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J. Phillipson

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Thesis for the Degree of M. Ed.

THE GRAMMAR SCHOOL CAREER

J. Phillipson

April 1955

## HISTORICAL INTRODUCTION

### ADMISSION TO GRAMMAR SCHOOLS IN NORTHUMBERLAND

In 1903 the number of pupils in Grammar schools in the County of Northumberland was less than 500 and the number of publicly-assisted pupils was about 20, i.e. 3 per 1000 of the children eligible by age.

At that time pupil teachers received no full-time education.

Under the Education Act of 1902, Local Education Authorities were formed and the government urged that pupil teachers should receive a sound general education, along with young people intended for other careers: as a result pupil-teacher centres were formed which developed naturally into grammar schools. Scholarships were increased in number and in 1909 pupils were no longer required to become teachers.

The first scholarship examinations were tests of attainment, coming towards the end of the Elementary School course. They included English and Arithmetic and, at various times, some or all of the following:- Reading, Dictation, History, Geography, Knowledge of Common Phenomena, Drawing and Needlework.

In 1906 instead of the usual selective examination for scholarships, there was an optional examination for the highest division or class of elementary schools the pupils reaching a satisfactory standard to receive a certificate of proficiency, and the examination to be regarded as the preliminary test for Scholarships. This examination was held in 1906, 1907, and 1908 and about one-fifth of the number of children eligible were presented. It was then proposed to make Part I of the examination (Arithmetic and English) compulsory for all children in Standard 6 or above. After discussions with the Board of Education and a strong protest by teachers against making the examination compulsory, it was conducted experimentally in 1909: it is not now possible to state what proportion of the pupils were tested, but the number was nearly four times greater than in the three previous years.

Next, the head teachers of Elementary schools were asked to give the qualifying test, each in his own school, and to recommend suitable pupils for interview by a local Examinations Board: unfortunately, the number recommended was so large that another independent examination had to be held, and in future years recommendations were made without the formality of a qualifying test.

Later, head teachers were asked to assign marks to candidates, ranging from 20 for an average pupil to 50 for an excellent pupil. In practice a high mark was so freely given that the teachers' marks failed to differentiate between the really outstanding candidates.

In 1908, scholarships for intending teachers were awarded to pupils aged 12, 13, 14 and 15. Later the upper age limit was lowered to 13 but awards were still made to pupils ranging in age from 10 to 13 years; the 10 year-olds, if unsuccessful, would still have two more chances.

In 1918, under the influence of the Education Act of that year, the number of Scholarships was increased to 200. Scholarships were still awarded by areas, irrespective of the number of children in the area or their performances in the Scholarship Examination; this was to remain so until 1929.

Sir Godfrey Thomson, then Professor of Education at Armstrong College, Newcastle-upon-Tyne, relates that in the early twenties he gave a Public Lecture in Newcastle on Binet tests. After the lecture an H.M.I. explained to Sir Godfrey that the Northumberland Education Committee was concerned because its Scholarships were being won mainly by candidates from a few of the best schools and was looking for a method of encouraging able pupils in smaller rural schools. As a result, the Education Committee, in 1921, offered a few scholarships to pupils who had not entered for the usual scholarships examination, the selection to be made solely on the result of an Intelligence Test. Professor Thomson undertook the experiment which he described in the British Journal of Psychology (General Section) Vol. XII, Part 3, December 1921. Answers to the questions on the test paper were given by underlining or crossing out, or by writing a word or a figure, and the time for the test was exactly one hour. On the result of this test 13 pupils were given free places in grammar schools. In all, 2710 children took this test, some as competitors for scholarships, the rest to provide a suitable background.

The Education Committee were now convinced of the possibilities of Group Tests and in 1922 every child in the two groups 11 plus and 12 plus was tested, using the Northumberland Test (1922), devised by Sir Godfrey Thomson and the Terman Group Test, Form A. In all, over 13,000 children were tested and Sir Godfrey Thomson and Sir James Luff discussed the distribution of intelligence in the British Journal of Psychology (General Section) Vol. XIV, Part 2, October 1923, under the title "The Social and Geographical Distribution of Intelligence in Northumberland." Later Sir James Luff carried out a follow-up enquiry into the records of some of the pupils tested.

In 1923 the National (American) Intelligence Test was used and in August of that year Sir Cyril Burt met the Education Committee and discussed the value of Intelligence tests and the practicability of applying intelligence test technique to tests of attainments. In 1924 Ballard's Chelsea Test in

Intelligence was used and then, in 1925, Sir Cyril Burt produced for the Committee Burt's Northumberland Tests of Arithmetic and English. Nearly 14,000 children aged 10 plus and 11 plus, that is, all the children of those age-groups in the county, took these tests. Norms were prepared from scores obtained in London, Scotland and Northumberland. It must be understood that this was not a scholarships examination as this test revealed many children of high intelligence who had not been entered for the scholarships examination. It would have been advisable to include an Intelligence Test on this occasion.

Investigations following the 1925 experiment by Burt showed that it was essential to make some allowance for the age of the pupils and, accordingly, for the Grammar Schools' Admission Examination in 1928, the younger members of the 11 plus age group were encouraged to enter by the announcement that an allowance would be made for the months by which they fell short of the maximum age. Three tests were given - Arithmetic, including problems, English, not a formal essay but based on a printed passage for reading, and a Moray House Intelligence Test prepared by Sir Godfrey Thomson. In assessing the results an age allowance was made which was based on the candidates' own performance and relative weighting of the three tests was brought under control, although equal weighting was given to each. Such was the first attempt to remedy defects in the examination and to bring into consideration the result of the Intelligence Test. This procedure was continued for the three years following.

Every candidate for admission to a grammar school was now given Moray House tests, devised by Sir Godfrey Thomson.

In 1929 an important step was taken in that the geographical distribution of awards was upset by awarding a scholarship to every child who reached the required standard: at the same time the number of awards was increased to over 300.

In 1931 the Education Committee arranged an examination for all pupils due for admission to senior schools. This consisted of standardised tests in Arithmetic and English and an Intelligence Test, all devised by Sir Godfrey Thomson. Over 2,000 pupils took this examination which enabled the head teachers to group their children immediately on entry to the Senior School. Head teachers found the information very useful and were anxious to have the same information in 1932.

In 1932 the two series of examinations became merged: the grammar schools' admission examination had been testing more than a third of the pupils attaining the age of 11 and the senior schools' admission examination, which already included most of the same children, was rapidly increasing in scope with the spread of reorganisation. For the first time the

two were merged as an experiment and the technique of the senior schools' admission examination was applied to the selection of pupils for grammar schools. It was required that where any pupils were presented as candidates for admission to a grammar school, all the pupils of examination age must take the examination.

The examination was on the same lines as the senior schools' admission examination of 1931; standardised tests of Arithmetic, English and Intelligence prepared by Sir Godfrey Thomson were used and the results were worked out as in previous years. Of the children in the county of the age under review, 97 per cent. were presented for the examination, and it was agreed that in 1933 all children of the 11 plus age group would be tested.

The Grading Examination of 1933 was taken by over 7,000 children who were over 11 but under 12 years of age on the 1st August 1933 and by 184 other children. The examination was held in their own schools where the children took standardised tests in Arithmetic, English and Intelligence prepared by Sir Godfrey Thomson. Teachers marked the worked papers but Sir Godfrey was responsible for evaluating the marks. His method was described in the British Journal of Psychology, Vol. II, page 125, under the title "The Standardisation of Group Tests and the Scatter of Intelligence Quotients." Previously the standard scale had been constructed from the Mean and the Standard Deviation but in this case, as the numbers were large, it was simpler and sufficiently accurate to use the Median instead of the Mean and the 84th Percentile instead of the upper S.D. The scale values were altered too, 100 becoming the Norm with 30 as the range represented by one S.D. An allowance was made for every month of a child's age below the maximum.

About 50 per cent. of the places in the grammar schools were filled by "special place" pupils who were entitled in cases of financial need to total or partial remission of fees. The remaining places were taken by pupils who were assisted by local scholarships or whose parents were willing to pay the fees. In the latter case there was no remission of fees whatsoever even if the parents could not afford to pay them. All pupils whose marks were 1.7 S.D.'s above the Mean were awarded "special places" and the number so awarded in 1933 was 345, or 4.6 per cent. of the pupils. The standard for fee-paying pupils was 1 S.D. above the Mean but many parents could not afford the fees and consequently, in order to fill vacant places, this was often disregarded. A list of "special place" winners and fee-payers was prepared and a committee of head teachers revised the marking of the worked papers of the pupils on this list, special attention being given to border-line cases, particularly where the date of birth fell near the end of a month, or where the pupil had had a serious illness. Finally, the lists were compared with head teachers' estimates of the pupils and any marked discrepancies were enquired into.

From 1933 onwards there was very little change in the system until the 1944 Education Act came into operation and there ceased to be fee-payers. In 1944 the performance of children admitted to grammar schools in 1942 and 1943 was investigated and it was found that the relative order of nearly one third had changed considerably.

In 1944 the publication by the Ministry of Education of Circular 1654 led to the admission of a number of older pupils to the grammar schools: these pupils had to reach a certain standard of attainment and also had to promise to enter the teaching profession. These children were not introduced into the grammar schools in small numbers but were grouped together into one or two schools in order to make up a form which retained its individuality until the Sixth Form, although this arrangement involved some of the children having to lodge away from home. Another batch of over-age pupils was admitted in 1945 as intending teachers but it was decided that the children would not be obliged to fulfil this promise, and the scheme of providing recruits to the teaching profession was discontinued. However, Northumberland has carried on this policy of admitting older pupils by examining at 12 and 13 years of age, any children recommended by their head teachers, and this arrangement caters successfully for the late developer in the modern school. There is also transfer in the opposite direction, i.e. from the grammar to the modern school: any child from the grammar school whom the head teacher considers unsuitable is examined along with the nominees from the modern schools and, as a result, some are usually transferred. The number of adjustments made at the age of 13 plus is generally about 100 from the modern to grammar schools and about 20 in the opposite direction.

The investigation of 1944 led to an attempt to improve the method of selection and for that purpose Area Panels and Record Cards were introduced in 1946. The Panels usually consist of 10 head teachers with the county examinations officer present in an advisory capacity. The function of the Panels is to interview and give further tests to the children in the 'border-line' group. The limits of this group were determined by applying the findings of McClelland to the situation in Northumberland, but it was found that, in order to gain maximum efficiency of estimate, all pupils with scores between 431 and 291 marks would have to be included. The correct pass mark to give a minimum number of misfits was found to be 353, but only 6.6 per cent. of those pupils with marks from 350 to 399 had been able to qualify at a later date, therefore the border zone was established between 400 and 429 marks.

The following supplementary tests were given to the children interviewed: 1. Writing 2. Interests 3. Literary 4. Writing about a picture 5. Speed and accuracy 6. Arithmetic problems. A new order of merit was made up from the above tests, along with a medical report and a detailed school

record: the performance in the Grading Examination was not given to the Panel.

In 1947 there was a modification of procedure in the Area Panels and the four criteria which were the basis of selection were: 1. Attainment 2. School record 3. Assessments in methods of thinking 4. Assessment in work habits.

Since 1945 the tests have been drawn up by the county Examinations Officer on behalf of the Northumberland Education Committee: the raw marks are standardised and an age allowance is added at the same time as standardisation is carried out.

Up to 1945 no distinction had been made between boys and girls in awarding grammar school places, but the Education Committee became concerned about the excess of girls over boys gaining admittance and decided to give them separate consideration in that year. The present procedure is to standardise the scores for the girls and boys separately, then, on the basis of these scores, divide the boys and girls separately, into the usual groups - I, II and III: group I being those of high intelligence, group II 'border-line' pupils, and group III those not considered suitable for grammar schools. It is thus possible for the standards of the boys and the girls to differ, as a girl is compared with all the other girls and a boy is compared with the boys. Further variations occur in the adjustment to group II and in the interviews by the Area Panels, with the result that the girls generally outnumber the boys by 14 to 13.

In adjustments to the border-zone and in selecting from the border-zone, pupils who are considered suitable for admission to grammar schools, use is made of teachers' assessments. The primary school draws up orders of merit in Oral and Written English, Mental and Written Arithmetic, Nature Study, and Social Studies, and these orders of merit are then converted to scores with a mean of 50 and a standard deviation of 10, the average of these scores being the teachers' assessment. This assessment does not allow for the differences between schools nor for the differences in the ages of the children. In order to adjust this, the Mean Grading Examination mark is calculated for each school group, and the primary school assessment average score is increased or decreased by the corresponding fraction of the standard deviation: an allowance is also made for age at the same time, and thus each child in the county who takes the Grading Examination is awarded a score, which is known as the Scaled Primary T-score.

As a result of the Grading Examination, the children are divided into three groups, but the final composition of these groups is in the hands of the primary school head teachers, as they can recommend a child for transfer from Group I or Group III to Group II, if they can justify this from the school record. For instance, if a child whose work is normally of a low standard is placed in Group I, and another whose work is usually good is placed in Group III by the Grading Examination, the head teacher can suggest that both be placed

in Group II, where they are given further tests. The Area Panel, in making its decision, consults only the child's Scaled Primary T-score and the performance in these supplementary tests, and the attainment in the primary school is usually regarded as being the more important. For some time a 5-point grading was used to assess the pupil's ability in the oral interview but this was found to be so unreliable that it is not used any longer. However, since 1954, an English essay is one of the criteria used by the Area Panels.

In 1946 the qualifying age was changed from 11 to 12 years on August 1st to the same age on September 1st.

In 1947 a Non-verbal Intelligence test was added to the tests in English, Arithmetic and Verbal Intelligence and, as in the past, each test was given equal weight.

The weighting was altered in 1951 when the standard deviation of the Non-verbal Intelligence test was changed to 5, the others remaining at 15. In 1953 a further change was made in that the Arithmetic test was given a standard deviation of 10 instead of 15, but in 1955 this reverted to 15 as the Arithmetic test contained less mechanical arithmetic and more problems.

Thus selection is based on two main factors, performance in the Grading Examination set by the local authority and the teachers' assessments: if these two factors are in agreement no further tests are made, but in the cases where they disagree, further tests are given and final selection is made by the Area Panels with performance in these tests and teachers' assessments, adjusted for differences in schools and ages, as the two criteria.

Although investigation has shown that the Scaled Primary T-score is possibly a better predictor of grammar school success than the Grading Examination, it would be rather inadvisable to dispense with the latter in view of the difficulty in adjusting the differences between the very small rural schools in Northumberland and the larger schools in the industrial areas. The Mean Grading Examination mark, on which this adjustment is based, is reliable with a large year-group but almost useless with a very small year-group. Harking back, it is interesting to note that Sir Godfrey Thomson was asked by the Education Committee in 1921 to introduce intelligence tests as they felt that children of high intelligence in the rural schools were not gaining their proper share of grammar school places.

The number of children now being awarded places in the grammar schools is between 13 and 16 per cent. of those eligible, including those admitted at 13 plus.

## THE GRAMMAR SCHOOL CAREER

### The Academic Progress of a single Year-Group in the Grammar School.

#### Introduction

One of the greatest problems in the educational world, particularly since the passing of the Education Act of 1944, has been the allocation of children to secondary schools. The Act aimed at establishing 'parity of esteem' between the various types of secondary school and it was felt that once the gap between the grammar school and the old elementary school had been closed, the 'scholarships examination' would become a thing of the past and children would be graded according to ability and aptitude and allocated to a certain type of secondary school.

But instead the selection process has become a highly competitive examination of the utmost importance to pupils, parents and teachers alike. This is due to two main factors: it is the only road to the professions, and middle-class parents who, in the past, could be fairly confident of being allowed to send their children to the grammar schools as fee-payers, or could afford to send them to boarding schools, now find that their children must reach the required standard in the selection examination: also, in the last few years, the ordinary people have become very anxious that their children should have the best possible education in order to enable them to become scientists or professional people. Therefore most parents set out, by every means in their power to encourage, help and cajole their children to reach the required standard.

It is generally accepted that the selection process is more accurate now than in the past, but efforts are being made to make it more accurate still, and the criterion for assessing this accuracy is the attainment in the grammar school.

The major part of the research programme of the National Foundation for Educational Research is concerned with follow-up studies of the selection process. In 1953 Professor P.E. Vernon initiated a lively correspondence in the Times Educational Supplement on coaching for selection tests and the topic was considered so important that the Times reprinted the correspondence in booklet form. At the moment the Ministry of Education is conducting an enquiry into the general effect of the selection process on the primary school and the amount of homework and coaching which is done.

Attempts have been made in the past to assess the efficiency of the technique of selection at 11 years, using the attainment in the grammar school and in the General Certificate

of Education, normally taken after five years in the grammar school. There are many other factors which influence the grammar school pupil but examinations are the only criterion we can rely on to any great extent.

### Existing Literature

#### 1. Predictive Capacity of Selection Process

In 1932 Professor C.W. Valentine (1) compared results in School Certificate with marks obtained in entrance examinations. In 5 of the 10 centres he found no correlation but in 2 others he obtained correlations of .40 and .44. He found that the biggest changes in attainment occurred during the 1st year in the grammar school.

In 1940 T.E. Stubbins (2) correlated Entrance Test marks and Headmasters' assessments with School Certificate results. He found that the English test was the best predictor of School Certificate results generally, that the Intelligence test was the best predictor of Mathematics and Science and was, in fact, better than the Arithmetic test in this respect, and, finally, that the Headmasters' estimates were of very little value.

In 1942 W. McClelland (3) conducted a full-scale follow-up enquiry in Dundee involving over 3,000 children. He concluded that the best prediction was given by a battery consisting of the Intelligence Quotient, a combined mark of the English and Arithmetic examinations and the teachers' estimates, scaled on the Intelligence test scores. This battery gave a correlation of .804.

In 1945 W.G. Emmett (4) compared Entrance Test results with the school order of merit 2 or 3 years later and found that a standardised Moray House Intelligence test gave a much better prediction than locally set unstandardised papers in English and Arithmetic.

