October 24, 1932.

The Surgeon General,
U. S. Public Health Service,
Washington, D. C.

Sir: (Through Assistant Surgeon General L. R. Thompson)

I have the honor to transmit herewith an article entitled "Norwegian Immigrants; Their Intelligence as Rated by Tests." This is the fourth of a series of articles which I have transmitted on the intelligence of immigrants. There will be one more article entitled "English Immigrants; Their Intelligence as Rated by Tests."

Respectfully,

Lawrence Kolb,
Senior Surgeon.

1 Inclosure
LK:ENW

NORWEGIAN AND SWEDISH IMMIGRANTS - THEIR INTELLIGENCE AS RATED BY TESTS

By LAWRENCE KOLB, Senior Surgeon
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This is the fourth of a series of articles by the author on the intelligence of immigrants(1). This one, like the other three, presents the results of work that was done to determine the suitability of certain tests for testing the intelligence of immigrants, to find the standard expectation of different groups on the tests, to make comparative studies of different national groups that come to this country to live, and to measure the effect of education, sex, environment and other factors on intelligence test ability, so that the results could be applied to the practical problem of diagnosing mental deficiency in immigrants.

(1) Italian Immigrants - Their Intelligence as Rated by Tests, by Lawrence Kolb, Supplement
Irish Immigrants - Their Intelligence as Rated by Tests, by Lawrence Kolb and R. A. Vonderlehr, Supplement
German Immigrants - Their Intelligence as Rated by Tests, by Lawrence Kolb, Supplement

A random selection was made of persons who came to the American Consulates in Oslo, Stockholm and Gothenburg ~~in order~~ to undergo the medical and other examinations necessary to secure an immigration visa. Those who had more than the usual common school education were excluded from the selected number and the remainder were given intelligence tests in addition to the usual medical examination that all immigrants receive. The method of securing a random selection was the same as that described in the Irish and German articles.

Persons with more than the usual common school education(1) were excluded

(1) Eight Norwegian men and 12 Norwegian women with slightly more than the usual common school education were examined.

from the specially examined group in all the countries where the work was carried on. They were not examined for two reasons. First, because such persons are obviously not mentally defective and what they can do with tests has very little practical application to the sizing up of immigrants suspected of defect. Second, because it was desired to examine in all the countries applicants with a more or less uniform educational background so that valid comparisons could be made.

A person who had attended a secondary school or college for a year or more was considered to have more than the usual common school education. The proportion who had done this was estimated at about 12 per cent of the total number who applied for visas in Norway and a somewhat smaller percentage in Sweden. The exclusion of this more intelligent group from the group that was specially examined and is reported on doubtless gives a picture of intelligence that is lower than the general run of immigrants from these countries would show.

Scope and Plan of the Work

The general plan of the work in Norway and Sweden was the same as that already reported for Italy, Ireland and Germany. Each case was studied from the standpoint of occupation, place of residence, size of home, size of family, schooling, reading ability and reading habits as well as from the standpoint of test performance.

A total of 633 persons distributed as follows ~~were~~ was examined in the two countries.

	Men	Women
Norway	183	231
Sweden	107	112

The applicants expected to be put through various tests and the special intelligence test examination was given to them as if it were a routine procedure; very few were disconcerted by it and cooperation was good, but some had travelled long distances the night before and were fatigued because of insufficient sleep. Individual scores were affected by this, and probably by other disturbing factors, but it is unlikely that the scores of the group as a whole were lowered a great deal because of them.

Schooling and Reading Habits

Education is compulsory in Norway and Sweden and the schools are said to be good. As a rule children start to school when seven years of age and go until 14. In exceptional cases they may start when six. There are continuation schools in both countries to which all pupils are supposed to go for a short period of time after leaving the public school. Attendance at the continuation schools is not always compulsory and the actual time spent in them is small, but they, doubtless, add something to the educational equipment.

The figures for attendance at school as shown in the captions of Tables 1, 2, 4 and 5 do not give a complete picture of school attendance. The years and grades are correct, but a year's schooling is not uniform throughout the country. Attendance is in accordance with arranged schedules, but the schedule for attendance in rural districts varies with the density

of the population and the number of available teachers. In Norway where the situation was specially studied, rural children may go to school every other day, every other week, every other fortnight, every other month, etc., but the minimum time required is 72 days of six hours each. In actual hours of attendance city children get nearly twice as much schooling as country children. The Norwegians had more schooling and made nearly a grade more in school than the Swedes, but all Swedish groups made between the sixth and seventh grades.

The reading habits of a people are an index of their education and possibly to a certain extent of their native intellectual ability, but the influence of leisure must be considered. The reading habits of the groups under consideration are given in the table below.

Reading Habits - Percentages

	Males		Females	
	Norway	Sweden	Norway	Sweden
Reads daily	66.4	68.3	81.9	66.9
Reads 1 or more times a week	30.7	31.7	14.7	32.3
Never reads	2.9		3.4	.8

There is no significant difference between the groups except in the case of the Norwegian women who have the highest percentage for daily reading.

