OCCUPATIONAL CLASSIFICATION OF THE UNEMPLOYED

THE INDUSTRIAL QUALITY OF THE UNEMPLOYED, WITH PARTICULAR REFERENCE TO OCCUPATIONAL CLASSIFICATION

by

N. W. Morton

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Appendix 'A'

Chapter One: Introduction

Among the essential characteristics of the industrial system which has constituted the core of our economic life for the past century and a half are two phenomena which form the theoretical starting-point for this study: unemployment, and the specialization of labor. The former might be termed a pathological symptom of the malfunctioning of our economic machinery, owing its existance perhaps to several etiological factors, and exhibiting itself in accordingly different phases; while the latter is probably to be regarded as a necessary adjunct to a constantly increasing complexity of societal organization. The latter phenomenon constitutes in itself no extremely pressing problem which must be dealt with as a necessarily unfortunate aspect of our economic life, although its practical implications do of course require consideration in the determination of the mode of existance of the individual and in the structuration of the economic threads of the web of society. Unemployment, however, affecting as it does the mechanical efficiency of the process of production and distribution of wealth, tinging permanently or from time to time the life of the individual with a gloomy hue, and presenting to the community and the state otherwise not inevitable problems of individual and group assistance and adjustment, must be regarded as a most deplorable phase of modern industrial organization.

Unemployment lends itself to psychological study from two major aspects: as an occurence or process having to do with the individual, and therefore from the differential viewpoint reflecting (not necessarily depreciatively) upon him; and as a problem of society to the solution of which the methods and findings of psychology may render some assistance. In the light of the former aspect, and as a matter of pure curiosity, as well as for utilitarian purposes, one is prone to enquire regarding the general character of those individuals who are at any time, and particularly during a general depression, unemployed, as compared with those steadily at work. Is it the less capable who are first laid off in time of industrial inactivity, or is it because they are older, or younger, or two of all three, or is it simple chance that determines who shall go first? Do they as a group differ from the general population in respect of any measurable psychological characteristics, and if so, what relationship exists between these characteristics and other individual variables, such as age, education, and occupational history? To what extent is their differentiation traceable to faults or incongruities of their training? Do they undergo personal or professional degeneration during the process of unemployment, and to what extent? How far have they fallen out of line with current and future occupational trends, and how far are they redeemable? Such questions as these occur spontaneously to the student.

As a serious social problem requiring solution or at least alleviation, unemployment necessitates careful inspection with regard to its causes and conditions, at least as they appear to the eyes of the contemporary student of societal and industrial organization, before any specific recommendations may be made as to its obviation. While in the hands of the economist investigation into the cause of unemployment has yielded a mass of theoretical analyses and generalizations frequently conflicting in character, yet as they present certain broadly defined trends which must be regarded as substantial. From these observations may be outlined several apparent types of unemployment:

I. Cyclical unemployment -Referable to cyclical changes in the volume of industrial activity, with consequent variations in labor demand.

2. Seasonal unemployment - Characteristic of industry in general in consequence of variations in demand for services and products and in production schedules, and more significantly and with fuller application in the case of specialized trades and industries.

3. Technological unemployment -A more recent phenomenon generally attributed to the displacement of workers by mechanical devices, usually considered to be compensated in part by increased mass purchasing power owing to decreased cost of production, but yet an important constant factor by reason of the loss of buying power on the part of the discharged workers themselves.

4. Unemployment owing to friction of adjustment of the displaced worker - The usual lag of time created in part by comparative lack of efficient means of bringing together the employee-seeking employment and the employment-seeking worker, and in part also by the desire on the part of the employer to maintain a constant fund of readily procurable labor.

5. Unemployment owing to personal and individual causes- Advanced age, particularly operative where pension or superannuation systems exist in his industry; maladjustment of the individual to the type and level of work best fitted to his capacities and experience; the operation of a tendency to 'Wanderlust'; sheer inability of the individual, as occasioned for instance by mental defect, to meet the demands imposed upon him by all except the most unorganized, unskilled and casual work.

6. Unemployment owing to other causes of a miscellaneous character -As for instance, decadence of certain outmoded industries; emergency stoppage of work, as by mechanical breakdowns and accidents; depressing effects of foreign tariffs upon the sale of goods designed for the export market; or of unfavorable trade combines or agreements.

A scrutiny of these generally accepted classes of causes reveals that while all are perhaps more or less amenable to obviation by some manner of readjustment of the character of our social and economic organization, this holds most truly

and exclusively in the case of cyclical unemployment; while it is extremely dubious, at the least, whether there will not always be such emergency dislocations and breakdowns as characterize, for instance, even the most effeciently operated industrial plant, with consequent loss of work. Implications arising from a study of the causes of unemployment other than these however, are such as to suggest the hypothesis that certain of the data and methods of industrial psychology may prove applicable in the solution of problems of unemployment thus presented.

Analysis of a discussion of possible means of coping with technological and seasonal unemployment reveals the fact that much of their unfortunate effect arises from the friction which occurs in the securing of renewed employment by the displaced worker, and from the lack of adequate knowledge concerning the changes which occur. To an appreciable extent, therefore, although not wholly so, technological and seasonal unemployment, together with the loss of work traceable to trends of decadence in certain trades and industries, may be classed with the fourth type of unemployment indicated, namely, that owing to the inefficiency of connection of the unemployed individual with the potential employer. Douglas and Director*

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* Douglas, P.H., and Director, Aaron, The Problem of Unemployment MacMillan, N.Y., 1931 . Pp. 151-155.

in a contemporary treatise on the nature , causes and treatment of unemployment, cite among the means of reduction of the losses of temporary unemployment the following:

I. The forecasting by competent organizations of the trades and industries in which a displacement of labor is likely to occur and the probable degree of displacement which may be expected.

2. An efficient system of public employment offices which will help to find a job for the displaced workers in other industries or occupations.

3. The revamping of our systems of vocational training so that juveniles who are being trained may be given some preparation which will fit them for alternative industries and so that displaced adults may be prepared for new or different types of work.

A consideration of these suggestions together with an appreciation of the general character of the problem of labor adjustment casts light upon the possible application of industrial psychology in the evolution of efficient means of solution of this problem. It may be attempted to sketch something of the possible nature of this relationship. First and foremost, there is need, in a survey of the character of employment trends in all industries subject to advancement or

to retrogression in their position of importance, as indicated above, of an evaluation of the nature of the human abilities, skills, training and other traits which are placed in greater or less demand in accordance with such economic trends. The reason for this is sufficiently obvious: insofar as it is known or may be assumed that demands placed upon the worker are of a differential character in accordance with differences in the type and level of work involved, variations in such demand will make requisite a stock-taking of the psychological character of the demand and of the industrial qualities of the individuals who are subject to it in a varying degree.

The development and integration of a system of public employment bureaux geared to a level of efficiency capable of dealing with the situation necessitates not only such information afforded by current surveys of employment trends but also precise and individual data concerning the character and industrial qualities of each worker with whom it deals, and concerning also the specifications required for a given type of work. Much of that data, although not all of it, contemporary applied psychology is in a position to afford, if not in a flawless manner, at least in accordance with a standard higher than that maintained in any other way. The realization of this possibility is apparent in recent studies of the development and future prospects of public employment bureaux organized on a sufficiently worthwhile scale. Douglas and Director*, in a discussion of the necessary

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* Op. cit., pp. 354-356.

specialization of function in the administration of such offices, point to the necessity of securing an analysis of the important jobs in terms of trade skills which are required, of the use of psychological tests in order to grade and classify the worker, and to the desirability, in order to avoid overlapping of service and consequent waste, of the institution of a permanent record of the worker on file in central offices. Essentially the same recommendations are made by Harrison and his associates in a previous study.*

The third point brought out by Douglas and Director, regarding the need for foresight in training and retraining, deserves particular attention. The relationship between job specifications in terms of the abilities, interests and personality and character traits involved, and adequate vocational guidance, has been apparent for sufficiently long to render further reference to it unnecessary. The need for similar knowledge with respect to workers displaced by technological changes, by seasonal variations in employment, by personal incompatibility, or by some other occurrence which involves unemployment is, however, subject to less frequent reference. The problem of retraining in particular, as pointed out by Parker,** involves in its essential analysis a determination of the nature of the skills and their relationships inherent in the jobs to which retraining applies, as well as an evaluation of the individual in similar terms.

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* Shelby M. Harrison and Associates. Public Employment Offices. Russell Sage Foundation, 1926.

** W. E. Parker. Methods of the Public Employment Center of Rochester. Pers. J. 10 (1932) 307-317.

A fully developed system of employment adjustment would thus comprise the following attributes:

1. An efficient system of employment centers, together with an adequate research staff and a central record office.

2. A continuous survey of employment trends, so complete and far-reaching in its analysis of the causation of such trends whether brought about by technological change, shift in consumer demand, initiated either by the industry or by the broader movement of public interest or want, or by reason of cyclical or otherwise external variations in the tempo of production, as to make possible some degree of forecast of the probable character of future trends.

3. An audit of the general distribution of occupational skills and interests and other traits relevant to the industrial quality of workers. Required also would be a knowledge of the necessary qualifications for each job sufficiently distinct to be considered by itself, of the interrelationships of jobs conceived upon this basis, and of their changing character.

4. Evaluation and placement of displaced workers, with training or retraining whenever necessary, on the basis of their ascertained qualities and of the requirements of jobs considered within the scope of their general ability level.

5. Maintenance of schemes of vocational guidance so as to take advantage of a knowledge of the probable character of the future employment situation, and inclusive also of a scientific stock-taking of the individual's vocational possibilities.

6. In view of the distribution of occupational skills, a possible readjustment or modification of working conditions or of technological change so as to secure for each individual the possibility of future employment. A marked increase in the use of machinery might, for instance, be incompatible with the existence of a mass of individuals incapable of even the most unskilled work, and thus rendered devoid of employment.

Such a scheme, while perhaps somewhat Utopian in its projected character, would meet some of the more pressing demands raised by modern industrial conditions. Although its immediate relation to major situations of unemployment would be slight, insofar as these

are brought about not by friction of adjustment of labor* supply and demand but rather by substantial economic cycles or trends, nevertheless its constant usefulness and significance would be such as to recommend its adoption at least in some form. Its relationship to industrial psychology stands defined as a general project of research into the nature of occupational abilities and traits, and of their interrelationship as regards different jobs, considered whenever possible in terms of success or its lack on the job. An outline of certain specific points which would require initial investigation from the distinctively psychological point of view would include the following:

1. A survey of the nature of the distribution of occupational abilities among the adult working population.

2. A determination of the precision with which the requirements of an occupation in terms of such psychological traits as 'general intelligence', clerical ability, mechanical insight and mechanical dexterity can be expressed as quantitative indices.

3. A knowledge of the extent to which these indices, expressed as statistically treated test scores, are of such a character that they will exhibit significant differences as regards different occupations or occupation groups.

4. A knowledge of the degree to which occupations falling within certain empirically determined groups possess a common denominator as regards their requirements, and of the degree to which these requirements are unique.

5. A knowledge of the interrelationship between specific, relevant abilities, as measured by test scores, for different ability levels.

6. A knowledge of the relationship between personal qualities so defined and items of information concerning the individual's personal history, training and experience.

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* 'Labor' is used here as having a general occupational application, without reference to degree of skill. Cf. Soddy's use of the term 'diligence' in 'Wealth, Virtual Wealth, and Debt', (Dutton, N.Y., 1933, pp. 58-61).

These desiderata, together with a general investigation into the character of available groups of unemployed men, were taken as the major aims of this preliminary study, with the intention of ranging the occupations under observation into whatever form of scale based upon ability levels they might fit. It was thought that very possibly some such grouping as provided by Taussig* on the basis of non-competing economic groups would prove useful, since at the beginning, at least, the number of cases would hardly justify segregation by specific jobs or trades. The study was intended to include within its scope as wide a range of occupations from the least to most skilled as it might be possible to encompass, and both employed and unemployed men. Particular attention was to be paid to unemployed groups, as they constitute the raw material assimilated and distributed by any form of employment exchange, and it was considered that they as a class might be subject to special study, but employed groups were to be included also, both to serve as controls and to round out the picture of the occupational structure. When the study was commenced, in the autumn of 1931, the employment situation was distinctly abnormal, owing to current industrial decline, and large numbers of individuals normally employed were without work, in addition to those subject to chronic intermittent unemployment This situation did not change during the successive interval, although it was subject to something of the usual seasonal

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* F. W. Taussig. Principles of Economics. MacMillan, N.Y. 2nd Ed. Rev. 1920. Vol. 2, pp. 134-137.

variations.

Had the industrial situation approached more nearly the normal there would in all likelihood have been the basis, it was thought, to present more clear-cut, sharply defined comparisons of employed and unemployed groups of workers. As it was, however, this was not the case: any significant normal differences were likely to be obliterated through the dilution of the normally unemployed group by individuals who at any time other than the present would have steady work. It was considered, however, that there was probably still a difference to be found in the character of these two groups, since it was to be expected that comparative efficiency would constitute to some extent the standard by which those individuals to be retained by business and industrial firms and those to be 'laid off' would be judged.* If this were to any appreciable extent the case, differences exhibited for various occupations between employed and unemployed groups might form some clue as to the relative importance of traits necessary for successful performance in these occupations.

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* On the other hand, seniority rather than efficiency determined the status of the individual in certain cases, notable in the case of railway employees.

Chapter Two: Historical

A. Testing of Unemployed Men.

The literature on this topic is extremely sparse. While there undoubtedly exist considerable quantities of data concerning the tested mentality of unemployed workers, the only published studies discovered by the writer, prior to those based upon current researches, are two: an investigation by Johnson of unemployed men in Portland, Oregon, in 1914-15,* and one made by Pintner and Toops with applicants of the Dayton, Ohio, and Columbus, Ohio, Free Employment Offices, in 1916-18.** The former used the Stanford Revision of the Binet-Simon Scale and found about 21% to be feeble-minded. The latter employed several short-scaled group tests: Whipple's Cancellation Test, several tests of the Woodworth-Wells series, and the Knox Cube Test. 94 men at Columbus and 40 men at Dayton were examined, and a considerable amount of information concerning each individual's experience and education was secured. The samples obtained from the two cities were dissimilar, there being 28.7% feeble-minded at Columbus, and only 7.5% at Dayton. The distribution of mental ages paralleled the distribution of cases according to their industrial status: whether (1) unemployed,

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* Johnson, B.R. Unemployment and Feeblemindedness. J. of Delinquency, 2 (1917) 59-73.

**Pintner, R. and Toops, H.A. Mental Tests of Unemployed Men. J. of App. Psy. 1 (1917) 325-341 and 2 (1918) 15-25.

although normally at work; (2) casuals; (3) of the odd-job type, who work fairly steadily upon short-time jobs; and (4) unemployables. Certain of the general conclusions derived from the study are worthy of mention:

> "(1) There seems to be a distinct relationship between the mentality and the industrial class to which a man belongs, the unemployed class ranking highest, followed by the casuals, the odd-jobs men, and the unemployables. No men of normal mentality were found in the unemployable group."
>
> "(2) On the whole the older men among the applicants seem to be more retarded than the younger men."
>
> ""(3) The grade in school achieved by the men, according to their own statement, is higher than their mentality in general would warrant, though it bears out the poor mental endowment of the class."
>
> "(4) The best position ever held, as given by the men themselves, shows that few have ever held positions requiring any considerable degree of responsibility."

On the whole, these investigations have little more than historical interest for the present study, because the conditions of unemployment are distinctly different and because the test results are hardly comparable, except in a very general manner. The only really comparable study of unemployed men that exists is that embraced within the general research on occupational traits carried out by the Employment Stabilization Research Institute of the University of Minnesota. To this reference will be made in the following section.

B. Occupational Classification.

The literature on this topic is considerably more voluminous, as regards both objective job description and specification in verbal terms, and test (that is, 'psychological') data. Insofar as the former relates to the general concept and technique of job analysis, it is of comparatively long standing, receiving its original impetus from the work of Frederick W. Taylor, and being carried on with the expanding development of scientific management and personnel study and procedure. It must however be regarded as complementary to the methods and the type of material dealt with in a study of tested occupational characteristics, because while these two approaches toward occupational classification have a clase bearing one upon the other, yet it is intended that each shall form a separate unit of the total job description. As Viteles* points out in a discussion of the relationship between vocational guidance and job analysis, a distinction must be made between the extrinsic and intrinsic qualities of a vocation, namely, between description of occupational requirements based upon external observation of the duties, hours, wages, etc., and statements of the mental abilities and other traits (their level and relationship) necessary for success. In the present exposition of the history of occupational classification, refernce is made for the most part to specifications based upon test or other data, as denoting those qualities of mind and of behavior which are of importance in the successful performance of the job.

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* M. S. Viteles. Vocational Guidance and Job Analysis. Psy. Clin. 15 (1924) 157-182.

The general concept of the stratification of occupations into non-competing groups receives discussion by Taussig.* These groups are five in number:

A. "The class of the well-to-do; those who regard themselves as the highest class, and certainly are the most favored class. Here are the professions, so-called,--- the lawyers, physicians, clergymen; teachers of the higher grades, salaried officials, public and private, in positions of responsibility and power; not least, the class of business men and managers of industry, who form in democratic communities the backbone of the whole group."

B. "Next comes the group that approaches the well-to-do; the lower middle class, which avoids rough and dirty work, and aims at some sort of clerical or semi-intellectual occupation. Here are clerks, book-keepers, salesmen, small tradesmen, railway conductors, foremen, superintendents, teachers of the lower grades."

C. The skilled -- "the aristocracy of the manual laboring class", such as carpenters, bricklayers, plumbers and machinists.

D. The semi-skilled -- "who, while not needing specialized skill, yet bear some responsibility and must have some alertness of mind." Street-car motormen and miners form examples of this class.

E. The unskilled -- such as laborers and farm-helpers.

Some indication of the closeness of application of this scale to a scheme of intelligence levels is given in a report by Flanders,** who correlated the Stanford-Binet mental ages of 47 workers, mostly clerks, with the Taussig ranking of each individual's father's occupation, and found the coefficient to be +.35. Moreover, the connection being one generation removed, and the

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* Op. cit., pp. 134-137.

** Flanders, J.K. Mental Tests of a Group of Employed Men. J. of App. Psy. 2 (1918) 197-206.

dispersion of test scores probably not being so great as would be the case if a sampling of the entire industrial population were used, this figure in all likelihood understates the case.

The first really generous and significant body of data regarding the mental qualities characteristic of various occupations resulted from the testing of U.S. Army recruits during the world war.* Quantitative stratification was for the most part limited to the classification of occupations by intelligence test scores (Alpha and Beta Examinations) and while it was observed that the occupations represented arranged themselves in hierarchic fashion (Fig. 1), yet considerable overlapping existed between those placed adjacent in the scale. While a broad classification upon the basis of intelligence was permissible and desirable, yet it did not lend itself to a finer analysis which would be to any degree useful or reliable in the grading of the individual. The extent to which intelligence was apparently a factor varying with the level or character of the occupation was exhibited by Kelley,** who showed that general intelligence and vocational choice correlated to the extent of ±.484; and vocational choice and all factors other than intelligence to the extent of ±.875. In doing this, Kelley made several assumptions: that if the standard deviation of test scores for the entire group were 1.00, that for each separate occupation would be about 0.875; that the intelligence test position of a

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* See Yerkes, R. M. (Ed.) Psychological Examining in the U.S. Army. Mem. Nat. Acad. Sci. 15 (1921) 819-837.

** Kelley. T.L. Principles Underlying the Classification of Men. J. of App. Psy. 3 (1919) 50-67.

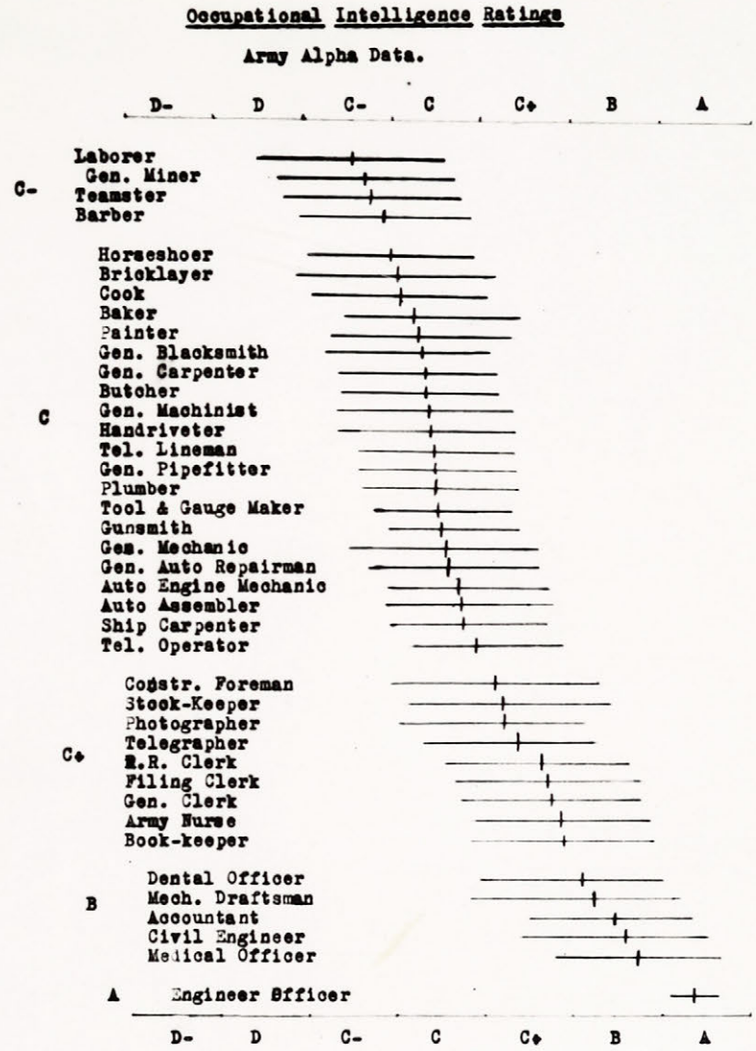
Occupational Intelligence Ratings
Army Alpha Data.
D-
D
C-
C
C+
B
A
C-
Laborer
Gen. Miner
Teamster
Barber
Horseshoer
Bricklayer
Cook
Baker
Painter
Gen. Blacksmith
Gen. Carpenter
Butcher
C
Gen. Machinist
Handriveter
Tel. Lineman
Gen. Pipefitter
Plumber
Tool & Gauge Maker
Gunsmith
Gen. Mechanic
Gen. Auto Repairman
Auto Engine Mechanic
Auto Assembler
Ship Carpenter
Tel. Operator
Constr. Foreman
Stock-Keeper
Photographer
Telegrapher
C+
R.R. Clerk
Filing Clerk
Gen. Clerk
Army Nurse
Book-keeper
Dental Officer
B
Mech. Draftsman
Accountant
Civil Engineer
Medical Officer
A
Engineer Officer
D-
D
C-
C
C+
B
A

Figure 1.

vocation and its position in a scale which was a composite of all other factors influencing an individual's choice of an occupation were uncorrelated; that the true ranking of a vocation would correlate perfectly with all other factors except intelligence, if intelligence were held constant; and that the formulae for partial correlation and for the standard deviation of the errors of estimate in the case of two variables were adequate for the statistical treatment of these variables. Granting all these assumptions, it was obviously indicated, therefore, that further research into occupational classification must go beyond intelligence in its search for a scale.

