) Errands (milliner's assistant).		
27	41	X	60	—	—	E	E	B	B	C	C	E	A	C	C	C	D	D	E	E	C	E	D	E	D	E	—	C	+ C - C	- (1) Factory sweeper.			
F 28	157	Y	98	98	104	D	E	E	C	D	D	B	D	C	D	C	E	E	B	D	—	E	B	D	E	—	C	C	+ D	C	- (1) Factory (rubber layer).		
29	206	Z	75	80	—	E	E	C	C	C	E	C	B	A	C	C	E	D	E	C	E	E	A	D	E	D	E	D	C	+ C	C	+ (1) Silk factory (semi-skilled).	
G 30	119	X	90	89	93	E	E	B	A	C	C	B	C	D	C	A	C	E	D	E	C	D	E	D	C	D	B	E	E	C	D	C	Unemployed.
31	7	A	91	89	93	E	E	C	E	D	C	C	B	C	E	D	C	C	E	E	E	—	E	E	E	B	E	D	C	+ C - C	No record of employment.		
32	151	Y	67	—	—	E	E	—	E	D	E	—	—	B	C	—	—	D	C	E	E	—	B	E	E	C	D	D	(1) Idle; (2) domestic; (3) factory.				



## NOTES ON TABLE XXII

Recommendations for domestic work have arisen in regard to so many different points that high uniformity in the ratings of individuals of this group can hardly be expected. Sometimes the temperamental ratings are supported by good ratings in the dexterities, sometimes by good ratings in the tests of practical ability, sometimes by intelligence quotients as high as 100. It is in this group perhaps more than in any other, except the shop assistants, that appearance and physique will be deciding factors. Table XXII gives no indication as to the nature of these. This may explain curiosities such as:

No. 13 who does not seem to be very suitable for domestic service but who is holding her post.  
Nos. 50, 51 and 53 whose ratings in tests are uniformly of the lowest order.

TABLE XXII

GIRLS TO WHOM DOMESTIC WORK WAS RECOMMENDED

Refer- ence No.	School No.	Measures of Intelligence			School Subjects		Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability				Tempera- ment			Occupation found												
		1	2	3	Eng.	Arith.	M.A.B.	C.C.	F.R.	Des.	1. Dexterity			2. Speed		3. Perception		Sub.	Pict.-comp.	Mazes	Cub. Im.		Items	Faces										
											1	2	3	4	B.	W.	N.B.								Tap.	Sp. 2.	Scr.	Par.	Pur.	Trac.				
A	1	30	C	90	97	—	C	D	A	A	B	B	C	B	D	C	E	C	D	E	A	D	D	B	B	A	C	B	C	D	C	+ C	C	(1) Domestic.
2	63	B		95	98	—	B	C	E	B	D	B	E	B	D	C	B	A	C	E	C	E	D	B	C	C	D	C	A	B	C	C	(1) Idle; (2) domestic; (3) do- mestic; (4) idle; (5) bakery.	
3	10	A		94	93	—	D	E	C	B	D	C	C	B	B	A	C	D	B	C	D	C	A	C	D	C	E	D	C	B	- C	+ C	(1) Idle; (2) domestic; (3) do- mestic; (4) domestic.	
4	118	X		86	94	93	D	E	B	D	E	E	E	E	C	D	B	D	C	E	E	D	E	D	D	D	D	D	C	C	+ C	(1) Idle; (2) shop; (3) weaver; (4) domestic.		
5	9	A		88	91	91	E	E	E	B	E	D	C	B	D	—	C	E	B	E	E	E	A	D	D	E	C	E	E	C	+ C	+ C	(1) At home.	
6	1	A		82	93	90	D	E	C	B	E	C	E	E	C	C	E	D	C	D	C	C	B	E	C	C	C	B	E	C	+ D	C	(1) Domestic service.	
7	193	Z		88	—	—	D	D	D	B	C	D	A	B	C	C	C	C	D	A	C	C	B	E	D	B	D	C	D	C	D	C	(1) Machinist (rubber works); (2) saleswoman; (3) kitchen- maid.	
8	101	X		86	—	—	C	D	E	C	D	E	C	A	C	C	B	B	C	C	B	E	C	D	E	B	B	C	C	C	C	C	(1) Domestic; (2) unemployed ("wages too small").	
9	178	Y		82	—	—	C	C	D	—	—	—	D	C	D	B	E	C	A	B	E	D	C	C	B	E	D	—	B	- C	- C	(1) At home, mother ill; (2) shop; (3) shop; (4) domestic.		
10	87	X		87	86	—	E	D	B	A	D	C	D	D	—	—	D	B	B	E	B	E	E	B	E	D	A	C	B	B	C	- C	- C	(1) Idle; (2) factory; (3) domes- tic; (4) waitress.