In 1950 D. Rutter (5) compared entrance examination marks from 1934 to 1943 with School Certificate marks, and these investigations, involving 9 successive year-groups, a total of 472 pupils, produced a maximum correlation of .542.

In 1951 Professor A. Peel & D. Rutter (6) compared marks from entrance examination results in 1944 with School Certificate results in 1949, using marks obtained by 279 pupils in 5 grammar schools. The Intelligence test proved to be the best single overall predictor, but the English test was a more efficient predictor of language subjects than the Arithmetic was of Mathematics. The maximum prediction of the core subjects English, French and Mathematics was .597, but for the Science group of subjects was only .554.

In 1952 Dr. I. Macfarlane Smith (22) found that a Non-verbal or Spatial test gave a much better prediction of ability in technical drawing, woodwork, metalwork and art than an intelligence test (either verbal, or mixed verbal and non-verbal).

In 1952 W.G. Emmett & F.S. Wilmut (7) compared entrance test results in 1941 and 1942 with School Certificate results in 1946 and 1947. Moray House standardised tests in English, Arithmetic and Intelligence were used, and the criterion was the total of School Certificate marks in 5 main subjects. It was found that English Language, French and Mathematics could be satisfactorily predicted, while correlations for Physics, Chemistry and English Literature were lower: Geography, Biology and Art were not satisfactorily predicted. Their conclusion that attainment in Art could not be predicted was confirmed by a Moray House enquiry concerning Art. The multiple correlations obtained were .577 and .578. These investigators found that correlation between entrance tests and grammar school attainment improved with the passage of time, i.e. that correlations with School Certificate were higher than those with performance lower down in the school. There was a highly significant difference between the mean performances at 16 years of the children from each of the four grammar schools concerned.

In 1954 W.G. Emmett (8) enquired into the predictive capacity of primary school tests, correlating standardised tests in English, Arithmetic and Intelligence with attainment in the grammar school 3 years later. He found that the best single predictor was the Intelligence test and the least effective the English test, both in the case of the Moray House standardised tests and the County entrance examination, which included an essay. Correlations for the sample of 985 grammar school pupils were .483 with the Moray House standardised tests and .524 with the marks obtained in the County examination.

E.R. Clarke (15) says that an examination tests actuality, not potentiality, and that an entrance examination is accurate, not in selecting those pupils suitable for a grammar school education, but in selecting pupils who would be successful in a second examination of the same type. "The individual," says Clarke, "is an individual to a measurable extent but of an unpredictable nature ..... there are no convenient or magic dimensions whereby a human being can be assessed comprehensively." He also questions the reliability of the School Certificate or General Certificate of Education, as he believes that the essay type of question gives an element of error of considerable dimensions.

G.B. Jeffrey (10) says that intelligence is "a measure of the opportunities of the child rather than the promise of future performance." He goes on to say that personality decides the gap between what we can and what we do.

Professor P.E. Vernon (19) has recently stated that about

one-quarter of those selected for grammar school work will not prove really capable of grammar school work, and at least 5 per cent. of those relegated to modern schools should be able to undertake such work later.

A.F. Watts & P. Slater (18) believe that achievement at 16 plus is not a satisfactory criterion, as qualities which ought to play a part in grammar school success are not easily examinable, and achievement may be affected by changing interests and by variations in the home, the school and the teaching.

C.W. Valentine (1) has put forward many reasons why there is great discrepancy between results at entrance and results in the School Certificate, such as luck in the type of question, mental condition at the time of the examination, differences in the marking of School Certificate papers, development of specific abilities in the grammar school, qualities of character, and varying rate of mental development between 11 and 16 years.

## 2. Age Allowance in Mental Tests

Valentine (1) found in his enquiry that most areas gave age allowances to candidates, and he states that it would be unfair not to do so, even though there is no age allowance in the School Certificate examination or in the grammar school. On investigation he found that the correlation between the selection examination and the School Certificate was almost the same whether the age allowance was given or not.

In 1930 Northumberland Education Committee made adjustments in scores to compensate for differences within each age-group with beneficial results. A great difference had been noted between those children born in the quarter 1st August to 1st November, and those born in the quarter 1st May to 1st August, as is shown by the following figures for 1911 to 1915:-

	<u>Number of Successful Pupils</u>		
	<u>Age 12</u>	<u>Age 11</u>	<u>Age 10</u>
Born 1st August to 30th October -	192	50	8
Born 1st May, to 31st July -	95	9	0

The effect of the adjustment is shown by the following figures for 1930:-

<u>Age on 1st August</u>	<u>Number of Successful Pupils</u>
11 years: 9, 10, & 11 months	66
11 " 6, 7, & 8 "	64
11 " 3, 4, & 5 "	65
11 " 0, 1, & 3 "	61

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10 years 9, 10, & 11 months	26
10 " 6, 7, & 8 "	24
10 " 3, 4, & 5 "	21
10 " 0, 1, & 2 "	21

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McClelland (3) found that an age allowance increases the number of misfits: he observes that if we admit a young pupil through giving him a bonus for his youth, he may prove to be a failure later on and our efforts to do justice to him would only have resulted in great disappointment.

Sir Godfrey Thomson (3) states that the object of an age allowance is not to improve prediction but to do justice to children born in different months of the year and he goes on to justify the allowance. The reason for the apparent increase in the number of misfits, says Thomson, is the fact that the secondary school does not give an age allowance, therefore secondary school marks agree better with marks that do not include an age allowance.

The N.U.T. Report (1949) on Transfer to Secondary Schools (12) shows that, at the time of the investigation, 11 out of the 106 local authorities concerned did not give an age allowance. However, one County Borough found that, while the "good" entrant under the age of 11 years did well and worked without strain, the border-line entrant who would have been below the qualifying mark if his age had not been under 11, was often immature and proved to be an ineffective struggler at the bottom of the form. As a result, this authority's Examination Board recommended that, while children between the ages of 10 and 11 might still be admitted, they should be required to reach the same standard as children of 11 years; that is, no additional age allowances should be given for months below the age of 11.0 years. It may be pointed out that this recommendation agrees with the policy of the County of Northumberland.

### 3. Use of Teachers' Assessments

While Northumberland Education Committee was holding its first Scholarship Examinations it was already trying to make use of the teachers' knowledge of the pupils. It began by staging two examinations, the first being a qualifying test for the second, then decided to dispense with the first examination by asking the head teachers to give the test, each in his own school, and to recommend suitable pupils for interview by a Local Examinations Board. Unfortunately the number recommended was so large that another independent examination had to be held, and in future years recommendations were made without the formality of a qualifying test.

Later, head teachers were asked to assign marks to candidates, ranging from 20 for an average pupil to 50 for an excellent pupil: in practice, a high mark was so freely given that the teachers' marks failed to differentiate between the really outstanding candidates.

However, the Scaled Primary T-Score now used in Northumberland is found to be very reliable.

Valentine (1) suggested that better guidance in selection might be obtained by more careful noting of the recommendations of primary school headmasters and "weighting the recommendations of those heads who prove to be most reliable where cases are followed up." In one centre he found that pupils not recommended by the headmasters did badly in the entrance examinations and, if successful, fared badly in the grammar school: out of 15 such cases, only 1 obtained the School Certificate. Valentine mentions that C.C. Ross and T.L. Kelly carried out two enquiries in the U.S.A. and found that records of work in the primary school gave a better prophecy of success than intelligence tests.

McClelland (4) says that, as an educationist, he is "alive to the evils of external examinations" and he talks of "the educational advantages to the pupils resulting from the removal of the incubus of external examination from the primary school." He suggests that an improvement in the teachers' standard of marking might enable the external examination to be removed from the primary school.

The Norwood Committee (1943) in their Report (9) said that they were prepared to regard the school record as "the best single means at present available of discovering special interests and aptitudes and level of intelligence": they would regard the school record as "the most important factor to be taken into consideration in the recommendation of the appropriate education."

The N.U.T. Report on Transfer (12) shows that Northumberland found that, while their standardised tests had the advantages of impartiality, objectivity and statistical refinement, there

were also attendant disadvantages to be found in the cramping of the primary school curriculum and the wastage in the grammar schools.

The Report says that the most significant change proposed in selection procedure was the introduction of school records: 39 authorities proposed to introduce them, 12 of whom intended that the record should eventually become the basis of allocation. This meant that 71 out of the 101 authorities who contributed to the Report were using, or intended to use school records in their selection procedures.

The Report mentions that Newport found that the head teachers' mark showed a higher correlation with work in the grammar school than either the written examination or the intelligence test. Investigations had shown that correlations between the written examination and intelligence test, and the results of work in the first, second, and third years of the grammar school became progressively lower, but the correlation between the head teachers' mark and school work became progressively higher each year.

Dr. G.B. Jeffrey (10) said recently in a lecture on the criteria for selection that there is a temptation to let other things than English and Arithmetic go by the board towards the end of the primary school career and that education in the primary school is impeded by the selection process. According to Dr. Jeffrey, the teacher is the best witness of the child's attainments.

Sir Cyril Burt (13) says that it is ideal to rely on the teacher to select the children at 11 years if his or her observations over the years are recorded in a precise and comparable form, but the capacity of teachers to do this varies and the standard therefore varies from school to school. As a result, we must use tests but we must always check the marks obtained in the tests with the school record cards.

A.F. Watts (11) quotes G.F. Peaker, one of Her Majesty's Inspectors as saying that the effect of the English test on the primary school is 'devastating': in ticking, crossing out and underlining the children have no time to write out a complete sentence. Watts suggests that one should subject the teachers' estimates to mathematical treatment, or train the teachers to produce assessments which do not need modification.

In 1953 G. Bosomworth (14) tested the predictive value of the Scaled Primary T-Score in the Northumberland grammar schools and found that it gave a regression coefficient of .282 with the average grammar school mark while the best predictor in the Grading Examination was the English test with a regression coefficient of .261. The selectivity of the initial battery of tests was significantly improved by the inclusion of the Scaled Primary T-Score while the Unscaled Primary T-Score deserved less weighting than any of the individual tests in the Grading Examination.

P.E. Vernon (19) said that a well constructed group test

at 10 or 11 years yielded on the whole slightly better prediction of grammar school success than any other single instrument except scaled teachers' estimates. However, he said that such tests are artificial and narrow and should be supplemented by properly standardised teachers' judgments of suitability.

At the moment Middlesex has a long term proposal to abolish tests and base its selection on the primary school record, and the West Riding is aiming towards a system which will select children on general classroom work and intelligence test results.

A.F. Watts (11) may be proved right in time, in saying that "the time is not far distant when teachers will find themselves fully responsible for the allocation of their pupils to appropriate courses of secondary education except that it may be found necessary to submit the case of an occasional 'border-line' candidate to a panel of referees."

#### 4. Sex Differentiation

In 1936 J.B.T. Davies & G.A. Jones (16) found that in the selection examinations girls did a little better in English, but boys did distinctly better in Arithmetic: in English the boys are better at comprehension but the girls are better at essay, thus the difference between the overall English scores is small.

In Northumberland it was found that, some time after 1940, more girls than boys were being admitted to the grammar schools, and as a result, in 1945 the policy of considering the boys and girls separately, was begun.

The N.U.T. Report (12) says that most authorities provide fixed numbers of places for boys and for girls in their grammar schools and thus give separate consideration to the sexes.

W.G. Emmett (8) found that in tests for grammar school selection girls were markedly superior in English and Intelligence tests and slightly superior in Arithmetic. He states that such differences have only arisen since 1940 and it has been found that in many districts the leeway is made up in 2 or 3 years.

J.J.B. Dempster (17) carried out experiments in testing primary school children in Southampton and one of the results obtained was that girls were better than boys in Arithmetic, English and Intelligence tests. Dempster also asserts that the same thing appears to be true in the General Certificate of Education, but not at university level, where conditions are reversed. He also found that girls appear to find non-verbal tests more difficult than do boys, and therefore suggests that for that reason, the wisdom of including non-verbal tests is doubtful, especially if boys and girls are compared together.

Dr. I. Macfarlane Smith (22) has shown, that in working a spatial test, there is a significant difference between the mean raw scores of boys and girls at all ages within the age range, varying from 4.8 in the age-range 11.0 to 11.11 to 6.2 in the age-range 13.0 to 13.11.

The Northumberland Education Committee has investigated the General Certificate of Education results of the 480 pupils in the county who took the examination at Ordinary level in the summer of 1954 and, taking the average of the best 5 subjects, the girls averaged 51.7 per cent. and the boys 50.5 per cent.

The Durham Examinations Board's figures for the same examination for July 1954 show that the girls have 32.3 per cent fails and the boys 38.2 per cent. fails.

Statistics for the whole country for the same examination in the summer of 1953 show that the average percentage of fails for girls was 36.8 while that for the boys was 41.9.

The Trend of Scottish Intelligence (24) shows that the mean scores in intelligence tests for both boys and girls was higher in 1947 than in 1932, but the major proportion of the increase has been contributed by the girls, who have converted an inferiority of .094 in 1932 into a superiority of 1.742 in 1947.

##### 5. Home Background and Size of Family

In 1923 Sir Godfrey Thomson and Sir James Duff (23) studied the social distribution of intelligence in Northumberland and found that the Intelligence Quotient varied from 96.0 in the case of children of labourers to 112.2 in the case of children of the professional class.

The Essex Education Committee (21) has stated that children who are suitable for a grammar school education can be rendered unsuitable by bad home conditions. "Even if the conditions cannot be called bad," says their Report, "the lack of any cultural background or of any understanding of the meaning of an educated outlook insidiously cramps the mind of the pupil and retards his progress."

Professor P.E. Vernon says (19) that the difference between good and bad upbringing produces differences of 10 to 20 points in selection tests.

The Central Advisory Council for Education in England in their latest Report (20) state that, of about 16,000 children from semi-skilled and unskilled families who entered grammar schools in 1946, some 9,000 failed to gain 3 passes at ordinary level in the General Certificate of Education. The Council fail to suggest any definite reason for such poor performance, but nevertheless suggest that a higher proportion of children should be given grammar school places.

The Trend of Scottish Intelligence (24) has definitely

shown that the family size and intelligence test scores are negatively associated, varying from a mean score of 42.08 for an only child to 30.88 for families of 6 children.

### Scope of Enquiry.

Most of the research previously carried out concerned large numbers of pupils from various schools, and dealt with attainment in the grammar school at one particular stage. The object of this enquiry was to study one single year-group right through the grammar school, and to compare the results with the findings of previous investigators. The question was to what extent this small sample would compare with large groups previously studied and thus, to what extent could the findings appertaining to a large group be applied to a school.

For instance, many headmasters are apt to attach great weight to the scores obtained by their pupils in the entrance examination and accept them as an infallible guide to grammar school attainment, while others ignore these marks completely and judge the child solely on his present performance.

The information available concerning each child was as follows:-

1. Raw and standardised scores obtained in Grading Examination tests in English, Arithmetic, Verbal Intelligence and Non-verbal Intelligence.
2. Marks obtained in all the internal examinations taken in the grammar school.
3. Marks obtained in the General Certificate of Education at ordinary level, taken after 5 years in the grammar school.
4. Father's occupation and number in family.
5. Scaled Primary T-score - assessment on a county basis of general ability in the primary school.

One of the questions to be borne in mind was the possibility of dispensing entirely with external examinations, in this case, the Grading Examination and the General Certificate of Education. Such a step was advocated by the Norwood Committee in 1943, but has never been put into operation, although many teachers and educationists are adamant in the opinion that external examinations do have a harmful effect, both on the primary school and on the grammar school. In the case of the primary school, several authorities are thinking of allocating children at 11 plus solely or mainly on the basis of the school record, but in the field of secondary education the trend is in the opposite direction. Many authorities and many teachers in the modern schools now think it is desirable to have an external examination, either at county or national level, for the secondary modern school, because it would provide an incentive which seems to be lacking, and would give the child a certificate which would be of value to himself and to any prospective employer. On the other hand, many feel that the liberal nature and the freedom of the modern school would be jeopardised, and much that is true education would go by the board.

It must be pointed out that this study applies only to this group and could not justifiably be applied to any other similar school group, but it is the kind of group with which the teacher has actual contact, which exists in every grammar school. That there is a difference between schools has been shown by Emmett and Wilmut (7) who found that the pooled School Certificate score differed from school to school, and even when the differences in mean ability at 11 plus were removed, the differences between schools were still significant at the 1 per cent. level.

### The School Group

The year group which was the subject of this investigation consisted of 57 pupils who entered the local grammar school in 1949: there were 32 boys and 25 girls and the small numbers are due to the fact that some of the pupils left school before taking the General Certificate of Education. Only those who had spent a full five years in the school were included so that a full knowledge of the group studied should be available.

All the grammar school subjects were included in the investigation and all scores for all examinations were standardised so that they had a mean of 50 and a standard deviation of 10 .

The results apply only to this highly selected group of pupils and no attempt has been made to estimate what they would have been for an unselected population.

## I. PREDICTION OF GRAMMAR SCHOOL PERFORMANCE

### Grouping of Pupils at Selection & Follow-up of Groups

(See Appendix pp. 1A, 2A)

On the results of the Grading Examination, after the raw marks have been standardised, the children are divided into 3 groups:-

- I. Children of High Intelligence - recommended for transfer to grammar school, without further testing.
- II. "Border-line" pupils - decision as to type of secondary education made only after Area Panels have considered their scores in further tests and their primary school record.
- III. Children unsuitable for grammar school education: if the primary school headmaster considers that any child's examination score is not consistent with their school record, the child can be placed in Group II for further testing.

On considering the average performances of Groups I and II, we find that the grouping at selection is in general confirmed by the attainment in the grammar school, as Group I is superior at every stage. Let us compare the results of the General Certificate of Education:-

Group I :	Average -51%	Average Passes -5.0	Fails -25%.
Group II :	" -47.8%	" " -4.3	" -33%.