Despite this fact the majority of later researches and discussions concerning occupational classification on the basis of mental abilities have dealt with general intelligence or some closely related variable alone. For this two main reasons may be assigned: the fact that most of these studies were unrelated, and it was reasonable at least to commence with the distribution of general intelligence, and secondly, because many of the theoretically residual factors are of such a nebulous character, and are, for the present at least, less amenable to quantitative treatment. A general survey of the character of these post-war studies is, however, worthy of scrutiny.

Yoakum* in 1922 in a discussion of potential developments in vocational guidance technique indicates the necessity for further knowledge regarding occupational requirements in terms of

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* Yoakum, C.S. Basic Experiments in Vocational Guidance. J. Pers. Res. 1 (1922-23) 18-34.

abilities other than general mental alertness, and points out certain contemporary research in that direction. Fryer* slightly later points to the existence of five occupational levels determined with intelligence as a standard, not dissimilar to those remarked by Taussig:

(1) Professional occupational level (superior intelligence required).

(2) Technical occupational level (high average intelligence required).

(3) Skilled occupational level (average intelligence required).

(4) Semi-skilled and low-skilled level (low average intelligence required).

(5) Unskilled occupational level (inferior intelligence required).

Fryer gives in his report average test scores and their range for 96 occupations, obtained from the testing of a group of 3598 applicants to the vocational department of the Central Branch Y.M.C.A. at Brooklyn, N.Y.

The use of classified indices of personal qualities of workers in the construction of wage scales and promotional charts is indicated by several writers. Bills** suggests the employment of rating scales of the graphic type for this purpose and emphasisestthe apparent success of the method. Pruette and Fryer*** outline what they call a 'functional classification' of

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* Fryer, D.A. Occupational Intelligence Standards. School and Society, 16 (1922) 273-277.

** Bills, M.A. Job Classification and Personnel Rating. J. Pers, Res. 1 (1922-23) 384-393.

*** Pruette, L. and Fryer, D. Group Problems of the Executive. J. Pers. Res. 3 (1924-25) 39-45.

occupations, based largely upon group feeling, attitudes and habits, and suggest its use for general classification and for promotional purposes. Hopwood* proposes a cross-classification of occupations within a single industry or plant, based upon 'service grades' (which parallel intelligence levels) and 'functional classes', denoting different types of work of comparable complexity in different departments or divisions. These latter might be brought about, so far as individual allotment is concerned, by differences in interests and specific abilities other than intelligence, as suggested by Viteles. Scott, Clothier and Mathewson,** in a discussion of the use of tests in personnel work, point out the possibility of devising mental alertness standards, both in terms of average and critical score, for various types of office work (Fig. 2).

Cyril Burt***, in a discussion of necessary procedures in vocational guidance, emphasizes the need for an analysis of the qualifications needed for particular occupations, and especially the psychological qualifications, rather than those of a more nominal and superficial character. Among the qualities to be assessed are the physical characteristics of the individual, his educational attainments, and a number of psychological capacities among which general intelligence is the easiest to measure. The task of measuring specific abilities, according to Burt, becomes especially important in the case of the large group of

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* Hopwood, J.O. The Grades of Labor. Pers. J. 8 (1929-30) 114-124.

** Scott, W.D., Clothier, R.C. and Mathewson, S.B. Personnel Management. McGraw-Hill, N.Y., 1931, pp. 256-257.

*** Burt, C. The Principles of Vocational Guidance (II). Br. J. Psy. 14 (1923-24) 336-352.

Some average scores of typical groups are presented in Table 13. For the sake of convenience certain business firms have reduced

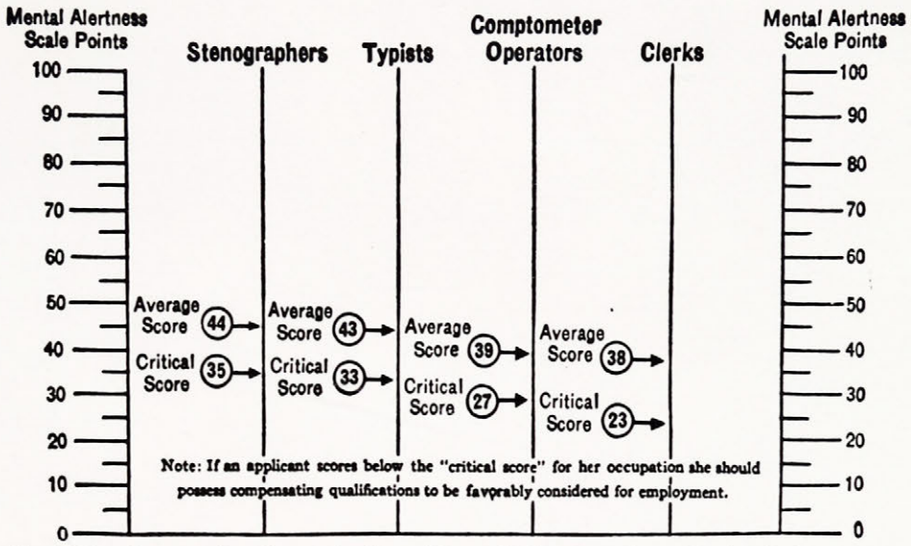

FIG. 50.—Occupational standards on Mental Alertness Test (Series I) for women applicants and women employees in a large tire manufacturing company.

the findings secured from their own employees to simple charts, as shown in Figures 50, 51, and 52.

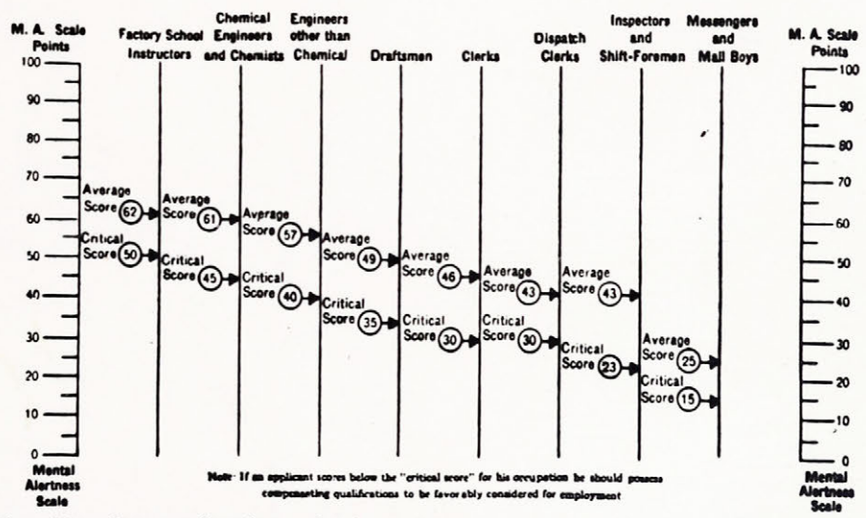

FIG. 51.—Occupational standards on Mental Alertness Test (Series I) for male applicants and male employees in a large tire manufacturing company.

The so-called average score is the actual average for the company, and the critical score is the score below which almost no one succeeds in that particular occupation.

Figure 2.

individuals of mediocre intelligence, because there is at this level much more need of differentiation.

In a later publication, * Burt and Spielman set forth a tabular representation of vocations according to the degree of intelligence required, together with a statement of the incidence in percentage terms of these classes among the general population (Table 1). The term 'mental ratio' is here used as the index of intelligence, and appears in its conception to be comparable to the intelligence quotient (mental age divided by chronological age x 100). If compared with Terman's distribution table of I.Q.'s by percentage incidence among a school population it will be noted that (whether, in Burt's case, for children or adults) Burt's distribution is perceptibly more platykurtic, and possesses a greater percentage of cases at each extreme. Too, all Burt's occupational requirements appear to be inordinately high, if considered in termsmof the I.Q. The specifications for 'Higher professional and administrative work', namely a mental ratio of over 150 and averaging 165, seem rather excessive in view of the Terman classification of I.Q. 120-140 as indicating very superior intelligence, and over I.Q. 140 as 'near' genius or genius. Some light is cast on the matter however by the observation that since a mental ratio was not directly calculable for individuals above age 16, in such cases the measurement of intelligence was first obtained

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* Industrial Fatigue Research Board, Report No. 33. A Study in Vocational Guidance. 1926. Part II. Spielman, W. and Burt, C. The Estimation of Intelligence in Vocational Guidance.

Distribution of Intelligence Among Children and Adults (After Spielman and Burt).

Mental Ratio				
Over 150	Scholarships (University Honors)	0.2	0.1	Highest professional and administrative work: lawyer, teacher, broker, etc.
130-150	Scholarships (secondary)	2.0	3.0	Lower professional, technical and executive work: dentist, accountant.
115-130	Central or higher elementary	10.0	12.0	Clerical and highly skilled work: book-keeper, nurse, patternmaker.
100-115	Ordinary elementary	38.0	26.0	Skilled work: tailor, bus-driver, policeman, farmer.
85-100	Ordinary elementary	38.0	33.0	Semi-skilled repitition work: barber, bricklayer, cook, waiter.
70-85	Dull and backward classes	10.0	19.0	Unskilled repitition work: farm hand, porter, packer, laborer.
50-70	Special schools for the mentally defective.	1.5	7.0	Casual labor: simplest routine work, and occasional employment on purely mechanical tasks under supervision.
Under 50	Occupation centers for the ineducable	0.2	0.2	Institutional: unemployable (imbeciles and idiots).

Table 1.

in terms of standard deviation units or percentiles, and then translated into mental ratio. Such a procedure would of course be likely to result in the situation described.

Considerable attention has been paid, especially by German students of vocational psychology, to the division of occupations according to psychological types of interest. Lipmann* cites a number of classifications proposed on this basis. An experimental study by Fryer**, however, with a division of vocations into 'humanic' and 'mechanic', with sub-types of 'concrete' and 'abstract', leads to the conclusions that "Individuals are unable to make any generalized interest distinction of value for vocational prognosis", and that "As psychological types of work, these classifications appear to be of little significance."

Resort has been had upon occasion to the estimation by research workers of the degree of ability required for or present in specific jobs, in order to form a quantitative rating scale. The Barr scale used by Terman and his associates in the study of gifted children, based upon the estimates of 30 judges, and expressed in P. E. values, is of this type.*** A similar scale was drawn up in the study of mechanical ability and its possession by members of various occupations by Paterson, Elliot and their co-workers.****

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* Lippman, O. Psychologie der Berufe, in Hdbh. d. vgl. Psy. (Ed. G. Kafka). Munich, 1922. Vol. II, p. 478 ff.

** Fryer, D.A. Types pf Work. J. App. Psy. 9 (1925) 304-310.

*** Terman, L.M. et al. Genetic Studies of Genius. Stanford University Press. Vol. I, 1925. Pp. 66-72.

**** Paterson, D.G., et al. Minnesota Mechanical Ability Tests. University of Minn. Press, 1930. Pp. 136-140.

Something of an indication of the agreement between ranking of this type and test scores is furnished in a recent study by Pond* dealing with the distribution of intelligence test scores, age and schooling in a factory population of 9,075 men, divided into 44 occupational groups. These occupations, ranked by eight persons according to the degree of intelligence required to do the work involved, correlated in their order with general intelligence test scores to the extent of +.768 (reliability of judges' estimates = .984). The correlation of rank with mean schooling was +.741, and with age, +.002. As in the case of the Army Intelligence test classification of occupations, there was much overlapping.

The industrial depression which commenced in 1929 has served as the impetus for a number of studies of the relationship of industrial psychology to the solution of certain problems of unemployment, and among these have been researches into the nature of occupational characteristics and differences, approached from the psychological viewpoint. In March, 1931, at the conference held under the joint auspices of the Personnel Research Federation and the Social Science Research Council, and in a discussion of the need for research during industrial depression, there was brought up, among other points, the question of the comparative character of the contemporary group of unemployed, and the urgency of their study from a genetic aspect.** In the

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* Pond, M. Occupations, Intelligence and Schooling: Their Relationship and Distribution in a Factory Population. Pers. J. 11 (1932-33) 373-382.

** Unpublished report of the conference of March 21-22, 1931.

autumn of the same yaar, a committee of the Social Science Research Council undertook to investigate the trend of job specifications and job classification and the feasibility of the institution of more broadly applicable standards in this field.* The nature of the thought displayed in this connection illustrated the applicability of the methods of industrial psychology to such a project, since "What is required is a systematic enquiry into the component elements of individual jobs and into human qualifications and physical conditions necessary for performance."**

In 1931 also there was originated at the University of Minnesota an Employment Stabilization Research Institute aimed at an investigation of the causes, conditions and effects of unemployment within three northwestern cities, Minneapolis, St. Paul and Duluth.*** Included in its program was a project of individual diagnosis and retraining of unemployed workers. This plan of individual investigation and rehabilitation comprised two specific aims: to determine the predominant and contributing causes of the individual's unemployment and to classify each person with respect to his actual and potential usefulness. To this end a clinic was instituted, which offered a thorough psychologicalaand medical examination. The series of tests included: educational status, educational ability, clerical

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* Social Science Research Council. Job Specifications as a Basis for the Operation of Employment Exchanges. N.Y.,1931.

** Ibid., Appendix I-1.

*** Stevenson, R.A. The Minnesota Unemployment Research Project. University of Minn. Press, 1931. Vol. 1, No. 1.

aptitude, vocational interests, mechanical dexterity, mechanical aptitude, physical strength, personality traits, trade skill proficiency and sensory acuity. The data obtained were recorded in a manner illustrated in Fig. 3. Comparable data for control groups of employed persons were also obtained, inasmuch as a comparison with unemployed was necessary for the purpose of information as to the type of industrial material being handled and as a clue to the character of employment (or displacement) policies of industrial firms. Some indication of the respective character of these two groups is provided by the distributions of scores made by employed and unemployed workers on a clerical test (Fig. 4).* This would suggest, as is remarked by the writer, that within the length of time covered by the investigation at that moment, the presence or absence of a degree of clerical aptitude was an important factor in the determination of whether a clerical worker should be retained or not.

The psychographic method of delineation of the individual's psychological traits with respect to the norm for the group has suggested the interpretation or consideration of these as being patterned, and the investigation of these 'patterns' has furnished considerable scope for enquiry. Trabue, in a recent study of these,** concludes that they provide a means of occupational classification on the basis of psychological traits considerably

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* Paterson, D.G. The Minnesota Unemployment Research Project. Pers. J. 10 (1931-32) p. 326.

** Trabue, M.R. Occupational Ability Patterns. Pers. J. 11 (1932-33) 344-351.

Case No. M. .... S. *99* D. ....

SUMMARY RECORD of INDIVIDUAL DIAGNOSIS *

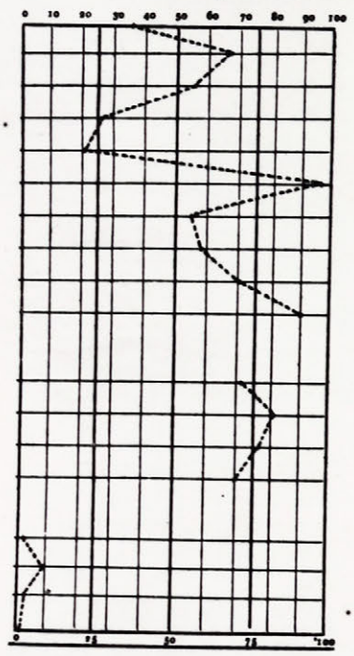
Age *20* Sex *m*

Number of Children *0* Other dependents *0*

Examiner's Initials	Measure Employed		Score	Percentile Rating
F.F.	Schooling: Age *17* Grade *9*		...	*36*
F.G.	Classification Test	*X .7*	*52*	*67*
F.G.	Verification Test	*IX .9*	*47*	*56*
F.G.	Clerical Aptitude: Numbers		*82*	*27*
F.G.	Clerical Aptitude: Names		*78*	*21*
F.G.	Dexterity: Finger Test		*3.53*	*97*
F.G.	Dexterity: Tweezer Test		*5.77*	*55*
F.G.	Dexterity: Manual Test		*242*	*58*
F.G.	Mechanical Assembly *A B C*		*277*	*71*
F.G.	Spatial Relations *A B C D*		*934*	*90*
F.G.	PERSONALITY INVENTORY			
	Neurotic	Stable	*—111*	*72*
	Dependent	Self-sufficient	*71*	*81*
	Introvert	Extravert	*— 71*	*77*
	Submissive	Dominant	*86*	*70*
F.G.	STRENGTH TESTS			
	Right Hand		*65*	*2*
	Left Hand		*75*	*9*
	Back		*200*	*3*
	Legs		*250*	*1*

GENERAL PROFILE

Per Cent of Total Population Lower



F.G. Vocational Interests: Claimed *Forest ranger, cabinet maker, radio operator, electrical engineer.*

Tested Highest in *Physician (B), Engineer (B–), Lawyer (B–), Farmer (B–), Editor (B–).*

Trade Claimed *None.* **Test Rating**.....

F.F. Occupational History *Sorting lumber and checking stock, June–Oct., 1928; looked for a job, Nov. 1928–May, 1929; measuring and wrapping sandpaper for shipment, June–Dec., 1930.*

GENERAL ASSETS

Unusually high speed and dexterity of fingers.

Excellent mechanical aptitudes, combined with definite mechanical interests.

Stable, self-sufficient personality.

Fairly good intelligence.

Likes woodwork.

GENERAL LIABILITIES

"Hunchback," deformed chest but not noticeable in street clothes.

Little clerical aptitude.

Slightly deaf in both ears.

Dental caries and pyorrhea.

Untidy appearance of clothing and hair.

Not strong physically.

* Examiner's entries are printed in italics.

Figure 3.

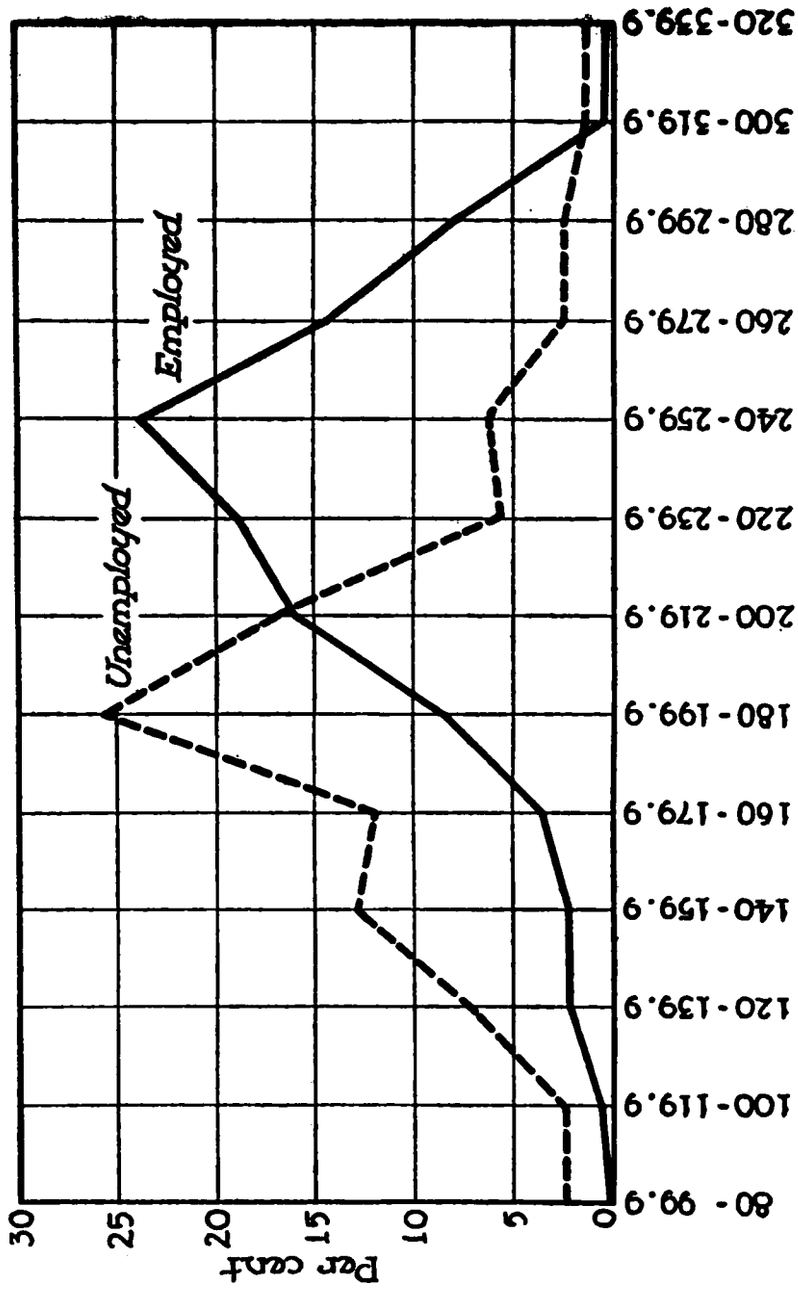


FIG. 2. SHOWING DISTRIBUTION OF SCORES MADE BY EMPLOYED AND BY UNEMPLOYED CLERICAL WORKERS ON THE MINNESOTA VOCATIONAL TEST FOR CLERICAL WORKERS

Figure 4.

superior to previous methods. He finds that, as shown in Fig. 5, they display reasonable stability for workers from different vicinities, and that they are differentiated for individuals graded for efficiency in the occupation under consideration (Fig.6). The statistical treatment of the data for these exhibits is not shown, so one is ignorant of the statistical validity of the differentiation in the latter instance, and of the extent to which mean scores are typical of the individual in the former. As the matter of overlapping of requirements for different occupations is of considerable importance, this latter omission strikes one as being particularly unfortunate.