11	65	B	82	—	—	D	D	B	B	D	D	E	E	C	D	C	D	B	D	C	D	A	B	C	E	E	D	D	C	—	Three posts domestic (first mistress died).
12	168	Y	71	79	—	E	C	E	E	E	C	D	C	E	B	B	A	D	E	C	E	E	B	D	E	E	C	D	C	—	Factory (rubber); (2) domestic.
13	177	Y	72	80	79	E	E	E	E	E	E	—	—	D	E	D	B	E	E	E	D	E	E	B	D	E	C	D	C	—	(1) Domestic.
14	153	Y	95	104	112	C	C	D	D	C	B	D	C	B	C	C	E	D	D	C	C	C	E	E	A	E	D	C	—	(1) Shop assistant.	
15	26	C	100	103	106	B	A	D	C	B	C	C	D	E	E	D	C	E	B	C	C	D	B	B	C	D	B	C	C	—	(1) Weaving (linen).
16	57	B	98	104	—	A	D	D	D	C	C	C	D	D	B	C	C	D	D	C	D	C	B	E	C	D	C	C	—	(1) Weaving (linen).	
17	155	Y	100	96	—	D	C	A	B	A	B	A	D	C	C	B	C	C	A	C	C	C	B	B	D	E	C	C	—	(1) Unemployed; (2) shop; (3) factory (rubber).	
18	131	X	100	101	96	C	E	C	D	E	D	C	C	E	B	D	C	B	C	B	E	E	A	C	E	D	D	C	C	—	Factory (rubber).
19	17	C	95	94	90	C	C	C	B	B	C	D	E	A	E	C	D	B	B	C	C	C	D	C	A	D	D	C	—	(1) Factory; (2) weaving.	
20	25	C	95	—	—	B	B	C	A	B	C	A	A	C	C	C	C	B	B	C	A	B	A	B	D	B	C	C	—	(1) Weaving.	
21	18	C	94	—	—	D	C	A	B	D	B	B	C	C	B	E	C	C	C	C	D	B	C	B	C	B	C	C	—	(1) Weaving.	
22	6	A	90	93	—	D	E	A	D	D	B	D	B	C	A	A	A	C	E	C	D	A	E	C	E	E	E	C	—	(1) Factory.	
23	29	C	89	—	—	C	A	C	B	C	B	C	E	D	D	E	D	C	E	E	C	B	C	B	A	D	C	C	—	(1) Weaving (linen).	
24	55	B	88	—	—	C	C	B	D	D	C	C	D	C	C	D	A	A	C	B	C	A	C	A	B	C	A	B	—	(1) Weaving (linen).	
25	134	X	82	91	—	D	E	C	C	B	C	C	C	C	C	C	D	E	D	A	C	B	A	C	B	B	B	C	D	D	(1) Factory (rubber); (2) unemployed (slack trade); (3) factory (rubber), same employer.
26	180	Z	80	—	—	—	—	C	D	—	—	—	—	A	B	C	B	E	C	B	C	A	B	—	—	C	C	B	E	—	(1) Factory (rubber).
27	62	B	90	91	—	—	—	B	C	B	A	C	C	C	B	B	A	E	C	C	C	A	A	D	B	C	B	C	C	—	(1) Factory; (2) factory.
28	105	X	82	—	—	D	D	C	B	B	B	C	E	—	—	D	A	A	C	B	D	C	C	D	E	B	B	C	C	C	(1) Domestic; (2) domestic; (3) weaving; (4) unemployed.



TABLE XXII—continued

Reference School No.	Measures of Intelligence			School Subjects		Measures of Mech. Ability			Measures of Manual Dexterity						Other Measures of Ability					Tempera- ment			Occupation found.									
	1	2	3	Eng.	Arith.	Map.	C.C.	F.R.	Des.	1 Dexterity			2 Speed			3. Perception			Sub. Pict.-comp.	Mazes	Cub. Im.	Items		Faces	1	2	3					
										1	2	3	4	B.	W.	N.B.	Tap.	Sp. 1										Sch.	Par.	Tr.		
29 73	X	82	—	—	C	D	B	B	A	B	D	B	D	E	C	E	E	A	C	—	A	C	B	C	—	C	—	C	+	(1) Idle; (2) factory (rubber shoes).		
30 59	B	82	—	—	D	E	B	C	B	D	—	—	—	D	E	C	A	E	C	D	C	E	B	C	C	B	C	+	C	—	(1) Presumed factory work in brewery.	
31 127	X	82	93	81	D	E	B	C	D	C	—	—	—	D	D	E	D	E	B	E	D	D	B	D	C	C	D	C	+	C	—	(1) Factory (rubber).
32 74	X	80	86	—	E	E	C	B	B	C	D	D	E	E	C	E	C	C	C	D	B	A	D	E	D	B	C	+	C	—	(1) Idle; (2) factory; (3) factory (unskilled).	
33 84	X	77	—	—	E	D	D	C	D	C	—	—	—	D	D	D	B	C	E	D	B	E	C	B	A	C	C	C	C	C	(1) Idle; (2) factory; (3) unemployed (rubber work detrimental to health).	
34 126	X	71	80	—	E	E	C	C	C	E	E	C	E	E	C	E	E	E	A	D	E	A	D	C	D	C	C	C	—	C	(1) Factory (rubber), re-engaged.	
35 150	Y	73	—	—	E	C	C	C	D	D	C	D	C	B	D	B	D	D	A	E	D	D	B	B	D	E	C	+	C	—	(1) Factory (rubber), re-engaged; domestic service in interval, ("wages too small").	
36 48	B	66	—	—	—	—	C	D	—	—	C	D	B	A	B	D	C	C	E	—	D	C	E	C	—	—	C	C	C	C	(1) Factory; (2) weaving.	
37 71	X	63	63	—	E	E	E	D	E	D	E	D	E	D	E	C	E	E	E	E	E	E	E	E	D	E	C	D	C	—	(1) Factory (rubber shoemaking).	
38 121	X	93	98	93	D	C	C	D	E	D	C	A	B	D	B	E	E	A	C	C	E	E	B	E	C	D	C	B	—	C	+	(1) Nursemaid; (2) factory (linen).
39 99	X	93	95	98	D	E	B	B	C	C	D	C	D	C	B	E	D	A	C	B	C	C	D	E	B	B	C	+	D	D	(1) Going with chip potato cart; (2) domestic work at home.	
40 100	X	90	—	—	B	C	B	D	B	C	B	B	C	D	D	C	D	E	C	E	C	B	E	E	B	B	C	+	C	C	+	(1) Waitress in summer time; (2) domestic service; (3) waitress; (4) unemployed.
41 123	X	89	86	—	D	B	E	E	D	D	A	E	E	E	E	A	E	E	C	B	C	D	C	C	C	C	C	+	D	C	(1) Idle; (2) factory; (3) apprentice tailress.	
42 91	X	89	—	—	D	C	E	C	C	D	C	B	B	D	E	C	B	D	A	D	C	A	C	B	B	C	E	C	+	C	C	(1) Machinist; (2) machinist.