Girls are superior to the boys in both groups at all stages of the grammar school career, although the difference is very small at G.C.E. .

Group III has not been considered up till now as here there are special circumstances attending one boy. This boy, Rank Order 55 out of 57 in selection examination, is a spastics case hindered by physical disability in that he has no use of the right hand and only partial use of the left hand. This is probably one reason why he did not reach the required standard in the tests but his transfer to Group II and his admission to grammar school have been fully justified by subsequent results, as his rank position in the year group has never been less than 8th.

But, disregarding this special case, it will be seen that, of the remaining 3 pupils, one has an average mark in the G.C.E. which would justify her inclusion with the children of high intelligence in Group I, another is good enough for Group II, and the third, although obviously not of very high intelligence, has a better average in G.C.E. than some of the pupils in Group I, i.e. pupils of high intelligence who have failed to make the best use of their abilities. It is quite within the bounds of probability that there are numerous other children of approximately the same standard of ability, who

would be equally capable of success in the grammar school. On the other hand, there are 8 or 9 pupils in Group I who have failed to make the necessary progress in the grammar school due to circumstances of social environment or character which have prevented them from making the most of their capabilities.

Figures for the General Certificate of Education for the same year-group in the whole of the county, involving 480 pupils are as follows:-

Group I	:	Average	-	53.3%
Group II	:	"	-	47.9%

The difference is higher than that noted in the school group.

Correlations between Selection Criteria and Grammar School Attainment. (See Appendix p. 3A)

The correlation coefficients obtained apply only to this particular group of pupils, but they do suggest that it would be of value to repeat the enquiry using a much larger number of cases. The criteria for transfer to a grammar school, that is, the total standardised score of the 4 tests given, does not, in this instance, give very good prediction, in fact, it gives the poorest prediction of all the batteries tried. The experiment was tried of omitting the score for the non-verbal intelligence test from the total and this gave considerable improvement in prediction, although none of the results were significant at the 1% level and the prediction of G.C.E. was inferior. Using the Scaled Primary T-score in various ways with the scores for the tests never failed to improve prediction, but undoubtedly the best predictor is the Scaled Primary T-score itself.

As the Scaled Primary T-score does not include any non-academic subjects it was thought that leaving out these subjects from the grammar school total would give better correlations but this is not the case except in the 1st and 3rd years. The writer was very concerned at the low correlation between the total of the standardised scores and the 1st and 2nd years in the grammar school, which Valentine (1) has already noted.

Prediction appears to be most satisfactory in the 3rd and 4th years of the grammar school, and the prediction of G.C.E. is not very satisfactory. It is interesting to note the very low correlation of .182 which is obtained with G.C.E. when the Non-verbal score is omitted from the total of the tests.

Inter Correlations for Selection Criteria and for Grammar School Attainment. (See Appendix p. 4A)

The correlation between the Scaled Primary T-score and the total for the tests is not very high but is significant at the 1% level. It would seem that, for the group in question, the teachers' assessments are appreciably different from the performance in the tests, but they are more efficient in predicting grammar school success than the tests. The Scaled Primary T-score correlates fairly highly with the English and Arithmetic tests as these are the main subjects in the primary school but shows negative correlation with the Non-verbal test as the T-score does not include any non-verbal subjects.

The high correlations between the grammar school examinations, all significant at the 1% level, indicate a high degree of reliability. The time factor is evidently of importance as the correlations are usually highest when the difference in time is lowest.

There is better correlation between the grammar school examinations and the G.C.E. than there is between the grammar school examinations and the selection tests. This seems to indicate that the abilities measured by the grammar school are roughly the same as those measured by the G.C.E., whereas the selection tests do not measure the same ability. This is allied to the criticism, sometimes made by grammar school teachers, that their schools, where so much emphasis is placed on written English, are badly served by a selection process which does not call for any proficiency in this particular skill. The Scaled Primary T-score predicts grammar school and G.C.E. attainment much more efficiently because it is an estimate of the work in the primary school.

As was to be expected, the 1st year grammar school marks are more than twice as efficient in predicting G.C.E. success than the selection tests, but it is interesting to note that the Scaled Primary T-score is almost as good in this respect as the 1st year marks.

In order to test the assumption that academic subjects are more reliable than the non-academic the inter correlations were calculated again, this time omitting the non-academic subjects from the totals. This, in general, did have the effect of increasing the correlations.

Comparison between Entrance Examination and Average Attainment in the 2nd Year at the Grammar School.

Grammar school achievement in the 2nd year, or after 2 years, is usually regarded as the best criterion of prediction at 11 years; as, at that stage, the pupils have had time to settle down to the new type of work, specialisation has not yet begun, and the many various factors which affect the children between 13 and 16 years of age are not so strong in their effect.

It is generally at this stage that a check is made on selection at 11 years, i.e. there is usually some transfer from grammar to modern school of unsatisfactory pupils and from modern to grammar of late developers. In other words, this opportunity of further transfer is a safeguard of the selection procedure, so that those who were wrongly selected in the light of the grammar school experience, are removed and those who were not admitted but deserve to be are brought in. Yet it is very inadvisable to transfer anyone from grammar to modern school, unless it is absolutely essential.

The regression coefficients and multiple correlation (See Appendix p. 5A) show that the Arithmetic test is the best predictor of average attainment in the 2nd year of the grammar school, while the Non-verbal test has no predictive value at all. The maximum prediction or multiple correlation is quite low at .290 .

In order to see how this affected individual cases a comparison was made between Rank Order at 11 and Rank Order at 13, using both the total obtained in selection tests and the Scaled Primary T-score, or teachers' assessments.

The total at selection used here is the total score of the 4 tests, after the marks have been standardised and an age allowance has been made.

Comparison between Rank Orders at 11 and at 13 years.

Using the selection test order we find that of the 10 best pupils at 11, only 4 remain in this group while the 2nd and 3rd have dropped in position to 44th and 49th, although they are the only ones to drop below half-way.

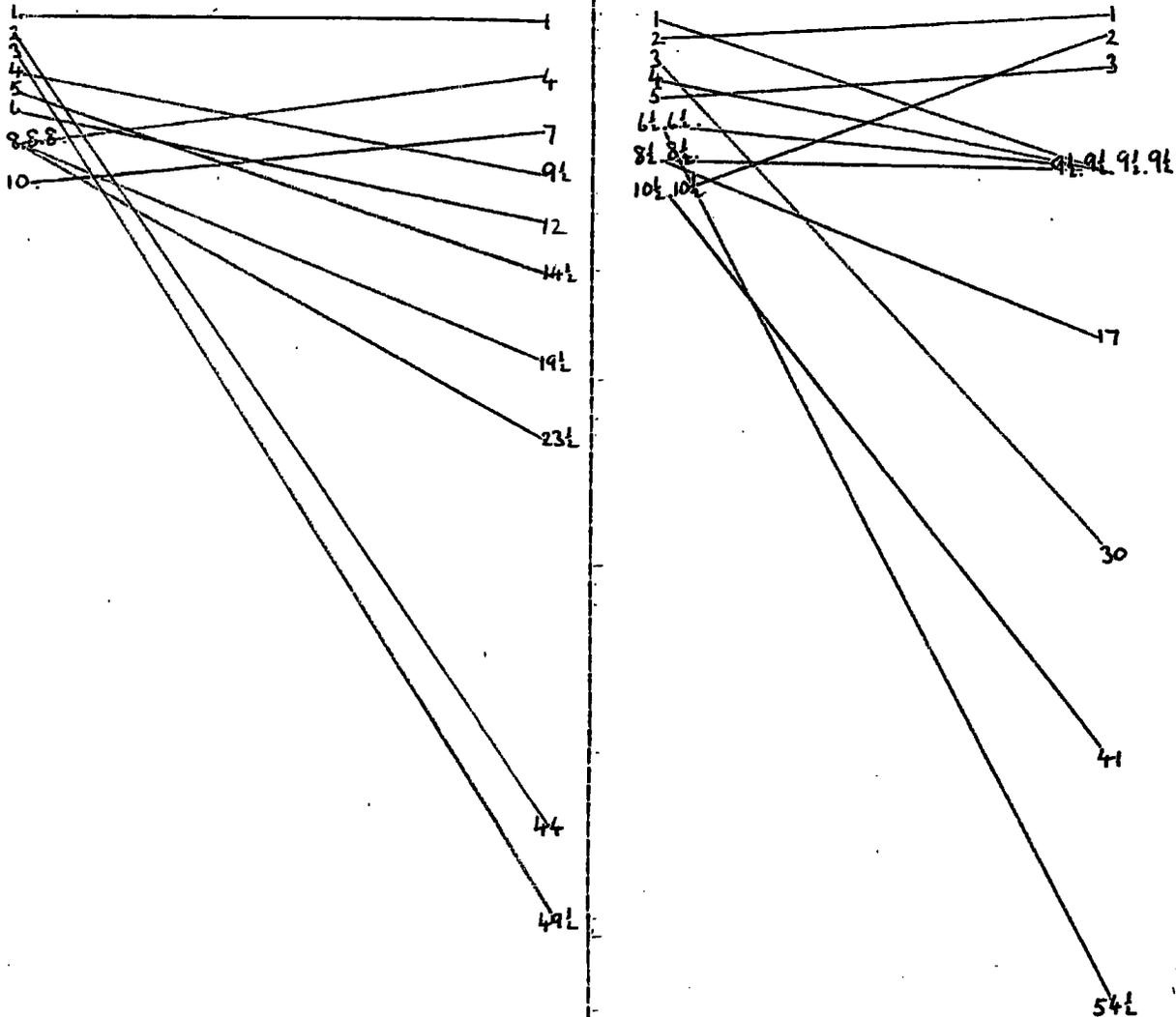
Making use of teachers' assessments 7 out of the first 11 remain in that group at 13, which would seem to indicate that these assessments are superior in selecting the best pupils. On the other hand, 3 of the best pupils have dropped below half-way and one is almost bottom of the whole year-group.

Rank order at selection.

Rank order 2nd yr. Grammar

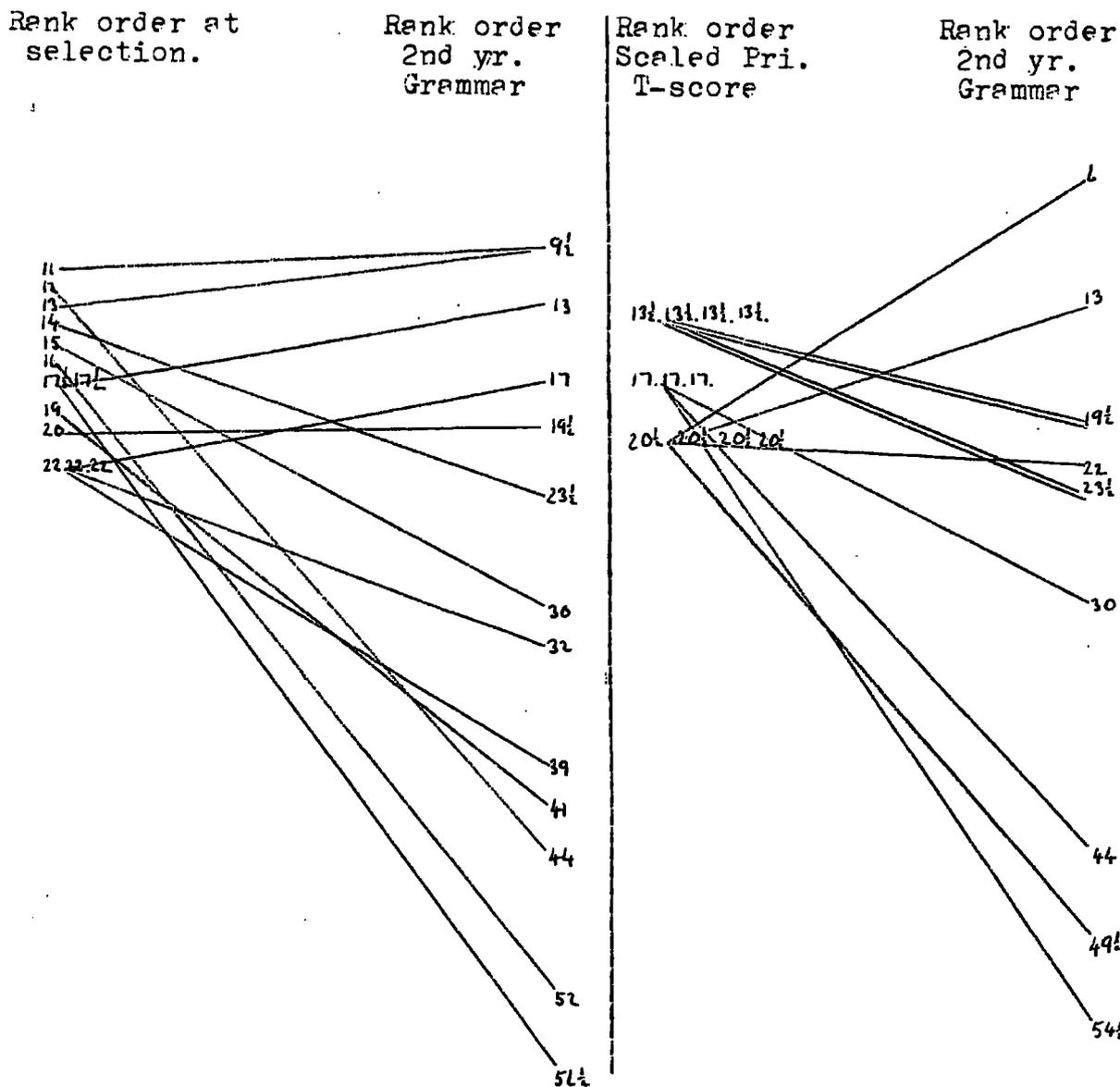
Rank order Scaled Prim. T-score

Rank order 2nd yr. Grammar



On considering the 2nd group in rank orders it is found that neither means of prediction is very reliable in view of the wide spread at 13, particularly downwards. It was expected that when so many pupils in the first 10 failed to maintain that standard, those in the next group below would rise to fill these positions, but this is not so. These leading positions will evidently be filled by children who were about or below the half-way mark at selection. Only 1 or 2 pupils rise into the first 10 at 13 and 4 manage to remain in the section under consideration.

The range in positions in the grammar school is 47 and 48.5 places, almost covering the range of the whole group, which is 57 in number.



Here we have under consideration what is roughly the middle group at selection: but notice how it changes in character in the grammar school - it is no longer a middle group but spreads over almost the whole range of positions.

The range of positions is very wide, whether using entrance examination order or order from teachers' assessments, but the order in the examination is better at prediction in so far as it gives us 6 pupils in the same group at 11 and 13, while the primary school order only gives us 3.

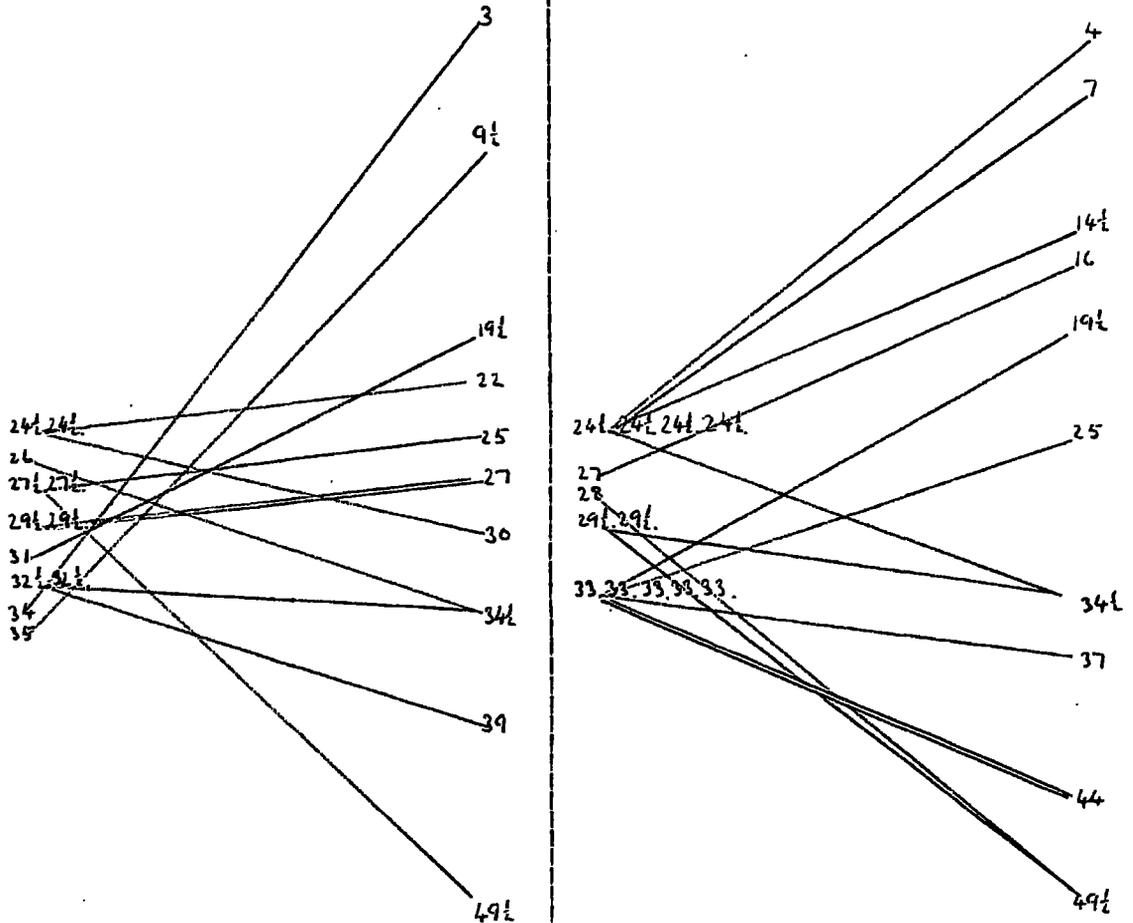
It is worth noting that the two pupils placed 34th and 35th by the selection tests are the best of those placed in the 'border-line' group on the results of that examination.