Within the scope of the Minnesota investigation there has been an enquiry into the characteristics of a somewhat atypical group of unemployed casual workers, secured in 1931 through the institution of a relief hostel, which sheltered a meximum of some 300 men.* It was found that this group, with a median age of 49 years, was of such a character that even under the most favorable circumstances about a third would not be fully self-supporting at any type of work. In clerical ability and in mechanical aptitude they were as a group considerably below the average of the total working population. Those over age forty (200 of the total of 287) were significantly inferior to those below that age. Physical strength appeared to be the most

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* Hansen, A.H., Trabue, M.R. and Diehl, H.S. The Duluth Casual Labor Group. Employment Stabilization Research Institute Series, Vol. I, No. 3. Univ. of Minn. Press, 1932.

Figure 5.

Department Store Saleswomen in Different Cities

Employed Control Cases

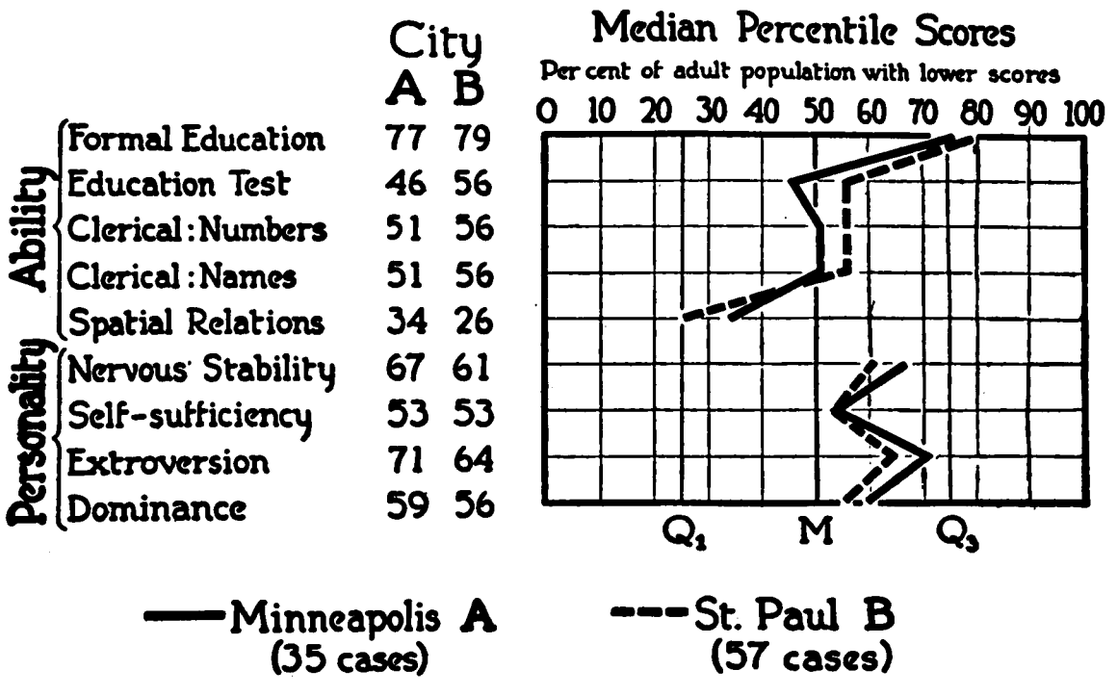

FIG. 2. SIMILAR AVERAGE SCORES OF SUCCESSFUL SALESGIRLS IN DIFFERENT DEPARTMENT STORES

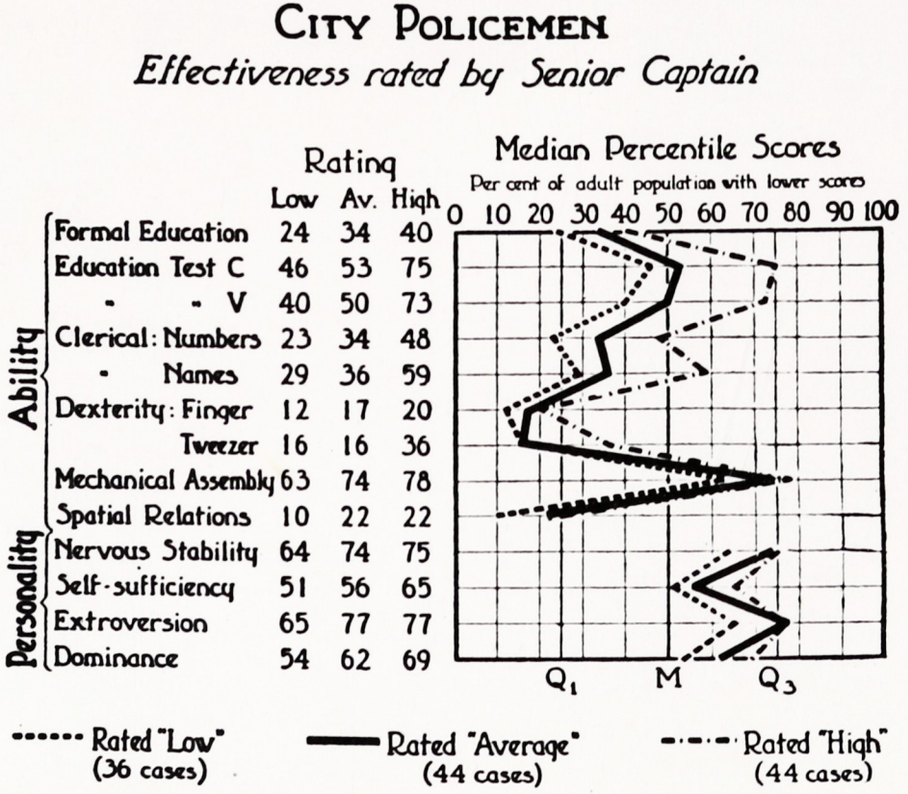

FIG. 5. COMPARISON OF GOOD, AVERAGE, AND POOR POLICEMEN

Intelligence and clerical ability seem to attract higher ratings from this supervisory officer.

Figure 6.

distinctive trait-difference when the group was dichotomized with respect to recency of employment, those individuals who were at that time unemployed for less than four months being to a great degree superior to those unemployed for a year or longer (Fig. 7).

A recent discussion by Parker* of the aims and methods of the Public Employment Center of Rochester, N.Y., outlines many of the problems which face the student of occupational abilities and their relationships. He emphasizes the barren character of a stress upon minute details of job specification to the neglect of broader and more easily comparable psychological qualities, and suggests as being more fruitful a classification of jobs, whether superficially similar or dissimilar, into broad groups according to common elements of operations and related skills. He states further: "If we succeed in making such groupings of jobs, it should greatly aid us in the process of transferring workers from job to job and in stabilizing the flow of workers from one seasonal occupation to another."** The problem of training and retraining and of their relationship to specific abilities also meets with attention.

A general survey of this bulk of literature is indicative of two main conclusions:

(1) That job classification according to psychological

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* Op. cit., pp. 309-314.
** Ibid. p. 311.

Trait Measured	Percentile Ratings for Men Unemployed 1 yr. +	– 4 mo.
Schooling: Age and Grade reached	23	35
Verification Test of Education	10	12
Number Checking Speed	8	10
Finger Dexterity	10	16
Tweezer Dexterity	5	5
Mechanical Assembly	11	21
Spatial Relations	0	5
Strength: Right Hand	32	64
Strength: Left Hand	27	69
Nervous Stability	50	48
Self-sufficiency	38	35
Extroversion	51	47
Dominance	27	34

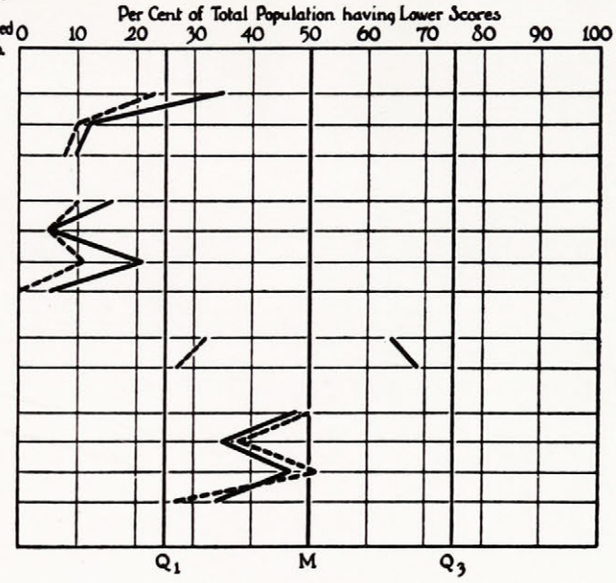

FIG. 9. — Relation of recency of employment to abilities. The only measured characteristic in which the more recently employed men surpass to any great degree the less recently employed is strength of grip.

Trait Measured	Percentile Ratings by Age Groups 19	40	60	All
Schooling: Age and Grade reached	35	17	23	23
Verification Test of Education	30	8	10	10
Number Checking Speed	22	4	0	7
Finger Dexterity	47	12	2	8
Tweezer Dexterity	25	5	3	5
Mechanical Assembly	58	5	3	9
Spatial Relations	15	2	0	3
Strength: Right Hand	35	3	2	7
Strength: Left Hand	53	14	4	13
Nervous Stability	52	43	37	47
Self-sufficiency	40	28	30	33
Extroversion	49	51	38	47
Dominance	44	30	29	34

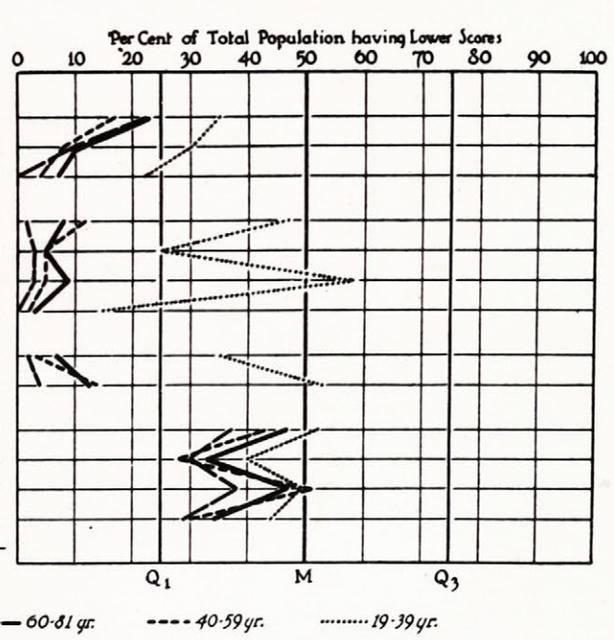

FIG. 10. — Relation of age to test scores. The continuous line indicates the median percentile rating for the entire group of unemployed casual laborers. Only in the strength of his left hand and in the amount of education reported does the average homeless man surpass the lowest tenth of the general population in abilities.

Figure 7.

traits, receiving its birth principally through Army personnel work and the demands of vocational guidance, has been concerned until lately chiefly with the ranking of jobs according to intelligence levels, but that

(2) Recently has come the realization that such grading, to be worthy of individual diagnosis, must take cognizance also of many other factors of the individual, including his education, age, experiential background, specific skills and personality traits, and that having such information at his disposal, there are available for the psychologist materials with which to make a much broader and more useful tentative classification of jobs than have hitherto been existent. It is through the availability of such data that a knowledge of the relationships of psychological traits inherent in the modern occupational structure will be built up.

Chapter Three: Tests, Questionnaires and Other Instruments for the Acquisition of Personal Data.

At the initiation of this investigation, the first problem to be coped with was the derivation of a means of securing personal information concerning the individuals under survey. To meet this, a four page questionnaire, and later, for a predominantly unskilled group of unemployed, a modified two-page version of it, were devised. The former covered several main sections of enquiry:*

1. The individual's name, age and address, and information concerning his parents: their nationality, and the occupational experience of his father.
2. Information as to the individual himself under several headings:
   - A. Place of birth, marital status, religion, length of domicile in Canada and in Montreal, etc.
   - B. His regular occupation, regularity of employment during the past three years, possession of part-time work during the previous twelve months.
   - C. Education and training, including apprenticeship, with reasons for leaving school (possible reasons were cited and were to be checked by the individual).
   - D. Occupational history (1) from time of leaving school until aged twenty, and (2) since age twenty.

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* See Appendix 'A' for sample.

E. Reason for present unemployment. Possible reasons were presented, to be checked by the person interviewed, and the individual was required further to indicate whether the loss of his last job was due to discharge, lay-off, or voluntary resignation, and whether he had had any serious illnesses or bodily incapacities, such as to interfere with his employment, and if so, what their nature and duration were.

F. Statements concerning family relationships, such as employment of wife, education and employment of children, etc.

The modified form of this questionnaire used with the labor group above-mentioned covered the majority of this information, although in less detail.

The tests employed, either with the total group or in part, covered a fairly wide range, and were as follows:

(1) Revised Beta Examination - This was a revision of U.S. Army Beta Examination, modified as to content and mode of administration. Of the original seven Army Beta sub-tests, it contained five, these being similar to the originals as to form, but largely changed however, except for the maze test, as to content, and one additional sub-test, as follows:

(a) Maze test (original Beta).

(b) Digit-symbol association test (original Beta, but so reversed that the examinee completed the test by writing numbers rather than symbols).

(c) Common-sense picture test (new) - which consisted in indicating which of four pictures of objects or scenes was wrong or incorrect.

(d) Form-board test (as in original Beta, but with altered content).

(e) Picture-completion test (form as in original Beta, but with modified content).

(f) Dissimilarity-checking test (as in original Beta, but extended at the lower end to include forms and objects as well as digits).

The manner of presentation was new in that instead of using a blackboard demonstration, each test was preceded with a similar exercise (not, however, identical in content) which was completed, with aid if necessary, by all examinees. No assistance, however, was given in the test proper.

The total possible score was 123, and the letter-grades (after Army Alpha and Beta) were as follows:

A	100-123
B	87-99
C+	75-86
C	65-74
C-	55-64
D	45-54
E	0-44

The time necessary for administration ranged from 25 to 40 minutes, depending upon the character and size of the group tested, and the number of assistants. Intercorrelation of

alternate tests, compensated for decreased length by the modified Spearman-Brown formula,* gave a reliability coefficient of .90.

(2) Army Alpha Examination - This was the Psychological Corporation revision of Army Alpha executed by Dr. H. O. Bregman, following in the main Form 8 of Army Alpha proper, and having a reliability coefficient in the neighborhood of .97. Time of administration, forty minutes.

(3) Otis S-A Test of Mental Ability - Higher Examination, Form A.** Reliability coefficient, .92. Administration time, 35 minutes.

(4) New Stanford Achievement Test, Advanced Examination, Form V. The tests included therein were used as a measure of school achievement. Certain of the tests, namely, Test 5 (Literature), Test 6 (History and Civics) and Test 8 (Physiology) appeared either inappropriate on account of their content or unworthy of use in view of the additional time required to administer them. Tests 1,2,3,4,7,9 and 10, having a total administration time of about two hours and a quarter, were used in their entirety whenever possible, and had as a group a reliability coefficient of about .95. Individual test reliability coefficients range from .84 to .96.***

(5) Thurstone Clerical Examination - Form A. This test is scored both in terms of speed and accuracy, and the total score is the

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* Kelley, T.L., Statistical Method. p. 206 (Formula 158).

** See Otis, A.S. Manual of Directions for Otis S-A Tests of Mental Ability. World Book Company, N.Y., 1928.

*** Kelley, T.L., Ruch, G.M., and Terman, L.M. Guide for Interpreting (Second Revision). World Book Co., N.Y., 1929. p.9.

sum of the number of errors made (weighted) and the number of minutes required to complete the test. One alteration in the procedure of scoring seemed advisable: Test 5, consisting in the classification by cities of a list of mixed names, included in its instructions the injunction to place these names in alphabetical order within each city group. Placement in alphabetical order was disregarded in a great many cases, and this would have resulted in what appeared to be undue penalization, quite uncorrelated with the total score for the remainder of the examination. Accordingly, therefore, the necessity for placement in alphabetical order was disregarded. Thurstone* cites the test as having a validity coefficient of .61, with office ratings as a criterion. When age and schooling are added, by the device of multiple correlation, the coefficient is raised to .67. Stedman,** using it to predict grades of students of book-keeping, found that it correlated to the extent of .74 with grades, and correlated with the Carlson Book-keeping Test to the extent of .73. The correlation between the Terman Group Test and grades was.58.

(6) The Scott Company Filing Test - This was developed by the Scott Company as a test for filing clerks. According to Paterson,*** the extent of correlation between rated trade status and score,

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* Thurstone, L.L. A Standardized Test for Office Clerks. J. of App. Psy. 3 (1919) p. 248.

** Stedman, M.B. Factors Influencing School Success in Book-keeping. J. of App. Psy. 14 (1930) 74-82.

*** Paterson, D.G. The Scott Company's Filing Clerk's Test. J. Pers. Res. 1 (1922-23) 547-561.

for a group of 43 filing clerks, is .82, while the coefficient for mental alertness and trade status is .63.

(7) The Minnesota Paper Form Board, Forms A and B. - This is a development of the form board test of Army Beta Examination, considerably lengthened and increased in scope.* It was determined by the Minnesota investigators to have a validity coefficient of .52 (uncorrected for attenuation) when the quality of shopwork was used as a criterion, and to have a reliability coefficient of .90.** Similarly, Hall*** found it moderately diagnostic in the determination of promising pressman apprentices, and to have in this case a validity coefficient of .58 when correlated with ratings.

(8) The O'Connor 'Wiggly Blocks' - This constitutes a performance test of 'engineering aptitude', the material used being nine pieces of wood which are required, after being laid before the subject in a prescribed fashion, to be placed together so as to form a 10" x 5" x 5" block.**** Three trials are given, a time score being used. The second and third trials, according to O'Connor's instructions, are weighted for practice effect, and the final score is the mean of the three weighted trial scores. O'Connor states that these have been used successfully in the selection of engineering apprentices at

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* Paterson, D.G. et al. Minnesota Mechanical Ability Tests. p. 57 ff.

** Op. cit., pp. 299.

*** Hall, O.M. An Aid to the Selection of Pressman Apprentices. Pers. J. 9 (1930-31) 77-81.

**** Keene, F.L., and O'Connor, J. A Measure of Mechanical Aptitude. Pers. J. 6 (1927-28) 15-24.

the Schenectady plant of the General Electric Company, and gives some indication of definitive grade norms.* Scott, Clothier and Mathewson, in their discussion of test uses and results, provide further data regarding the validity of this test.** Its reliability is doubtful. O'Connor states the interrelation between trials 1 and 2 to be .36, and between trials 2 and 3, .38.

(9) Stenquist Mechanical Aptitude Test I - This is a picture test requiring the pairing of 190 mechanical objects, presented in sets of five pairs, so as to indicate those that normally go together. It was employed by Stenquist for purposes of vocational guidance, on the assumption that in the case of boys knowledge of the relationship of mechanical objects was indicative of mechanical aptitude. He cites it as having a median validity coefficient of .67, and ranging as high as .84,*** while the final findings of the Minnesota investigators**** indicated it to have a validity coefficient for their quality criterion of .24, and to have a reliability coefficient of .89. Simpson,***** in a study of the mechanical aptitudes of a

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* O'Connor, J. Born That Way. Williams and Wilkins, Baltimore, 1928.