German male immigrants(1) read more than Norwegian and Swedish male

(1) German Immigrants - Their Intelligence as Rated by Tests. By Lawrence Kolb. Supplement

immigrants, but Norwegian and Swedish females read more than German females. This is of interest in connection with the comparative scores. The superiority in test ability of males over females is greater in Germany than in Norway and Sweden.

Size of Home

The average number of rooms without kitchen in the homes in which the subjects lived with their parents is given in the table below.

Size of Home (Rooms)

	Males		Females	
	Urban	Rural	Urban	Rural
Norway	3.8	5.3	3.7	5.2
Sweden		3.4		3.3

Figures can not be given for the size of Swedish city homes because only three in the Swedish group were from the city. The Norwegian rural groups came from much larger homes than the city groups, and their homes were nearly two rooms larger than the homes of the Swedes.

A discussion on the relation of immigrants' homes to their intelligence was given in the German article(1) together with a comparative table.

(1) German Immigrants - Their Intelligence as Rated by Tests. By Lawrence Kolb. Supplement No. 1, the P.H.R.

Size of Family

The figures given in the table below embrace the subject, his brothers and sisters, including those that have died, and his parents.

Average Size of Family

	Males	Females
Norway	8.5	8.9
Sweden	8.8	8.8

The birth rate in Norway and Sweden is low, but the families that furnish immigrants to the United States are as large or larger than the families of any national immigrant group that has been studied, with one exception. Large families are supposed to go along with poor economic conditions and lower

intelligence as compared with the community as a whole. Individual exceptions are, of course, admitted, but if the supposition holds true, the high intelligence of these two immigrant groups, the least intelligent in their own countries, furnishes interesting food for speculation.

The Tests

The tests are the same as those that were employed at Cologne, Germany. A number of simple tests (see Irish article) were tried at first in Norway, but most of these were soon eliminated because 100 per cent of the subjects did them correctly. A few were considered unsuitable because they were verbal. The list follows:

(1) Ferguson Form Board Test

(2) Pintner Non-language Test

(3) Porteus Maze Test

(4) Gwyn Triangle Test

(5) Healy Construction Test A.

(6) Healy Construction Test B.

(7) Cube Imitation Test (Pintner Modification)

(8) Arranging Weights (Stanford Binet, year 9)

(9) Drawing Designs from Memory (Stanford Binet, year 10)

(10) Ball and Field Test (Stanford Binet, years 8 and 12)

(11) Identifying Geometric Figures (Mullens LearningTest)

(12) Repeating digits forward

(13) Repeating digits backward

All of these tests are of proved value in work with immigrants. The first three are the most important; the others are smaller in scope and the score made on any one of them is likely to be misleading.

The tests are non-verbal to the extent that no verbal constructions are necessary in the solution of them. Scandinavian immigrants appear to be able to do verbal tests, but the necessity for translation renders the results uncertain and this reduces the value of such tests for practical purposes.

Method of Giving and Scoring Tests

Instructions for the tests were given in the language of the country and in sufficient detail to insure that the subject understood what was wanted of him. The tests were given and scored by standard methods. They have been dealt with either by reference or description in the three articles referred to on page one. These three articles belong to a series of which this one forms a part. Therefore, no description contained in them will be given here(1).

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(1) A description of the tests(except the Pintner Non-language) and method of giving them may be found in Terman's "Measurement of Intelligence"; Bronner, Healy, Lowe and Shimberg's "Manual of Individual Tests and Testing"; Pintner and Patersons "Scale of Performance Tests" and in the articles by the present author on the intelligence of Italian and Irish Immigrants.

The Pintner Non-language test is described in the Pintner Non-language Test Manual. College Book Publishing Co., Columbus, Ohio, and in the Psychological Monograph No. 132. Princeton, N. J.

Much may be learned about the intelligence of immigrants by noticing the facility with which they grasp instructions for performing the tests. Some are very slow in this respect, due either to poor education or poor native ability. Failure to understand instructions has not been allowed to influence the results in the case of any individual or national group. When a subject did

not understand at first the instructions were repeated over and over until he grasped their meaning or it became obvious that his failure to do so was caused by native dulness and not by poor education or some other disturbing factor. Little difficulty was experienced with the Scandinavian groups. As a rule a minimum of instructions was all that was necessary.

The Test Results

The main body of the work was done in Norway, and the Norwegians were given all the tests. The Swedes were given two tests in order to check up on the assumption that Norwegian and Swedish immigrants have about equal intelligence and to measure the effect of possible selective factors on the test ability of two closely related immigrant groups. One of the tests taken by the Swedes, the Ferguson Form Board Test, is not directly affected by formal education, the other, the Pintner Non-language Test, is directly affected to a certain extent by formal education, including practice with the pencil, familiarity with drawings, etc.