Rank order at selection.

Rank order 2nd yr. Grammar

Rank order Scaled Pri. T-score

Rank order 2nd yr. Grammar



The pupils in this 4th group were all 'border-line' pupils on the results of the selection examination.

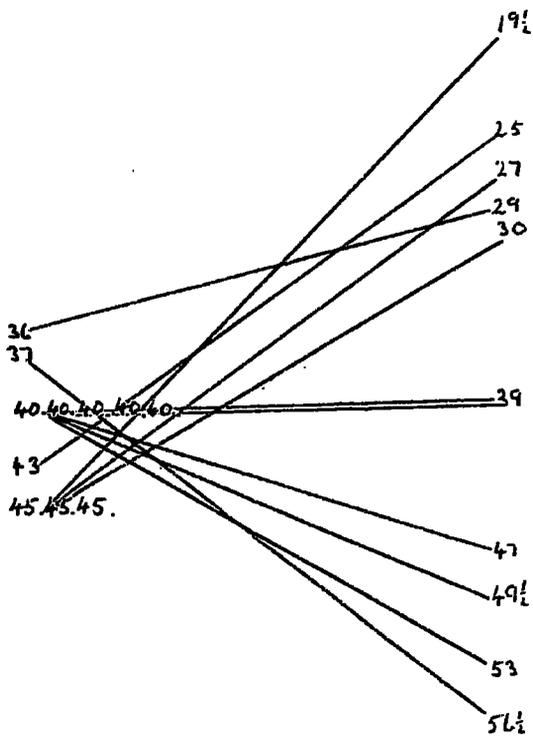
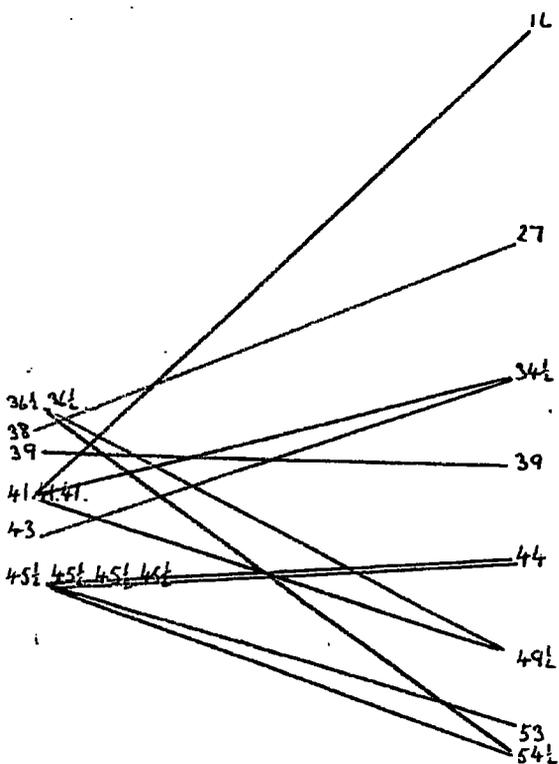
Both the criteria for selection have produced a group which contains no really outstanding pupils and whose range in the grammar school is 37 and 38.5 places. Using the rank order based on performance in the tests the group contains 4 pupils who move up out of the group, 3 who remain, and 5 who move down into the lower group: using the Scaled Primary T-score we have 5 who move up, 2 who remain, and 4 who go down.

Rank order at selection.

Rank order 2nd yr. Grammar

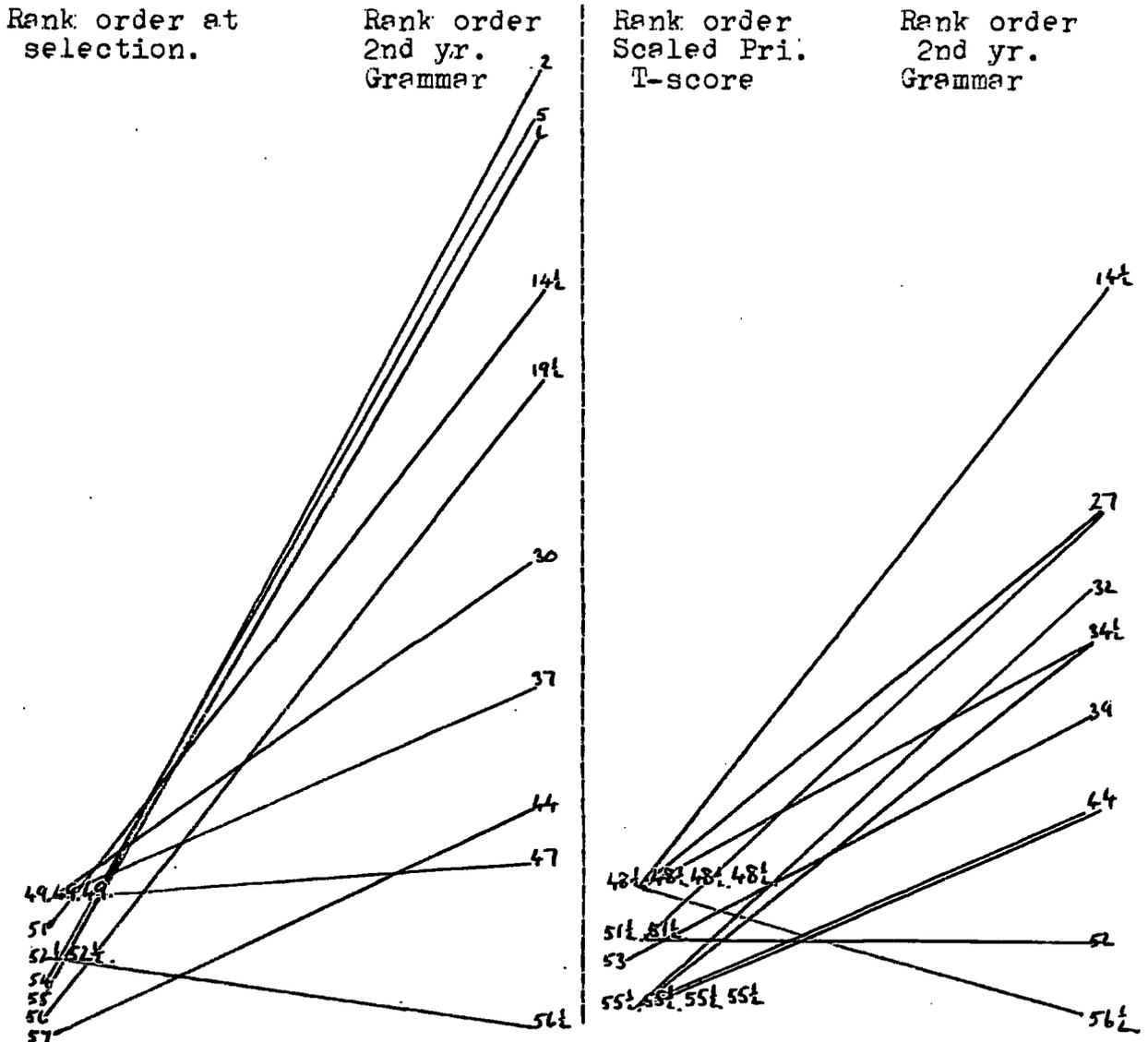
Rank order Scaled Pri. T-score

Rank order 2nd yr. Grammar



On the left of the page the group of 10 pupils comprises the 6 poorest of the 'border-line' pupils and the last 4, who were not considered suitable for grammar school on the results of the Grading Examination. It is very disturbing to find that, of the two pupils who share the 52nd position in the selection examination, one becomes 6th in the grammar school and the other is the poorest in the whole year-group: the girl placed 54th and recommended for transfer to the modern school on the results of the selection tests, is now 5th in the year-group. The boy placed 55th is a special case of physical disability, already mentioned. (See p. 20) It must be pointed out that the three pupils placed 52nd, 54th and 55th by the selection tests, who have progressed to 6th, 5th and 2nd, were placed 20th, 25th and 10th respectively by the Scaled Primary T-score.

Note that only 1 or 2 pupils placed in this bottom group remain in that group in the grammar school.



Correlations between Entrance Tests and Specific Subjects  
in the 2nd Year of the Grammar School Course. (See Appendix p.5A)

English

As is to be expected, the correlation between English in the selection tests and English in the grammar school is highly significant. The only other significance is between the Scaled Primary T-score and grammar school English, and in this respect, the Scaled Primary T-score is a much better predictor than the total of the tests, which is the criterion for admission to the grammar school. Rather surprising is the low correlation between the Verbal Intelligence and English in the grammar school: perhaps it is because the type of intelligence measured by the tests is not the type needed to achieve success in the grammar school English examinations.

French

The Scaled Primary T-score is the best predictor here, with the English test and the Verbal Intelligence test also significant. The selection tests as a whole are not very successful in predicting attainment in French as the Arithmetic and Non-verbal tests do not help much in this matter.

Latin

The Scaled Primary T-score again gives the best prediction and the Verbal Intelligence test shows high significance. Some specific ability seems to be required for French and Latin which is not required for English, as the two former correlate highly with Verbal Intelligence but English does not: this may be connected with the abilities necessary in acquiring a new language.

History

Only the correlations with the primary school assessment have high significance and the battery of tests shows negative correlation. It is quite probable, of course, that the specific abilities required for success in History are not tested in the selection process, e.g. ability to write a reasoned piece of English and ability to marshal a series of facts, whereas it is possible that these qualities do influence the primary school marks.

Geography

The Primary T-score, the battery of tests and Arithmetic are all significant. This is one of the few subjects to show a fairly high correlation with the Non-verbal Intelligence test and it is thus evident that non-verbal ability is helpful in the study of diagrams and maps.

(See Appendix p. 5A)

### Mathematics

The highest correlation is with the primary school assessment, next in order is the total of the battery of tests, followed by the Arithmetic test. Non-verbal ability is evidently necessary to some extent in the lower school Mathematics course.

### Science

Primary school assessment is the best predictor: there is a fairly high correlation with the Non-verbal test and a negative correlation with Verbal Intelligence. Evidently a difficult subject to predict.

### Art

Here the primary school assessment is of no value in prediction, in fact, it shows negative correlation. The Non-verbal test shows a correlation which is significant at the 1 per cent. level, while English and Verbal Intelligence give negative correlation.

### Woodwork

Only the boys are considered as the girls' marks for practical subjects were not available. The Non-verbal test is significantly correlated at the 1 per cent. level, but Woodwork seems to correlate more with general intelligence than does Art, as there is a high correlation with the total for all the selection tests.

### Average for All Subjects

The best correlation of .455 is that with the Scaled Primary T-score: the battery of tests, which is the criterion for admission to the grammar school, gives a correlation of only .144. Of the 4 tests Arithmetic gives the best correlation, followed by English and Verbal Intelligence, and finally, Non-verbal Intelligence gives negative correlation.

When the total of 3 tests only is used as the criterion, omitting the scores in the Non-verbal test, the correlation increases to .305, a result which is significant at the 5 per cent. level. (See Appendix p. 3A)

### Summary

The Scaled Primary T-score gives significant correlation with 7 of the 9 grammar school subjects, failing to predict only in the case of Art and Woodwork, and the primary assessment is the only criterion to show significant correlation with the average of the grammar school subjects, in fact, the significance is at the 1 per cent. level.

The total of the standardised scores in the selection tests, which is the criterion for admission to the grammar school, gives significant correlations with Geography, Mathematics and Woodwork: when raw scores are used the correlations are improved, which is to be expected as, in that case, there is no age allowance either in the test scores or in the grammar school scores.

The English test correlates significantly with English and French, and fairly highly with Latin, but gives negative correlation with Art.

The Arithmetic test correlates significantly with Mathematics and Geography, and quite highly with Woodwork: its lowest correlation is with History.

Verbal Intelligence gives high correlation with French and Latin, fairly high correlation with History and negative correlation with Geography, Science and Art.

The Non-verbal test correlates significantly with Art and Woodwork and negatively with all other subjects except Geography, Mathematics and Science.

Inter Correlations between Specific Subjects in the 2nd Year of the Grammar School Course. (See Appendix p. 6A)

As these are internal examinations the correlations are therefore much higher than those between external examinations and internal examinations and significance at the 1 per cent. level is used to indicate reliability.

English correlates significantly with French, History, and Latin, which is to be expected, but also with Geography and Mathematics: it also correlates quite highly with Woodwork and Science, which seems to indicate the overriding importance of English in the grammar school. There is negative correlation with Art and the highest correlations are with French and Latin.

Latin correlates significantly with all subjects except Science, Art and Woodwork but correlates most highly with French, English and Mathematics.

French also correlates very highly with Mathematics, in fact, there is roughly equal correlation between French and English, Latin and Mathematics.

History correlates significantly with all subjects except Art and Woodwork but the figures are not very high, the best correlation being with Geography.

Mathematics correlates significantly with all subjects except Art and its highest correlations are those with Latin, French, Geography and Science.

Science correlates highly with Mathematics and Geography and significantly with History.

Geography correlates significantly with all subjects except Art and French, although the correlation with Art is quite high and bears out the fact that non-verbal ability is important in Geography.

Art gives significant correlation only with Woodwork and correlates negatively with the language subjects and with History. It shows positive correlation only with Geography, Science and Mathematics.

Woodwork correlates significantly with Art, Geography and Mathematics.

Comparison between Entrance Examination and Average Attainment in the General Certificate of Education.

The General Certificate of Education is perhaps a better criterion of grammar school achievement than the school examinations as it is an external examination, taken by hundreds of pupils from many different schools, and is thus free of the 'halo' effect sometimes found in school examinations. This 'halo' effect is one of the reasons why G.C.E. results vary from school to school, but there are others such as differences in character, social environment, teaching and average ability.

The entrance examination ought not to be as successful in predicting G.C.E. performance as it is in predicting attainment at 13 years, but the entrance examination does attempt to select those likely to succeed in G.C.E. as this examination is the main object of the grammar school course.

It has already been shown that school examinations correlate better with each other than with the entrance tests or the G.C.E., so it is quite possible that these two external examinations may correlate highly with each other, if they are measuring similar abilities and the school examinations are measuring something slightly different.

The reliability of the G.C.E. is sometimes called into question because of the difficulty of marking objectively the essay type of answer and the entrance tests are often criticised on the grounds that they do not measure the abilities that are required in the grammar school, therefore it is possible to obtain a low correlation.

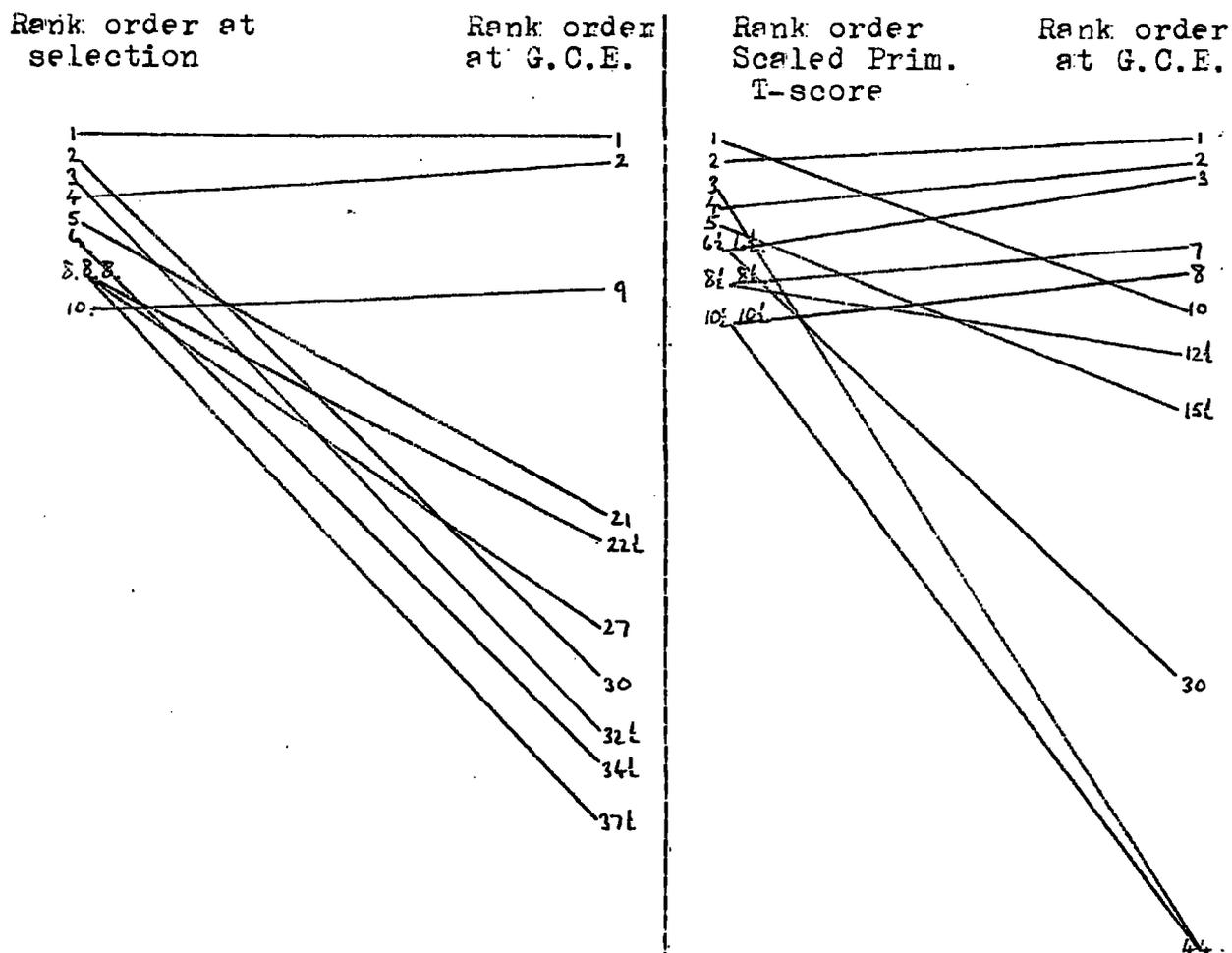
The regression coefficients and multiple correlation (See Appendix p. 7A.) show us that the maximum prediction of the selection tests is now .518 as compared with .290 at the age of 13, although the total of the tests only gives a correlation with G.C.E. of .232. The prediction obtained from the Scaled Primary T-score is now .358 as compared with .455 three years previously. Thus, by use of weighting, the selection tests can have better predictive capacity than the Scaled Primary T-score, but, as used at present with equal weighting, their efficiency is never at any time as high as that of the Scaled Primary T-score.