** Scott, W.D., Clothier, R.C., and Mathewson, S.B. Personnel Management. Pp. 227-229, 275-276.

*** Stenquist, J.L. The Stenquist Mechanical Aptitude Tests. World Book Company, N.Y., 1922. P. 11.

**** Op. cit., p. 299.

***** Simpson, R.M. The Mechanical Aptitudes of 312 Prisoners. J. of App. Psy. 16 (1932) 485-495.

group of convicts, found that it displayed a reasonably significant relationship to the individual's occupational experience: 53% of the persons scoring in the highest quartile had held as their longest job (for an average of 54.1 months) one essentially involving mechanical operations, while only 14% of the lowest quartile (with an average period of 51.3 months) had had similar mechanical experience. It appeared to be related positively to the Army Alpha Examination, the correlation coefficient being +.46 ± .03, although the Minnesota investigators had found it to correlate only to the extent of +.04 with Otis scores, and +.11 with Otis mental age.*

(10) The Allport-Vernon Study of Values - This consisted in a scale designed to measure the strength of certain basic interests in the individual: theoretical, economic, aesthetic, social, political and religious, as developed in the theory of Spranger.** It has a split-half reliability coefficient of .72.***

(11) The Bernreuter Personality Inventory - This forms, on the basis of responses to 125 questions concerning personal attitudes, interests and behavior, a series of four scales designed to measure (a) neurotic tendency, (b) self-sufficiency, (c) introversion-extroversion, and (d) dominance-submission.

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* Op. cit. Appendix IV.

** Spranger, E. Types of Men. Translated from the German by P.J.W. Pigors. Halle, 1928.

*** Vernon, P.E. and Allport, G.W. A Test for Personal Values. J. Abn. & Soc. Psy. 26 (1931) 231-248.

It was validated on the basis of four previous single scales, with which it has validity coefficients ranging from .67 to .91 (uncorrected for attenuation).* Its reliability coefficients range, for the four scales, from .85 to .88 (split-half method, corrected by the Spearman-Brown formula).

(12) A modified version of the Allport A-S Reaction Study, designed to measure dominance-submission. This was intended to be used with those groups for whome the Bernreuter Personality Inventory would be too long and complex, and differed from it in that it was attempted to make the situations involved and presented for decision more concrete and less generalized. The process of selection of significant items for the test and of the validation of the whole proved so slow, however, that the data could not be incorporated in this present study.

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* Bernreuter, R.G. The Validity of the Personality Inventory. Pers. J. 11 (1933) 303-308.

Chapter Four: The Nature of the Groups Tested and the Procedure of Testing.

A. Unemployed Groups

Three main groups of unemployed men were in all tested over a period of two successive years. They were derived from three corfesponding cources, and as the method by which they were secured varied with the circumstances of the situation at the time, these groups must needs be subdivided and treated separately in the consideration of the total procedure involved.

For this purpose they may be regarded as essentially five in number:

1. Individuals secured from a registration bureau for office workers operated by the local Y.M.C.A. With the full cooperation of the management of this bureau, there was sent to each individual registered from October 1931 to March 1932 a letter of invitation from the Department of Psychology requesting him to be present at the University on a date several days later for the purpose of administering to him a number of psychological tests. The personal usefulness to him of the information concerning himself and so derived was stressed, and to all individuals completing the series of tests a personal conference in which to talk over and explain the test results was promised. Approximately 20% of the 1500 persons registered at the bureau responded to this invitation. They were not altogether office workers, inasmuch as the bureau had accepted as

a registrant any individual who wished to place his name upon its files, although those persons not engaged in an occupation of a generally clerical nature were segregated from the others as to record. The testing was almost altogether of a group character, and took up from five to eight hours for each test-group (of which there were nine), split up into three or four periods in the afternoons, a day or two apart.

The general questionnaire described in the previous chapter and a general intelligence test were always given in the first period, since the drop in attendance from the first to the second period was usually from 15 to 30%, and it was desired to have these initial data for all comers. On the following days the other tests were given, and after cessation of group testing and the scoring of the tests, there was sent to each individual completing the series a request to appear on any day between certain hours in order to discuss his test scores and their implications. Most of the persons who reappeared singly in this manner were administered the O'Connor 'Wiggly Block' Test, and certain of the information given in the general questionnaire was checked. Altogether, some 150 of the 300 men partaking to any extent as subjects in the testing program were thus interviewed.

2. Individuals registered at the same employment bureau from March 1932 to May 1933. To these, approximately 300 in number, were given, under a parallel project in the Department of Psychology dealing with educational testing, a series of

educational tests, and in addition, the Otis Examination and the Bernreuter Personality Inventory, as well as the same general questionnaire. To the last two groups covered under this project there were administered also the Revised Beta Examination, the Thurstone Clerical Examination and the Stenquist Mechanical Aptitude Test I.

This total group differed from the preceding group derived from the same source in that it was secured at a time a year later than the former one, in that the tests were administered in a large room adjacent to the registration bureau office instead of at the University, and in that the individuals included had registered for employment during a different period of the depression. Moreover, in the second group a large number of persons derived personal monetary 'relief' through the bureau, whereas this had been the case in only a few instances with members of the first group.

3. A group secured from those attending educational classes at an institution provided for the daytime shelter of unemployed men. This institution, a purely temporary and annual affair, commenced its activities in the fall of 1931 in a disused school building owned by a local industrial firm and capable of sheltering several thousand persons at a time. It was provided with rough wooden tables and benches, and included a library for playing cards and other games. The maximum attendance of any one day was probably in the region of 5,000. No analysis of the

nationality of the individuals making use of the building was made, but since almost all were registered at a parallel and contemporary refuge which provided food and shelter at night, certain data for 1931-32 for the latter institution are probably typical of the former. At the latter, of a total of 19,117 men, approximately 36% were French-Canadian, 18% English-Canadian 16% British other than Canadian, and 30% foreign and for the most part non-English-speaking.

The group secured for testing was judged to be in all probability atypical, since the majority were English-speaking, and moreover were for the most part attending educational classes, with which only 750 of the entire population were at all concerned. It was felt, however, that they furnished material for a beginning, and to them was administered the Beta Examination, while in a number of cases the Stenquist Test I and Army Alpha were also given. Some 300 men in all were covered.

4. A further group from the same institution as in (3), in 1932-33. Having secured during the previous winter a certain amount of experience in dealing with the individuals sheltered at this institution, a beginning was made in October, 1932, on a more thorough basis. During a two-week period following the opening of the shelter, all individuals entering the building were required to be registered in a room a portion of which was set apart for this purpose, and in the hands of an interviewer, who (since there were several) could speak the language of the

registrant, a modified form of the previous year's questionnaire was filled out. To each registrant was given a registration card, which he was strictly enjoined to keep in his pocket, on pain of non-admission to the shelter, and which was numbered to correspond to the completed questionnaire. Following the first fortnight during which the shelter was open, new entrants decreased sharply in number, but for a period of several weeks all newcomers were required to register in this manner, and all unregistered persons who were later subject to testing. Thus nearly 4,000 persons were registered by May, 1933, when the institution was closed for the summer.

For testing purposes there was set apart a room which could be used from 9:00 to 10:00 a.m. on any day, and from 9:00 a.m. to noon on Saturdays. It was removed from the other main rooms was for the most part reasonably warm and well-ventilated, and contained two or three rough tables, with benches and chairs to correspond. At one corner was placed a small table, screened from the rest of the room, and used for individual tests. Through the generosity of two local manufacturers of tobacco products there was secured an ample weekly supply of packages of cigarette tobacco, one of which was offered to each man who completed a single test. Since practically all individuals were destitute, and since, if the recipient of it did not smoke, the tobacco had a certain commercial value in kind, this offer had a fairly wide appeal. Thus, during the course of the winter, approximately one thousand persons were given one or

more tests, each of which was recorded or marked with the registration number to correspond, in order that eventually recourse might be had to the general questionnaire previously completed.

No one individual was, as a rule, allowed to complete more than one test at a single sitting. On each occasion his card was punched in such a manner that the number and kind of tests he had taken might be known. In spite of this precaution, however, a numbersof men 'repeated' for a test, although these 'repeats' were eventually culled out. As a rule, some fifteen to thirty men could be accommodated at once for group tests, while for the O'Connor Blocks from one to three persons could be handled at a time, depending upon the number of examiners.

5. Registrants at a second employment bureau, during March-May 1933. This bureau was limited to protestants, and had a total registration at the time of nearly seven thousand, 3591 of whom had been registered within the previous twelve months. In securing subjects for testing from this source, two methods were used:

(a) Notices were posted inviting individuals interested to act as subjects for tests, with a promise of personal discussion of the results afterwards.

(b) As it was found that the supply secured in this way was limited, and as there was considerable danger of obtaining thus an atypical group only, names were selected at random from the files, and to these persons were sent letters of

invitation. Approximately 10% of the individuals circularized in this manner responded.

By these joint methods a total group of 140 was secured, a number of whom dropped out after the initial session. In all, about 60% completed the entire series of tests. The members of this self-selected remaining group were interviewed individually, and were administered at the time the O'Connor 'Wiggly Block' Test.

B. Employed Groups

It was deemed advisable, in planning this entire project, to secure, for their own direct surveillance, as well as for comparison purposes, as typical as possible a group of employed workers, representing the widest possible range of occupations. Securing such groups proved extremely difficult in its accomplishment, however, and the process of gathering data infinitely slow. This was occasioned by the fact that industrial firms would not as a rule allow their employees to be tested in company hours, and because usually the matter of cooperation was left entirely to the willingness and interest of the employee. In some cases also no approach in any form whatsoever was possible.

Clerical workers from three firms in all were tested, and a scattering of occupations of a non-clerical type were represented by a few persons from these three and a fourth. The three principal firms included two railways and an insurance company, all of which had their head offices in Montreal. In the case of

employees from the two railways, most of the testing was done on the company's premises, in a special and adequate room set apart for this purpose, at noon-hours and between five and six o'clock. The rest of the testing was carried on in the evening at the University in a quiet class-room. The insurance company was good enough to allow the first two hours of testing to be done in company time in a large class-room in their building, while the remaining tests were administered in the evening at the University, as in the other cases. A total of approximately 140 clerical workers and some 30 other individuals were tested between January and March, 1933.

It was not possible in the time remaining for field work to secure further groups of employed workers for examination, and this portion of the general project was therefore left to be completed in the ensuing year.

C. Recording of Data

Following testing in each case the completed test blanks were scored, and whenever possible (as in the case where unemployed men were secured through an employment bureau) the data included were checked and corrected. The final data for each person were then recorded upon a filing card indicating source, name, age, main and subsidiary occupations, length of time unemployed (adjusted for each group to a fixed base), country of birth, occupation of father, education, etc., as well as all test scores.

D. Validity of the Samples Secured

One of the chief advantages attendant upon the entire procedure of securing sample groups for testing was the fact that in almost all cases the individuals presenting themselves did so quite voluntarily. The invitation to them was always worded in such a way as to be attractive as possible, but no direct coercion or marshalling of individuals was possible. It was to be expected that a number of motives would influence the individual in his decision to attend or not to attend the tests: on the one hand, curiosity, acute self-interest, desire to curry favor, the thought of better chances to get a job, and on the other, self-consciousness, timorousness, circumspection, or an antagonistic attitude toward such procedures. All these factors, therefore, may have tinged the data, and may have rendered them less valid and clearly objective.

The question of the accuracy of the samples of unemployed that were obtained proved one that was directly insoluble. Not only was it necessary to know whether or not a tested group was typical of the main body of which it was a sample, but there loomed still larger the problem of the relation of these major groups of unemployed to the entire body of jobless individuals in Montreal. There was of course possible, so far as tested mentality was concerned, no direct recourse to further-lying data, as the data on hand were themselves original. Checking the accuracy of sampling could then be done only for personal and occupational data directly, and for the remainder, by analogy. It could be assumed that if

the tested sample was typical of the source group as to age, education, nationality, etc., then it would probably tend to be typical as to intelligence test scores. Similarly such analogies might be employed in the relation of major source data to data for the entire body of unemployed, although at the time the latter data for Montreal were unavailable. The truth of this assumption cannot of course go unquestioned, but it remains as the best possible test of sampling under the circumstances. The ordinary statistical checks were of course employed, but the standard error of the mean was, for instance, of little value if the qualitative identity of a sample with the group from which it was drawn was a moot point.

Furthermore there arose the problem of the combination of data from each of the five groups of unemployed workers, and from the three main groups of employed men. Had all of the unemployed workers, on the one hand, and all the employed, on the other, been drawn each from the one source, this question would have been obviated. As it was, however, there were several sources, each one considerably different in character from the others. One possible solution of this difficulty was of course to weight each group according to the comparative size of the source from which it was drawn. There were, however, several objections to this: in the first place, the weighting would have to be extremely rough, as there was considerable difference in the relative activity of the files of the various employment bureaux. Secondly, there was

the ever-present danger that the sample was not typical of the source in any case, and that heavy weighting would accentuate its disparity. Thirdly, there was the fact that in any event the sources from which samples were drawn did not in themselves by any means present a complete picture of the unemployed. For these reasons it was thought inadvisable to attempt such manipulation, and accordingly the data from each source were for the most part considered by themselves.

Chapter Five: The General Character of the Unemployed Groups

The five groups of unemployed men represented in varying numbers different strata of the total group of Montreal unemployed, sampled at different times. The extent to which they differed in the distribution of grades of occupations may be noted in Fig. 8, where the percentage distribution of the five Taussig occupational grades for each group is graphed. Group I, although known not to be a fair sample of its source, was composed in the main of men whose grades were C, D and E. Group II, which was much more nearly a satisfactory sample of the main group, was made up of a majority of E grade men, with only 4.2% A and B. Group III was predominantly of grades C (36.4%) and D (42.1%). Groups IV and V were mostly of a clerical and commercial class, there being 81.5% grade B in the former, and 69.8% in the latter. The remainder of these two groups were of the A, C and D level, there being practically none of grade E.

The extent to which these groups were satisfactory samples of their source may be judged to some extent by the comparative data in Tables 2-4. In the case of Group II absolute and percentage distributions were available for age and country of birth for some 3,350 cases, more than 85% of the total number of cases secured through the general registration scheme. With these were compared the distributions of the same variables for the tested group (Table 2). It may be seen that the tested group tended to be younger than the sample group, as there were 13.0% of the cases aged 50 years and over in the former, as compared with 25.2% in

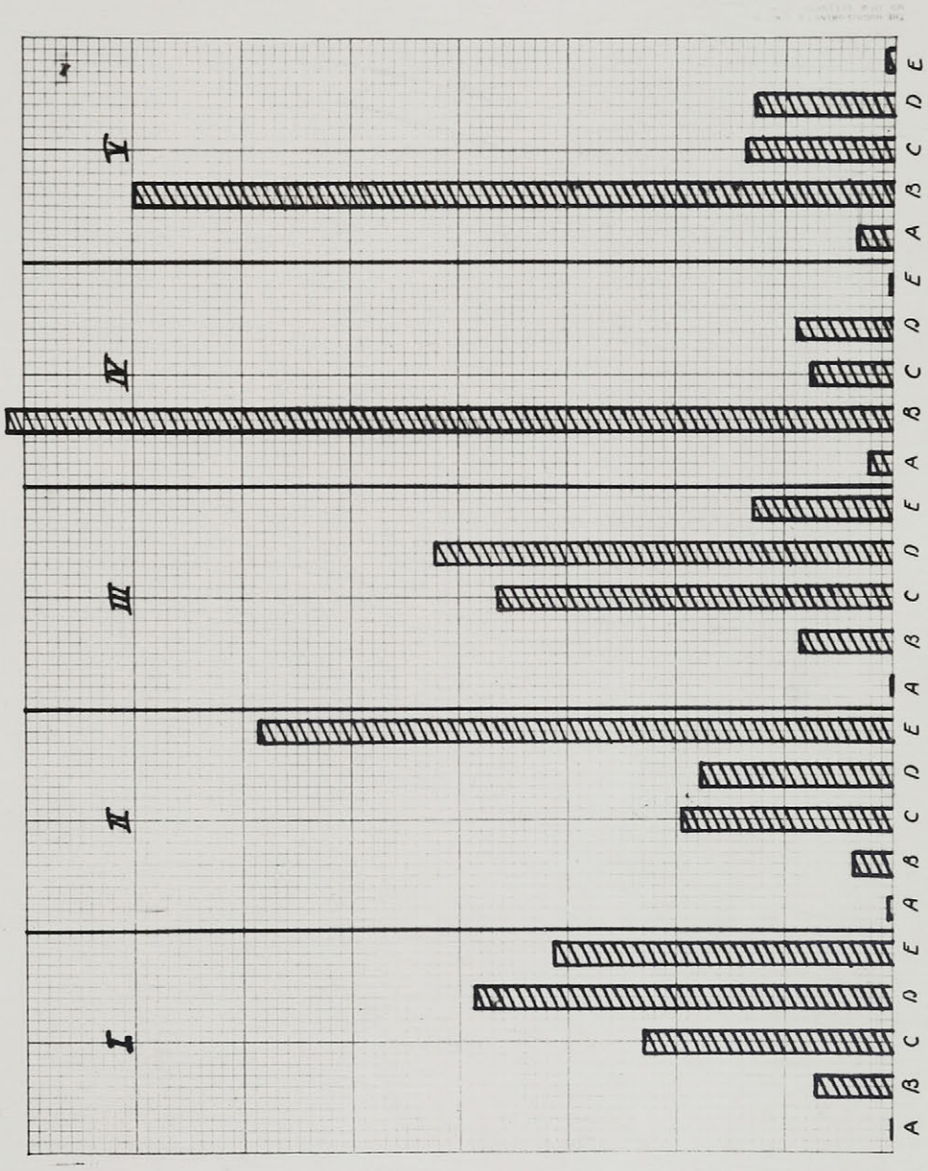

Figure 8.

Comparison of Sample Group and Tested Group for Age and Country of Birth, Group II.

Age

	Sample Group		Tested Group	
	N	%	N	%
15-17	7	0.2	6	1.1
18-20	74	2.3	37	6.5
21-22	94	2.9	31	5.5
23-24	97	3.0	30	5.3
25-29	387	11.9	82	14.4
30-34	511	15.7	98	17.2
35-39	486	14.9	80	14.1
40-44	423	13.0	77	13.6
45-49	357	10.9	53	9.3
50 up	821	25.2	74	13.0

Country of Birth

	Sample Group		Tested Group	
	N	%	N	%
Canada:				
English	320	9.6	103	18.0
French	1418	42.3	242	42.2
U.S.A.	47	1.4	9	1.6
Br. Isles	313	9.3	128	22.4
Other	1252	37.4	91	15.8

Table 2.

the latter, and 50.0% below age 35, as compared with 36.0%. As regards country of birth, the sample group contained in percentage terms only half as many English-speaking Canadians as the tested group, half as many individuals born in the British Isles, and more than twice as many individuals born in countries other than Canada, U.S.A. and the British Isles. The proportion of French-Canadians was the same. It was apparent that apart from French, there were certain language abnormalities in the sampling, as there were too many English-speaking men, and too few speaking languages other than English and French. The continental group, a large proportion of the total,had recieved relatively poor representation.

In the caseof Group III there was at hand a strictly chance sample of the main body of individuals from which the tested group was secured. This sample had been obtained through the recording of every sixth case filed, until 800 in all had been accumulated. The tested group was slightly younger on the average than the sample group. but the median of both groups fell in the 35-39 interval. As in the case of Group II, there were a greater number of English-speaking persons tested than the sample indicated there to be , in percentage terms, in the tatal population. There appeared to be a remarkable close adjustment as regards education, a parallel which was judged to be of some importance, as education was thought to be one of the best indicators of a non-test character as to the general level of the group.

Comparison of Sample Group and Tested Group for Age, Education and Country of Birth, Group III.

	Sample Group		Tested Group	
	N	%	N	%
Age				
18-20	17	2.1	6	4.2
21-22	21	2.6	2	1.4
23-24	32	4.0	13	9.1
25-29	135	16.9	22	15.4
30-34	135	16.9	25	17.4
35-39	125	15.6	21	14.7
40-44	113	14.1	22	15.4
45-49	100	12.5	12	8.4
50 up	122	15.3	20	14.0
Country of Birth				
Canada - English	151	18.9	45	31.7
French	108	13.5	10	7.1
U.S.A.	15	1.9	2	1.4
Br. Isles	312	39.0	79	55.6
Other	214	26.7	6	4.2
Education				
Grade 4	81	22.5	31	22.6
5	31	8.6	12	8.8
6	86	23.9	31	22.6
7	102	28.3	37	27.0
8	28	7.8	13	9.5
High School (any period)	30	8.3	12	8.8
College or University	2	0.6	1	0.7

Table 3.

The chance sample for Groups IV and V was obtained through the selection of every third case on the files of the employment bureau and tabulation of its data. Records for 600 cases were amassed, covering the period from October, 1931, to February, 1933. Comparable data for age, country of birth and education were again arranged, as in Table 4. The tested groups, according to the apparently usual tendency, were again somewhat younger than the sample group, although Group IV approached the latter somewhat more closely, as the average age of the individuals composing it was 4.4 years greater than that of Group IV. The approximation for countries of birth appeared in both cases to be fairly good, and likewise for the rough educational groupings.

The general data for the age, education, period unemployed (each from its own base-date, however) and test scores of each group are reproduced in Tables 5-9, including the number of cases, mean and standard deviation for each variable. In Table 10 are grouped the mean data for the entire five groups, in order to make possible an easy comparison of their respective standing. While no one of the groups was homogeneous, each source had certain characteristics (the scope of its purpose, and the general occupational level of the individuals with which it dealt) which had foreordained distinct differences between the tested groups drawn from it and those secured from other sources. These differences may be observed in the tabled data, and are particularly prominent for scores on 'tests' proper, although they extend also to age and

Comparison of Sample Group and Tested Groups for Age, Education and Country of Birth, Groups IV & V.