The results for the main groups of cases are scored by the percentile method or as percentages of successes, and comparative scores for subgroups of the main groups, showing the median test age or time for completion are given for some of the tests.

Ferguson Form Board Test

The results on the Ferguson Form Board Test by three different methods of scoring are shown in Table 1.

(Take in Table 1)

The Meehan Shimberg method of scoring referred to here as the Shimberg scoring is the one most commonly used and the only one that has been standardized for age(1). Sixty points is the highest that it is possible to make

(1) A Manual of Individual Mental Tests and Testing. pp. 126-127. Bronner, Healy, Lowe and Shimberg.

according to it, and more than 30 per cent of the Norwegian males made this score. The Ferguson method of scoring gives a better spread at the top.

The median test age of the Norwegians by the Ferguson Test is 16.83 years for the males and 16.50(2) years for the females. These are the

(2) Both figures are based on the Meehan Shimberg male norms.

highest scores that have been made by any immigrant groups and they are higher than the American norms. The Swedes of both sexes test between 15 and 16 years(2). The males come within a fraction of the American male norms and the females do considerably better than the American female norms.

Only one Norwegian man and three Norwegian women failed to complete all of the six Ferguson boards in the allotted five minutes for each board. This was a surprising performance in view of the failure of 50 per cent or more of some immigrant groups to complete more than four boards (see Irish and Italian articles).

Table 2 shows the results on the Pintner Non-language Test.

(Take in Table 2)

The Pintner Non-language Test is a severe test of the intelligence of adults. The only education that is absolutely necessary for its performance is the ability to write the digits, but the various problems presented by it seem to be associated with things learned at school. There is a difference of between six and seven years in test ability between the best and worst

literate national groups on this test. Some of this is due to different grades of literacy, but much of it can ~~only~~ only be explained by assuming that one group is better endowed than another with the native ability required to do the test well. Some of the rural Norwegians who made high scores on this test had never been to the city before, and their 7.2 years schooling really was only half time. The last two problems of the test, reversed drawing and picture reconstruction, are most often failed by immigrants. Some comprehend their meaning slowly, if at all, others perform very poorly, but many rural, poorly schooled Norwegians had no difficulty with them.

The score of 425 made by the Norwegian males on the Pintner Non-language Test is equivalent to a test age of 15.92 years while the females make 15.88 years. These are very high scores for immigrants in view of what has been learned about the low scores of adults as compared with children and youths upon whom tests are standardized.

What other adults do, as shown by the median test age of national groups given in the table below, furnishes a more reliable comparison.

Median Test Age on Pintner Non-language Test. Females Age 15 - 44 Groups. All Literate.

			British		Germany		Ireland		
	Norway	Sweden	England	Wales	Cologne group	Stuttgart group	North	Free State	South Italy
Test age	15.88	13.46	15.34	12.96	12.79	13.29	12.17	8.81	8.57

Table 3 gives the percentile scores of the Norwegian groups on the Porteus Maze Test.

(Take in Table 3)

The adult mazes were not given and without them the Porteus Maze Test handicaps intelligent adults ~~in so far as the score they make is concerned~~ because 16 years is the maximum possible score and carelessness rather than lack of intelligence leads to mistakes for which no corrections are allowed. The median test age of 15 years made by both sexes on this test is, therefore, very good. The ten percentile of both sexes here is 13 years. This is equal to or better than the 50 percentile score of three other female (all literate) national groups and is equal to the 85 percentile score of one(1) of them.

(1) Italian Immigrants - Their Intelligence as Rated by Tests. By Lawrence Kolb. Supplement

Tables 4 and 5 show the median test age according to occupation, age, and residence for subgroups of the total groups. The residence comparison is omitted for Sweden because too few (only three males and ten females) lived in the city to make the results reliable.

(Take in Tables 4 and 5)

The figures for schooling show that insofar as time of attendance and grade reached are concerned, there is not much difference between the various groups. It has already been pointed out, however, that a year's schooling in the country may mean much less in actual time than a year's schooling in the city.

Age has made little difference here in contrast to some other countries where the 35-44 age groups test considerably lower than younger groups. The slight differences noted here are not significant.

Skilled workers have a slight edge on the unskilled and the farmers in Norway. They surpass the farmers, but not the unskilled in Sweden. In all other countries where this work was carried on the skilled showed a marked superiority to other groups. The female domestic servants make very good scores. They are the lowest scoring Norwegian group and yet they test higher than the highest scoring male immigrant group in any other country except England. This is in ~~face~~ spite of the fact that the males in all countries have tested higher than the females.

The Norwegian city group of both sexes tests one year higher than the country group on the Pintner Non-language test, but there is practically no difference between ~~the sexes~~ city and country groups on the other tests.

Table 6 shows the first and second trial percentile scores on construction tests A and B and Table 7 shows the same for the Gwyn Triangle Test.