43	A		4	113	109	107	B	C	C	B	B	A	E	E	E	D	B	C	C	B	B	C+	C+	C+	(1) Domestic; (2) idle.
44	X		111	109	95	—	B	B	A	B	B	A	A	A	A	A	C	A	A	B	B	B	B-	C+	(1) Domestic; (2) domestic; (3) domestic; (4) idle.
45	C		20	87	103	—	D	C	B	B	B	C	C	C	C	A	B	C	A	C	B	D	C	C	No record of employment.
46	A		3	100	98	—	C	D	B	C	E	B	C	D	D	C	E	C	A	D	C	B	B	-C+	In a home.
47	A		13	83	90	85	E	E	C	E	E	D	C	B	E	E	E	E	B	E	E	C	D	E	(1) Idle; (2) between -maid; (3) unemployed.
48	Y		138	79	—	—	D	D	C	E	E	E	D	E	B	C	D	D	B	B	C	B	D	C	Errands in factory (rubber), promoted to shoemaking.
49	X		136	73	73	74	E	E	D	D	E	D	E	E	D	C	E	C	E	E	D	E	B	D	No record of employment—at home.
50	X		112	60	—	—	E	E	E	C	E	E	C	D	E	E	E	E	E	E	E	D	E	B-D	Domestic work at home—mother dead.
51	A		5	58	61	—	E	E	D	C	E	E	E	E	E	E	E	E	A	E	E	E	D	E	At home—simple home duties.
52	F		8	80	79	82	E	E	C	C	E	D	A	E	C	B	D	C	B	D	A	E	B	E	Domestic service.
53	G		15	61	—	—	E	E	E	E	E	E	E	E	E	E	E	E	E	B	E	E	E	D	(1) Idle; (2) domestic; (3) domes- tic; (4) idle—at home (father ill) first employer removed to Edinburgh).







19	314	A	84	91	—	D	C	A	B	B	A	A	C	A	B	A	C	A	B	D	A	D	E	—	C+ C- C- (1)	Apprentice plumber.							
20	332	C	90	91	—	C	C	B	A	B	B	A	C	B	A	D	B	D	B	C	A	C	B	E	D	B	C+ C	(1)	Apprentice moulder.				
21	378	X	83	85	—	C	D	B	C	C	D	A	B	A	C	A	A	E	C	D	B	C	E	C	D	C+ B- C- (1)	Brick works; (2) apprentice slater.						
22	371	B	91	—	—	A	B	E	C	C	C	E	C	B	C	E	A	C	A	E	A	A	B	D	C+ C+ B- (1)	Apprentice slater and plasterer.							
23	423	X	86	—	—	C	D	C	B	B	B	C	C	D	D	A	A	B	D	C	D	C	D	C	B	C	B	C	B- (1)	Apprentice painter.			
24	528	Z	83	86	—	D	C	A	E	C	C	B	C	A	D	D	B	C	B	E	C	B	D	A	C	B	B	C+ C	C- (1)	Apprentice engineer.			
25	361	B	116	117	91	B	B	B	A	B	C	A	B	A	A	D	D	E	A	C	B	C	B	A	C	B	A	C	C+ C+ C+ (1)	Errands (grocer).			
26	334	C	113	117	—	A	A	C	C	B	C	C	C	A	A	D	B	E	B	A	D	C	B	A	C	B	D	B- B+ C	(1)	Farm work.			
27	370	B	98	—	—	A	B	B	C	B	C	E	B	B	A	B	C	C	D	E	B	C	A	D	A	C	C+ C+ C+ (1)	Assistant groundsman; (2) groundsman; (3) hotel porter.					
28	386	X	99	97	93	C	D	B	C	A	C	C	C	A	D	A	C	C	B	D	C	D	C	B	C	C	C	B- C+ C	(1)	Errands; (2) laundry delivery van; (3) errands.			
29	487	Y	93	88	102	D	B	A	C	D	B	C	C	A	B	B	E	D	D	E	C	D	C	D	B	C	B	D	B	B- C+ (1)	Unemployed (evening work on fish and chip cart).		
30	319	A	91	97	—	C	D	B	A	C	A	D	D	A	B	D	C	C	D	D	C	A	C	D	C	A	B	B	C	C+ C- (1)	Errands (baker); (2) apprentice butcher.		
31	522	Z	92	—	—	B	A	A	B	A	B	A	D	A	D	A	B	C	A	A	B	A	C	D	B	B	B	B+ C+ C	(1)	Fishmonger, with father.			
32	465	Y	92	91	—	C	C	—	D	C	C	—	A	A	—	—	A	C	B	C	—	—	—	—	—	—	—	C- D	C- (1)	Errands (baker).			
33	402	X	89	—	—	E	D	A	A	A	B	D	C	—	A	D	C	C	B	C	D	C	D	B	D	B	B	A	B- B- C+ (1)	Hairdresser; (2) glazier; (3) errands; (4) cinema operator.			
34	393	X	90	90	—	C	C	B	B	C	C	E	D	C	A	D	B	A	B	A	C	B	C	C	A	B	B	B	B- C+ C+ (1)	Van-delivery messages (one firm).			
35	364	B	85	—	—	C	B	A	C	C	C	C	C	A	C	C	A	C	A	C	C	A	B	B	D	C	C	C	C	C	C	(1)	Farm work.
36	359	B	96	—	—	A	D	A	B	B	C	D	A	C	B	A	B	A	A	D	A	A	B	A	B	C	B	C+ C	C	C	C	Assisting father.	
37	434	Y	106	126	112	C	B	B	D	D	D	E	D	E	D	D	C	D	D	A	A	B	E	D	D	D	C	B	B	C+ C	C	C	No information.
38	509	Z	107	106	—	—	—	C	D	B	B	A	D	C	C	E	A	C	B	A	—	—	A	A	A	D	—	—	C+ C+ C+	No record of employment.			
39	458	Y	91	105	—	B	B	B	C	B	B	A	B	C	E	A	C	C	D	B	B	A	C	B	C	C	B	B	B	C- C	C	C	Unemployed (morning and evening papers).
40	303	A	76	81	83	E	E	A	D	C	C	E	E	E	E	E	D	A	E	D	C	E	D	C	E	C	E	C	E	C	C	D	No information.
41	315	A	99	101	—	D	E	B	A	D	C	D	C	A	A	D	B	E	D	C	D	A	C	A	B	D	C	E	B	C+ B	C	B	No information.
42	355	B	95	—	—	A	C	B	D	C	E	C	C	B	C	E	A	E	D	D	B	C	A	B	B	D	D	B	C	C- C- (1)	Factory (unskilled work).		