	Sample Group		Tested Groups IV		V	
	N	%	N	%	N	%
Age						
15-17	1	0.2	17	5.7	9	3.2
18-20	29	4.9	60	20.3	36	13.0
21-22	51	8.6	40	13.5	33	11.9
23-24	55	9.3	31	10.5	16	5.8
25-29	115	19.6	56	18.9	34	12.2
30-34	99	16.8	25	8.5	29	10.4
35-39	79	13.4	27	9.1	37	13.3
40-44	66	11.2	17	5.7	32	11.5
45-49	42	7.0	13	4.4	23	8.3
50 up	54	9.0	10	3.4	29	10.4
Country of Birth						
Canada - Eng.) Fr.)	277	46.2	140	48.3	136	46.8
U.S.A.	12	2.0	11	3.8	5	1.7
Br. Isles	257	42.8	111	38.3	115	39.5
Other	54	9.0	28	9.6	35	12.0
Education*						
Elementary	194	34.1	103	35.4	107	37.9
Elem. & H.S?	308	54.1	163	56.0	150	53.2
College or University	67	11.8	25	8.6	25	8.9

Table 4.

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* Attendance, but not necessarily graduation.

Summary of Data for Group I (Labor) - 1931-32

	N	M	S.D.
Age	242	29.6	9.1
Education	235	6.6	1.9
Period Unemployed*	236	0:10	0:5
Alpha	28	79.1	36.5
Beta	263	76.6	19.3
Stenquist**	31	78.0	14.6

Table 5.

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* Median and Q, in years and months. Base date as at May 1, 1932.

** For 'mechanical' class. Range of scores 22 to 95.

Summary of Data for Group II (Labor) - 1932-33

	N	M	S.D.	D*
Age	568	36.0	11.4	
Period Unemployed**	548	2:0	0:9	
Alpha	32	77.4	39.4	
Beta	722	63.9	21.2	
New Stanford	106	81.6	21.0	
Stenquist	313	44.5	18.8	
Hand dynamometer:***				
Left, 1st trial	111	85.7	21.4	42.1
2nd trial	111	85.3	18.0	44.5
Right, 1st trial	111	90.8	15.2	38.3
2nd trial	111	91.5	15.6	40.6

O'Connor Blocks:

N = 204

Class A - 0.00-2.75	32.5%
B - 2.76-4.00	17.5%
C - 4.01-6.00	24.0%
D - 6.01 up	26.0%

Table 6.

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* D is used as a measure of dispersion, and is equivalent to the range included by the 90th and 10th percentiles.

** Median and Q, in years and months. Base date as at May 1, 1933.

*** In pounds pressure.

Summary of Data for Group III (Labor & Trades) - 1933

	N	M	S.D.
Age	143	36.7	11.0
Education	137	6.1	2.2
Period Unemployed*	134	1:1	0:8
Alpha	70	94.1	42.2
Beta	139	73.0	23.3
Thurstone	81	145.0	49.5
New Stanford	83	96.3	16.3
Minn. Paper Form Board	93	27.9	11.8
Stenquist	130	53.9	20.4
Bernreuter B1-N	40	-55.5	84.5
B2-S	40	54.5	49.2
B4-D	40	40.5	65.0

O'Connor Blocks:

N = 54

Class A - 0.00-2.75	35.2%
B - 2.76-4.00	20.4%
C - 4.01-6.00	24.0%
D - 6.01 up	20.4%

Table 7.

* Median and Q, in years and months. Base date as at June 1, 1933.

Summary of Data for Group IV (Clerical & Commercial) - 1931-32

	N	M	S.D.
Age	296	27.6	10.1
Education	291	8.9	2.2
Period Unemployed*	267	0:7	0:4
Otis	279	43.3	11.3
Beta	174	93.1	13.7
Thurstone	183	105.9	33.0
New Stanford	206	108.6	8.7
Minn. Paper Form Board	30	29.2	9.6
Stenquist	159	56.1	15.7
Bernreuter B1-N	230	-38.9	87.0
B2-S	230	40.0	55.0
B4-D	230	40.1	64.8
Study of Values:			
Theoretical	257	31.7	6.7
Economic		32.5	6.9
Aesthetic		23.8	8.1
Social		30.3	6.4
Political		31.3	6.7
Religious		30.9	7.8

O'Connor Blocks:

N = 96	Class A - 0.00-2.75	29.2%
	B - 2.76-4.00	20.8%
	C - 4.01-6.00	19.8%
	D - 6.01-up	30.2%

Table 8.

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* Median and Q, in years and months. Base date as at April 1. 1932.

Summary of Data for Group V (Clerical & Commercial) - 1933

	N	M	S.D.
Age	278	32.0	12.0
Education	282	8.9	2.3
Period Unemployed*	265	Q:11	0:7.5
Otis	286	40.9	12.6
New Stanford	287	103.0	12.5
Bernreuter B1-N	75	-43.3	81.3
B2-S	75	39.4	51.9
B4-D	75	39.6	63.0

Table 9.

---

* Median and Q, in years and months. Base date as at June 1, 1933.

Comparative Data for Groups I-V.

	Mean				
	I	II	III	IV	V
Age	29.6	36.0	36.7	27.6	32.0
Education	6.6		6.1	8.9	8.9
Otis				43.3	40.9
Alpha	79.1	77.4			
Beta	76.6	63.9	73.0	93.1	
Thurstone			145.0	105.9	
New Stanford		81.6	96.3	108.6	103.0
Minn. P.F.B.			27.9	29.2	
Stenquist	78.0*	44.5	53.9	56.1	
Bern. B1-N			-55.5	-38.9	-43.3
B2-S			54.5	40.0	39.4
B4-D			40.5	40.1	39.6
O'Connor Blocks:					
Class A - 0.00-2.75		32.5%	35.2%	29.2%	
B - 2.76-4.00		17.5	20.4	20.8	
C - 4.01-6.00		24.0	24.0	19.8	
D - 6.01-up		26.0	20.4	30.2	

Table 10.

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* 'Mechanical' class.

education. In general, it was apparent that (taking into account divergences in accuracy of sampling) the unemployed individuals of the lower occupational classes were somewhat older, and were also, as would of course be expected, less well-educated. Their general intelligence test scores were of course lower, and their clerical ability considerably less. There existed no distinct differences with respect to scores on the O'Connor Block Test. There appeared to be some differences with respect to scores on the Bernreuter Personality Inventory, at least for the first and second scales, although the validity of these differences would be slightly dubious, in view of the fact that it was given to only 40 cases in Group III. Differences in the Stenquist Mechanical Aptitude Test were also slight, although it had been given in a large number of cases, and might be expected to represent each group as well as any other test given. One indicator of its validity was secured through its administration to 31 members of a class in automobile mechanics (Group I). These men had an average score of 78.0 on the test, the range being from 22 to 95, with a standard deviation of 14.6, and an average Army Alpha score of 79.1. A general sample of Group III, on the other hand, with an average Army Alpha score of 94.1, had a mean Stenquist score of 53.9, indicating with some basis the fact that the Stenquist Test was at least measuring acquaintance with mechanical devices, and possibly also aptitude for dealing with them, apart from general intelligence, which in this case, in terms of averages, varied inversely with the Stenquist score.

A comparison of some of the data obtained for Group II (of whom 58.5% were of the general laboring class) with those for the Duluth Casual Labor Group is of some interest. Their educational attainments appear to be roughly the same, making allowance for differences in educational grade divisions in the two countries, the Duluth group having attained an average of 7.2 grades (American), and the Montreal group an average of 6.2 grades (Quebec system). The tested group of Montreal had a mean age of 36.0 years, approximately 3 years less than that of the source-group, and some 13 or 14 years less than that of the Duluth group. In spite of the fact that the age of the Montreal group was considerably less than that of the Duluth group, the mean hand dynamometer score was also appreciably less, although dynamometer scores in the Minnesota study were found to vary inversely with age to a noticeable degree. The mean score for the Montreal group, right hand, was found to be 90.8 pounds, and for the left, 85.7 pounds; while for the Minnesota group it was, for the right hand, 98.8 pounds, and for the left, 96.0. Less variation from the mean was also exhibited by the Montreal group. It would seem then that although the Duluth group was itself markedly inferior in physical strength, the Montreal group was even more so.

It may be observed that in general no one of these groups of unemployed, whatever be their mean relationship to groups of employed individuals, was lacking in individuals with potential ability. To this all of the test scores, as well as the generalized impression that the examiner received from direct relations

with the men, bore witness. To condemn them without further investigation as being 'practically all really unemployable' (a judgment which was heard made on several occasions by various individuals) would obviously be to state an opinion without much factual basis. On the other hand, however, there is little doubt that a number of the present unemployed are characterized to so great a degree by mental inferiority that if they cannot be classed as entirely unemployable, they must at least, in any program of rehabilitation, be considered as fit for only the most unskilled type of work. The distribution of scores for Beta Examination casts some light upon the extent to which individuals of inferior intellect constitute a portion of the unemployed. Of 722 cases for Group II, 150, or 20.1%, have Beta scores of E grade, that is, under 45; of Group III, 19, or 13.7%; and of Group IV, one, or 0.6%. Since in all three cases the average age of the tested sample appears to be somewhat less than that of the total group from which the sample is drawn, it is probably safe to say that these percentages should be even greater. While an E grade Beta score does not necessarily signify extreme mental defect, it does in all likelihood indicate that the individual to whom it attaches cannot be expected to carry on work of any appreciable complexity. Furthermore, it may be noted that the percentage of individuals having E grade Beta scores varies inversely with the ranking of their occupations (Taussig grades). Among those of 'A' ranking no E grade Beta scores are found; among 195 cases of 'B' ranking, only one, or 0.5%; among those

of 'C', there are, of a total of 218, 9 cases, or 4.1%; among those of 'D', 19 of a total of 245, or 7.9%; and of those of 'E' ranking, 86 of 365 cases, or 23.6%. Taking the negative age sampling of the groups into account, then, it may be said that of the laboring class, some 25 to 30% are of well below average mental ability, and perhaps a third of these, or 10% of the total, are actually of the mentally defective grade. These figures, it is expected, are conservative. In the light also of the distribution of occupations among the general population, it would seem that some 15% at least of the entire group of unemployed could be classed as significantly below average general intelligence, with a third of these seriously defective. These percentages are probably, although not certainly, well above those for the general employed population. It may be inferred therefore that in all likelihood the contemporary group of unemployed, particularly those who describe themselves simply as 'laborers', present a particular problem of rehabilitation, inasmuch as they promise less than the average stock of personal assets in the way of ability. Moreover, if future trends provide an increase in specialized technology, and less demand for the completely unskilled type of labor, it is probable that this problem will become an even more pressing one than it is at the moment.

Chapter Six: The Interrelationship of Test Variables

A knowledge of the interrelationship between the test variables employed is important for the light that it casts upon the possibility of differentiation of the various supposedly distinct traits measured, and as an index of the extent to which tests which presumably tend to measure some common factor actually do so. Furthermore, given the zero order relationship between two or more variables, it is possible to determine the extent to which the index of correlation is in fact abnormally dilated through the introduction of some third spurious factor, such as age.

A sample of 350 individual record cards was selected for correlation purposes, the occupations of the individuals whose records these were extending over the entire available range. For only a few pairs of the jointly considered variables were there 350 cases, however, because in a number of instances a test had been given comparatively infrequently, or in only a portion of the entire range of occupations. The minimum number of cases used as the basis for any correlation coefficient was 80, and the majority of populations were 150 or more. The zero order Pearson coefficients of correlation, together with their probable errors, are exhibited in Table 11.

Age is seen to correlate significantly and negatively with every test variable, especially with general intelligence, as measured by Beta Examination. It is probable that to a certain extent these coefficients would be lower were it not for the

	Age	Education	Otis	Beta	Beta, Test 4	New Stanford	Thurstone	Stenquist	O'Connor Blocks
Age	-	-.198 ± .037	-.226 ± .054	-.519 ± .026	-.306 ± .033	-.265 ± .040	-.350 ± .047	-.274 ± .038	-.151 ± .039
Education	-.198 ± .037	-	.276 ± .053	.621 ± .027	.437 ± .036	.535 ± .035	.574 ± .036	.206 ± .051	.081 ± .056
Otis	-.226 ± .054	.276 ± .053	-	.622 ± .047	.552 ± .053	.757 ± .025	.804 ± .025	.080 ± .075	.312 ± .065
Beta	-.519 ± .026	.621 ± .027	.622 ± .047	-	.757 ± .015	.723 ± .024	.794 ± .022	.581 ± .028	.296 ± .040
Beta, Test 4	-.306 ± .033	.437 ± .036	.552 ± .053	.757 ± .015	-	.566 ± .034	.595 ± .038	.529 ± .031	.428 ± .035
New Stanford	-.265 ± .040	.535 ± .035	.757 ± .025	.723 ± .024	.566 ± .034	-	.827 ± .017	.334 ± .045	.199 ± .049
Thurstone	-.350 ± .047	.574 ± .036	.804 ± .025	.794 ± .022	.595 ± .038	.827 ± .017	-	.278 ± .052	.272 ± .054
Stenquist	-.274 ± .038	.206 ± .051	.080 ± .075	.581 ± .028	.529 ± .031	.334 ± .045	.278 ± .052	-	.416 ± .038
O'Connor Blocks	-.151 ± .039	.081 ± .056	.312 ± .065	.296 ± .040	.428 ± .035	.199 ± .049	.272 ± .054	.416 ± .038	-

Table 11.

already observed fact that the relatively inferior groups of unemployed men were somewhat older, with consequent boosting of the relationship between age and the other variables. The positive relationship between education and contemporary scholastic achievement is not marked, and is indeed higher for either of Beta Examination or the Thurstone test. This relationship diminishes considerably if general mental ability (Beta) is held constant by partial correlation, becoming .159. It would seem, therefore, that the New Stanford test is measuring only to an insignificant degree the purely informative or factual product of education, and indicates with closer precision either the general ability with which the individual is endowed, or the extent to which this has been facilitated by his education and development, or both. In general it may be noted that four tests, Otis, Beta, Thurstone and New Stanford, are comparatively highly correlated with each other, and evidently embrace to a significant extent a common factor.

The two tests considered as possible measures of mechanical ability, the Stenquist and the O'Connor Blocks, correlate to a relatively low degree with the other tests used, and evidently, whatever may be their validity are not simply measuring general ability. They intercorrelate to the extent of .416, a relationship which is indeed not high, and which is lowered somewhat by partialling out general intelligence (Beta), being reduced to .314. This residual coefficient is indicative however of the fact that their interdependence does not rest merely upon a common factor

of general mental alertness, insofar as Beta Examination measures such a function of the individual. Test 4 of Beta, which was thought also to be to some extent an index of mechanical ability, is clearly linked as strongly to those tests which measure some phase of general ability as it is to either of the Stenquist test or the O'Connor Blocks Test. Its relationship to the Otis test, .552, is strikingly the same as found by the Minnesota investigators of mechanical ability between the paper form board test and Otis mental age: .56.*

The use of the partial correlation coefficient indicates that the interrelationship of these tests is not dependent to any great extent upon a common factor of age. The partial correlation coefficient for Education and Beta Examination, with age held constant, is .618, whereas the zero order relationship is .621. Similarly, for Stenquist and Beta, the partial correlation coefficient is .534, as compared with zero order .581; and for Thurstone and Beta, .764, as compared with .794. Apparently age functions slightly as a spurious factor, but only to an insignificant degree.

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* Op. cit., Table 89.

Chapter Seven: The Relationship of Age to Other Characteristics

The relationship of the age of the unemployed man to his various measurable characteristics, particularly to those which bear upon his industrial fitness, is one which is of more than theoretical interest, because relatively advanced age is very frequently cited as a reason for the lack of employment of the individual. It has generally been found that in the case of adults, the relationship between age and scores on tests of the 'achievement' type is negative, that is, the older individual tends to make a lower score on such a test than the comparatively younger man. In the Minnesota study of the Duluth Casual Labor Group, it was found that the younger individuals were consistently superior, and alone approached the median percentile rating of the theoretical general population for the various tests. It is not necessarily to be argued from these data alone that the same relationship holds true for the general population, as the unemployed are probably, at least in part, a selected group, in the selection of whom particularly those who are older and at the same time inferior may be especially included. A recent study of Jones and Conrad,* however, provides evidence for the opinion that the same negative relationship between age and general mental ability is true in general. On the other hand, Miles** has found that there is no relationship between age and a number of sensori-motor

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* Jones, H.E. and Conrad, H.S. The Growth and Decline of Intelligence: A Study of a Homogeneous Group Between the Ages of Ten and Sixty. Gen. Psy. Mon. 13 (1933) No. 33.

**Miles, W.R. Abilities of Older Men. Pers. J. 11 (1932-33) 352-357.

functions, which are, however, notably poorly related to more generalized abilities.

In the attempt to discover any possible age-ability relationship in the present instance, it was considered that in addition to the procedure of correlation (Chapter Six) the best general method of approach was to choose groups of sufficient size at the extremes of age, and to compare them directly. This procedure follows that of Hansen, Trabue and Diehl in their study of ability differences related to recency of employment in the case of the Duluth group. Therefore the quartiles at each extreme of age were chosen for four groups of unemployed, two predominantly of the laboring class, and two of the clerical and commercial class. As the average ages for these four groups were appreciably different, and as the groups were heterogeneous with respect to each other, they were allowed to remain segregated. Moreover, in accordance with differences in the mean age and the distribution of ages, the quartiles varied among the various groups as regards their position in age-level.

The data for the various groups and for the variables that were capable of treatment in each case in this manner are presented in Tables 12-15. In each instance the number of cases in the extreme quartile-groups for each variable considered are shown, together with the means, their absolute difference, the standard errors of the means, and the ratio of the absolute difference to its standard error. According to the customary statistical pro-

Group I (Labor) - 1931-32.

Ages (A) 36 and over, and (B) 22 and under.

	N		M		Diff.	σ_M		$\frac{\text{Diff.}}{\sigma_{\text{Diff.}}}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Education	54	57	6.6	6.7	0.1	0.29	0.23	0.3
Period unemployed	56	55	14.2	10.1	4.1	1.18	1.01	2.7
Beta	52	53	72.0	84.6	12.6	3.05	1.90	3.5
Beta, Test 4	52	53	8.5	10.3	1.8	0.55	0.49	2.4

Taussig Grades:

	(A)	(B)
A	0	0
B	5	5
C	17	18
D	17	18
E	19	18
Total	58	59

Table 12.

Group II (Labor) - 1932-33.

Ages (A) 44 and over, and (B) 27 and under.

	N		M		Diff.	σ_M		$\frac{\text{Diff.}}{\sigma_{\text{Diff.}}}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Period unemployed*	133	139	32.8	23.0	9.8	1.34	1.09	5.7
Beta	121	132	63.1	73.0	9.9	1.90	1.61	4.2
Beta, Test 4	121	132	7.4	8.7	1.3	0.31	0.33	3.0
Stenquist	58	41	51.4	45.8	5.6	1.93	2.50	1.8

Taussig Grades:

	(A)	(B)
A	1	0
B	6	4
C	32	19
D	28	22
E	74	102
Total	141	147

Table 13.

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* In months.

Group IV (Clerical and Commercial) - 1931-32.

Ages (A) 33 and over, and (B) 20 and under.

	N		M		Diff.	σ_M		Diff. / σ Diff.
	(A)	(B)	(A)	(B)		(A)	(B)	
Education	73	74	9.0	8.7	0.3	0.24	0.26	0.9.
Period unemployed	70	60	14.7	8.1	6.6	1.57	0.80	3.5
Otis	72	69	41.5	45.1	3.6	1.34	1.44	1.8
Beta	43	48	86.4	96.9	10.5	2.15	2.01	3.6
Beta, Test 4	43	48	9.9	11.4	1.5	0.55	0.49	2.0
Thurstone	45	47	110.3	107.7	2.6	5.20	4.64	0.4
New Stanford	55	53	108.0	109.2	1.2	1.44	1.15	0.6
Stenquist	37	43	55.7	54.2	1.5	2.60	2.20	0.4
Bern. Bl-N	60	57	-47.2	-36.7	10.5	11.36	11.03	0.7
Study of Values:								
Theoretical	64	66	31.3	32.8	1.5	0.75	0.84	1.3
Economic			30.8	34.1	3.3	0.95	0.71	2.8
Aesthetic			23.7	21.9	1.8	1.00	0.80	1.4
Social			31.8	30.0	1.8	0.73	0.85	1.6
Political			30.4	31.2	0.8	0.88	0.69	0.7
Religious			32.1	30.7	1.4	1.10	0.96	1.0

Taussig Grades:

	(A)	(B)
A	4	0
B	61	54
C	4	1
D	4	8
E	0	0
Total	73	63

Table 14.

Group V (Clerical and Commercial) - 1933

Ages (A) 39 and over, and (B) 21 and under.

	N		M		Diff.	σ_M		$\frac{\text{Diff.}}{\sigma_{\text{Diff.}}}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Education	68	70	9.3	8.4	0.9	0.33	0.21	2.3
Period unemployed*	69	58	20.5	14.8	5.7	1.96	1.55	2.7
Otis	75	69	37.4	42.7	5.3	1.37	1.53	2.6
New Stanford	72	71	101.6	103.3	1.7	1.52	1.31	0.8
Bern. Bl-N	22	16	-16.1	-22.4	6.3	16.80	15.63	0.3

Taussig Grades:

	(A)	(B)
A	6	0
B	53	42
C	8	5
D	9	12
E	0	1
Total	76	60

Table 15.

* In months.

procedure, it was assumed that if a difference was at least three times its standard error it was for all practical purposes real and beyond the limits of chance variations (although of course in strict theory still subject to chance). In order to provide a rough check upon the occupational status of the groups under comparison, the distribution of Taussig occupational grades for each group was computed. These distributions, it may be noted, indicate that no major discrepancy exists for any of the pairs of groups.