(Take in Table 6 and 7)

The median score (time for completion) ~~of~~ on Test A gives the males a test age of more than 17 years and the females slightly less than 17 years according to the norms of Lowe, Shimberg and Wood(1). By the same norms

(1) Further Standardization of Construction Tests A and B. Journal of Applied Psychology. 1924, pp. 324-338.

both sexes do decidedly better than 17 years on Test B. The median time allowed for completion by the 17 year olds is 80 seconds, but the male Norwegian completes the test in 35 seconds and the female in 40 seconds.

The time allowed for completion of the Triangle Test by 16 year olds is 35 seconds according to Pintner and Paterson norms(2). The Norwegian

(2) Scale of Performance Tests. Pintner and Paterson, p. 116.

males and females complete the test in 20 and 22 seconds respectively.

Although these groups do the three tests very well on the first trial the second trial performance is much better, but the second trial performance is not of special value in testing the intelligence of Norwegian immigrants. With less intelligent groups, many of whom fail to complete the tests in the allotted five minutes, a second trial given immediately after the first is more valuable for diagnostic purposes than the first.

Ten per cent or more of some other national immigrant groups failed to complete these tests on the first trial. Of the 411 Norwegians who took them only one failed on the Gwyn Triangle and Healy B tests and none failed on the Healy A test.

In Table 8 the median score (time for completion) on the three tests is given for age, occupation and residence groups.

(Take in Table 8)

The comparative results are practically the same as that shown in Tables 4 and 5 for the tests given there, but skilled workers here are consistently superior to other workers. This is a return to the usual findings for immigrant groups. The farmers and unskilled workers do very well with the tests, and the female domestic servants again do better than the male immigrants of any country except England. The age groups show no constant difference, but city people of both sexes score slightly better than country people on all three tests.

Cube Test - Pintner Modification

The test was given by Pintner's method using the 12 movements or lines shown below.

1st move	1 2 3 4	7th move	1 3 2 4 3
2nd move	1 2 3 4 3	8th move	1 4 3 2 4
3rd move	1 2 3 4 2	9th move	1 3 1 2 4
4th move	1 3 2 4	10th move	1 4 3 1 2 4
5th move	1 4 3 2	11th move	1 3 2 4 1 3
6th move	1 4 2 3	12th move	1 4 2 3 4 1

The percentile scores showing the number of lines completed are given in Table 9. The median for both sexes on the Cube Test is 8 lines completed which equals the adult level according to Pintner and Paterson's norms(1).

(1) Scale of Performance Tests. Pintner and Paterson, p. 137.

The Norwegians do the test well and it seems that any group of non-defective adults should find it simple, but the median for the literate males of one national group was 5, test age 7, and the median for the females was 4, test age 6. The 90 percentile score of this group is no better than the 10 percentile Norwegian score.

(Take in Table 9)

The scores of other adult immigrant groups given below form a more reliable basis for comparison than the American norms.

Pintner Cube Test - Median Score. Lines Completed. Immigrants Age 15-44 Groups. All Literate

	Norway	England and Wales	Germany	Irish Free State	South Italy
Median score - males	8	8	7	6	5
Median score - females	8	8	7	6	4

Repeating Digits Forward and Backward

The series of digits shown below was used and the rate of pronunciation was approximately seven in five seconds. Success with one line in a series of three was counted as success for the number of digits in that line and the next higher series was immediately given. The test was stopped after four lines in succession were failed.

Digits

Forward		Backward	
641	374859	92	471952
352	521746	387	583294
837	273859	529	732638
4739	9285164	6528	4162593
2854	7231895	4837	3826475
7261	3857291	8629	9452837
31759	72534896	31879	
42837	49853762	69482	
96176	82795482	52961	

The percentile scores for the number of digits repeated are given in Table 10.

(Take in Table 10)

Seventy-five per cent of the males and 85 per cent of the females repeat seven digits forward. This more than satisfies the Stanford requirement for the 14 year age level. Eighty-five per cent of both groups repeat five digits backward, which is considerably better than the Stanford requirement for the 12 year level. The Stanford requirement for the 16 year level is six digits backward. Sixty-five per cent of the Norwegian women did this.

Repeating digits is a valuable test in work with immigrants, but the Stanford requirements are not applicable to them. For some reason that is not understood, non-English speaking people seem to be handicapped by the test, and it is probably influenced more by education and environment than its apparent simplicity would lead one to expect. The median of the literate males of one national group is five digits forward and three backward which performance only equals the Stanford requirement for the 7 year level, but this group was judged to have a corrected mental age between 12 and 13 years

(see Italian article). The score of six digits forward and four backward made by the 90 percentile of the latter group equals the 10 percentile Norwegian score.

Table 11 shows the percentage of persons comprising various subgroups that succeeded on four tests.