64	467	Y	98	91	98	E	C	C	C	C	C	C	A	E	E	D	B	D	E	E	C	E	E	C	D	C	B	C	C	D	G+ C- O+	(1) Messages and shop assistant.	
65	358	B	92	-	-	C	C	A	A	C	A	A	C	B	B	C	D	B	C	D	B	C	D	B	C	B	A	A	B	C	B	B- O+ C+	(1) Factory; (2) apprentice gardener.
66	420	X	72	-	-	E	B	C	C	C	D	E	B	B	B	C	E	D	C	D	D	D	C	D	D	D	B	A	B	C	C+ C	(1) Errands; (2) assisting fire-wood merchant.	
67	530	Z	93	87	-	B	C	C	C	C	B	B	C	C	C	D	D	E	E	C	A	B	A	C	B	D	A	B	A	C	C	(1) Apprentice storekeeper.	
68	321	A	96	92	91	E	E	D	C	E	D	C	E	D	E	D	C	C	E	C	C	B	D	C	C	D	B	C	D	B	B	C+ B	(1) Seasonal employment.
69	381	X	88	86	93	E	D	D	E	D	D	C	A	A	C	B	C	C	E	C	C	E	C	D	B	D	B	C	D	B	C- C- D	(1) Idle; (2) van-boy (parcels delivery).	
70	377	X	87	87	87	D	D	D	D	E	D	C	D	D	A	D	C	D	D	C	B	-	B	C	B	B	A	C	C	O- C- C-	(1) Farm work.		
71	413	X	81	89	-	C	C	C	E	C	C	A	A	A	D	A	B	B	A	D	C	A	D	A	B	B	A	A	B	A	B	O+ B-	(1) Idle; (2) Apprentice hair-dresser.
72	471	Y	71	81	-	E	D	D	D	C	B	A	C	C	A	D	B	B	A	C	C	B	A	B	B	A	C	D	A	C	O+ C+ C+	(1) Errands; (2) fishmonger; (3) unemployed.	
73	485	Y	88	-	-	C	C	E	D	C	D	A	A	C	B	D	B	B	A	D	B	B	D	A	A	E	B	C	E	B	C	C	(1) Grocer's assistant, starting as errand boy.
74	489	Y	84	-	-	B	C	C	E	C	C	B	E	D	A	D	E	A	D	E	A	D	D	B	C	B	B	C	C	A	C	O- C+	(1) Idle; (2) errands; (3) errands; (4) unemployed.
75	372	B	84	-	-	C	C	C	B	B	C	C	B	C	B	C	E	C	A	B	E	D	C	A	D	A	B	B	C	B	O	C+ C	(1) Packing department (factory).
76	488	Y	83	-	-	C	B	E	C	E	D	B	D	C	D	E	D	E	D	C	C	B	B	E	B	B	D	D	B	C	C	(1) Assistant greenkeeper on golf-course.	
77	501	Y	83	-	-	C	D	C	B	A	C	B	D	A	B	B	A	D	A	C	C	A	C	D	E	C	A	B	C	A	B	O+ C+	(1) Errands; (2) errands; (3) apprentice plumber.
78	418	X	83	-	-	C	C	D	E	E	E	C	-	-	D	E	C	B	C	E	C	A	E	C	D	A	A	C	O	C+ C-	(1) Brick works; (2) porter (temporary); (3) brickworks.		
79	414	X	81	-	-	-	-	D	C	-	-	C	B	-	-	B	D	D	C	A	-	-	D	B	A	C	-	-	O+ C+ C	(1) Apprentice moulder; (2) brick works; (3) apprentice moulder.			
80	424	X	80	-	-	C	B	D	E	-	C	D	A	E	A	E	C	C	D	B	A	B	C	A	A	A	B	A	C	O+ C+ C	(1) Apprentice baker.		
81	419	X	70	73	-	E	D	B	D	C	D	B	B	A	B	B	C	C	D	B	E	-	-	D	E	D	B	-	D	C- C	(1) Butcher; (2) fish restaurant.		
82	427	X	80	-	-	C	E	E	D	C	C	E	B	-	-	C	C	B	C	A	A	D	C	A	E	C	D	O- C- C-	(1) Golf club factory; (2) brick-works; (3) assisting coal merchant; (4) assisting coal merchant; (5) idle.				
83	452	Y	74	-	-	C	B	E	D	B	B	E	C	E	D	C	D	C	D	D	C	C	A	D	B	B	C	C	O+ C-	C+	(1) Bakehouse assistant; (2) emi-grated to Canada.		
84	384	X	76	-	-	D	E	E	A	D	C	D	B	C	D	D	C	C	D	A	-	-	D	D	E	D	-	-	C	D	D	(1) Apprentice joiner; (2) gar-dener's assistant. (First post given up for health reasons.)	
F	85	411	X	91	105	98	C	C	C	C	C	A	C	B	-	-	C	A	B	C	A	C	B	B	E	B	B	C	B	C	O- C	(1) Errands; (2) errands (butcher); (3) potato warehouse; (4) silk mills (apprentice).	
G	86	436	Y	85	92	93	C	D	C	C	B	D	C	A	B	A	C	D	E	E	A	D	B	D	C	E	C	D	-	C+ C-	(1) Apprentice clerk.		
87	365	B	80	-	-	D	C	E	C	B	A	D	C	B	C	C	D	C	B	B	B	C	C	C	D	D	E	C	D	E	C+ C+ C+	(1) Factory (unskilled).	
88	497	Y	66	-	-	C	D	C	C	C	D	E	B	C	B	E	C	E	E	B	E	C	B	B	C	B	E	B	C	O	C	(1) Painter's assistant; (2) ditto; (3) ditto; (4) ditto.	