It may be observed that the only two variables that vary with some degree of consistency with age, and that are beyond the realm of chance, are recency of employment and general intelligence (Beta Examination). While in all other cases except one there is a negative relationship between age and score, it is not sufficiently marked for each single variable to be an individually certain one. In general, then, there is some statistical evidence for the fact that the older individual tends to have been unemployed for a longer period, whatever his class of occupation, and to exhibit a less degree of mental alertness. Other variables appear to vary likewise in a negative manner with age, but this relationship is a considerably more attenuated one.

Chapter Eight: The Relation of Recency of Employment to Other Characteristics.

In the determination of the relationship between recency of employment and other variables, the same procedure that had been employed for age differentiation was used, namely, the comparison of groups extreme with respect to the principal variable. For each of the four groups of unemployed the top and bottom quartiles (approximately) were selected and compared directly. The data are presented in Tables 16-19.

It will be seen that age and general intelligence test scores are the two variables most clearly differentiated with respect to recency of employment, age varying negatively with recency of employment, and general intelligence positively. As in the case of the differentiation by age, the remaining variables tends to be attenuated from the more clearly displayed tendency exhibited by general intelligence, but are consistently indicative of minor differences in the same direction. In the Minnesota study of casual labor, no attempt was made to determine the statistical validity of any exhibited differences, although minor differences were allotted discussion as though they possessed significance. Physical strength received emphasis as the most clearly displayed difference, but it would seem also, from an inspection of the published tables, that age was likewise subject to negative variation with recency of employment.

Group I (Labor) - 1931-32

Period unemployed (A) Eighteen months and over, and (B) Six Months and under.

	N		M		Diff.	σ_M		$\frac{\text{Diff.}}{\sigma_{\text{Diff.}}}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Age	52	57	33.2	26.5	6.7	1.47	0.95	3.8
Education	48	55	6.6	6.7	0.1	0.30	0.22	0.3
Beta	42	54	73.2	81.6	8.4	3.01	2.23	2.2
Test 4, Beta	42	54	7.9	9.7	1.8	0.62	0.51	2.3

Taussig Grades:

	(A)	(B)
A	0	0
B	3	5
C	16	10
D	15	24
E	18	18
Total	52	57

Table 16.

Group II (Labor) - 1933-33

Period unemployed (A) Three Years and over, and (B) Fifteen months and under.

	N		M		Diff.	σ_M		$\frac{\text{Diff.}}{\sigma_{\text{Diff.}}}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Age	156	120	39.2	31.0	8.2	0.98	1.04	5.7
Beta	138	108	61.7	69.5	7.8	1.90	1.90	3.3
Test 4, Beta	138	108	7.4	8.2	1.1	0.29	0.39	2.3
Stenquist	51	42	46.1	52.5	6.4	2.80	2.20	1.8

Taussig Grades:

	(A)	(B)
A	0	1
B	5	5
C	23	25
D	22	30
E	106	60
Total	156	121

Table 17.

Group IV (Clerical and Commercial) - 1931-32.

Period unemployed (A) One year and over, and (B) Four months and under.

	N		M		Diff.	σ_M		Diff. / $\sigma_{Diff.}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Age	80	78	30.8	27.1	3.7	1.20	1.02	2.3
Education	80	77	8.7	8.9	0.2	0.25	0.26	2.4
Otis	75	75	40.6	45.0	4.4	1.30	1.30	2.4
Beta	39	55	89.5	95.6	6.1	2.00	1.83	2.3
Test 4, Beta	39	55	10.8	11.5	0.7	0.51	0.49	1.0
Thurstone	44	47	117.1	98.6	18.5	6.20	4.40	2.4
New Stanford	40	59	105.0	110.5	5.5	2.10	1.20	2.3
Stenquist	35	50	59.0	53.8	5.2	2.63	2.19	1.5
Bern. Bl-N	61	61	-28.2	-33.1	4.9	11.20	10.82	0.3

Taussig Grades:

	(A)	(B)
A	2	3
B	64	65
C	6	2
D	8	7
E	0	0
Total	80	77

Table 18.

Group V (Clerical and Commercial) - 1933

Period unemployed (A) Two years and over, and (B) Six months and under.

	N		M		Diff.	σ_M		$\frac{\text{Diff.}}{\sigma_{\text{Diff.}}}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Age	68	53	35.9	29.2	6.7	1.50	1.40	3.3
Education	60	52	8.8	8.7	0.1	0.35	0.26	0.2
Otis	63	52	38.0	45.5	7.5	1.50	1.60	3.4
New Stanford	63	54	99.9	106.6	6.7	1.68	2.45	2.3
Bern. Bl-N	22	16	-50.5	-59.9	9.4	17.40	14.10	0.4

Taussig Grades:

	(A)	(B)
A	4	1
B	42	41
C	8	5
D	13	7
E	0	0
Total	67	54

Table 19.

It seemed very possible in the present case, since recency of employment was known to bear a distinct relationship to age, that the difference in general intelligence and other test scores apparently varying with the length of time unemployed actually and in reality varied rather with age. In order to determine the extent to which this might be so, one group (Group II) was divided as to its component groups, differing as to time unemployed, in such a way that the number of individuals for each Taussig grade was constant (to ensure stability of occupational level), and the average ages for the entire pair of groups approximately the same. This procedure resulted, as is shown in Table 20, in a reduction of differences in test scores to a point at which they were statistically unreliable. One would conclude from this, therefore, that in very large part, if not wholly, apparent differences in test scores in consequence of differences in recency of employment, are in reality attributable to differences in age, which itself remains more or less in negative variation with recency of employment.

In accordance with the extent to which this last conclusion may be said to be true, then, it may be remarked that those individuals longer unemployed are not selected for dismissal or discharge from their occupation simply because of the inferior nature of their industrial caliber, but rather because they tend to be somewhat older, and hence, apparently, primarily less adaptable and mentally alert (insofar as such a function as mental alertness is

Group II (Labor) - 1932-33

Period unemployed (A) Three years and over, and (B) Fifteen months and under.

	N		M		Diff.	σ_M		$\frac{\text{Diff.}}{\sigma_{\text{Diff.}}}$
	(A)	(B)	(A)	(B)		(A)	(B)	
Age	110	110	34.0	31.9	2.1	0.88	0.96	1.6
Beta	96	99	66.4	69.1	2.7	2.22	1.94	0.9
Test 4, Beta	96	99	7.7	8.1	0.4	0.38	0.40	0.7
Stenquist	42	42	49.1	49.8	0.7	3.10	2.25	0.2

Taussig Grades:

			Average Age	
	(A)	(B)	(A)	(B)
A	0	0	-	-
B	5	5	42.0	24.2
C	23	23	39.1	36.0
D	22	22	38.4	34.9
E	60	60	30.0	29.8
Total	110	110		

Table 20.

adequately measured by a general intelligence test. It may, of course, be said on the other hand, that a general intelligence test is not a necessarily adequate and complete test of occupational fitness, and that, while scores upon such a test vary negatively with age, it is really age itself, with its accompanying disadvantages of a formal rather than a functional nature, that tends, at least as one causative factor, to bring about earlier unemployment. It is not improbable that it is the conjunction of the two factors, increased age, with its disabilities formal and actual, in the case of individuals with a relatively lower grade of intelligence, that tends to determine to some extent whether the individual shall or shall not be employed at such a time as the present.

In the case of one of the sources of two of the major groups of unemployed, namely, the registration bureau for office workers (Groups IV and V), it was possible to obtain with a fairly high degree of accuracy the date of registration of the persons included within these groups. Correlation of the date of registration with certain of the important test and other data resulted in the coefficients displayed in Tables 21 and 22. All of these for Group Iv are positive except age, while for Group V three are negative (age, education and period unemployed), the others positive. Combination of the two (Table 23) resulted in setting up a number of conflicting tendencies, apparently because the trend of one of the constituent groups controvened that of the other.

The Relationship of Date of Registration to Other Variables

Group IV

	r	PE_r	M
Age	- .088	.043	27.7
Education	.015	.043	8.9
Period unemployed	.110	.037	9.9*
Otis	.126	.044	43.3
New Stanford	.138	.050	108.4
Bern Bl-N	.031	.049	-41.3
Beta	.059	.055	
Test 4, Beta	.086	.055	
Thurstone	.021	.055	
Stenquist	.026	.059	
O'Connor Blocks	.104	.074	

Table 21.

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* Months. An upward adjustment of 14 months was required for this group on combination with Group V, in order that both groups might have a common base-date.

The Relationship of Date of Registration to Other Variables

Group V

	r	PE_r	M
Age	- .071	.041	32.2
Education	- .013	.043	8.9
Period unemployed	- .291	.041	17.1
Otis	.067	.042	41.7
New Stanford	.030	.042	103.9
Bernreuter B1-N	.147	.076	-33.3

Table 22.

The Relationship of Date of Registration to Other Variables

Groups IV and V.

	r	PE_r
Age	- .154	.029
Education	- .021	.030
Period ,unemployed	- .234	.029
Otis	- .025	.031
New Stanford	- .168	.031
Bernreuter B1-N	.021	.041

Table 23.

Age, for instance, while negatively and insignificantly correlated with date of registration for both of the constituent groups, becomes positively and significantly correlated after summation, apparently because the later group was significantly older than the earlier group. While an insignificant correlation existed between date of registration and period unemployed for the earlier group, a significant negative coefficient appeared for the later group, sufficiently strong in its trend to remain negative (-.234 $\pm$ .029) after combination of the two groups.

In general then there is little relationship to be found between date of registration at this employment office and period of unemployment, only one coefficient being significant, namely, that for date of registration and period unemployed for Group V. Age for both groups appears to bear a significant positive relation to date of registration, although a very weak one, but in view of the contrasting tendencies displayed in this respect by the constituent groups, there is little of a positive nature to be said about it.

Chapter Nine: The Comparison of Unemployed Men Receiving Relief Assistance with Those Not Receiving Assistance.

The acquisition of data for members of Group V (Commercial and Clerical) as regards those that had been receiving some form of direct, charitable and organized relief assistance through the management of the employment office at which they were registered and those that had never received assistance through this agency, and, so far as was known, were receiving none of any sort, made possible a comparison of the two groups so distinguished. A presentation of the comparative data with respect to them is made in Table 24.

It will be observed that certain of the differences are moderately large, and a number of them statistically significant. Those individuals receiving relief are significantly older (by an average of six years), and have been longer unemployed. There is no distinction with respect to education, both groups having completed nearly nine grades of school (second year of high school). The educational achievement of the relief group is lower, however, as well as their scores on the Otis test. While there are fairly large differences for the B1-N and B2-S scales of the Bernreuter Personality Inventory, the populations are considerably smaller than for the other variables, and only the recorded difference in 'self sufficiency' approaches validity. The direction of this last difference is somewhat difficult to interpret, inasmuch as the individuals receiving assistance are indicated to be more

Comparison of Age, Education, Recency of Employment and Test Scores.

R - Relief

N - Non-relief

	N		M		Diff.	Diff. / σ Diff.
	R	N	R	N		
Age	93	176	36.0	29.9	6.1	3.8
Education	87	168	8.7	9.0	0.3	0.3
Period unemployed	89	156	19.7	14.2	5.5	2.9
Otis	91	169	37.7	44.0	6.3	4.0
New Stanford	89	171	100.0	105.6	5.6	3.4
Bernreuter B1-N	34	41	-28.4	-55.7	27.3	1.5
B2-S	34	41	56.5	25.2	31.3	2.7
B4-D	34	41	44.1	35.9	8.2	0.5

Table 24.

self-sufficient than those that have apparently maintained their own independence, and to reach a level of 'self-sufficiency' such as was attained by a group of employed clerical workers. One might hazard the somewhat wild speculation that they are unemployed in part because they tend to have baulked at initial pre-dismissal salary cuts (as happened in a few instances), but as eighty to ninety per cent. of the group were 'laid off' rather than summarily discharged, at least according to each individual's own account, this hardly seems probable. It may best be left as a perhaps chance anamoly at the source of which one may guess with little profit.

Chapter Ten: The Comparison of Unemployed Men By Countries of Birth.

It was not possible, if any statistical significance were to attach to the conclusions, to segregate the various groups of unemployed by single countries of birth, because too few individuals would thus be apportioned to each country to make a comparison worth while. A four-fold division, however, was made on the basis of geographical and language distinction, and all cases not falling within one of these four classes were discarded. The four categories were as follows:

A - Canada - English-speaking

B - Canada - French-speaking

C - British Isles

D - Continental European countries.

The mean data for these four sub-groups of each of groups I, II, IV and V are shown in Tables 25 and 26, together with the ratio of each difference between two sub-groups to its standard error.

It is notable that in only a few instances could intercomparisons of these four sub-groups be made with any assurance that reliable differences existed, and these when present appertained principally to age and period unemployed. English-speaking Canadians were in three of the four groups significantly younger than continental Europeans, probably because the latter tended not to emigrate to Canada until they had reached a fairly mature age. Those of the latter who were of the higher

Comparative Data By Countries of Birth, Groups I and II.

	Mean				Diff. / σ Diff.					
	A	B	C	D	A-B	A-C	A-D	B-C	B-D	C-D
Group I										
Age	27.2	32.1	29.5	32.4	**3.3**	1.6	**3.1**	1.7	0.2	1.7
Education	6.8	6.1	6.8	7.4	**1.8**	0.1	1.3	2.2	2.9	1.6
Period unemployed	11.6	13.4	11.6	15.0	1.1	0.0	1.6	1.0	0.7	1.6
Beta	82.5	73.0	82.1	72.2	2.5	0.1	2.5	2.8	0.2	2.7
Test 4, Beta	9.5	10.1	9.7	10.4	0.9	0.2	1.2	0.7	0.5	1.0
Group II										
Age	38.0	35.9	32.7	36.7	1.6	3.1	0.9	2.2	0.7	2.5
Period unemployed	24.1	28.8	24.2	31.7	3.1	0.1	4.3	2.9	1.8	4.0
Beta	68.3	68.1	69.8	54.2	0.1	0.5	4.2	0.7	4.4	4.5
Test 4, Beta	7.1	7.7	8.1	7.9	1.2	1.7	1.3	0.8	0.4	0.3
Stenquist	54.1	51.4	47.3	39.5	0.8	1.8	3.1	1.4	2.9	1.8

Table 25.

Comparative Data By Countries of Birth, Groups IV and V.

	Mean				Diff./σ Diff.					
	A	B	C	D	A-B	A-C	A-D	B-C	B-D	C-D
Group IV										
Age	24.6	26.0	30.2	29.5	0.6	4.4	3.0	1.9	1.4	0.4
Education	-8.7	9.2	8.7	9.9	0.7	0.1	2.1	0.7	0.9	2.0
Period unemployed	12.2	8.3	10.3	6.4	2.3	1.3	3.5	1.2	1.0	2.3
Otis	43.3	42.5	43.1	46.1	0.3	0.1	0.8	2.5	1.0	0.9
Beta	95.7	93.0	91.3	91.5	1.0	1.8	0.9	0.6	0.3	0.0
Thurstone	110.1	107.0	105.2	113.0	-	-.9	0.3	-	-	0.7
New Stanford	108.4	107.4	109.1	108.8	0.4	0.5	0.1	0.7	0.3	0.1
Stenquist	60.7	49.7	52.6	58.0	2.5	2.8	0.8	0.6	1.7	1.6
Bernreuter B1-N	-31.6	-43.8	-43.2	-58.6	0.7	0.9	1.5	0.0	0.7	0.8
Group V										
Age	27.7	30.2	35.3	39.0	0.7	2.4	3.4	1.4	1.8	0.8
Education	8.7	8.8	8.6	10.9	0.1	0.6	3.2	0.4	2.5	2.8
Period unemployed	17.1	18.6	15.7	21.3	0.3	0.8	1.1	0.6	0.4	0.9
Otis	42.3	35.5	41.0	40.8	1.4	0.8	0.6	1.2	1.0	0.0
New Stanford	103.6	94.5	104.0	95.3	2.5	0.3	1.9	2.6	1.1	1.6

Table 26.

occupational grades tended to have been unemployed a shorter time (principally because they had but recently emigrated), and those of the lower grades to have been unemployed longer. In general the continental Europeans, particularly those of the upper classes, tended to have achieved a higher educational status than other groups.

In but a few cases were differences in test scores such as to suggest their validity. The continental Europeans of Group II (Labor) had definitely lower Beta scores than those individuals included within the other categories, and probably significantly lower Stenquist scores. The same tendency, although less well marked, was found in the case of those of Group I. Inasmuch as both the Beta Examination and the Stenquist Test were non-verbal and in practice appeared to present no insuperable language difficulty, these differences probably have some basis in fact.

Clear differences between English- and French-Canadians were not apparent. Tendencies in regard to age and period unemployed were unstable and conflicting, and except for one group, there were no differences in Beta scores. Those of Group IV seemed to differ as regards the possession of mechanical ability, as denoted by scores on the Stenquist Test, the average score of the French-Canadian group being 11 points lower than that of the English-Canadians. Similarly, there were few distinct differences between English-Canadians and those persons born in the British Isles. In three of the four groups the latter tended to be older, but

this tendency was reversed in Group II. Those in Group IV tended to possess lower Stenquist test scores than English-Canadians.

On the whole, then, it may readily be seen that there were but a few scattered significant differences as regards the distribution of variables for these categories denoting language and countries of birth, and none of a wholly consistent character. It would seem therefore that while the exploration of such differences might be of some interest, it would hardly be likely, under the circumstances, to prove of very much profit, or to give assurance that any broad conclusions might be derived.

Chapter Eleven: The Barr Rating Scales and Test Scores

The Barr-type rating of occupations, used as an index of the required amount of a given ability considered necessary in the pursuance of each occupation, has been used in at least two extensive investigations: in the Terman study of gifted children, where Mr. F.E. Barr developed this type of scale to rate fathers' occupations in terms of the degree of intelligence required for their successful pursuance; and in the Minnesota research into mechanical ability, where this method was adopted for rating fathers' occupations for intelligence and mechanical ability. In the former case it was found that the average rating for fathers of gifted children included within that survey was significantly higher than the average rating for the general population, as determined from census data. In the Minnesota study no significant relationship was found between either the Barr intelligence or mechanical ability ratings and any of the test scores. Certain of the 'environmental' ratings (that is, for cultural status, literary interests, tools owned by father, etc.) correlated significantly with the Barr ratings, however.

The procedure by which the original Barr scale was constructed commenced with the rating on a scale of from 0 to 100 of one hundred representative occupations by 30 judges, according to the grade of intelligence that each occupation was believed to demand. Probable error values were then determined from a distribution of the averages of these 30 ratings, and the P.E. value, which ranged from zero ('Hobo') to 20.71 ('Inventive genius'), was used as an

index of the occupation to which it was attached. The average P.E. value for the general population was estimated to lie between 7.92 and 8.88.

By a similar method, the Minnesota investigators developed the Barr-type scale for mechanical ability, using however standard deviation values, which ranged from 0.27 ('High national official') to 5.73 ('Inventive genius').

It was decided in the present investigation to determine something of the interrelationship of these scales, and their correlation with test scores, for the individuals themselves tested (not one generation removed), in order to assist in casting light upon the nature of the abilities tested. Accordingly a sample group of 246 unemployed men, representing a wide range of occupations and abilities, was selected, and these individuals were rated on the basis of the Barr scales for their own and their father's occupations. To all of these men had been given the Beta Examination and the Stenquist Mechanical Aptitude Test I, and to the majority, the Otis Examination (N = 109) and the O'Connor Blocks (N = 194). As only 79 of the group had been administered the Minnesota Paper Form Board, it was thought inadvisable to use it for correlation purposes, but test 4 of the Beta, involving essentially the same type of content, was used in its stead. This was considered justified in the main by the fact that the Minnesota Paper Form Board and Test 4 of Beta Examination

correlated positively to the extent of ,875 ± ,014. *

The Barr ratings for each individual's occupation were then correlated with his test scores, resulting in the coefficients presented in table 27. In addition, the Barr intelligence and mechanical ability ratings were correlated with those of his father, the coefficients being, for intelligence rating,.647 ±.025 and for mechanical ability, ,300 ± .039.

Fifteen of the twenty-one coefficients derived were found to be significient, that is, four or more times their probable error. The Barr intelligence scale correlated positively and significantly with all of the five tests except the O'Connor Blocks, the strongest relationship being with Beta examination, .609 ± .027. The mechanical ability scale, on the other hand, was significantly correlated in only two instances: with the Stenquist Mechanical Aptitude Test I (.332 ± .038) and the O'Connor Blocks(.206 ± .047) IN the case of these two, the Stenquist, the relationship between it and the intelligence scale was as high as with the mechanical ability scale (.348 vs. .332).

The two scales themselves intercorrelated to the extent of + .100 ± .043, this coefficient not being, of course, significant. Inspection of the scatter of ratings in the correlation chart indicated however that the principal reason for this lack of linear relationship was the fact that while the mechanical ability

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* Uncompensated for attenuation. Taking the reliability of the M.P.F.B. to be .82 (single form), the coefficient, adjusted for attenuation, becomes .966.