(Take in Table 11)

The first test, drawing the Binet designs from memory, was passed by 95.1 per cent of the total group of males and by 91.8 per cent of the total group of females. These figures are better than those for other immigrant groups. A comparison is given below.

Drawing Designs from Memory. Immigrants, Age 15-44 Groups. All Literate

	Norway	England and Wales	Germany	Irish Free State	South Italy
Males, per cent succeeding	95.1	86.0	80.0	59.2	36.6
Females, per cent succeeding	91.8	70.7	75.0	31.0	23.8

The test is influenced to a certain extent by schooling, and poor schooling is in a measure responsible for the low scores of the two worst groups.

Arranging weights, which is placed at the 9 year level in the Stanford Scale, has been done well by immigrant groups from all countries. The test is too easy to allow of significant comparisons between adults.

The Geometric Figures Test (Mullan's Learning Test) has no standards except those worked out for different groups of immigrants. The Germans did this test considerably better than the Norwegians.

The Ball and Field Test (Stanford Scale 8 and 12 year levels) was passed at the 12 year level by an acceptable percentage of all male groups, but some of the female groups fall slightly below it. The Norwegians do the test better than any other group, but all immigrant groups seem to be handicapped by it.

The comparisons between the various Norwegian subgroups are practically the same as those shown in Tables 4, 5 and 8. An exception occurs in the Ball and Field Test on which the males are markedly superior to the females, instead of only slightly so as on other tests. The skilled workers are superior to other workers on all the tests and the city people are superior to the country people, but on the Ball and Field Test the female country group is superior.

On drawing designs from memory and the Ball and Field test the female domestic servants are again superior to the males of any other nationality.

Education, Sex and Environment

The effect of education, sex and environment on the test ability of these immigrant groups has been covered in the discussions under Tables 4, 5, 8 and 11. As to education, it is noted (Tables 4 and 5) that the skilled had slightly more schooling than the unskilled and farmers and that city people had more than country people, but the figures for years and grade do not tell the whole story. The city people had many more hours of schooling than the country people.

Better education may account in part for the superiority on the Pintner Non-language Test of the skilled over the unskilled and farmers in both countries, and of the city people over the country people in Norway. As to sex, the superior reading habits of the Norwegian women (see reading table) must be thought of as a possible reason why they test nearly as well as the men. It can not be solely responsible, however, as female immigrants from other countries (Ireland and Italy) with as much or more schooling than the males did decidedly worse on the tests. Differences in education and environ-

ment have affected the test ability of these groups, but the two factors cross each other in so many ways that their separate influence can not be measured.

In view of the results in other countries, it is of interest that the various sex, residence and occupation groups in Norway and Sweden, especially in Norway, tested so nearly alike. In explanation it has been observed in the general course of this work that the test ability of subdivisions of dull groups of adults is very sensitive to educational and environmental influences and that this sensitivity decreases as we test groups with higher levels of intelligence. In other words, the effect of various environmental factors on the test ability of dull people is great, but on people who have as much native ability as these two Scandinavian groups it is slight.

It remains to be explained why the Norwegian immigrant tests higher than the Swedish immigrant as there is no reason for supposing that the average Norwegian has more native ability than the average Swede. The explanation is that when this study was made some factors were at work which tended to impel a slightly different grade of people to leave the two countries for the United States. The table below illustrates this.

Environment and Training - Male Immigrants, Norway and Sweden

	School grade reached	Size of home fooms	Percentage of city residents	Percentage of skilled workers
Norway	7.4	4.9	28.4	26.8
Sweden	6.4	3.4	3.2	17.7

The Norwegians had more schooling and lived in larger homes than the Swedes and there were more skilled workers and city residents among them. These are conditions that have been associated with higher scores than the opposite conditions in all countries where immigrants have been tested. This means that the Swedes who are reported on here were nearer than the Norwegians to the bottom of the scale of intelligence test ability of their respective countries.

General Ability of the Groups

We have pointed out before(1) that the scores made by some groups of

(1) Italian, German and Irish articles.

adult immigrants give misleading and unfair pictures of their intelligence and that the true median mental age of a group may be several years higher than its median test age. This conclusion was arrived at through observing that groups from the same country but with different educational and environmental backgrounds made widely different scores on tests. The true median mental age of other national groups has been based on the score that the males made on the Ferguson Form Board Test because the Ferguson test seemed to be fairer to the groups as a whole than any other test and the males were not handicapped in the performance of it because of a non-stimulating environment as were the females. The same measure is now applied to the Scandinavians. By this measure the Norwegians have a mental age of 16 years and 10 months and the Swedes have a mental age of 15 years and 10 months.

Intelligence test scores are only valuable by comparison and enough has been learned in the course of this work to prove that the comparison of scores made by the working class of adults with scores made by public and high school children is usually if not always unfair to the adults. This is what is done when it is stated that an adult has a certain mental age. A better comparison is with other adults.