18	330	C	77	82	78	D	D	C	C	E	E	C	B	A	D	D	B	C	A	C	E	E	E	C	E	E	B	B	C	—	(1) Cattleman.				
19	494	Y	78	79	—	D	C	D	D	E	E	E	D	C	D	E	E	D	E	D	C	D	D	C	D	D	C	C	—	(1) Errands (three years)					
20	398	X	78	67	76	E	E	E	D	E	C	C	B	E	B	E	E	E	E	E	D	D	E	D	D	E	D	D	D	+	(1) Coal drawer.				
21	399	X	69	70	—	E	E	C	C	D	E	D	E	E	C	C	C	A	E	E	—	B	E	E	E	—	C	D	+	D	+	(1) Errands; (2) milk delivery; (3) brick works; (4) factory.			
22	341	C	75	—	—	D	D	A	E	E	E	B	D	C	E	C	E	E	C	E	C	E	E	A	E	D	E	C	—	C	(1) Ploughman.				
23	541	Z	99	98	—	A	B	D	A	B	A	B	C	B	D	D	C	B	A	C	D	A	A	B	A	D	B	C	B	C	+	(1) Office work (grain merchants).			
24	373	B	98	93	94	D	D	C	C	E	D	E	E	D	D	C	E	C	D	C	D	D	E	E	A	B	B	D	C	—	C	(1) Seasonal work, rabbit-trapping.			
25	302	A	89	91	—	D	C	A	D	C	A	C	D	A	A	C	C	A	B	A	C	A	C	D	A	B	C	C	B	C	C	+	(1) Apprentice blacksmith.		
26	366	B	85	—	—	C	D	C	D	D	C	C	A	A	B	C	C	D	A	D	A	C	C	D	D	E	E	C	C	—	C	+	(1) Idle; (2) boot warehouse; (3) Apprentice joiner.		
27	467	Y	80	—	—	D	D	D	D	C	D	D	E	A	A	D	D	C	D	C	B	C	D	D	C	E	B	C	+	C	+	D	—	(1) Farm work and game-keeping.	
28	347	B	74	78	—	B	C	E	A	E	E	A	E	E	E	E	E	E	C	D	E	E	D	D	B	D	E	C	+	C	—	C	+	(1) Factory (bobbin-mills); (2) apprentice moulder.	
29	340	C	72	78	—	C	C	D	E	C	E	D	D	A	E	B	B	C	C	A	E	D	D	E	D	E	C	D	C	—	C	(1) Idle; (2) apprentice joiner.			
30	343	B	91	100	99	D	C	A	B	D	D	C	D	B	E	E	C	D	C	E	C	E	D	E	D	E	E	C	—	D	C	—	No record of employment.		
31	313	A	91	97	90	D	D	A	B	B	C	C	D	B	C	D	E	D	C	A	B	A	C	E	D	D	E	E	C	C	C	—	No record of employment.		
32	392	X	92	91	87	D	C	D	B	C	A	D	B	A	B	E	B	A	A	A	B	B	E	C	C	B	D	C	+	C	—	C	+	No record of employment.	
33	369	B	81	89	90	D	D	D	E	E	D	D	D	D	E	D	B	A	C	D	D	C	E	D	C	E	C	B	—	C	—	D	No record of employment.		
34	376	B	80	79	—	E	E	D	C	E	D	C	A	B	A	D	C	D	D	B	C	A	E	E	C	E	B	E	C	—	D	D	+	No record of employment.	
35	367	B	74	71	75	E	E	D	D	E	E	C	E	C	E	D	C	E	C	A	E	E	C	E	E	C	E	E	C	—	C	—	D	No record of employment.	
36	493	Y	61	—	—	D	C	E	E	C	D	E	E	E	C	D	E	D	E	E	E	D	E	D	—	B	E	D	D	D	D	D	Unemployed (continuously).		
37	375	B	85	—	—	A	B	C	B	E	C	B	D	D	D	C	D	A	C	D	B	B	A	E	B	B	D	C	C	—	D	(1) Farm work.			
38	503	Y	79	—	—	D	D	D	E	D	B	E	D	E	—	A	A	C	C	D	D	D	A	B	E	C	C	B	C	C	C	(1) Apprentice gardener.			
39	455	Y	66	61	65	E	E	C	E	E	E	B	A	C	C	D	B	E	C	D	E	E	C	D	E	E	E	D	C	+	D	C	—	(1) Farm work.	
40	307	A	53	56	—	E	E	D	E	E	E	E	E	D	D	E	D	E	E	E	E	B	E	E	E	E	E	E	C	—	D	D	(1) Farm work.		
41	498	Y	64	69	—	E	E	C	D	D	D	C	B	E	D	E	D	D	E	E	E	E	E	C	B	E	E	C	C	—	C	—	C	—	(1) Potato lifting; (2) paper delivery; (3) unemployed.