Let us study the predictive capacity of the tests and the primary record as applied to individuals, by comparing rank orders from these two criteria and the rank order in G.C.E.

The total at selection used is the total of marks obtained in the tests after the raw marks have been standardised and an age allowance added: this total is normally the criterion for admission to the grammar school.

Comparison between Rank Orders at Entrance and in G.C.E.

The Scaled Primary T-score seems to be a better predictor than the tests as only 3 of the first 10 chosen by the tests remain in the group at G.C.E., while 6 of the first 11 selected by the primary assessment still maintain that standard. It is interesting to note that, since the 2nd year, only 1 pupil in each group has dropped below 10th, and in the other case, 11th position. In addition the range of positions revealed at 13 years has been slightly reduced in both cases, although there are still many pupils who fall below the half-way mark, 5 of those selected by the tests and 3 of those selected on the primary record.



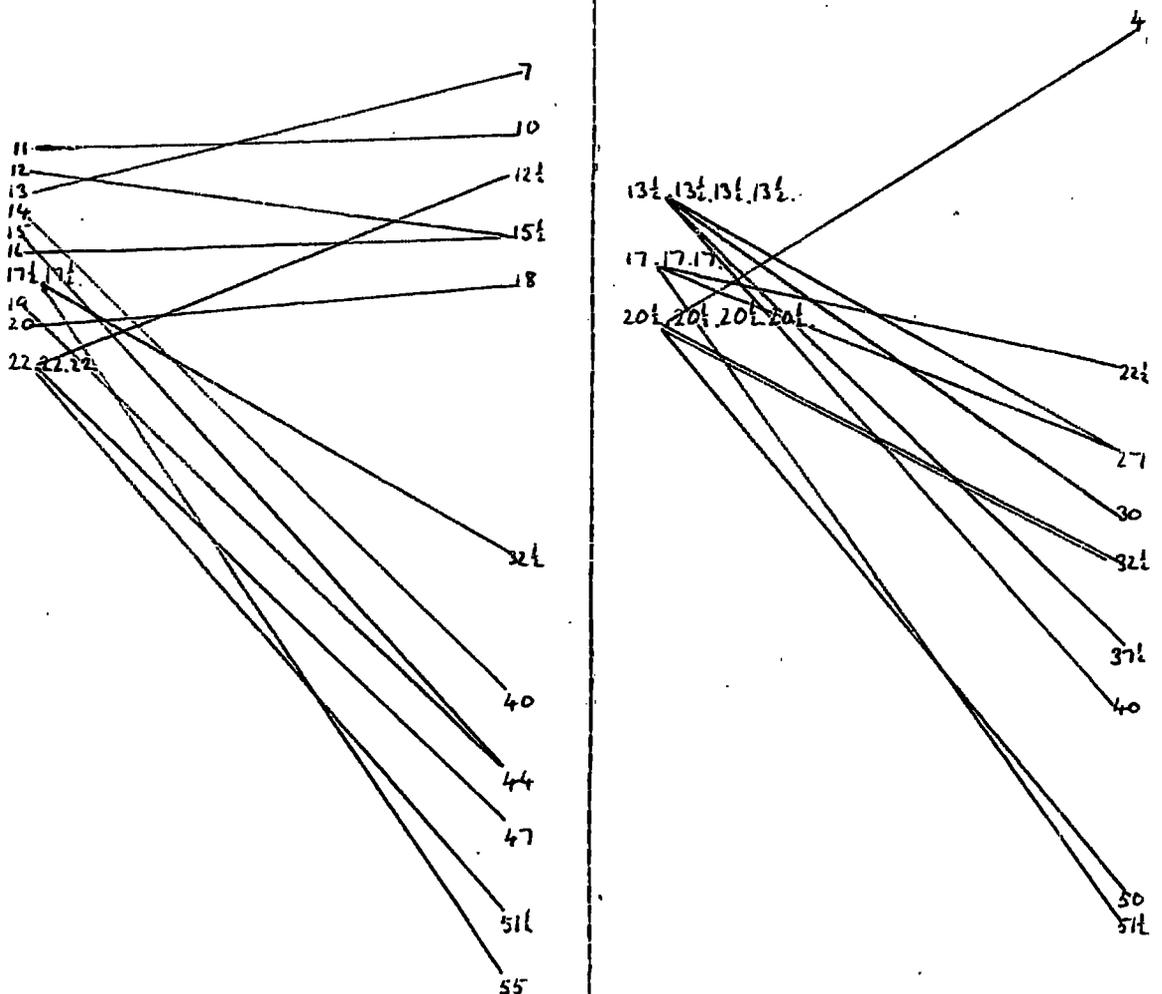
On considering the second group of pupils in rank order, it is found that the selection tests do pick out 4 pupils who remain in the same group at G.C.E., while the Scaled Primary T-score only picks out 1. It is surprising how few of the pupils in this group improve in position in the grammar school, while so many drop below half-way: using the selection tests as a criterion, we have 7 out of 13 who do so, and the number who drop below when we use the teachers' assessments as a criterion is 7 out of 11. These figures do show the very great changes that take place between 11 and 16 years of age, although the number falling below half-way was exactly the same at 13, in the case of selection by tests.

Rank order at  
selection.

Rank order  
at G.C.E.

Rank order  
Scaled Prim.  
T-score

Rank order  
at G.C.E.



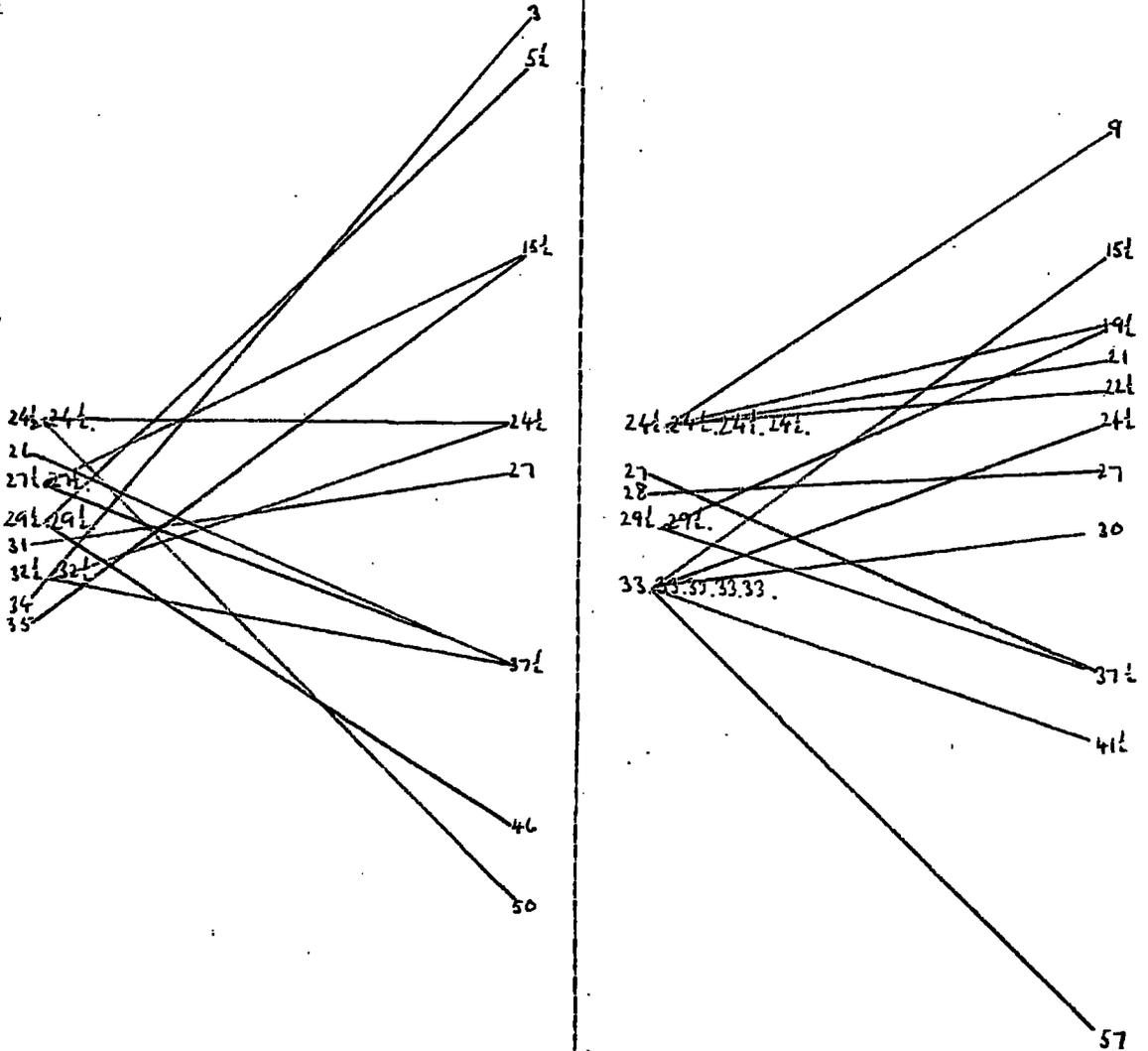
This is roughly the middle section of the year-group, but at G.C.E. it has spread over almost the whole range of positions in the group, the range being 47 in one case and 48 in the other. They have spread fairly evenly in both directions however, with 4 or 5 pupils rising above or falling below this section and 3 remaining in the same section.

Rank order at selection.

Rank order at G.C.E.

Rank order Scaled Pri. T-score

Rank order at G.C.E.



The pupils in this group were all 'border-line' cases at selection and were admitted after further testing by the Area Panels.

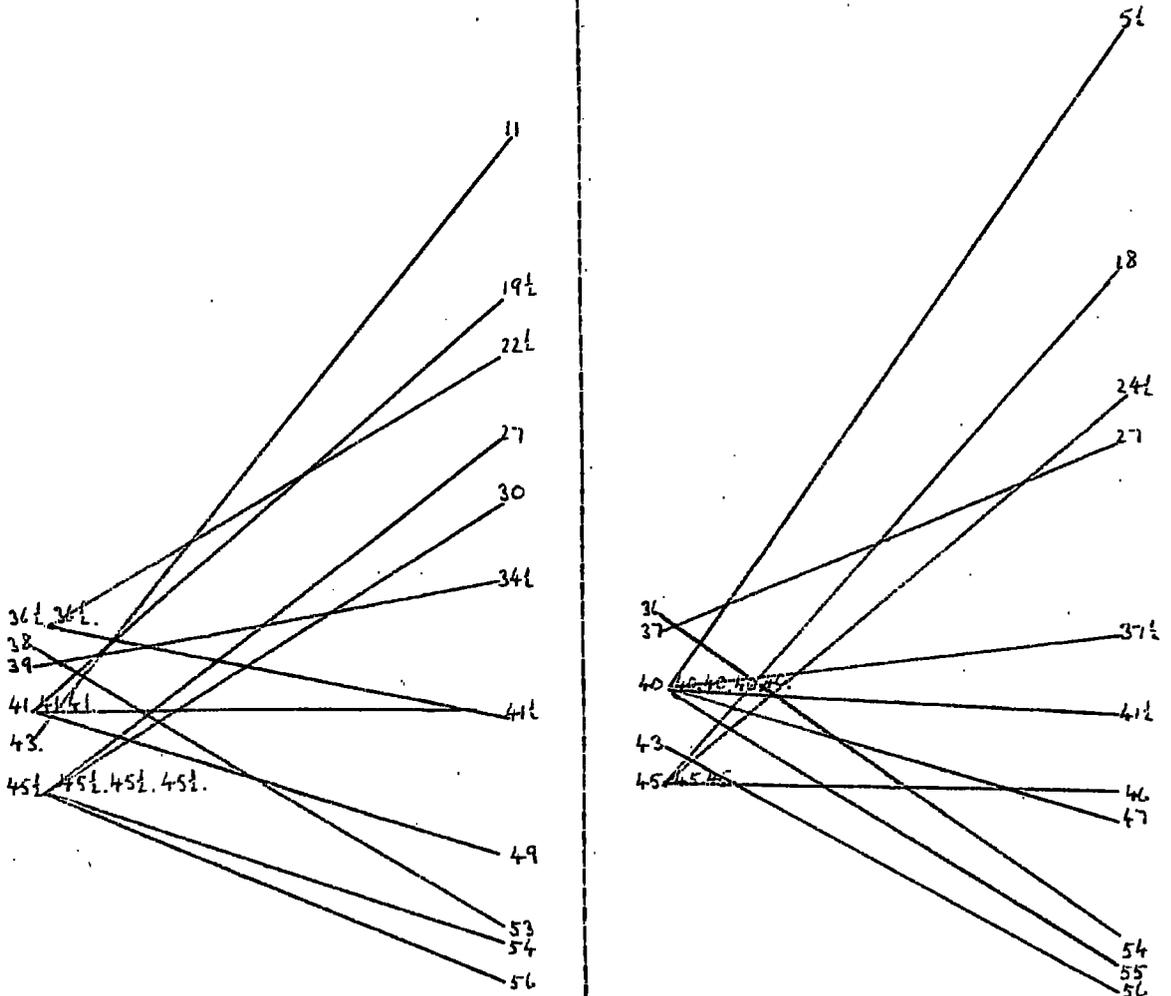
There has been some change since the age of 13, as the spread of positions is now in both cases, larger than it was then. The distribution is fairly even, being 6 improving, 1 remaining, and 4 going down in the case of the selection tests, and 4 : 3 : 4 respectively, when the rank order from Scaled Primary T-score was used.

Rank order at selection.

Rank order at G.C.E.

Rank order Scaled Pri. T-score

Rank order at G.C.E.



This group consists of 6 'border-line' pupils and 4 who were placed in Group III on the results of the entrance tests, as these results showed that they were not suitable for a grammar school education. Of these 10 pupils shown on the left-hand side, 3 are still in the same section at 116 and 3 are among the best 10 pupils in the year-group. The selection tests: tests completely failed to predict the potential ability, of at least half, as they are in the first 20 at G.C.E.

The rank order based on the Primary T-score is not much more successful as here again we have 5 children out of 11 coming up into the first 20 at G.C.E. Of the remainder, 5 were placed fairly accurately at or near the bottom of the list and one is in the middle.

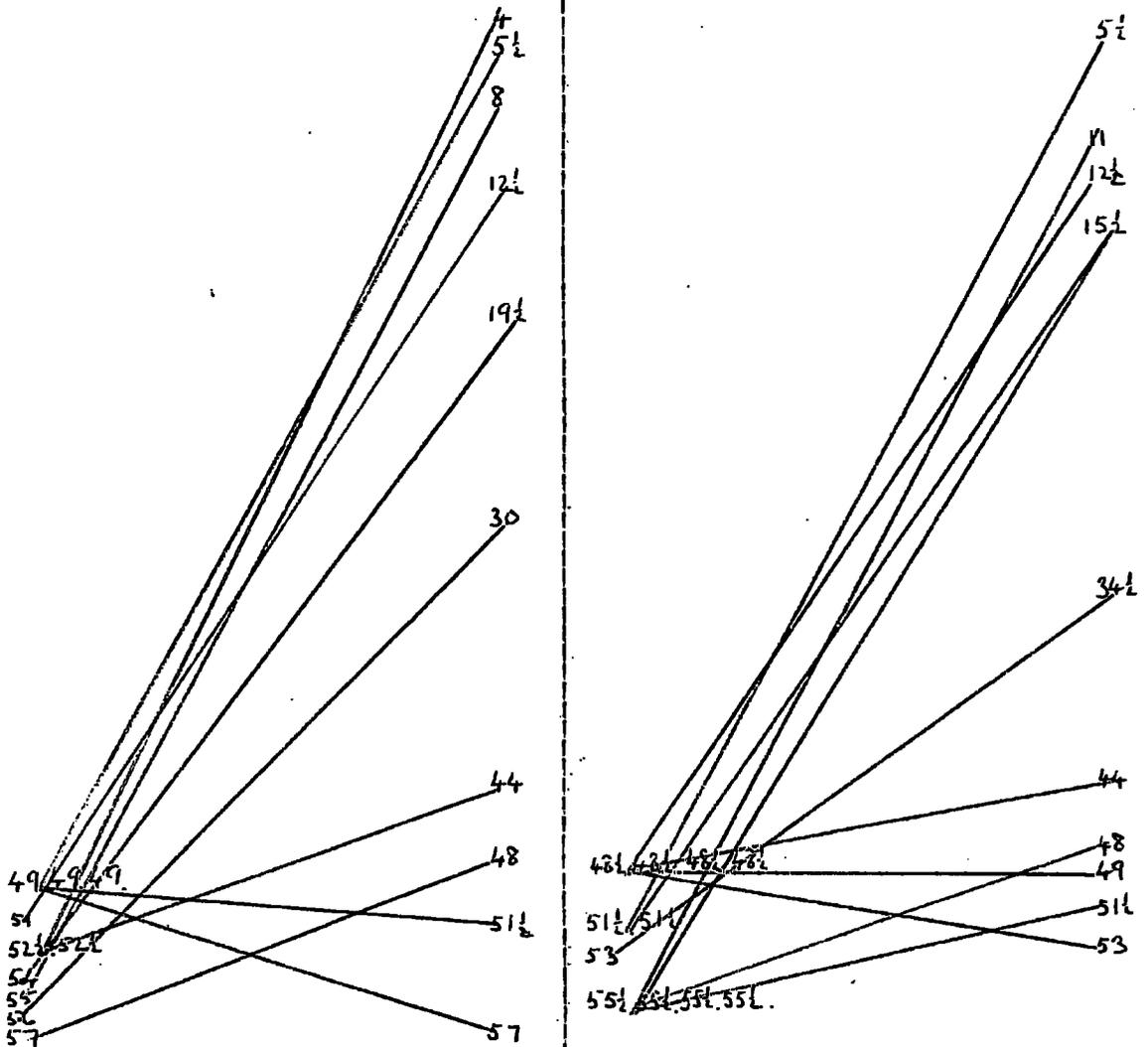
When we compare attainment at G.C.E. with attainment at

Rank order at selection.