The scores of male immigrants of other countries may be found in the three articles dealing with their intelligence. The true mental age of the various national groups ranges from 16 years and 10 months to 12 years and 4 months. The American draft army made 13.15 years on the army tests(1), but

(1) Memoirs National Academy of Science, Vol. 15, pp. 790.

a direct comparison of the Scandinavian groups with the army on the basis of the Army test results would not be fair to the Army. A comparison of the Pintner Non-language test results with the Army scores would be more valid. The Norwegian males made 15.92 years and the Swedish males made 14.28 years on the Pintner Non-language test, but the Army tests were taken under more difficult conditions.

An exact comparison with American intelligence can not be made, but from the comparisons we have with other immigrant groups and the Army and some work (unpublished) with the Ferguson and Pintner tests on American office workers, it is inferred that the intelligence test ability of the two Scandinavian groups is superior to that of the average white American.

The fact that verbal tests have not been used does not affect the comparisons. Some individuals have more natural verbal sense than others, but in groups comprised of individuals selected at random, those with more verbal sense will be mixed indiscrimently and in approximately equal numbers in different groups. There is no reason to suppose that one group of immigrants is more verbally minded than another or ~~than~~ that Americans are more verbally minded than Europeans. Comparisons based on non-language tests are ~~the~~ then valid comparisons of the general intelligence of groups of persons selected at random.

The Criterion and Measure of Defect

The mental age is a convenient and reasonably accurate measure of intelligence provided it is not confused with the test age as is so often done. It has been shown that the test age of some groups of immigrants may be four or five years less than the true (corrected) mental age(Italian article). The test age of other groups on a few tests may be more than the true mental age, but as a rule the corrected mental age is higher than the test age.

The Corrected Mental Age

The corrected mental age as finally determined on any test is the test age corrected for the errors introduced by poor education and unfavorable environment. The method of finding it has been described in detail in the German, Irish and Italian articles. It is based on the wellgrounded assumption that all adult groups in the same country except the skilled workers who are suprior to the others have equal native ability and that the Ferguson Form Board Test brings out the full native ability of the general group of males. Using these assumptions as a working basis, the score of an individual on any test that is scored by the percentile method is located on the correct percentile of hig group by reference to the percentile table of the group. The same percentile on the men's Ferguson score table is then referred to, and whatever mental age this percentile score indicates is the corrected mental age.

As an illustration of the method of finding the corrected mental age from the tables published here: If a Swedish woman makes a score of 246 points on the Pintner Non-language Test we note that this score falls at the 10 percentile on Table 2. This gives her a test age of slightly less than 10 years. We now turn to Table 1 and find the ten percentile Swedish men made a score (Shimberg) of 39 on the Ferguson test. This is equivalent to a mental age of 13 years and 6 months. The corrected mental age of this Swedish woman is then 13 years and 6 months.

In using the Ferguson test as a standard it is to be borne in mind that it is a standard for the group, not for the individual. For groups it is accurate, but the actual score that an individual makes on the Ferguson test may be misleading. His Ferguson score may fall at the 10 percentile and his Pintner score at the 40 percentile. This variation is brought about by a difference in the types of ability, either innate or acquired, that is called for by the two tests, and it illustrates what we have stressed in writing about immigrants - that conclusions should never be drawn from one test, no matter how poor the results happen to be.

The lowest scoring Norwegian in this series of cases (Table 1) has a corrected mental age of 12 and the lowest scoring Swede has a corrected mental age of 10. The test age of the lowest scoring Norwegian on the Pintner Non-language test (Table 2) is ten; considered alone, this seems to be poor, but when compared with ~~other national~~ the score of imigrant groups from other countries, it is seen to be good, as it is better than the median ~~score~~ of two of them. The lowest scoring Swede about equals the 30 percentile of two other national groups. The fact is that there was no mentally defective person among the 633 immigrants that are reported on here. However, mentally defective adults may apply for admission from Scandinavia and there should be some way to determine that they are defective.

There is no sound reason for judging Scandinavian and German immigrants by different measures. The educational and cultural backgrounds of the two peoples are too much alike for these factors to cause an appreciable divergence in their intelligence test ability. For practical purposes then, Norwegian, Swedish and German immigrants may be considered as of common origin and the German scores used as a standard for the three groups.

Table 12 in the German article(1) shows the corrected mental age of

(1) German Immigrants - Their Intelligence as Measured by Tests. By Lawrence Kolb, Supplement

low scoring Germans on nine tests. This table and the discussion that goes with it on the significance of test results are equally applicable to low scoring Scandinvaians and may be used as a guide when it is necessary to decide whether or not one of them is mentally defective. The reader who is interested in this phase of the subject is, therefore, referred to the German article.

Summary and Conclusions

A total of 633 prospective Norwegian and Swedish immigrants between 15 and 45 years of age was given intelligence tests in Oslo, Stockholm and Gothenburg.

Both the Norwegian and Swedish groups ~~represented~~ are representative of the general run of immigrants from whom all with more than the usual common school education has been excluded.