TABLE XXV  
GIRLS NOT YET LEFT SCHOOL

Reference No.	School	Measures of Intelligence			School Subjects	Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability					Tempera-ment							
									1. Dexterity		2. Speed		3. Perception	Sub.	Pict.-comp.	Mazes	Cub. Im.	Items	Faces	1	2	3				
		1	2	3		1	2	3	4	5	1	2	3										4	5		
8	Z	129	146	133	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B-	B		
116	Z	135	146	127	A	B	—	A	A	B	B	A	A	B	B	A	B	B	B	B	C	C+	C+	C+		
117	Z	122	134	139	A	A	A	B	B	A	C	D	C	D	A	B	D	B	B	C	A	B	C+	C+	C	
111	Z	123	130	139	A	B	A	A	A	B	A	A	B	D	B	A	A	B	B	D	B	D	B-	C+	B-	
35	C	131	138	123	B	A	B	A	B	A	D	B	B	B	C	C	B	A	A	B	C	B	C	C+	C-	C+
113	Z	121	139	128	A	C	C	C	C	E	D	E	C	D	A	B	B	A	B	C	B	A	C	B-	C+	C+
107	Z	120	137	127	B	A	C	D	A	A	B	B	E	D	C	B	A	C	B	C	B	A	D	B	C-	C
72	X	128	132	124	B	A	C	A	B	A	C	A	C	B	C	C	B	A	A	C	B	A	A	B-	C+	C+
128	X	127	130	122	A	A	B	B	B	D	B	B	B	B	B	C	B	C	B	C	C	B	A	B	B	B
127	Z	121	133	121	—	C	A	D	—	—	D	D	B	A	E	A	C	B	D	C	B	C	D	D	—	B
194	Z	121	129	125	C	C	A	B	C	C	A	A	C	C	B	A	B	C	A	C	B	B	C	C	C	B-
199	Z	115	136	115	A	A	D	B	B	A	A	A	C	E	D	C	B	C	A	B	C	A	B	B	C	B+
16	A	126	124	117	A	D	C	C	D	D	C	E	E	D	D	C	C	A	B	B	C	A	A	B	B	C+
184	Z	122	123	—	A	A	A	A	A	A	B	B	C	C	B	A	B	C	B	A	A	A	B	B	A	C
121	Z	116	122	127	C	C	A	B	B	C	B	B	B	A	D	C	B	C	C	B	A	B	D	B	B	C
183	Z	103	128	126	B	C	C	B	B	A	C	D	C	B	D	C	B	B	B	B	A	C	C	A	B	C+
187	Z	114	119	127	A	B	B	E	C	C	B	C	D	A	B	B	A	C	B	D	C	C	D	B	B	C
112	Z	126	118	117	B	C	D	D	C	C	B	C	C	B	B	A	C	E	—	—	C	D	D	C	—	B
125	Z	110	126	121	B	A	D	D	C	B	D	E	C	E	E	C	D	D	E	A	A	E	C	B	B	C
114	Z	108	119	127	C	C	D	B	B	A	C	B	F	D	D	D	C	A	E	C	E	C	C	D	C	B-