Rank order at G.C.E.

Rank order Scaled Prim. T-score

Rank order at G.C.E.



13 years of age (see p. 28), we find that the pupils at the bottom of the lists in the selection tests are already showing great promise in the 2nd year at the grammar school: but, of the pupils placed at the bottom of the list on their primary school record, only 1 has succeeded in getting into the first 20 at the age of 13, yet, 3 years later, in the G.C.E. the number of pupils in the first 20 has increased to 5. These 4 pupils have developed considerably in the upper part of the school and their ability has not been noted either in the primary school or in the lower part of the grammar school: it is evident, therefore, that under these circumstances it would be difficult to predict these successes.

When we consider the 5 pupils who were at the bottom of the list in the selection tests and in the first 20 at G.C.E. we find that these children showed high ability right from the beginning of the grammar school course (except in one case) and this ability ought to have been revealed in the selection examination.

Here are the records of the 5 pupils who showed poor ability at selection but high ability in the grammar school:  
Rank orders:

	<u>Selection</u>	1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.	G.C.E.
(1)	49	31	47	48	38	19	5
(2)	51	31	14	13	4	8	12
(3)	52	8	6	9	10	13	4
(4)	54	8	5	6	6	16	19
(5)	55	3	2	2	6	5	8

N.B. No. 5 is a physically handicapped boy. (See p. 20)

Records of the 5 pupils who showed poor ability in the primary school, but high ability in the G.C.E. :

	<u>Prim. school</u>						
(1)	51	31	27	35	38	31	5
(2)	48	31	14	13	4	8	12
(3)	51	43	52	37	47	26	15
(4)	55	52	34	27	12	16	11
(5)	55	31	44	13	29	20	15

N.B. No. 2 in each case is the same pupil whose ability was not revealed by either of the criteria at 11 years. This shows that both methods of selection can fail to select the 'late developer', but in this case the ability might have gained the pupil a transfer to the grammar school at 13 years.

There may, of course, be many pupils of approximately the same ability at 11 years, who could later reach a high standard of work in the grammar school, and this case gives support to the suggestion of the Central Advisory Council for Education in England (25) that a higher proportion of children should be given grammar school places.

Correlations between Entrance Tests and Specific Subjects  
in the General Certificate of Education. (See Appendix p. 7A)

English

There have evidently been some new factors affecting the attainment in English since the comparison was made between attainment in selection tests and attainment at 13 years of age. The correlation with the English test at entrance is no longer significant, but the correlation with the total scores in the selection tests is now significant. In other words, the criterion for selection predicts performance in G.C.E. better than performance at 13 years of age.

It must also be noted that the Scaled Primary T-score, which was so efficient in predicting performance at 13 years, shows very little correlation with G.C.E. English.

The negative correlation with the Non-verbal Intelligence test shows good reliability as it is exactly the same as at 13 years of age.

French

All positive correlations are lower than at 13 years of age, but the Scaled Primary T-score is still the best predictor of attainment in French, although the English test also gives a significant correlation.

The correlation with the Arithmetic test is practically the same as at 13, but the correlation with the total of the selection tests reveals less significance than at 13 years of age.

History

Obviously a very difficult subject to predict as almost all the selection criteria give negative correlation. The only test which gives correlation is the test in Verbal Intelligence. The number of pupils who took this subject in G.C.E. is very small and this would obviously attenuate correlation, but it is rather difficult to explain the significant negative correlation with the selection test in English, although it must be borne in mind that the English test does not include any assessment of the ability to write a piece of continuous English.

(See Appendix p. 7A)

### Mathematics

The Arithmetic test and Scaled Primary T-score are still significantly correlated as at 13 years of age, but the total of the selection tests ceases to be significant. The correlations with the tests in English and in Verbal Intelligence have both increased since the comparison was made at 13 years of age.

### Science

The correlation with the English test at selection has now become significant, while the correlation with the Arithmetic test has become negative: this would seem to indicate that ability in English is more important in G.C.E. than it is lower down in the school. The Scaled Primary T-score is still the best predictor of attainment in Science.

### Geography

The best predictors are the Non-verbal Intelligence test and the total of the selection tests, neither of which gives a significant result, but the correlation with the Non-verbal test has increased to such an extent that it is now the best predictor of G.C.E. Geography.

The change from a significant correlation with the Arithmetic test of .272 at 13 years of age to a negative correlation of  $-.399$  at G.C.E. can only be explained by the suggestion that the character of the group has changed due to the influence of various factors which have developed since the age of 13, and to the fact that the number in the group has been reduced to 19.

### Art

The pupils who offer this subject in G.C.E. are evidently those with well-marked specific spatial ability, as the reduction in numbers from 57 to 21 and the development of this specific ability have caused the correlation with the Non-verbal Intelligence test to increase from .390 to .615 in the three years between 13 and 16.

The Scaled Primary T-score is of no value in the prediction of Art, but the correlation with the total of the selection tests is now quite high.

Other interesting changes since the age of 13 are---the increase in the negative correlation with the Verbal Intelligence test from  $-.122$  to  $-.468$ , and the change in correlation with the English test, from a negative correlation of  $-.202$  to a positive one of .356.

(See Appendix p. 7A)

### Woodwork and Domestic Science

The Scaled Primary T-score is of no value in predicting performance in these subjects: the best predictor is the Non-verbal Intelligence test, but the total of the selection tests is the next best, except for Verbal Intelligence.

### Average for All Subjects

As at 13 years of age, the Scaled Primary T-score is the best predictor, although the correlation is now lower. The English and Verbal Intelligence tests also give significant correlations, which show a substantial increase on those obtained at 13 years of age: it would appear that these two abilities are of increasing importance in the upper part of the grammar school course. The correlation with the test in Arithmetic now ceases to be of any value.

The total standardised score of all the selection tests, which is the criterion of grammar school admission, has an increased correlation of .232, which, although not a significant result, shows that this criterion is a more valuable predictor of G.C.E. performance than of performance in the grammar school at 13 years.

### Summary of Predictions

The Scaled Primary T-score is still the best predictor of grammar school success: it produces significant correlations with G.C.E. in French, Mathematics, Science and the average of all G.C.E. subjects.

The next best is the English test as it correlates significantly with French, Science and the average for all subjects. The Arithmetic test is useful only in predicting performance in Mathematics and the test in Verbal Intelligence gives no useful correlations except that with the average for all G.C.E. subjects.

The total score in selection tests gives a significant result in one instance only, that with G.C.E. English.

The best prediction given by any of the tests is the highly significant correlation of .615 between the Non-verbal Intelligence test and G.C.E. Art.

Inter Correlation between Specific Subjects in the  
General Certificate of Education. (See Appendix p. 8A)

Statistics here are not so useful as those for the grammar school examinations taken at the age of 13, as after three years in the school there is a varied choice of subjects apart from the three core subjects English, French and Mathematics. As a result the number of pupils concerned in these correlations is very much reduced and in some cases there are so few pupils that correlations are useless; e.g. only 1 pupil took Geography and History in the G.C.E. so that obviously we cannot obtain a correlation between these two subjects.

For the purpose of this enquiry the writer discarded any correlations involving less than 15 pupils.

On the whole the correlations are lower than those obtained at the age of 13 but the correlation between History and English has increased considerably, from .374 to .721: this does not necessarily indicate that age increases correlation as only 18 out of the 57 pupils in the year-group take these two subjects in G.C.E.

English would appear to be a very important factor in G.C.E. success as it correlates highly with 4 of the 7 subjects considered and is only of no value in the case of correlation with Art.

French correlates highly with English and Mathematics, but correlates negatively with Geography and the practical subjects. Mathematics correlates highly with 3 subjects, English, French and Science.

## II. EFFECT OF AGE ON GRAMMAR SCHOOL PERFORMANCE

It has usually been found that age does affect performance in entrance examinations at 11 years, and some investigators claim that the superiority in performance attributed to age persists even at G.C.E. level. The writer has attempted to discover whether this is true of this particular year-group.

Two groups were studied with an approximate difference in age of 9 months.

Group I: Age 11 y. to 11 y. 3 m. at testing - 1st Dec. 1948  
(15 pupils) " 11y. 9m. to 12y. at entry - 1st Sept. 1949

Group II: Age 10y. 3m. to 10y. 6m. at testing.  
(12 pupils) " 11y. to 11y. 3m. at entry.

### Average Marks of Groups at Testing (See Appendix p. 9A.)

1. When the means of the scores without age allowance were calculated the older group proved to be definitely superior, the greatest superiority being shown in Arithmetic, with a difference in mean score of 9.6%, which is significant at the 5 per cent. level. In the English test the older group was better by 5.3%, significant at the 10 per cent. level, and in Verbal Intelligence the superiority of the older group was 6.6%, also significant at the 10 per cent. level. In the Non-verbal Intelligence test the superiority of 5.5% was not significant at the 10 per cent. level.

The difference in the mean primary school assessments, when this assessment had not been adjusted either for differences in schools or differences in age, was 8.9% in favour of the older group, which was significant at the 5 per cent. level.

2. The adjustment of the scores by the addition of an age allowance ought to even out the differences between the two groups and it does so to a great extent. The superiority of the older group now varies from .7% to 3.9% and none of these differences is significant at the 10 per cent. level.

In the case of the Average Primary T-score, when this is scaled to allow for differences in age and differences between schools, the superiority of the older group is reduced to 4.6%, which is not significant at the 10 per cent. level.

### Average Marks obtained in the Grammar School

The mean average score of each group was calculated for each year of the grammar school career and compared. The results show that age has no significant effect on grammar school attainment although the older group is slightly superior at all times except in the G.C.E., when the position is reversed. The difference in the 1st Year of the grammar school is

only .9%, when we expect the difference at its highest. When we compare this with the difference in raw marks in the selection tests of 6.8%, we must conclude that, in regard to this year-group, the older group is better in tests but not in ordinary grammar school work. The difference of .9% in the 1st year grammar school results coincides much more with the difference of 1.9% obtained from the tests when the age allowance was added. The circumstances in the 1st year at grammar school, where new subjects are being introduced and all the pupils are starting off at the same level, seems to even up any difference in age just as effectively as adding the age allowance in the tests. If the age allowance added to the tests has been made correctly, it means that the older group is slightly superior in ability, irrespective of age, and this agrees roughly with the average attainment for all the grammar school examinations, where the superiority is 1.1%, as compared with that in the tests of 1.9% after the age allowance has been made. The conclusion to be drawn then, is that, in the case of this group, age does not affect attainment in the grammar school.

It is rather difficult to explain the superiority of the younger group in the General Certificate of Education, where they are better by 3%, although this difference is not significant. This seems to contradict all the previous results and can perhaps be ascribed to the deficiencies of this external examination in assessing general attainment.

#### Attainment in Grammar School English (See Appendix p. 10A)

In this subject the grammar school marks for English are the combined marks for English Language and English Literature, although these marks are given separately in the case of the G.C.E.

It can be said that age makes no difference to attainment in this subject as none of the differences are significant: during the 5 years in the school, the older group is superior 3 times and the younger group 2 times, and the superiority of the younger group at G.C.E. evens this up. This ascendancy at G.C.E. is the result of the much better performance in Literature of the younger group, as the Language result does not distinguish between the two groups. The difference of 6.5% in the averages for Literature is not, however, significant.

The composition of the groups may have affected these results as the G.C.E. figures for the whole year-group show that the girls are superior in Literature, while the boys are better in Language. The composition of the groups is as follows:

Group I - 12 boys, 3 girls. Group II - 7 boys, 5 girls.

Attainment in Grammar School Mathematics (See Appendix p. 10A)

The older group is superior in Mathematics, but only one of the differences is significant: the difference in the 1st Year is 8% but it is not so marked later on, the lowest difference being 2.5% in the school examinations.

In the General Certificate of Education the difference is negligible, in spite of the reasons against this:-

1. Boys are definitely better than girls in the whole year-group.
2. The older group (Group I) contains 12 boys and 3 girls.
3. The older group has been superior throughout the grammar school career, and in the examination held just before the G.C.E. the older group was 2.9% better than the younger.

Age thus does seem to give an advantage in grammar school Mathematics, but although the difference is marked and persistent, it is never large enough to be significant at the 10% level, except in the 1st Year.

Attainment in Grammar School French (See Appendix p. 10A)

This is an entirely new subject to all the pupils and attainment in French correlates highly with the selection tests in English and Verbal Intelligence. Group I (the older group) was significantly better than the younger group in these tests, and therefore one ought to expect them to show some superiority in French, but this is not so. The younger group is superior throughout the grammar school career, although the only significant difference is in the 5th Year school examination. This superiority could be explained by the fact that girls are better than boys in French and the older group is 75% boys, if this were true of this year-group, but this is not so, as figures for the 57 pupils show that there is little difference in attainment between boys and girls, until we reach G.C.E.

French and Latin are the only subjects in the grammar school in which the younger pupils are consistently superior: the inference to be drawn from this, that younger pupils do better at languages merits further investigation on a larger scale.

Attainment in Grammar School Science (See Appendix p. 11A)

In the first three years at the grammar school all the pupils follow the same course, and, the course being general in character, the results for the first three years are a good estimate of general ability in Science: after these three years the pupils are allowed to specialise in various branches of science and some drop Science altogether. The result is that the numbers taking Science in these two groups are really too small to be of any value after the 3rd Year.

During the first three years the older group is definitely superior, although the only difference that is significant is that in the 2nd Year. The fact that this older group contains a large proportion of boys does not affect the result, as in the lower school there is hardly any difference between the average performance in Science of boys and girls.

Attainment in Grammar School History (See Appendix p. 11A)

Here again the only figures of any value are those for the first three years, when every pupil takes the subject and we can say from these figures that attainment in History in the lower part of the grammar school is not affected by differences in age.

Attainment in Grammar School Geography (See Appendix p. 11A)

Once more the number of pupils taking this subject after the 3rd Year is very small and conclusions are based on the average attainment in the lower part of the grammar school. There is no significant difference between the average performances of the two groups, therefore it can be said that difference in age does not affect grammar school attainment in Geography.

Attainment in Grammar School Art (See Appendix p. 12A)

In Art the older group shows a slight superiority at almost every stage, although this difference is never significant: this superiority does however agree with the results of the Non-verbal Intelligence test, when the older group was 5.5% better than the younger group, a difference which was not significant.

After the 3rd Year the figures are not so reliable, as the number of pupils taking Art is much reduced, and in the 5th Year the younger group is 5.9% better than the older group. This reversal of superiority does show the difficulty of obtaining reliability in a subject like Art, although in this case the difference between the two groups is maintained consistently throughout, apart from this one lapse.

The older group consisted largely of boys and, when the whole year-group is considered, the boys are better than the girls: this may explain the superiority of the older group, but in this case, the superiority will be largely due to difference in sex and not difference in age.

In any case, none of the differences revealed either in the Non-verbal test, the school examinations or G.C.E. is significant, and therefore it must be concluded that age does not affect attainment in Art in the grammar school.

Attainment in Grammar School Woodwork and Domestic Science  
(See Appendix p. 12A)

As marks were not always available for these subjects in the lower part of the school, it was necessary to calculate a combined mark to cover the first three years in the school. Generally speaking, the older group is slightly better than the younger one, but at no time is the difference significant, so it must be presumed that age does not affect attainment in the practical subjects in the grammar school.

Attainment in Grammar School Latin (See Appendix p. 12A)

As in French, the younger group was definitely better in this language which was new to all, introduced in the 2nd Year of the grammar school course. Figures are only given for the first two years of study as, subsequent to this, the numbers are too small, but the superiority of the younger group shown here is not significant, therefore it can be said that age does not affect attainment in Latin in the grammar school.

One explanation of the younger group's superiority in Latin is the fact that the girls are better than the boys in this subject, when the whole year-group is considered, and Group I does consist largely of boys. This explanation does not, however, apply to the results in French.

### Summary of Effect of Age on Grammar School Attainment

There are significant differences in ability revealed in the selection tests, but this variation in ability only rarely has any significant effect on attainment in the grammar school. The superiority of the older group is significant in 1st Year Mathematics and in 2nd Year Science, but on the other hand, the younger group is significantly better in 5th Year French.

Nevertheless the older group does consistently show superiority in some of the subjects, i.e. Mathematics, Science and Practical Subjects, while the younger group is better consistently in the acquisition of new languages. In Art the older group is generally better, and in the Average for All Subjects it is superior on every occasion except the General Certificate of Education. In English, History and Geography the two groups are almost identical in attainment.

It can therefore be stated that the older group is, generally speaking, superior to the younger group, but the difference is not sufficiently significant to justify, for example, an age allowance. On the other hand, there is a significant difference of ability revealed in the selection tests and therefore an age allowance is justified at that time.

### Correlations with Age

1. Correlation between Ages of Pupils and Total of Scores  
in Entrance Examination (Standardised for Age)  
= .066
2. Correlation between Ages of Pupils and 2nd Year Grammar  
School Average = .180

### III SEX DIFFERENTIATION IN GRAMMAR SCHOOL PERFORMANCE

The year-group consisted of 32 boys and 25 girls.