The Norwegians had between 7 and 8 years of schooling and the Swedes between 6 and 7 years schooling. The Norwegians came from larger homes than the Swedes and more of them were skilled workers and city dwellers. Both groups came from families with an average of approximately 8.8 members.

The Norwegians tested higher than the Swedes due to factors that tended to select for emigration a relatively poorer group of Swedes, but the intelligence of both groups is considered to be very good. They tested higher than any immigrant groups yet reported and are believed to have a higher test ability than the average adult white American.

The true median mental age (corrected mental age) is arrived at by making corrections for the handicap of sex and environment. It is higher for some of the groups than the test age.

The true median mental age of all groups except the skilled workers, who are superior, is believed to be approximately 16 years and 10 months for the Norwegians and 15 years and 10 months for the Swedes.

Skilled workers, males and city dwellers test higher than unskilled workers, females and country dwellers, but the differences between the groups is slight as compared with the difference noted between immigrant groups in other countries.

The cultural background of Scandinavian and German immigrants is so much alike that they may be judged by the same standards in ~~so far as~~ estimating the significance of test results ~~is concerned~~.

Table 1

FERGUSON FORM BOARD TEST, NORWAY AND SWEDEN

	Males		Females	
	Norway	Sweden	Norway	Sweden
Median age	21	21	23	22
Average years of school	7.4	6.4	7.2	6.6
Average grade reached	7.2	6.4	7.2	6.5
Number of cases	138	107	200	101
	Shimberg score			
Percentiles				
100	60	60	60	60
90	60	60	60	60
80	60	60	60	59
70	60	58	59	56
60	59	56	58	52
50	59	53	57	49
40	58	50	57	48
30	57	48	55	44
20	56	44	52	40
10	52	39	46	31
0	30	18	24	13
	Ferguson score			
100	25	23	25	23
90	23	21	22	21
80	22	21	21	20
70	21	20	20	19
60	21	19	20	18
50	20	18	19	17
40	20	18	19	16
30	19	17	18	15
20	18	16	17	14
10	17	14	15	12
0	12	10	11	8
	Boards Completed			
100	6	6	6	6
90	6	6	6	6
80	6	6	6	6
70	6	6	6	6
60	6	6	6	6
50	6	6	6	6
40	6	6	6	5
30	6	5	6	5
20	6	5	6	5
10	6	5	6	5
0	5	3	4	3

Table 2

PINTNER NON-LANGUAGE TEST, NORWAY AND SWEDEN.

	Norway		Sweden	
	Males	Females	Males	Females
Median age	21	23	21	22
Average years school	7.4	7.2	6.4	6.6
Average grade reached	7.2	7.2	6.4	6.5
Number of cases	168	208	103	112
Percentiles				
100	558	553	556	536
90	503	503	460	444
80	470	480	433	407
70	452	459	416	395
60	442	441	390	371
50	425	424	371	354
40	409	404	345	339
30	387	382	324	318
20	363	357	308	288
10	334	332	259	246
0	247	244	166	163

Table 3

PORTEUS MAZE TEST, NORWAY.

	Males	Females
Number of cases	138	199
Percentiles		
100	16	16
90	16	16
80	16	16
70	16	15½
60	15	15
50	15	15
40	15	14½
30	14	14
20	13½	13½
10	13	13
0	7	9½

Table 4

AGE, OCCUPATION, AND RESIDENCE COMPARISON, NORWAY

Median Test Age on Three Tests

	Males							Females					
	Age comparison		Occupation comparison			Residence		Age comparison			Occupation	Residence	
	15-24	25-34	Skilled	Unskilled	Farmer	Urban	Rural	15-24	25-34	35-44	Domestic	Urban	Rural
Median age	20	29	22	20	21	22	21	20	28	36	22	24	22
Average years of school	7.4	7.3	7.7	7.2	7.2	7.7	7.2	7.3	7.2	7.2	7.1	7.4	7.2
Average grade reached	7.3	7.2	7.6	7.1	7.1	7.6	7.1	7.2	7.2	7.2	7.1	7.4	7.1
Number of cases	99	35	40	24	74	41	97	113	70	17	55	80	120
Median test age:													
Ferguson form boards	16.67	16.83	16.83	16.67	16.67	17.00	16.67	16.67	16.50	16.17	16.50	16.67	16.50
Porteus maze test	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	16.00	15.00	15.00	15.00
Pintner non-language	15.88	16.06	16.64	15.29	15.48	16.48	15.50	16.16	15.29	16.09	14.94	16.39	15.39

Table 5

AGE AND OCCUPATION COMPARISON, SWEDEN

Median Test Age on Two Tests

	Males					Females		
	Age comparison		Occupation comparison			Age compairson		Occupation
	15-24	25-34	Skilled	Unskilled	Farmers	15-24	25-34	Domestic
Median age	20	27	20	19	22	20	28	21
Average years of school	6.5	6.4	6.8	6.4	6.4	6.7	6.3	6.5
Average grade reached	6.4	6.3	6.6	6.5	6.3	6.6	6.3	6.5
Number of cases	84	19	16	15	72	78	34	39
Pintner non-language	14.38	13.42	14.38	14.70	14.00	13.48	13.35	13.44
Ferguson form boards	15.50	16.33	16.50	16.00	15.50	15.17	15.17	15.17

Table 6

HEALY CONSTRUCTION TESTS - TIME, SECONDS, NORWAY.