198	Z	107	113	126	B	C	B	B	B	C	B	B	C	B	C	A	C	E	D	C	A	B	B	B	A	C	C	+	C	-	C				
197	Z	115	123	119	C	A	A	C	A	A	E	B	C	B	B	B	C	B	C	A	C	A	A	B	B	A	B	B	-	C	C	+			
186	Z	113	119	123	B	B	C	B	B	B	B	D	C	A	B	D	E	B	C	C	E	C	C	C	B	C	C	B	-	C	+	C			
135	X	120	116	114	B	B	C	C	C	C	E	D	B	B	E	E	C	C	D	B	D	B	C	B	C	C	A	C	B	-	C	+	C		
181	Z	115	116	119	C	C	A	D	A	A	C	B	E	B	E	D	D	E	D	B	C	D	E	C	C	C	C	C	B	+	B	-	C		
154	Y	111	112	119	B	A	C	C	C	C	B	E	A	A	B	E	E	A	C	B	A	C	B	A	B	A	C	C	+	C	+	B			
170	Y	118	115	116	C	C	A	B	B	C	C	C	C	C	C	C	C	D	C	B	B	D	A	C	B	B	B	B	C	-	C	-			
145	Y	103	123	114	E	E	C	D	D	A	E	C	D	C	E	A	C	D	E	E	C	B	C	B	D	-	B	-	D	C	+	C			
190	Z	110	114	117	C	B	A	B	A	A	B	B	C	B	D	A	C	A	B	C	E	C	A	A	B	B	D	B	-	C	-	C	+		
125	X	115	116	100	C	C	B	B	C	B	C	B	-	-	C	C	E	B	C	B	A	D	B	C	D	A	C	C	+	C	-	B			
226	Z	106	114	106	A	B	E	B	B	B	B	B	C	B	B	A	E	E	C	A	B	C	D	C	D	B	B	C	C	+	C	+	C		
43	B	99	118	104	C	C	D	B	C	A	D	C	A	B	B	D	B	D	C	B	C	B	C	B	B	C	B	B	C	-	C	-	C		
208	Z	103	114	94	C	C	C	D	D	D	C	A	C	B	B	A	A	A	C	D	C	C	D	D	D	D	C	C	+	C	-	C	-		
219	Z	110	111	112	C	C	D	C	B	B	A	E	B	A	A	C	A	B	E	B	B	C	C	C	E	B	D	B	-	C	+	C	+		
205	Z	110	110	109	A	A	D	B	D	B	D	C	E	E	D	B	B	E	C	C	C	A	B	A	A	D	C	C	+	C	-	B	-		
203	Z	110	110	-	B	A	A	A	A	A	B	C	C	A	A	C	A	A	B	B	A	C	A	B	A	C	A	B	A	B	B	B	B		
210	Z	110	112	97	B	-	C	B	C	A	C	B	E	C	D	B	E	B	-	-	E	C	D	C	-	B	B	C	C	+	C	+	C		
195	Z	93	104	110	D	B	D	B	D	B	C	B	C	E	D	E	E	D	E	C	C	E	E	B	D	E	C	C	-	C	-	C	+		
182	Z	102	107	109	E	C	A	B	B	A	B	A	B	A	A	C	D	A	C	B	C	A	B	D	B	D	B	C	+	C	-	C	-		
12	A	94	109	98	-	-	C	C	C	A	D	E	E	D	B	E	C	D	E	A	D	A	D	B	C	E	E	C	B	C	C	-	C	-	
191	Z	105	106	107	B	B	C	A	B	B	A	A	A	C	E	B	A	D	C	B	A	B	E	B	A	B	A	D	C	+	C	-	C	-	
224	Z	95	102	106	C	B	A	B	B	B	A	A	B	A	A	B	B	A	C	A	B	C	C	A	B	B	D	D	B	B	C	-	C	-	
78	X	104	103	102	C	C	D	D	C	D	B	A	D	E	C	B	D	B	C	E	C	D	D	C	E	C	E	C	C	+	C	+	C	+	
104	X	101	95	99	A	C	E	C	C	C	B	C	-	-	A	C	C	B	E	C	B	B	C	D	C	C	A	C	+	C	+	C	+		
11	A	97	101	-	D	D	C	D	E	B	C	D	C	E	D	C	B	D	A	C	A	E	D	C	D	D	E	B	-	C	B	-	C	B	



TABLE XXVI

BOYS NOT YET LEFT SCHOOL

Reference School No.		Measures of Intelligence			School Subjects		Measures of Mech. Ability			Measures of Manual Dexterity					Other Measures of Ability					Tempera- ment									
										1. Dexterity		2. Speed		3. Perception			Sub.	Pict.-comp.	Mazes				Cub. Im.	Items	Faces				
1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
326	C	139	148	130	A	A	A	A	A	B	C	E	B	A	A	B	A	A	A	A	A	A	A	A	A	B	B	C+	
513	Z	122	134	129	A	B	D	B	C	A	B	A	D	C	B	C	D	C	B	C	A	E	A	A	A	B	C+	C+	
512	Z	129	135	120	A	A	C	B	A	B	C	D	A	B	A	C	C	—	—	A	C	B	B	—	—	B-	C+	B-	
535	Z	128	121	129	A	A	—	B	A	A	—	E	—	—	—	A	B	A	A	—	A	B	B	—	B	C+	B		
453	Y	128	129	119	A	C	B	B	—	C	A	C	B	B	A	A	A	C	C	D	B	A	D	D	—	C+	C+	C+	
407	X	125	124	111	A	A	B	B	A	C	A	A	B	A	A	B	A	B	B	A	C	A	B	A	A	B-	C+	C	
524	Z	119	135	117	A	B	A	A	A	A	A	C	B	A	C	D	B	D	B	B	B	A	B	A	C	B	C+	C+	
506	Z	119	132	124	A	A	B	B	C	C	A	A	D	A	B	C	D	B	C	C	A	D	B	B	A	B	C+	C	
527	Z	119	135	117	B	A	A	A	A	C	C	C	B	C	A	A	C	C	A	C	B	C	C	B	D	A	C+	C+	
508	Z	119	120	124	A	B	A	A	A	C	D	D	A	C	D	A	A	A	A	C	A	A	B	A	B	B+	C	C+	
523	Z	117	124	126	A	A	D	B	A	C	D	D	E	D	A	B	E	A	C	A	D	A	A	A	B	B-	C	C+	
514	Z	116	126	122	A	B	A	A	A	A	C	C	A	B	B	A	A	A	A	A	A	A	A	A	A	B	C+	B	
310	A	116	126	122	C	D	D	E	D	D	E	D	E	E	C	B	D	B	E	A	E	C	E	D	C	B	C	C	
358	B	121	118	116	A	B	C	E	C	C	A	A	D	B	C	C	C	A	B	C	A	C	A	A	B	B-	C+	B	
545	Z	119	118	114	A	B	A	B	A	A	A	A	A	A	A	A	B	—	—	A	A	B	A	—	—	B+	B	C	
534	Z	115	129	117	A	A	B	B	A	A	D	C	B	B	B	C	A	A	B	A	A	B	C	B	B	C+	C-	C+	
478	Y	115	124	112	A	B	D	C	C	C	E	A	D	D	C	D	A	B	A	A	A	A	A	A	B	C+	C	B-	
461	Y	113	126	125	B	C	C	B	B	B	C	E	B	D	C	B	C	A	C	B	C	A	C	A	D	B	C+	D+	C+
536	Z	115	128	—	A	A	A	A	A	A	A	A	A	B	A	A	A	B	A	B	A	A	E	B	A	B	B-	C	
542	Z	115	—	—	D	C	B	A	C	B	A	E	D	B	B	D	C	C	D	C	C	A	D	B	E	A	B	C	C
540	Z	114	130	117	A	A	B	C	E	B	C	A	A	B	D	C	C	D	B	D	C	C	A	C	A	C	B-	C+	C+