The object was to find out whether boys or girls are superior in the grammar school subjects and whether any differences revealed are significant and/or persistent.

#### Comparison of Performance of Boys and Girls in Selection Tests (See Appendix p. 13A)

##### 1. Raw Scores

In the particular group under consideration the girls are better in 3 of the 4 tests, i.e. English, Arithmetic and Verbal Intelligence, although the only difference which is significant is that in English. The boys are better in Non-verbal Intelligence but this difference is not significant. There is a significant difference in the average score for all the tests, again in favour of the girls.

The Unscaled Primary T-score, that is, the average mark given for each pupil by the primary school without adjustment for differences in school or in age, gives definite superiority to the boys, as the difference is significant at the 1 per cent. level.

Girls generally seem to do better in tests and it is possible that the teachers' estimates are more true than the selection test results, although they do err in the opposite direction.

##### 2. Scores Standardised and Age Allowance Added

The adjustments here favour the boys in the English, Arithmetic and Non-verbal Intelligence tests, bringing the mean scores nearer to those of the girls in English and Arithmetic, and increasing the superiority of the boys in Non-verbal Intelligence, making the difference significant.

The girls derive benefit in the Verbal Intelligence test, the Average of all tests and in the scaling of the Primary T-score: their superiority in the Verbal Intelligence test now is significant, their superiority in the Average of tests is increased in significance, and the superiority of the boys in the primary school assessment is lessened.



## Comparison between Boys and Girls in Grammar School Attainment

### English (See Appendix p. 15A)

The superiority of the girls is consistent throughout the grammar school course, although only 3 of the differences are significant. The superiority in G.C.E. English was the result of the girls obtaining very high marks in Literature, which more than equalled the boys' lesser superiority in English Language. From the results of the complete number of candidates submitting themselves for the General Certificate Examination of the Durham Examinations Board, involving nearly 5,000 pupils, it appears that the girls of this group compare favourably with the mass in Literature but not in Language, where, in the examination as a whole, the girls were superior by 12.2 per cent.

### Mathematics (See Appendix p. 15A)

The similarity in attainment between the two sexes revealed in the Arithmetic test of the entrance examination is not maintained in the grammar school as the boys are better than the girls at every stage of the grammar school career, and 4 of the 6 differences are significant. The school group is evidently more homogeneous than the total of candidates taking the G.C.E. of the Durham Examinations Board, as in the examination as a whole, the boys are 10.5 per cent. better than the girls.

### French (See Appendix p. 16A)

It is rather surprising to find that, in spite of the girls' superiority in the entrance examination in English and Verbal Intelligence and the high correlations between these two tests and ability in languages, the boys are better than the girls, although the differences are not significant. The girls do succeed in gaining the ascendancy in the 5th Year and in the G.C.E., but neither of these differences is significant and they are much lower than the difference between the sexes revealed in the Durham G.C.E. as a whole, in which the girls are superior by 13.4 per cent., whereas in the school group under consideration the difference is only 3.7 per cent.

Science (See Appendix p. 16A)  
(Includes Physics, Chemistry, Biology and General Science after first 3 years of General Science.)

The most useful figures for comparison are those for the first three years, as during that time there is no specialisation and all pupils take the same course in General Science. In the 4th and subsequent years some pupils take up to three science subjects while others take none.

In the lower part of the school the girls are significantly superior in the 1st and 3rd years, while the boys are better in the 2nd year, although this difference is not significant.

After specialisation has begun there is little overall difference between the two sexes, so that we can say that in the case of this school group, the sexes are roughly equal.

It is difficult to compare these science subjects as, after the 3rd year, when specialisation has begun, it is easier to get a high mark in Biology than in Physics or Chemistry: also it is usually found that girls do better in Biology than in Physics or Chemistry. In the case of the year-group which is under consideration the marks are all standardised and can therefore be compared, but for the whole of the Lurham G.C.E. the marks are raw marks provided by the Lurham Examinations Board.

History (See Appendix p. 17A)

The best criterion is the first three years in the school when all pupils take the subject: here the girls are slightly better than the boys, but the differences are not at any time significant. The figures after the first four years are unreliable as only 4 boys continue to take this subject.

The figure of 9.3 per cent., being the extent of the superiority of the girls over the boys in the whole General Certificate examination of the Durham Examinations Board is indicative of the extent to which girls are generally better than boys in this subject.

Geography (See Appendix p. 17A)

The year-group is fairly homogeneous as the differences between the sexes is negligible. This is rather different from the results furnished by the Lurham Examinations Board for the whole of the G.C.E. as there the boys are better than the girls by 6.8 per cent.

Latin (See Appendix p. 18A)

In the 2nd Year of the grammar school course all pupils took Latin and after one year's study in this subject, one-third of the pupils did not continue as their chances of success in this subject were small.

The most useful figures are those for the first two years of study in this subject and here the girls are superior, although the superiority is not significant. After this, the numbers are so small that they are of doubtful value.

On the whole we can say that the girls are slightly better than the boys, but this contradicts the results of the whole of the Durham G.C.E. in which the boys are slightly better than the girls.

Art (See Appendix p. 18A)

Here again the first three years in the grammar school provide the best criterion and we find that here the boys are significantly better than the girls: later, when the numbers are smaller the boys still maintain this superiority. The differences revealed in relative attainment in Art do confirm the superiority of the boys in the Non-verbal Intelligence although in that test the difference was only 4%, and was not significant.

It has generally been found that boys are better than girls in Non-verbal or Spatial tests (See pp. 15-16) and, if this is true, then we should expect this to show itself in grammar school Art as it does in the case of this group, but the figures for the Durham G.C.E. show that the girls are better than the boys by 13.1% in the whole examination.

Average for All Subjects (See Appendix p. 19A)

The relative attainments of the two sexes is practically the same as it was in the entrance examination: boys and girls are almost equal in grammar school achievement as the small differences are not significant. But this difference, although small throughout the school career, never fails to reveal itself except in the G.C.E. There are no grounds here for supporting the contention that boys are usually behind on entrance and make up the leeway later.

As it is sometimes felt that subjects like Art, Music, Domestic Science and Woodwork demand specific abilities and are not a real test of ability to profit from a grammar school education, the average performances were calculated excluding these subjects but the figures were practically the same as when they were included.

General Certificate of Education - Statistics (See Appendix p. 20A)

The average mark for the G.C.E. shows that the boys and girls are equal in attainment at this stage, but the figures showing the numbers of G.C.E. subjects failed show that the girls are more reliable than the boys.

The girls, for example, obtain a greater number of passes per pupil, because they do not fail so many subjects as the boys. The percentage of subjects failed by this group is 24.6% for the girls and 30.7% for the boys.

This greater reliability is also shown in the statistics supplied by the Durham Examinations Board and those appertaining to the whole country. The figures for these various groups of pupils do agree very closely:

School Group	-	Girls	have	6.1%	more	Passes
Durham G.C.E.	-	"	"	5.9%	"	"
All G.C.E. 1953	-	"	"	5.1%	"	"

These figures prove undoubtedly that girls are more successful in the General Certificate of Education: as far as the school group is concerned, it is evidently because the boys obtain more 'good' marks and more 'poor' marks than the girls as their average attainment is the same.

SUMMARY

In the case of this group it can be said that the girls are, on the whole better than the boys in the selection tests, although the boys are superior in the Non-verbal Intelligence test. This superiority shows throughout the school, although it is not significant and the girls are more successful in obtaining Passes in the General Certificate of Education.

The girls in this group are better in English and the boys excel in Mathematics and Art: apart from these subjects there is no real difference between the sexes, although the girls are slightly better in History and Latin.

IV. SIZE OF FAMILY

(See Appendix p. 21A)

The object here is not to attempt to show that low intelligence is associated with large families and vice versa, because these are all children of high intelligence, although they do come from families of varying sizes.

The object is to see if the size of the family does affect the attainment of the pupils in the grammar school. The numbers of cases are so small and the variations are so small in size that we must conclude that, in the case of this group, size of family does not affect attainment in the grammar school.

V. PARENTS' OCCUPATIONS

(See Appendix p. 21A)

It is rather difficult to divide present-day occupations into definite groups as so many of them may be in between two distinct groups: for example, is a grocery manager a skilled person?

Group I is professional and actually includes a headmaster and a ship's captain: Group II is a rather mixed group of self-employed and includes shopkeepers, market gardeners, and skilled trades: Group III includes shop managers, foremen and mining deputies - all supervisors of labour: the other groups are self-explanatory but it must be explained that miners are included in the semi-skilled group and this is the most common occupation, as out of the 57 cases concerned, 15 are miners and 3 are mining deputies, altogether about one-third of the whole of the group under consideration.

Group VI, the semi-skilled parents, is the only group in which the children show deterioration in attainment as they pass through the grammar school and in this respect there is agreement with the Report of the Central Advisory Council for Education in England (25): this Council has failed to suggest any definite reason for such deterioration in performance, but the Report of the Essex Education Committee (21) does attempt to suggest the type of home background that is unsuitable.

But it would be a mistake to allow home background to influence our decisions concerning the child at the age of 11, as the child with a poor background is already handicapped in so far as his general knowledge and vocabulary will not be so extensive as that of a boy of the same ability who has a good home background.

## VI. CHARACTER AND SOCIAL BACKGROUND

There are two further factors which affect the work of the grammar school pupil very much but, unfortunately, their effect cannot be measured statistically: they are personal character and out-of-school pursuits, two things usually closely connected.

Most teachers have come across cases of highly intelligent pupils wasting their undoubted ability and being a general nuisance to the school community, while the mediocre pupil, plodding persistently and patiently, comes out top in the long run. Even if we have accurate information concerning their characters before entrance, who is to decide which is the more suitable for the grammar school?

There are many attractions for those weak in character - the dance hall, the cinema, the local billiard saloon, the association with teen-agers who have left at 15 and are now men and women of the world - all these are temptations to the pupil in the upper part of the grammar school.

Even organisations such as Scouts, Girl Guides and Youth Clubs can take up a lot of valuable time and it does seem a pity that our most conscientious pupils often forego these worthwhile activities during the final year of their G.C.E. course, in order to concentrate on school work: a laudable action but undesirable in view of the valuable character training that can be derived from such activities, the opportunities of leadership and of mixing with other types of youth.

Character and social environment do play a most important part in the career of a grammar school pupil, but we should err if we allow our decisions to be too much affected by these things. Many pupils, deemed by all to be certain to fail their examinations through lack of industry and persistent neglect of study in the pursuit of pleasure, often make up their minds to work at full pressure for the last few months and so are successful in the end.

Thus we cannot justifiably allow these factors to influence decisions on transfer at the age of 11.

CONCLUSIONS

These conclusions apply only to the year-group under consideration.

1. Teachers' assessments, or Scaled Primary T-scores, generally give better prediction of grammar school attainment than do the selection tests.

2. Many pupils just below 'border-line' on the results of the selection tests are capable of achieving success in the grammar school.

3. The English test at selection is a good predictor of success in language subjects, the Arithmetic test predicts success in Mathematics and the Non-verbal Intelligence test is a good predictor of success in Art.

4. Mathematics are highly correlated with languages in the grammar school.

5. The older pupils are superior to the younger ones in Mathematics and Art, but the younger group is superior in French and Latin.

6. Girls are superior in the selection tests, but the boys are better in grammar school Mathematics and Art, while the girls are better in English.

7. There is no real difference between the sexes in average grammar school attainment, the girls being only slightly better than the boys all through the school. The girls achieve more passes in the General Certificate of Education although their average marks are not superior.

8. Size of family does not affect the attainment in the grammar school.

9. Attainment is affected by home background where the parents are engaged in semi-skilled occupations.

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APPENDIX

Attainment of Groups graded on Performance in Selection Tests.Group I - Children of High Intelligence.Girls

Total of tests. (Stand's'd)	Average at 13 yrs.	Average 13-16 yrs.	Average G.C.E.	Subjects passed G.C.E.
516	73.5	74	74	7
510	42.5	51	48.5	6
504	56	47.5	55.5	6
499	63	58.5	54.5	6
497	60	64.5	59.5	6
496	43.5	54	50.5	5
491	36	45	56	6
489	54	50.5	45	5
487	57.5	55	49.5	5
483	44	45.5	41.5	4
482	48	45	61.5	6
482	44	46.5	36	4
481	54	53.7	47	5
480	46	47	38	4
Girls' Mean-	51.5	52.6	51.2	5.4

Boys

506	37	47.5	51.5	5
505	59	64.5	69.5	6
503	61	49.5	46	5
499	50	56	55.5	6
499	50	54	48	3
498	62	58	63	7
494	58	61	64	6
493	56	56.5	43	4
492	46	43.5	40	4
489	36	43.5	39.5	3
488	46.5	44	52.5	5
486	50	48.5	44	4
486	46	38.5	38	2
486	55	52.5	58.5	7
485	54	50	47	3
485	49	52	50.5	5
484	46	47.5	48.5	4
483	51	52	53.5	6
480	52	53.5	54	6
Boys' Mean-	50.8	51.2	51	4.8

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Mean of Group: 51.1                      51.9                      51                      5

GROUP II - Border-line pupilsGirls

Total of tests. (Stand's'd)	Average at 13 yrs.	Average 13/16 yrs.	Average G.C.E.	Subjects passed. G.C.E.
479	66.5	67	61.5	7
477	34.5	46	47	3
477	39	42	50	6
475	49	41.5	30.5	1
474	55	56	59.5	6
473	47	50.5	57.5	6
472	46	45.5	43	5
470	39.5	43.5	57	5
470	53.5	39	33	2
Girls' Mean-	47.8	47.9	48.8	4.55

Boys

478	66.5	67	56.5	6
475	46	45	45	5
474	46	44	42.5	2
474	40.5	46.5	44	4
472	38	27	26.5	2
472	33	46.5	51.5	6
472	43	33.5	41.5	2
470	49.5	33	34.5	2
467	56	57	58	5
462	31	37.5	52	4
462	61.5	56	65.5	7
Boys' Mean-	46.4	44.8	47	4.1

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Mean of Group-47.1                      46.3                      47.8                      4.3

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GROUP III - Pupils included in Group II at Headmaster's Request.Girls

458	66	61	53.5	6
453	43	41.5	41.5	3

Boys

457	68	65	67	7
455	52.5	51.5	49.5	4

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Mean of Group-57.4                      54.7                      52                      5

Correlations between Selection Criteria & Grammar School Exams.

	No. of criteria	1st Yr.	2nd Yr.	3rd Yr.	4th Yr.	5th Yr.	G.C.E
(1) Total of tests (Raw scores)	4	.307	.299	<u>.400</u>	<u>.408</u>	.317	.220
(2) Total of tests (Standardised)	4	.199	.144	.344	.300	.243	.232
(3) Primary T-score (Unscaled)	1	.333	<u>.445</u>	<u>.361</u>	<u>.477</u>	<u>.410</u>	.255
(4) Primary T-score (Scaled)	1	<u>.442</u>	<u>.455</u>	<u>.418</u>	<u>.505</u>	<u>.414</u>	<u>.358</u>
(5) Standardised total minus Non-verbal test.	3	.325	.305	.324	<u>.347</u>	.242	.182
(6) Standardised total minus Non-verb. plus Scaled Pri. T-score.	4	<u>.408</u>	.351	<u>.418</u>	<u>.425</u>	.257	.271
(7) Standardised total plus Scaled Primary T-score.	5	.335	.292	<u>.411</u>	<u>.426</u>	.322	.310
(8) Standardised total and Scaled Primary T-score.	2	.330	.325	<u>.445</u>	<u>.470</u>	.354	.300

Effect of Including only Academic Subjects in Grammar School

						Totals.
(2)	.184	.180	.302	.201	.186	<u>.207</u>
(4)	<u>.475</u>	<u>.416</u>	<u>.478</u>	<u>.507</u>	<u>.390</u>	.277
(5)	<u>.394</u>	.317	.340	.265	.218	.247
(6)	<u>.457</u>	<u>.357</u>	<u>.444</u>	<u>.382</u>	.247	.270
(7)	<u>.358</u>	.313	<u>.415</u>	<u>.356</u>	.285	.298
(8)	<u>.367</u>	<u>.324</u>	<u>.438</u>	<u>.394</u>	.317	.278

Figures underlined are significant at the 1% level.

Inter Correlations - Selection Criteria (Standardised for Age)

<u>Tests:</u>	Arithmetic	Verbal Intell.	Non-verbal Intell.	Total of tests	Scaled Primary T-score
English	.083	.044	.081	<u>.406</u>	.341
Arithmetic	x	.234	-.045	<u>.501</u>	.300
Verbal Intelligence	x	x	-.196	<u>.427</u>	.141
Non-verbal Intelligence	x	x	x	<u>.540</u>	-.065
Total of tests	x	x	x	x	<u>.355</u>

Inter Correlations - Grammar School Results

	2nd Year	3rd Year	4th Year	5th Year	G.C.E.
1st Year	<u>.714</u>	<u>.679</u>	<u>.676</u>	<u>.664</u>	<u>.512</u>
2nd Year	x	<u>.637</u>	<u>.756</u>	<u>.703</u>	<u>.492</u>
3rd Year	x	x	<u>.770</u>	<u>.636</u>	<u>.530</u>
4th Year	x	x	x	<u>.749</u>	<u>.719</u>
5th Year	x	x	x	x	<u>.776</u>

Effect of including Academic Subjects only in Grammar  
School Totals.

1st Year	<u>.801</u>	<u>.729</u>	<u>.684</u>	<u>.618</u>	<u>.548</u>
2nd Year	x	<u>.713</u>	<u>.758</u>	<u>.727</u>	<u>.580</u>
3rd Year	x	x	<u>.847</u>	<u>.736</u>	<u>.700</u>
4th Year	x	x	x	<u>.871</u>	<u>.780</u>
5th Year	x	x	x	x	<u>.834</u>

Figures underlined are significant at 1% level.