	Barr Intell.	Barr Mech.	Otis	Beta Total	Stenquist	O'Connor Blocks	Beta, Test 4
Barr Intell.	-	.100 ± .043	.319 ± .058	.609 ± .027	.348 ± .038	.089 ± .048	.456 ± .034
Barr. Mech.	.100 ± .043	-	.085 ± .064	.018 ± .043	.332 ± .038	.206 ± .047	.142 ± .042
Otis	.319 ± .058	.085 ± .064	-	.700 ± .033	.219 ± .062	.315 ± .082	.651 ± .037
Beta Total	.609 ± .027	.018 ± .043	.700 ± .033		.517 ± .032	.373 ± .042	.786 ± .016
Stenquist	.348 ± .038	.332 ± .038	.219 ± .062	.517 ± .032	-	.384 ± .041	.476 ± .033
O'Connor Blocks	.089 ± .048	.206 ± .047	.315 ± .082	.373 ± .042	.384 ± .041	-	.461 ± .038
Beta, Test 4	.456 ± .034	.142 ± .042	.651 ± .037	.786 ± .016	.476 ± .033	.461 ± .038	-

Table 27.

ratings of 3.00 and over were correlated positively with intelligence ratings, those under 3.00 tended to be correlated negatively. The cause of this was that clerical and commercial occupations, while given a high rating on the intelligence scale, were rated at the inferior end of the mechanical ability scale. The curvilinear coefficient for these two (η_{xy}) was therefore determined to be .830 ± .013, and Blakeman's test for linearity of function* gave a resultant indicating clearly the predominance of the curvilinear trend, Zeta being over 28 times its P.E. The linear correlation coefficient between these two is given by the Minnesota investigators as being + .04, no attempt apparently having been made to determine whether the relationship were other than linear.

Following this clue, it was found that the same relationship held, though to a less degree, between the Barr mechanical ability rating and each of Beta (total), Beta Test 4 and Stenquist, the curvilinear coefficients being respectively .553 ± .030, .381 ± .037 and .471 ± .033. These were in each instance significantly greater than the corresponding linear correlation coefficients. The scatter diagrams illustrative of the various relationships are given in Figs. 9-12.

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* Kelley, T.L. Statistical Method. Formula 196.

The Zetas, together with their probable errors, were as follows:

	Zeta	P.E. Zeta
Barr Intell. - Barr Mech. Scale	.679	.024
Beta Total - Barr Mech. Scale	.306	.033
Beta, Test 4 - Barr Mech. Scale	.125	.027
Stenquist - Barr Mech. Scale	.112	.026

Several conclusions may be drawn from an inspection of these data. First of all, it becomes pretty well evident that if any of the mechanical ability tests (such as the Stenquist) measures mechanical ability, and there appears to be some evidence that they do, then the degree of mechanical ability required in an occupation above the median intelligence level is probably significantly less than the actual amount possessed by the individual in pursuance of that occupation. That is, an individual doing clerical work has on the average sufficient mechanical skill to pursue an occupation of a distinctly mechanical nature. On the other hand, knowing that intelligence and mechanical ability are fairly strongly coupled, at least so far as their measurement is concerned, it may be said that this is so simply because mechanical ability consists to a large extent in a general function of intelligence, which is largely resident in the holders of occupations the Barr mechanical ability ratings of which are below, say, 2.00 (this includes clerical and business occupations). As Simpson* has shown, the Stenquist test correlates to a fairly high degree with a general intelligence test, although at the same time it differentiates between those with and without mechanical experience

Secondly, it would appear that the Barr intelligence scale correlates fairly well with intelligence test scores. Indeed, it is well possible that in this instance the relationship would have been significantly higher if the application of ratings had been

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* Simpson, R.M. Op. cit. The correlation of Stenquist and Army Alpha was .46 ± .03.

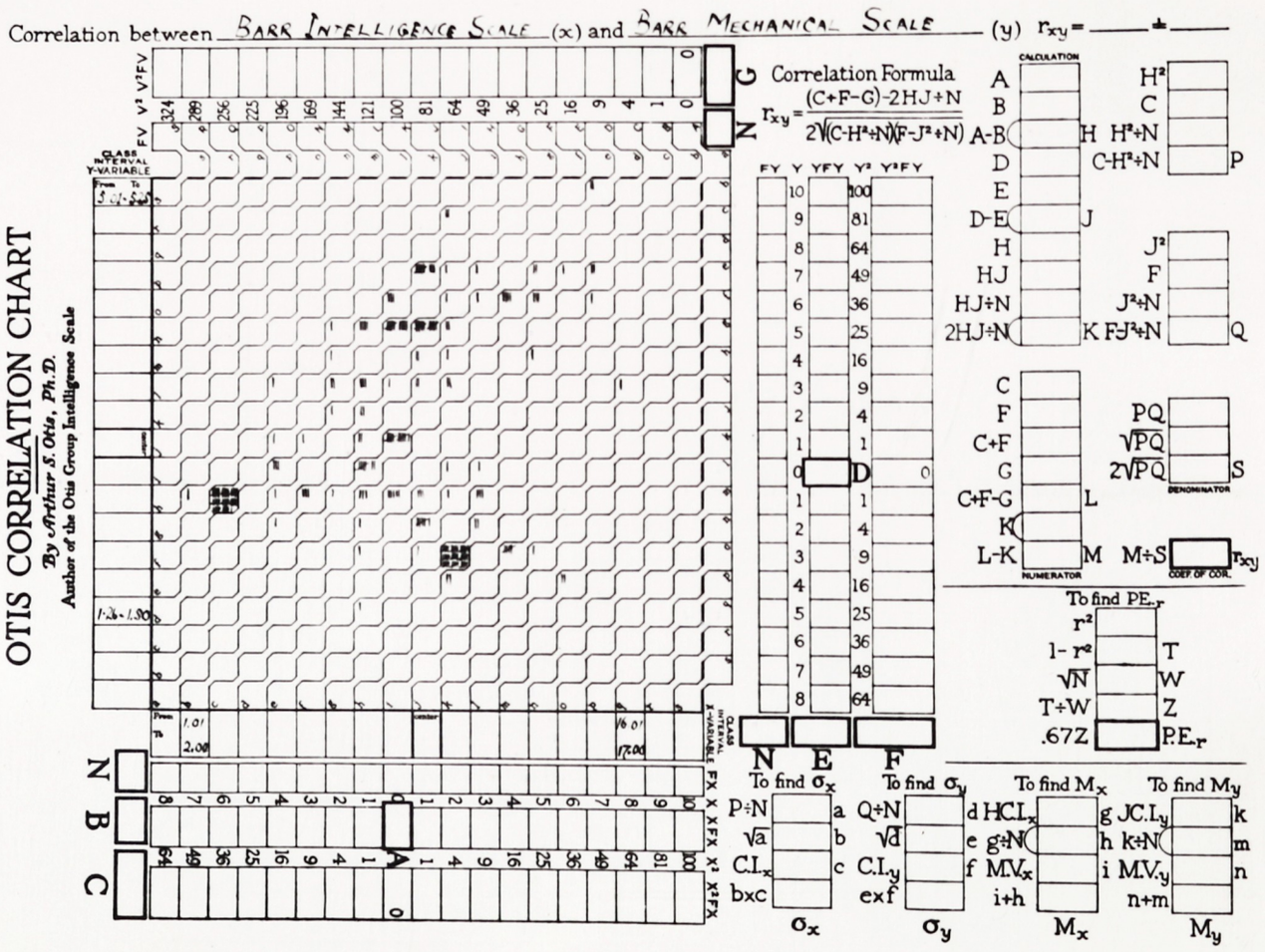
Correlation between BARR INTELLIGENCE SCALE (x) and BARR MECHANICAL SCALE (y) r_{xy} = ——— ÷ ———
OTIS CORRELATION CHART
By Arthur S. Otis, Ph.D.
Author of the Otis Group Intelligence Scale
Correlation Formula
$r_{xy} = \frac{(C+F-G)-2HJ\div N}{2\sqrt{(C-H^2\div N)(F-J^2\div N)}}$
CALCULATION
NUMERATOR
DENOMINATOR
COEF OF COR.
To find PE$_r$
To find σ_x
To find σ_y
To find M_x
To find M_y

Figure 9.

OTIS CORRELATION CHART
By Arthur S. Otis, Ph.D.
Author of the Otis Group Intelligence Scale
Correlation between BARR MECHANICAL SCALE (x) and BETA TOTAL (y) r_{xy} = ____ ± ____
Correlation Formula
$r_{xy} = \frac{(C+F-G)-2HJ \div N}{2\sqrt{(C-H^2 \div N)(F-J^2 \div N)}}$
CALCULATION
NUMERATOR
DENOMINATOR
COEF OF COR.
To find PE$_r$
To find σ_x
To find σ_y
To find M_x
To find M_y
CLASS INTERVAL Y-VARIABLE
CLASS INTERVAL X-VARIABLE

Figure 10.

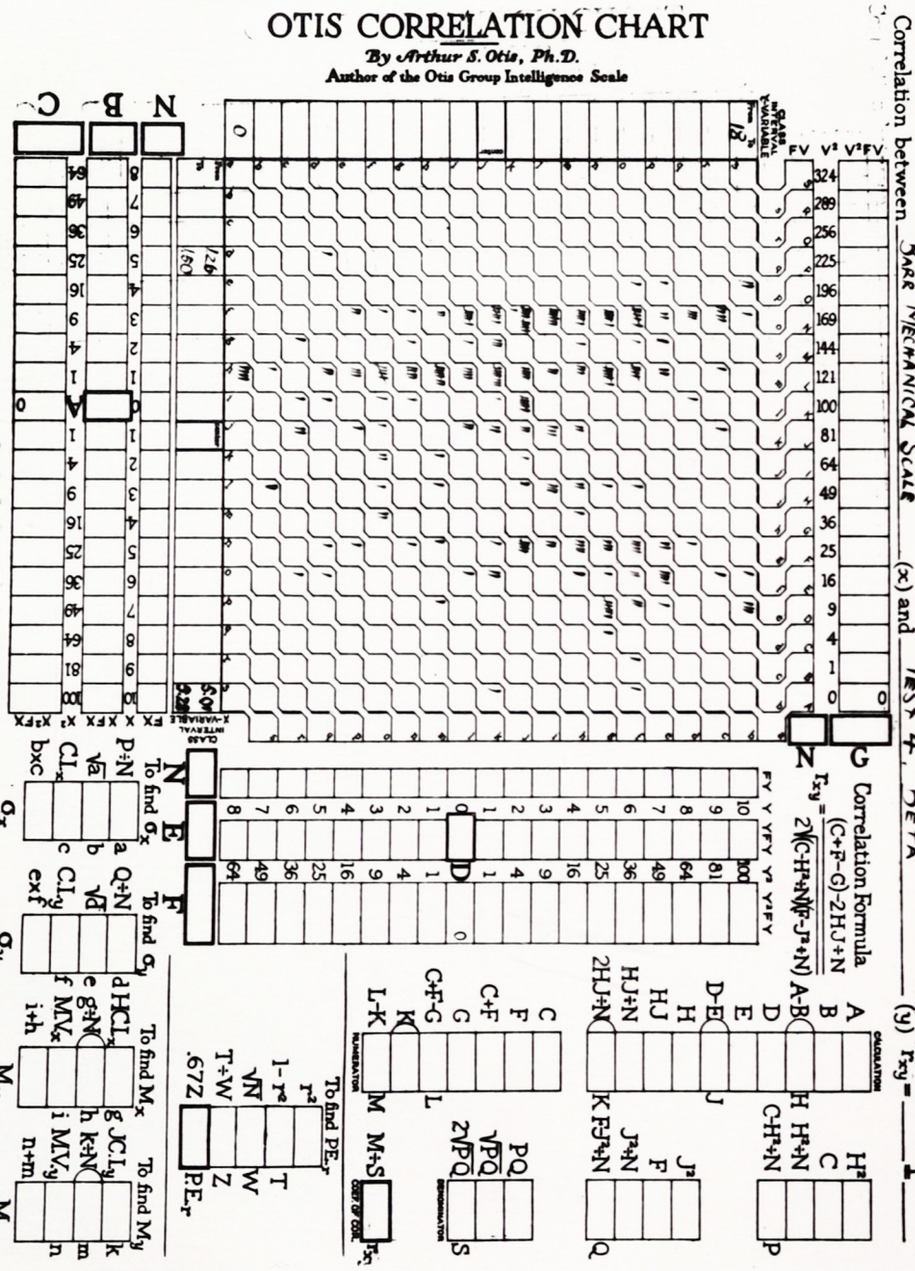
OTIS CORRELATION CHART
By Arthur S. Otis, Ph.D.
Author of the Otis Group Intelligence Scale
Correlation between BARR MECHANICAL SCALE (x) and TEST 4, BETA (y) rxy = ____
Correlation Formula
rxy = (C+F-G)-2HJ+N / 2√(C-H²+N)(F-J²+N)
CALCULATION
NUMERATOR
DENOMINATOR
COEF. OF CORR.
To find σx
To find σy
To find Mx
To find My
To find PEr
CLASS INTERVAL
X-VARIABLE
Y-VARIABLE

Figure 11.

OTIS CORRELATION CHART
By Arthur S. Otis, Ph.D.
Author of the Otis Group Intelligence Scale
Correlation between BARR MECHANICAL SCALE (x) and STENQUIST (y) r_{xy} = ____ / ____
Correlation Formula
$r_{xy} = \frac{(C+F-G)-2HJ+N}{2\sqrt{(C-H^2+N)(F-J^2+N)}}$
CALCULATION
NUMERATOR
DENOMINATOR
COEF. OF COR.
To find PE$_r$
To find σ_x
To find σ_y
To find M_x
To find M_y
σ_x
σ_y
M_x
M_y

Figure 12.

made by an individual with more insight into the nature of each occupation and also with greater consistency (considerable interpolation was necessary).

Thirdly, certain things may be said in this case about the tests themselves, even though these observations overlap with those contained in another chapter. It is noteworthy that the O'Connor Blocks, while (if measuring anything consistently) they contain something of a general intelligence factor, are most highly correlated with Beta, Test 4 (paper form board). One would infer that this implies a similarity in function in that they both call for a visualization of spatial relationships. (Here it might be said that the Minnesota group found their test of spatial relations to correlate to the extent of .63 with the form board). Again, with respect to the form board itself, the bulk of the evidence seems to show that its function is much better related to general intelligence than to mechanical ability. While it correlates to the extent of .476 with the Stenquist test, its relationship is much higher with even a purely verbal test like the Otis. In addition, it is to be observed, for whatever the distinction is worth, that the linear relationship between the form board and the Barr intelligence scale is much higher than between the form board and the Barr mechanical ability scale, and that curvilinear relationship (correlation ratio) is also somewhat higher.

Chapter Twelve: The Comparison of Employed and Unemployed Clerical Workers.

Owing to the fact that a control group of employed workers was secured for clerical occupations only, the only comparison possible between employed and unemployed men lay in this field. Of a total of approximately 175 employed individuals tested, 135 were engaged in strictly clerical work, such as recording, filing or checking. They were employed by three large firms, and constituted a sample of the remainder of an originally larger group, many of whom had been discharged in the previous two years, owing to diminished business activity. They were administered four tests in the main, in addition to several other tests, the populations of which were too small to warrant use of the test scores for comparison purposes. These four were the Revised Beta Examination, the Thurstone Clerical Examination, the Stenquist Mechanical Aptitude Test I, and the Bernreuter Personality Inventory. The data for these tests, and also for age and education, are presented in Table 28.

Inspection of the test and other data for the three employed groups indicated that while two of these groups were fairly similar in character, the third was largely dissimilar to the others. Accordingly, a comparison was made of these three groups (designated A, B and C), as shown in Tables 29-31, to determine the extent and validity of the apparent differences. These were negligible as between Groups A and B, but largely significant for

Employed Clerical Workers

	Group A			Group B			Group C	
	N	M	S.D.	N	M	S.D.	N	M	S.D.
Age	25	31.3	8.0	36	32.2	9.5	68	28.3	6.2
Education	11	8.27	1.3	36	7.33	1.7	67	10.89	1.8
Beta	29	94.0	7.4	38	91.6	12.5	68	102.1	11.2
Beta, Test 4	29	10.1	3.3	38	10.7	4.1	68	13.6	2.8
Thurstone	23	92.3	11.6	33	96.5	11.2	18	75.2	10.7
Bern. B1-N	28	-69.3	86.3	22	-57.3	87.5	18	-81.9	66.8
B2-S	28	45.5	54.4	22	47.8	47.6	18	65.0	53.5
B4-D	28	56.2	67.4	22	56.9	57.6	18	60.7	56.8
Stenquist	34	62.6		14	54.4	14.6			

Table 28.

Employed Clerical Workers

	M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	Group A	Group B			
Age	31.3	32.2	0.9	2.25	0.4
Education	8.27	7.33	1.06	0.48	2.2
Beta	94.0	91.6	2,4	2.44	1.0
Beta, Test 4	10.1	10.7	0.6	0.90	0.7
Thurstone	92.3	96.5	4.2	3.10	1.4
Bern. B1-N	-69.3	-57.3	12.0	24.9	0.5
B2-S	45.5	47.8	2.3	14.4	0.2
B4-D	56.2	56.9	0.7	17.7	0.0
Stenquist	62.6	54.4	8.2	4.50	1.8

Table 29.

Employed Clerical Workers

	M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	Group A	Group B			
Age	31.3	2813	3.0	1.76	1.7
Education	8.27	10.89	2.62	0.45	5.8
Beta	94.0	102.1	8.1	1.92	4.2
Beta, Test 4	10.1	13.6	3.5	0.70	5.0
Thurstone	92.3	75.2	17.1	3.48	4.9
Bern. B1-N	-69.3	-81.9	12.6	19.3	0.7
B2-S	45.5	65.0	19.5	12.2	1.6
B4-D	56.2	60.7	4.5	14.6	0.3

Table 30.

Employed Clerical Workers

	M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	Group B	Group C			
Age	32.2	28.3	3.9	1.75	2.2
Education	7.33	10.89	3.56	0.36	9.9
Beta	91.6	102.1	10.5	2.45	4.3
Beta, Test 4	10.7	13.6	2.9	0.74	3.9
Thurstone	96.5	75.2	21.3	3.18	6.7
Bern. B1-N	-57.3	-81.9	24.6	20.6	1.2
B2-S	47.8	65.0	17.2	12.1	1.4
B4-D	56.9	60.7	3.8	14.2	0.3

Table 31.

A and C, and B and C. Group C was in respect of education, Beta Examination scores, and the Thurstone Clerical Examination scores markedly superior, the differences being statistically significant in spite of the relative smallness of the groups.

The unemployed clerical workers were derived from the several major sources, although mostly, over a period of two years, from the registration bureau for office workers. So far as could be determined their duties when employed were of the same general nature as those of the employed clerks. They differed in their experience, however, in the respect that the majority of them had been employed by much smaller business firms. The data secured for them is exhibited in relation to that for the total of the employed groups in Table 32. The most extreme difference between the employed and unemployed groups was in age, while distinct differences existed also with respect to education, clerical ability and the three traits of personality measured by the Bernreuter scales. The employed group tended to have higher scores in the Beta Examination and the Stenquist Test, but were not statistically significantly superior. No discrimination was possible with respect to interests, as measured by the Allport-Vernon Study of Values.

A further comparison of the total group of unemployed with each of the single control groups indicated that the previously exhibited differences with respect to age were provided mostly by differences between the unemployed group and groups A and B of

Comparison of Total Group of Employed and Unemployed Clerical Workers

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	E	U	E	U			
Age	129	193	30.0	26.0	4.0	0.98	4.1
Education	114	186	9.62	8.76	0.96	0.26	3.7
Beta	135	97	97.4	94.2	3.0	1.53	2.0
Beta, Test 4	135	97	12.0	10.9	1.1	0.48	2.3
Thurstone	74	81	90.0	101.6	11.6	3.74	3.1
Bern. B1-N	115	107	-74.1	-42.9	31.2	10.90	2.9
B2-S	115	107	56.9	34.9	22.0	7.25	3.0
B4-D	115	107	61.5	37.5	24.0	10.90	2.9
Stenquist	48	75	60.2	53.3	6.9	2.81	2.5
Study of Values:							
Theoretical	38	92	29.2	31.3	2.1	1.25	1.7
Economic	38	92	32.2	33.1	0.9	1.42	0.6
Aesthetic	38	92	25.1	22.6	2.5	1.66	1.5
Social	38	92	30.8	29.9	0.9	1.14	0.8
Political	38	92	32.7	32.5	0.2	1.43	0.1
Religious	38	92	30.3	30.9	0.6	1.76	0.3

Table 32.

Comparison of Group A of Employed and Total Group of Unemployed Clerical Workers

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	E	U	E	U			
Age	25	193	31.3	26.0	5.3	1.75	3.0
Education	11	186	8.27	8.76	0.49	0.41	1.2
Beta	29	97	94.0	94.2	0.2	1.79	0.1
Beta, Test 4	29	97	10.1	10.9	0.8	0.71	1.1
Thurstone	23	81	92.3	101.6	9.3	3.76	2.5
Bern. B1-N	28	107	-69.3	-42.9	26.4	18.26	1.4
B2-S	28	107	45.5	34.9	10.6	11.54	0.9
B4-D	28	107	56.2	37.5	18.7	14.08	1.3

Table 33.

Comparison of Group B of Employed and Total Group of Unemployed Clerical Workers

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	E	U	E	U			
Age	36	193	32.2	26.0	6.2	1.73	3.6
Education	36	186	7.33	8.76	1.43	0.31	4.6
Beta	38	97	91.6	94.2	2.6	2.34	1.1
Beta, Test 4	38	97	10.7	10.9	0.2	0.75	0.3
Thurstone	33	81	96.5	101.6	5.1	3.48	1.5
Bern. B1-N	22	107	-51.3	-42.9	14.4	20.57	0.7
B2-S	22	107	47.8	34.9	12.9	11.43	1.1
B4-D	22	107	56.9	37.5	19.4	13.77	1.4

Table 34.