## A VOCATIONAL GUIDANCE RESEARCH IN FIFE

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320	Z	114	122	113	A	B	C	B	A	A	A	A	A	A	C	B	D	A	C	B	A	A	B	B	B
351	B	114	111	115	A	A	A	B	B	A	A	A	B	B	B	C	B	B	C	C	B	D	B	C	B-C+
496	Y	113	—	117	B	C	E	A	D	A	A	A	—	C	C	A	A	B	B	D	A	A	B	A	C+C-B-
462	Y	112	114	107	B	B	A	C	C	C	E	E	B	B	C	D	E	D	A	B	B	B	B	B	C-C
505	Z	110	119	121	A	C	A	C	A	A	A	D	C	B	A	C	C	A	A	A	B	B	A	B	B
525	Z	110	113	114	B	A	A	C	B	B	B	C	C	B	C	C	B	B	A	B	C	B	C	A	B
490	Y	108	124	117	B	C	B	A	C	C	A	A	C	B	A	A	B	B	A	C	A	D	A	D	B
356	B	111	110	107	B	C	B	C	C	B	C	D	E	C	D	B	E	B	B	A	C	C	B	B	B
518	Z	110	—	113	B	C	D	C	E	C	A	C	A	D	E	B	B	A	C	C	C	B	E	E	B
532	Z	108	114	114	C	B	A	A	A	A	A	A	A	A	A	B	C	A	D	A	B	A	C	B	B
544	Z	108	112	117	C	A	A	A	A	A	C	D	C	C	A	C	A	B	C	D	A	A	C	A	B
472	Y	108	117	109	C	C	D	C	C	D	C	B	D	B	E	D	E	A	B	C	C	C	A	C	A
543	Z	101	112	117	A	B	C	B	C	A	B	C	D	A	C	A	A	E	B	B	C	B	B	A	A
477	Y	106	110	103	C	C	E	A	B	A	B	A	B	A	A	A	A	D	B	B	B	A	A	A	B
533	Z	106	110	103	B	C	A	B	A	A	A	A	A	A	B	A	A	A	A	A	A	A	B	A	A
464	Y	102	114	101	D	C	D	C	B	C	C	C	C	C	D	B	B	C	C	C	B	C	A	C	B
379	X	102	105	107	C	C	D	A	A	A	C	C	B	C	B	C	B	D	C	A	A	B	D	B	B
519	Z	100	107	110	A	C	E	B	A	A	A	A	A	C	A	A	A	C	A	A	C	E	B	A	B
521	Z	99	101	97	C	D	C	C	A	C	A	A	B	A	B	C	A	D	B	A	C	E	C	B	C
516	Z	98	101	97	B	B	A	A	A	A	A	A	B	A	D	A	A	C	A	A	B	C	C	A	B
305	A	92	92	87	D	D	C	C	D	D	E	C	C	A	C	B	B	A	C	B	E	A	C	B	C
517	Z	90	90	95	D	E	C	B	D	C	D	B	C	A	A	B	D	A	C	A	E	B	C	C	B
301	A	89	91	89	C	D	D	E	D	E	C	C	D	E	E	E	C	D	E	D	E	A	B	E	C
454	X	90	91	—	C	D	C	B	C	C	E	C	C	A	D	B	A	A	C	B	C	C	A	B	B
529	Z	86	91	98	D	D	C	C	A	B	E	C	C	B	D	D	C	E	E	C	D	E	D	C	A
495	Y	86	—	89	—	—	E	E	—	—	E	E	E	E	E	D	E	—	—	E	E	E	C	—	—







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- Manual Skill. Its Organisation and Development. J. W. Cox. Cambridge University Press. 16s. od.
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- N.I.I.P. Journal, 1931. No. V. Pages 242-247.
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