Selection Tests (Standardised) & 2nd Year Grammar School  
Average - Regression Coefficients and Multiple Correlation.

	English Arithmetic	Verbal Intelligence	Non-verbal Intelligence	Multiple Correlation
Average 2nd Yr. Grammar	.151	.222	.002	-.079
				.290

Correlation between Entrance Tests and Attainment in Specific  
Subjects in the 2nd Year of the Grammar School Course.

Selection Tests (Standardised)

<u>2nd yr.</u> <u>Grammar</u>	Engl.	Arith.	Verbal Intell.	Non-Ve. Intell.	Total of tests	Primary T-score	Primary T-score Scaled
English	<u>.333</u>	.108	.075	-.076	.203	.256	<u>.284</u>
French	<u>.391</u>	.121	<u>.283</u>	-.162	.194	<u>.424</u>	<u>.444</u>
Latin	.200	.140	<u>.273</u>	-.241	.116	.088	<u>.416</u>
History	.082	.043	.207	-.180	-.021	<u>.332</u>	<u>.325</u>
Geography	.164	<u>.272</u>	-.045	.202	<u>.302</u>	<u>.316</u>	<u>.362</u>
Maths.	.161	<u>.345</u>	.179	.017	<u>.353</u>	<u>.415</u>	<u>.466</u>
Science	.147	.152	-.100	.171	.211	.214	<u>.282</u>
Art	-.202	.102	-.122	<u>.390</u>	.140	.091	-.051
Woodwork (31 boys)	.079	.266	.160	<u>.386</u>	<u>.453</u>	.078	.194
AVERAGE	.164	.239	.077	-.078	.144	<u>.326</u>	<u>.455</u>

All correlations significant at 5% level underlined.  
 Significance at 1% level = .354.

Inter Correlation between Specific Subjects in the 2nd Year  
of the Grammar School Course.

	French	History	Latin	Maths.	Science	Geogr.	Art	Woodw.	Average
English	<u>.655</u>	<u>.374</u>	<u>.649</u>	<u>.486</u>	.242	<u>.454</u>	-.060	.300	<u>.651</u>
French	x	<u>.403</u>	<u>.810</u>	<u>.661</u>	.343	.289	-.214	.125	<u>.752</u>
History	x	x	<u>.407</u>	<u>.362</u>	<u>.373</u>	<u>.541</u>	-.126	.132	<u>.583</u>
Latin	x	x	x	<u>.683</u>	.323	<u>.363</u>	-.243	.197	<u>.777</u>
Maths.	x	x	x	x	<u>.551</u>	<u>.624</u>	.005	<u>.357</u>	<u>.862</u>
Science	x	x	x	x	x	<u>.612</u>	.194	.262	<u>.618</u>
Geography	x	x	x	x	x	x	.303	<u>.517</u>	<u>.764</u>
Art	x	x	x	x	x	x	x	<u>.439</u>	<u>.174</u>
Woodwork	x	x	x	x	x	x	x	x	<u>.423</u>

All correlations significant at 1% level are underlined.

Selection Tests (Standardised) & G.C.E. Average.  
Regression Coefficients and Multiple Correlation.

	English	Arith.	Verbal	Non-verb.	Multiple Correlation
Average G.C.E.	.316	-.025	.382	.188	.518

Correlations between Entrance Tests and Attainment in  
Specific Subjects in the General Certificate of Education.

Selection Tests (Standardised)

<u>G.C.E.</u>	English	Arith.	Verbal Intell.	Non-ver. Intell.	Total of tests	Primary T-score	Primary T-score Scaled
English No.=57	.244	.225	.173	-.076	<u>.276</u>	-.090	.093
French No.=53	<u>.290</u>	.120	.078	-.138	.138	.200	<u>.295</u>
History No.=18	-.289	.043	.221	-.146	-.118	-.151	-.100
Maths. No.=47	.269	<u>.332</u>	.266	-.094	.161	.293	<u>.422</u>
Science No.=35	<u>.339</u>	-.046	.033	.067	.238	<u>.336</u>	<u>.432</u>
Geography No.=19	.199	-.399	.248	.352	.331	.091	.148
Art No.=21	.356	-.037	-.468	<u>.615</u>	.410	.075	.011
Woodw. & Dom.Sci. No.=27	-.162	.061	.234	.287	.195	.046	-.044
AVERAGE	<u>.346</u>	.082	<u>.353</u>	.139	.232	.255	<u>.358</u>

All correlations significant at 5% level are underlined.

Inter Correlation of Specific Subjects in the  
General Certificate of Education.

	English	French	Mathematics
French	<u>.513</u> (53)	x	<u>.482</u> (43)
History	<u>.721</u> (18)	.394 (17)	
Mathematics	.306 (47)	x	x
Science	.344 (35)	.273 (31)	.360 (32)
Geography	.420 (19)	-.041 (16)	-.032 (17)
Art	.069 (21)	.204 (19)	.139 (15)
Woodwork & Dom. Science	.267 (27)	-.036 (26)	.231 (21)

All correlations significant at 5% level are underlined.  
 " " " " " at 1% level marked  $\square$   
 (The numbers in brackets below the correlations indicate  
 the number of pupils involved in each instance.)

Comparison between Two Groups of Pupils, Group I being  
Six Months older than Group II.

<u>Average Marks in Entrance Tests.</u>		<u>(No Age Allowance made)</u>	
	Group I	Group II	Level of Significance
English	54.6	49.3	10%
Arithmetic	54.5	44.9	5%
Verbal Intelligence	51.9	45.3	10%
Non-verbal Intelligence	53	47.5	-
Average of all Tests	53.5	46.7	1%
Unscaled Primary T-score	54.2	45.3	5%

<u>Average Marks in Entrance Tests.</u>		<u>(Age Allowance added)</u>	
English	53.6	51.3	-
Arithmetic	52.1	48.2	-
Verbal Intelligence	49.7	48.7	-
Non-verbal Intelligence	50.8	50.1	-
Average of all Tests	51.5	49.6	-
Scaled Primary T-score	53.3	48.7	-

<u>Average Marks in Grammar School - All Subjects</u>			
1st Year	51.3	50.4	-
2nd Year	52.2	51	-
3rd Year	51.9	50.8	-
4th Year	53.5	51.7	-
5th Year	53.2	52.8	-
Average for 5 Years	52.4	51.5	-
G.C.E.	51.3	54.3	-

(Significance below the 10% level not shown.)

Attainment in Grammar School English

	Group I	Group II	Level of Significance
1st Year	49	48.9	-
2nd Year	48.8	50.9	-
3rd Year	49.8	50.7	-
4th Year	51.4	50	-
5th Year	53.6	50.9	-
Average for 5 Years	50.5	50.1	-
G.C.E.	46.5 (Lang. 48.7 Lit. 44.3)	49.2 (Lang. 48.8 Lit. 50.8)	-

Attainment in Grammar School Mathematics

1st Year	54.1	46.1	5%
2nd Year	53.4	50.2	-
3rd Year	53.1	49	-
4th Year	52.4	49.9	-
5th Year	54.8	51.9	-
Average for 5 Years	53.6	49.4	-
G.C.E.	48.9	48.5	-

Attainment in Grammar School French

1st Year	51.2	51.8	-
2nd Year	51.5	54	-
3rd Year	51.5	54.4	-
4th Year	50.4	54.9	-
5th Year	50.5	55.4	10%
Average for 5 Years	51	54.1	-
G.C.E.	51.3	57.1	-

(Significance below the 10% level not shown.)

Attainment in Grammar School Science

	Group I	Group II	Level of Significance
1st Year	51.3	50	-
2nd Year	53.6	48.3	10%
3rd Year	52.3	49.1	-
4th Year	52 (12 pupils)	47 (7 pupils)	-
5th Year	54.3(10 " )	49.5(7 " )	-
Average for 3 Years	52.4	49.1	-
G.C.E.	51.6(10 " )	52 (7 " )	-

Attainment in Grammar School History

1st Year	48.8	50.3	-
2nd Year	49	48	-
3rd Year	50.1	49	-
4th Year	50.8 (6 pupils)	53(7pupils)	-
5th Year	47 (3 " )	49.3(3 pupils)	-
Average for 3 Years	49.3	49.1	-
G.C.E.	43.8 (3 " )	52.7 (3 pupils)	-

Attainment in Grammar School Geography

1st Year	51	52.8	-
2nd Year	52.5	51	-
3rd Year	49.6	49.7	-
4th Year	48.2 (6 pupils)	49 (5 pupils)	-
5th Year	49 (3 " )	50.2 (4 " )	-
Average for 3 Years	51	51.2	-
G.C.E.	54.5 (3 " )	50.9 (4 " )	-

(Significance below the 10% level not shown.)

Attainment in Grammar School Art

	Group I	Group II	Level of Significance
1st Year	51.3	48.6	-
2nd Year	49.9	47.6	-
3rd Year	51.5	49.8	-
4th Year	56.5 ( 8 pupils)	47.5 ( 8 pupils)	-
5th Year	48.4 ( 8 pupils)	54.3 ( 7 pupils)	-
Average for 3 Yrs.	50.9	48.7	-
G.C.E.	51.9 ( 6 pupils)	48 ( 4 pupils)	-

Attainment in Grammar School Woodwork & Domestic Science

1st, 2nd & 3rd Yrs.	52.1	50	-
4th Year	57.7 ( 8 pupils)	49.9 ( 5 pupils)	-
5th Year	56.9 ( 8 " )	51.1 ( 5 " )	-
G.C.E.	53 ( 8 " )	50.1 ( 5 " )	-

Attainment in Grammar School Latin

2nd Year	50.2	53.9	-
(1st year of Latin)			
3rd Year	47 (12 pupils)	54.3 ( 9 pupils)	-

(Significance below the 10% level not shown.)

Comparison between Boys and Girls in the School Year-Group

	<u>Boys</u>	<u>Girls</u>	<u>Level of Significance</u>
<u>Entrance Examination - Raw Scores</u>			
English	48.6	51.9	10% G
Arithmetic	49.8	50	-
Verbal Intelligence	48.8	51	-
Non-verbal Intelligence	51.4	47.4	-
Average of all Tests:	49.1	51	10% G
Primary T-score (Unscaled)	51.7	44.7	1% B

Entrance Examination - Scores Standardised & Age Allowance Added

English	49.9	51.5	-
Arithmetic	50	49.8	-
Verbal Intelligence	47.1	53.2	5% G
Non-verbal Intelligence	51.3	48.2	5% B
Average of all Tests	49.7	50.7	5% G
Primary T-score (Scaled)	51.7	44.9	5% B

(Significance below the 10% level not shown.)

Statistics of Year-Group in Entrance Examination (Scores Standardised)

<u>Test</u>	<u>Mean</u>	<u>S.D.</u>	<u>Mean</u>	<u>S.D.</u>
English	119.8	5.82	120.1	5.95
Arithmetic	122.7	6.7	123.5	7.0
Verbal Intelligence	120.3	3.15	122.9	4.0
Non-verbal Intelligence	120.8	7.9	117.7	8.2



Comparison between Boys and Girls

	<u>Boys</u>	<u>Girls</u>	<u>Level of Significance</u>
<u>English in the Grammar School</u>			
1st Year	47.6	48.6	-
2nd Year	47.9	50.5	-
3rd Year	46.3	50.6	5% G
4th Year	47.7	51.6	10% G
5th Year	49.5	52.4	-
G.C.E.	44.6 (Lang.-47 (Liter-43.4	52.4 (La43.2 (Li53.6	1% G
. . . . .			
G.C.E. of Durham Exami-nations Board	64.7 (Lang.-65.9 (Lit. -63.6	79.1 (Len.78.1 (Lit.80.2	

Mathematics in the Grammar School

1st Year	50.2	45.6	10% B
2nd Year	50.6	45.2	5% B
3rd Year	50.9	45.3	5% B
4th Year	51.2	44.8	5% B
5th Year	51.7	49.4	-
G.C.E.	51.1	47.8	-
. . . . .			
G.C.E. of Durham Examinations Board	64.7	54.2	

(Significance below the 10% level not shown.)

Comparison between Boys and Girls

	<u>Boys</u>	<u>Girls</u>	<u>Level of Significance</u>
<u>French in the Grammar School</u>			
1st Year	48.4	47.6	-
2nd Year	48.7	46.6	-
3rd Year	48.6	48	-
4th Year	49	46.9	-
5th Year	46.4	50	-
G.C.E.	50.7	54.4	-

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G.C.E. of Durham Examinations Board	56.5	69.9	
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<u>Science in the Grammar School</u> (Includes Physics, Chemistry, Biology and General Science, after first 3 years of General Science.)			
1st Year	45.5	51.6	5% G
2nd Year	51.8	48.5	-
3rd Year	46.3	50.4	10% G
4th Year	49 (26 boys)	52.1(14 girls)	-
5th Year	50.4 (23 boys)	49.3(14 girls)	-
G.C.E.	49.9 (21 boys)	48.7(14 girls)	-

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G.C.E. of Durham Examinations Board	59.5	57.6	
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(Significance below the 10% level not shown.)

Comparison between Boys and Girls

	<u>Boys</u>	<u>Girls</u>	<u>Level of Significance</u>
<u>History in the Grammar School</u>			
1st Year	48.8	51	-
2nd Year	48.6	51.2	-
3rd Year	48.4	51.7	-
4th Year	48.1(18 boys)	51.7(18 girls)	-
5th Year	42.2( 4 boys)	52 (15 girls)	10% G
G.C.E.	40.6( 4 boys)	52.5(14 girls)	5% G.
. . . . .			
G.C.E. of Durham Examinations Board	55.2	64.5	
<u>Geography in the Grammar School</u>			
1st Year	49.9	49.8	-
2nd Year	50.8	49.2	-
3rd Year	48.5	50.9	-
4th Year	49.8(15 boys)	50 (17 girls)	-
5th Year	49.2(14 boys)	52 ( 5 girls)	-
G.C.E.	48.9(14 boys)	51.7( 5 girls)	-
. . . . .			
G.C.E. of Durham Examinations Board	68.3	61.5	

(Significance below the 10% level not shown.)

Comparison between Boys and Girls

	<u>Boys</u>	<u>Girls</u>	<u>Level of Significance</u>
<u>Latin in the Grammar School (No Latin in 1st Year)</u>			
2nd Year	48.6	52	-
3rd Year	48 (23 boys)	52.3 (19 girls)	-
4th Year	47.8 ( 5 boys)	51.1 (11 girls)	-
5th Year	48.7 ( 2 boys)	51.7 ( 8 girls)	-
G.C.E.	49 ( 2 boys)	50.2 ( 8 girls)	-
G.C.E. of Durham Examinations Board	62.2	60.1	
<u>Art in the Grammar School</u>			
1st Year	53.3	47.4	5% B
2nd Year	51.9	48.1	10% B
3rd Year	52.3	47.2	5% B
4th Year	53.7 (21 boys)	46.6 (11 girls)	5% B
5th Year	50 (23 boys)	46.5 ( 6 girls)	-
G.C.E.	53.3 (15 boys)	44.8 ( 6 girls)	5% B
G.C.E. of Durham Examinations Board	60.3	73.4	

(Significance below the 10% level not shown.)

Comparison between Boys and Girls

	<u>Boys</u>	<u>Girls</u>	<u>Level of Significance</u>
<u>Average for All Subjects in the Grammar School</u>			
1st Year	48.5	51.4	-
2nd Year	49.7	50.4	-
3rd Year	48.8	51.5	-
4th Year	49.3	50.2	-
5th Year	49.4	50.7	-
All school Exams.	49.1	50.8	-
G.C.E.	50	49.9	-

Average for All Subjects EXCLUDING Art, Music, Woodwork & Domestic  
Science.

1st Year	48.8	51.4	-
2nd Year	49.7	50.7	-
3rd Year	48.9	51.4	-
4th Year	49.5	50.2	-
5th Year	49.1	52.1	-
G.C.E.	48.7	51.1	-

(Significance below the 10% level not shown.)

Comparison Between Boys and Girls

	<u>Boys</u>	<u>Girls</u>
<u>General Certificate of Education (Ordinary Level) of the</u>		
<u>Durham Examinations Board: July 1954.</u>		

Results for Year-Group

Average No. of Subjects taken	6.6	6.64
" " " Passes	4.6	5.0
" " " Fails	2.0	1.64
Percentage Fails	30.7	24.56

Results for Whole G.C.E. (Durham Board) - 4,668 pupils

Average No. of Subjects taken	4.9	4.6
" " " Passes	3.0	3.1
" " " Fails	1.9	1.5
Percentage Fails	38.2	32.3

Results for General Certificate of Education (Ordinary Level)  
for all Examinations Boards - Summer 1953

No. of subjects offered:- 979,769.

Percentage Fails	41.9	36.8
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SIZE OF FAMILY

No. of children in family. (No. of cases)	1	2	3	4	5	6
	(14)	(21)	(11)	(6)	(4)	(1)
Average Score at Selection (Standardised)	48	53.5	47.6	48.6	42.5	48.5
Average Score at Selection (Raw scores)	50.6	51.5	48.7	49.2	45.4	48.5
Average in 2nd Yr. Grammar	50.3	50.4	52.3	49.2	41	52
Average in G.C.E.	51.3	49.8	50.9	49.4	42.9	54

PARENTS' OCCUPATIONS

Group I - Professional                      Group IV - Clerical  
 Group II - Self-employed                  Group V - Skilled  
 Group III - Foreman or Manager        Group VI - Semi-skilled  
 Group VII - Unskilled.

Group:- (No. of cases)	I (2)	II (6)	III (7)	IV (4)	V (9)	VI (23)	VII (5)
Average score at selection (Standardised)	52.5	45.7	50.7	51.7	52.4	50	46.3
Average score at selection (Raw scores)	49.5	46	50.4	52.9	51.8	50.4	46.8
Average in 2nd Yr. Grammar	59.5	48.4	49.1	57.9	54.9	47.6	50.5
Average in G.C.E.	60	48.3	51.3	55	53.1	46.2	53