	1st trial		2nd trial	
	Males	Females	Males	Females
Number of cases	183	231	183	231
	Healy A test			
Percentiles				
100	4	6	4	4
90	10	10	5	6
80	11	12	7	7
70	13	15	7	7
60	15	17	7	8
50	17	19	8	9
40	20	21	10	10
30	23	25	10	11
20	29	30	12	14
10	47	42	17	19
0	150	225	50	49
	Healy B test			
100	19	15	14	10
90	25	25	20	20
80	27	30	22	22
70	30	33	23	23
60	33	35	25	26
50	35	40	25	28
40	40	45	27	30
30	45	53	30	32
20	55	63	35	35
10	69	85	40	45
0	184	f	86	121

Table 7

GWYN TRIANGLE TEST - TIME, SECONDS, NORWAY.

	1st trial		2nd trial	
	Males	Females	Males	Females
Number of cases	183	231	183	231
Percentiles				
100	5	6	4	4
90	10	10	7	7
80	12	12	7	8
70	15	15	9	10
60	16	19	10	11
50	20	22	12	14
40	25	33	15	17
30	30	41	18	24
20	40	49	27	31
10	55	65	35	49
0	112	f	105	159

Table 8

AGE, OCCUPATION, AND RESIDENCE COMPARISON, NORWAY

Median Score on Three Tests, Time - Seconds

1st Trial

	Males							Females					
	Age comparison		Occupation comparison			Residence		Age comparison			Occupation	Residence	
	15-24	25-34	Skilled	Unskilled	Farmer	Urban	Rural	15-24	25-34	35-44	Domestic	Urban	Rural
Number of cases	136	43	49	42	92	52	131	135	78	18	70	88	143
Healy A test	17	15	15	20	17	15	18	20	18	21	19	19	20
Healy B test	36	35	33	36	40	32	36	40	39	38	43	39	40
Gwyn triangle	21	19	15	20	23	19	21	20	25	34	25	22	25

Tobb 9

PINTNER CUBE TEST, NORWAY

	Males 15-44	Females 15-44
Cases	170	218
Percentiles		
100	12	12
90	10	10
80	10	10
70	9	9
60	9	9
50	8	8
40	8	8
30	7	7
20	6	7
10	6	6
0	3	3

Table 10

REPEATING DIGITS FORWARD AND BACKWARD, NORWAY.

	Forward		Backward	
	Males	Females	Males	Females
Number of cases	103	164	103	164
Percentiles				
100	8	8	6	6
90	8	8	6	6
80	8	8	6	6
70	8	8	6	6
60	7	8	6	6
50	7	7	5	6
40	7	7	5	6
30	7	7	5	5
20	6	7	5	5
10	6	6	4	4
0	4	4	2	2

Table 11

AGE, OCCUPATION, AND RESIDENCE COMPARISON, NORWAY

Per cent Succeeding on Four Tests

	Males							Females					
	Age comparison		Occupation comparison			Residence		Age comparison			Occupation	Residence	
	15-24	25-34	Skilled	Unskilled	Farmer	Urban	Rural	15-24	25-34	35-44	Domestic	Urban	Rural
Number of cases	136	43	49	42	92	52	131	135	78	18	70	88	143
Binet designs	93.4	100.0	95.9	95.2	94.6	96.2	94.7	92.6	92.3	83.3	90.0	96.6	88.8
Arranging weights	92.6	100.0	100.0	92.2	93.5	100.0	92.3	91.0	97.4	100.0	90.0	98.9	90.9
Geometric figures:													
1st trial	34.6	41.9	57.1	14.3	35.9	44.2	33.6	37.0	33.3	33.3	37.1	42.1	31.5
1st & 2nd trial	86.0	97.6	91.8	80.9	90.2	92.3	87.0	83.0	86.0	66.7	74.2	86.3	80.4
1st, 2nd & 3rd trial	96.3	97.6	95.9	97.6	95.7	98.1	95.4	95.6	97.4	94.5	92.9	97.7	95.1
Ball and field:													
12 year level	81.6	76.6	83.7	78.6	79.3	84.6	78.6	68.6	55.8	61.1	60.9	54.5	69.5
T8 year & 12 year level	96.3	87.2	93.9	97.7	92.4	96.2	93.1	90.0	81.8	88.9	88.4	85.2	89.4