Comparison of Group C of Employed and Total Group of Unemployed Clerical Workers

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	E	U	E	U			
Age	68	193	28.3	26.0	2.3	1.03	2.2
Education	67	186	10.89	8.76	2.13	0.26	8.2
Beta	68	97	102.1	94.2	7.9	1.79	4.4
Beta; Test 4	68	97	13.6	10.9	2.7	0.50	5.4
Thurstone	18	81	75.2	101.6	26.4	3.82	6.9
Bern. B1-N	65	107	-81.9	-42.9	39.0	11.65	3.4
B2-S	65	107	65.0	34.9	30.1	8.46	3.6
B4-D	65	107	60.7	37.5	23.2	9.26	2.5

Table 35.

employed, and with respect to education, by those between the unemployed and groups B and C. Most of the other differences were supported by Group C of employed clerks (determined previously to be superior to Groups A and B), who had higher Beta and Thurstone scores, and displayed more emotional stability and self-sufficiency. These data are shown in Tables 33-35.

Since all of the employed workers tended to be somewhat older than the unemployed clerks, it was decided to make further comparisons taking age into account. All the individuals composing both groups that were 20 years of age or younger were eliminated. This depleted the employed group by only four, but diminished the unemployed by 63, those under 21 years having formed almost a third of the original group. There still remained an average difference of 0.5 years (Table 36), but this was of no significance. Apart from this, the actual differences previously observed remained almost constant, while those for the Beta Examination increased to a point of significance. Owing however to the fact that the populations had been reduced, certain of the differences, as for the Thurstone Clerical Examination, lost their significance.

Beyond this, a division of the two groups, employed and unemployed, according as they were aged 30 and under, and 31 and over, laid the basis for further intercomparisons, which are exhibited in Tables 37 and 38. The employed differed significantly only with respect to age (the basis of the division), while the only probable (but not certain)difference for unemployed was as regards

Comparison of Employed and Unemployed Clerks Aged 21 Years and Over

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	E	U	E	U			
Age	125	130	30.5	30.0	0.5	1.09	0.5
Education	109	122	9.67	8.75	0.92	0.29	3.2
Beta	123	64	98.1	91.7	6.4	1.88	3.4
Beta, Test 4	123	64	12.3	10.7	1.6	0.54	3.0
Thurstone	70	52	90.0	99.3	9.3	4.16	2.2
Bern. B1-N	111	71	-72.7	-40.8	31.9	12.54	2.5
B2-S	111	71	57.2	27.9	29.3	8.02	3.7
B4-D	111	71	59.7	33.5	26.2	9.25	2.8
Study of Values:							
Theoretical	37	52	29.3	30.5	1.2	1.39	0.9
Economic	37	52	32.1	32.7	0.6	1.62	0.4
Aesthetic	37	52	25.3	23.3	2.0	1.85	0.1
Social	37	52	31.1	30.6	0.5	1.26	0.4
Political	37	52	32.5	33.1	0.6	1.58	0.4
Religious	37	52	29.9	30.1	0.2	1.78	0.1

Table 36.

omparison of Age-Groups of Employed and Unemployed Clerical Workers

Ages (A) 30 and under, and (B) 31 and over

Employed Clerical Workers

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	(A)	(B)	(A)	(B)			
Education	72	41	10.03	8.73	1.30	0.44	3.0
Beta	79	48	98.3	95.9	2.4	2.19	1.1
Beta, Test 4	79	48	12.0	12.3	0.3	0.68	0.4
Thurstone	42	31	87.8	93.0	5.2	5.00	1.0
Bern. B1-N	68	44	-72.9	-73.8	0.9	15.19	0.1
B2-S	68	44	49.9	67.1	17.2	9.90	1.7
B4-D	68	44	61.3	63.1	1.8	11.50	0.2

Unemployed Clerical Workers

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	(A)	(B)	(A)	(B)			
Education	82	40	8.87	8.53	0.34	0.37	0.9
Beta	36	28	94.4	88.4	6.0	3.23	1.9
Beta, Test 4	36	28	11.6	9.6	2.0	0.87	2.3
Thurstone	34	18	96.5	104.7	8.2	7.62	1.0
Bern. B1-N	47	24	-43.9	-34.9	9.0	20.75	0.4
B2-S	47	24	33.3	20.3	13.0	12.50	1.0
B4-D	47	24	34.9	30.7	4.2	13.95	0.3

Table 37.

Comparison of Employed and Unemployed Clerical Workers, by Age Groups

Ages (A) 30 and under, and (B) 31 and over.

(A)

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	E	U	E	U			
Education	72	82	10.03	8.87	1.16	0,36	3.2
Beta	79	36	98.3	94.4	3.7	2.11	1.8
Beta, Test 4	79	36	12.0	11.6	0.4	0.65	0.6
Thurstone	42	34	87.8	96.5	8.7	4.84	1.8
Bern. B1-N	68	47	-72.9	-43.9	29.0	15.72	1.8
B2-S	68	47	49.9	33.3	16.6	10.07	1.6
B4-D	68	47	61.3	34.9	26.4	11.95	2.2

(B)

	N		M		Diff.	$\sigma_{Diff.}$	$\frac{Diff.}{\sigma_{Diff.}}$
	E	U	E	U			
Education	41	40	8.73	8.53	0.20	0.45	0.4
Beta	48	28	95.9	88.4	7.5	3.29	2.3
Beta, Test 4	48	28	12.3	9.6	2.7	0.90	3.0
Thurstone	31	18	93.0	104.7	11.7	7.72	1.5
Bern. B1-N	44	24	-73.8	-34.9	38.9	20.35	1.9
B2-S	44	24	67.1	20.3	46.8	12.35	3.8
B4-D	44	24	63.1	30.7	32.4	13.55	2.4

Table 38.

score on Test 4 of Beta Examination. Separate treatment of the employed and unemployed by these age divisions revealed the fact that while for the most part there had been brought about no great change in absolute differences between employed and unemployed groups, certain of these were rendered less reliable by reason of the diminished populations. For those 30 and under, education stood out as the sharpest basis of differentiation, those unemployed having an average of 8.9 grades of schooling, and those employed, 10.0. On the other hand, for those 31 and over, no distinction could be made on this point, which would tend to indicate that up to a period of some two decades ago the education of those at the present time distinguished with respect to economic status was undifferentiated, at least so far as amount of schooling was concerned. The employed and unemployed of this age-group were likewise to be discriminated on the average on the basis of scores on Test 4 of Beta, and probably also, for the entire test score. Apparently as well the employed were considerably more 'self-sufficient' (Bernreuter B2-S scale).

It will be observed from scrutiny of the above-presented tables that for the most part differentiation with respect to age of the employed and unemployed groups did not result in abolition of any of the absolute differences in the various test variables, but it did materially diminish their statistical significance by increasing the probable errors of the differences. If one disregards this for the moment, however, and attends only to the

absolute differences and their change with age, certain generalizations of some import may be made. It may be said that for younger groups of clerical workers education in terms of grades completed furnishes a fair average basis for distinction, but that this becomes decreasingly important with age. This, however, may be a purely contemporary distinction, as it may rest upon differences in relative opportunity for schooling at different periods. Differences in intelligence test scores, on the other hand, become increasingly diagnostic as age advances. This would indeed tend to support the observation that not mere age alone, or relatively lower intelligence, but rather the two coupled together, tend to result in the contemporary distinction of employed and unemployed. Differences in clerical ability seem also to be slightly more marked for older groups, and are in general diagnostic for a total group regardless of age. The most important divergence, however, is as regards 'self-sufficiency', in respect of which those employed show an increase with age, and those unemployed, a decrease, so that the difference for employed and unemployed in this trait, although originally of no statistical significance, finally becomes completely reliable. The four significant variables are, then, education (for younger groups), intelligence (for older groups), clerical ability and 'self-sufficiency'. It would seem probable also that these differences would have been even greater if an unemployed group more nearly a typical sample of its source (that is, older) had been obtained.

Chapter Thirteen: The Relation Of Taussig Occupational Grades to Test Scores

Owing to the fact that there was not on hand a sufficient number of cases to make possible a complete study of separate occupations in terms of test scores, it was decided as a measure preliminary to this to group the cases according to the Taussig occupational classification, and to treat the test scores through the medium of these grades. The original classification suggested by Taussig contained five such grades, and this was held to in the main, except that a further subdivision was made of the second grade, to include three classes of occupations, namely:

(1) Technical (draftsmen, industrial chemists, lower grade engineers, etc.),
(2) Clerical (accountants, book-keepers, clerks, etc.), and
(3) Salesmen and sales-clerks, investigators, etc.

The final classification thus stood as follows:

A - Professional (higher) and executive
B1 - Technical
B2 - Clerical
B3 - Sales
C - Skilled (machinists, mechanics, carpenters, plumbers)
D - Semi-skilled (hospital orderlies, shippers, servants)
E - Unskilled (farm helpers, laborers).

The populations, means and standard deviations for age, education and test scores are presented for these occupational

Taussig Grade 'A'

	N	M	S.D.
Age	16	39.5	9.5
Education	14	14.14	1.64
Otis	13	47.7	11.9
Beta	7	97.3	19.4
Beta, Test 4	7	13.3	3.7
Thurstone	6	93.0	22.6
New Stanford	15	111.3	14.1
Stenquist	7	66.3	7.7
Bernreuter B1-N	7	-34.4	91.0
B2-S	7	69.1	25.0
B4-D	7	51.3	69.3

Table 39.

Taussig Grade 'B'

	B1			B2			B3		
	N	M	S.D.	N	M	S.D.	N	M	S.D.
Age	59	32.0	9.3	325	29.1	11.0	57	34.3	9.5
Education	55	9.96	3.07	304	8.81	2.0	50	8.76	2.75
Otis	49	45.1	11.0	273	43.8	10.7	49	41.4	11.0
Beta	18	98.0	10.8	155	93.0	13.2	22	83.7	17.2
Beta, Test 4	18	13.5	2.3	155	10.9	3.5	22	10.3	3.8
Thurstone	18	97.7	10.1	122	103.8	13.6	19	106.7	15.7
New Stanford	50	111.3	8.8	179	106.7	9.4	37	102.6	14.3
Stenquist	15	71.3	12.2	116	53.2	16.9	17	54.8	14.7
Bern. B1-N	26	-34.2	97.3	170	-49.3	85.8	26	-66.8	79.0
B2-S	26	33.2	60.0	170	39.2	54.8	26	69.7	56.5
B4-D	26	51.4	63.5	170	40.1	61.8	26	69.7	71.3
O'Connor* Blocks	8	2.80	1.25	58	4.75	2.40	10	3.75	1.18

Table 40.

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* For M and S.D., read Median and Q.

Taussig Grades 'C', 'D' and 'E'.

	'C'			'D'			'E'		
	N	M	S.D.	N	M	S.D.	N	M	S.D.
Age	275	34.5	11.1	311	33.8	11.2	416	34.0	11.5
Education	168	7.20	2.05	182	6.68	2.08	98	5.28	2.42
Otis	56	38.7	12.6	51	33.3	11.3	5	37.0	11.6
Beta	218	79.1	17.2	242	73.9	19.1	365	62.0	21.5
Beta, Test 4	218	9.9	3.6	242	8.5	3.8	365	7.2	3.8
Thurstone	50	133.1	33.5	40	162.9	58.5			
New Stanford	84	98.7	16.1	102	91.8	18.0	40	78.9	22.0
Stenquist	102	61.0	16.5	108	53.3	19.4	124	44.0	19.2
Bern. B1-N	40	-49.3	83.0	41	-31.9	76.0			
B2-S	40	44.5	58.5	41	39.5	54.0			
B4-D	40	38.9	60.5	41	31.5	62.8			
O'Connor* Blocks	61	2.50	1.60	49	4.75	1.80	77	3.90	1.76

Table 41.

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* For M and S.D., read Median and Q.

Summary of Taussig Grade Data

	Mean						
	A	B1	B2	B3	C	D	E
Age	39.5	32.0	29.1	34.3	34.5	33.8	34.0
Education	14.14	9.96	8.81	8.76	7.20	6.68	5.28
Otis	47.7	45.1	43.8	41.4	38.7	33.3	
Beta	97.3	98.0	93.0	83.7	79.1	73.9	62.0
Beta, Test 4	13.3	13.5	10.9	10.3	9.9	8.5	7.2
Thurstone	93.0	97.7	103.8	106.7	133.1	162.9	
New Stanford	111.3	111.3	106.7	102.6	98.7	91.8	
Bern. B1-N	-34.4	-34.2	-49.3	-66.8	-49.3	-31.9	
B2-S	69.1	33.2	39.2	69.7	44.5	39.5	
B4-D	51.3	51.4	40.1	69.7	38.9	31.5	
Stenquist	66.3	71.3	53.2	54.8	61.0	53.3	44.0
O'Connor* Blocks		2.80	4.75	3.75	2.50	4.75	3.90

Table 42.

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* For Mean, read Median.

grades in Tables 39-41, and a summary of the means in Table 42. It will be noted that in each case the spread of scores is fairly great, so that there exists a great deal of overlapping between adjacent grades. The extent to which some of the differences may be considered as being reliable is indicated in Table 43, where the significance of the differences between the means for adjacent grades is shown.

A general survey of the trends of scores for the seven occupational grades reveals the following facts:

1. Age cannot be held wholly responsible for any downward trend of test scores, since age does not follow any consistent trend with respect to the grades of occupations.
2. The standard of education attained declines constantly with the grade of occupation, from a mean of 14.14 (third year college or university) to 5.28 (grade five, Quebec system). These differences are for the most part wholly reliable, in the light of their standard errors. There is no significant difference between B2 and B3 in this respect, but B1 appears to have a probably significant advantage over B2 and B3.
3. The trend of Otis scores takes the same direction. These differences are probable, however, rather than completely reliable.
4. The mean scores for Beta total and Beta, Test 4, decline in the same manner with the grade. Grade A seems to have no significant superiority over Grade B in this respect, nor does Grade B3 over Grade C. Most of the other differences, however, are completely reliable.

Table of Ratio of Absolute Difference Between Mean Scores to Standard Error of the Difference, for Taussig Grades.

	AB_1	AB_2	AB_3	B_1B_2	B_1B_3	B_2B_3	B_1C	B_2C	B_3C	C-D	D-E
Age	2.8	4.2	1.9	2.2	1.3	3.7	1.7	5.9	0.1	0.8	0.2
Education	7.0	11.6	9.1	2.7	2.1	0.0	6.3	8.0	3.7	2.4	5.0
Otis	0.7	1.2	1.7	0.7	1.7	1.3	2.8	2.8	1.2	2.3	-
Beta	0.1	0.6	1.7	1.8	3.2	2.4	6.8	8.9	1.2	3.1	7.2
Beta, Test 4	0.1	1.7	1.9	4.2	3.3	0.7	6.0	2.7	0.5	4.0	411
Thurstone	0.5	1.2	1.4	1.9	2.1	0.8	6.7	6.0	4.4	2.9	-
New Stanford	0.0	1.2	2.0	3.2	3.3	1.7	5.9	4.2	1.3	2.8	3.3
Stenquist	1.2	4.0	2.5	5.1	3.5	0.4	2.9	3.5	1.4	3.1	3.7
Bern. B1-N	0.0	0.4	0.9	0.8	1.4	1.1	0.7	0.0	0.9	1.0	-
B2-S	2.4	2.8	0.1	0.5	2.3	2.6	0.8	0.5	1.8	0.4	-
B4-D	0.0	0.4	0.6	0.8	1.0	2.0	0.8	0.1	1.8	0.5	-
O'Connor* Blocks	-	-	-	2.9	1.3	1.6	0.5	4.8	2.3	5.5	2.1

Table 43.

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* For Mean Score and Standard Error of the Difference, read Median Score and Probable Error of the Difference.

5. The mean scores for the Thurstone Clerical Examination increase steadily from Grade A to Grade E (that is, clerical ability diminishes). There are no significant differences for the three B-grade groups, however, and Grade B1 actually exhibits a lower mean score than Grade B2. Grade A is not reliably superior to any of the B-grade groups in this respect.

6. School achievement (New Stanford Test), while following the same general trend for occupational grades as education, does not show exactly the same rank-prder relationship. In this instance Grade A, although considerably higher than any of the other groups in educational attainment, shows no superiority to Grade B1 in contemporary educational achievement. For this there are two probable causes: the New Stanford test becomes inelastic at its upper extreme, as it is recommended for use only up to grade nine (American system), and the individuals composing the Grade A group were for the most part University-trained engineers, most of whose latter years of schooling had gone to purely technical study. The differences for most of the other grade-comparisons are three or more times their standard error.

7. No entirely significant differences are exhibited for any of the Bernreuter scales. As was expected (this being, in fact, one of the major reasons for the division of B-grade), Group B3 appeared to include individuals more emotionally stable and more dominant (B4-D scale) than any of the others. In view of the paucity of cases, however (26 for B3) these differences cannot be held to be entirely reliable. Groups A and B3 appeared under the same

conditions to be more 'self-sufficient' than the other groups. 8. The trend of average Stenquist Test scores reflected the apparently dual relationship that it bears to general intelligence and mechanical ability: there was a general tendency to decline with occupational grade, with the lowest mean score (44.0) at Grade E. At the same time, however, the average test scores of those groups which included individuals habitually doing technical or mechanical work were significantly higher than the mean scores of the other groups not distinguished in this way. Most of the differences were completely, or nearly completely, reliable. 9. A quite interesting arrangement of median scores was found for the O'Connor Blocks test. Grades B2 and D had a class C (4.01-6.00) median of 4.75, and Grades B3 and E slightly lower (that is, better) median scores of 3.75 and 3.90. Grades B1 and C, that is, those occupational grades which one would classify as mechanical or technical, had still better median scores of 2.80 and 2.50, both of which are in or near the Class A quartile division that O'Connor cites, and well below O'Connor's critical score of 4.00. These distinctions are largely probable, and in two cases are beyond doubt.

On the whole, therefore, it may be said that the Taussig occupational classification agrees fairly well with test score trends and differences, although with considerable overlapping from group to group. It is probable that certain distinctions or their lack might be brought out more clearly or rendered statistically more reliable had a larger number of cases been at

hand. Furthermore, it is probable that in a number of cases there existed some error with respect to the actual occupation of the individual, or with respect to the consistency of its classification. Finally, since it is not expected that there exists an ideal adjustment between the job and its occupant's capabilities, since still less would one expect to find this so among a group of unemployed men, and since the reliability of the tests themselves is not taken into account, one would judge that the real relationship is somewhat attenuated here. In spite of these disadvantages and inadequacies, however, it may be concluded that for a range of occupations such as these there is a steadily descending intelligence-level in parallel with occupational grade. This holds true also for education and educational achievement. Mechanical ability, on the other hand, while slightly correlated with intelligence in this respect, appears to be most particularly inherent in the holders of occupations either technical or mechanical. Clerical ability follows in rough fashion the general order of intelligence, and appears not by any means to be the sole property of a peculiarly clerical group of workers. This is true to the extent that one tends to doubt whether it is little more or less (at least so far as the Thurstone Clerical Examination goes) than somewhat attenuated general intelligence.* Possible

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* Cf. Anderson, R.M., The Measurement of Clerical Ability Pers. J. 8 (I929) 232-244.

personality differences for occupational groups require verification with a larger number of cases, but it seems probable that salesmen and sales clerks tend to be more emotionally stable and more dominant than other groups, which display less differentiation.

Chapter Fourteen: Summary and General Conclusions.

In summary it may be said that this project originally arose as a preliminary investigation into the general character and industrial quality of Montreal unemployed men, and as an enquiry into the possibilities of definition of occupational traits by means of psychological tests. Groups of unemployed men from several sources were tested, and were found to include individuals whose measured qualities were dispersed over a very wide range of ability. Owing to the heterogeneity of the groups secured, and because they displayed differences in the extent to which they formed accurate samples of their sources, it was impossible to combine the distributions of scores of these several groups and to make direct estimates of their relationship to the general population, but it seemed probable that there were present many persons of well above average ability, whose re-assimilation into industry would present in all probability no particular difficulty, there was on the whole a greater degree of general mental inferiority and of mental defect thanmay be expected to exist among the population as a whole. It is to be inferred from this finding that a special problem may exist in the rehabilitation of an appreciable number of the contemporary group of unemployed, inasmuch as their general ability level is extremely low and undifferentiated.

In the further study of the characteristics of unemployed groups, it was found both by the correlation method and by direct comparison that age varied very definitely in an inverse manner

with recency of employment and with general mental alertness. Other test scores appeared to vary negatively with age, but to a less appreciable degree. It seemed initially also that test scores showed the same negative relationship to recency of employment, but on further treatment of certain of the data in such a way as to hold age constant for the groups unemployed for a longer and for a shorter period, the original differences related to recency of employment disappeared. Furthermore, no significant relationship could be found between the date of registration of individuals composing two of the unemployed groups and education or test scores.

The comparison of those men that formed one group that were receiving relief assistance with those receiving no aid from this source resulted in the finding that the former group were significantly older and possessed lower test scores, but displayed no difference as regards education attained. It seemed probable also that they differed in one aspect of personality, the relief group being more 'self-sufficient'. To this seemingly anomalous difference no interpretation could be attached.

The comparison of unemployed men by general categories of countries of birth indicated that although there existed significant differences in isolated instances, these were sometimes of a contradictory nature for different groups and in general presented no well-defined trend. It appeared unprofitable, therefore, for the purposes of the moment, to explore further such differences as existed.

The study of the relationship of the Barr intelligence and mechanical ability scales to test scores and of the interrelationships of the tests themselves indicated that the Barr intelligence scale correlated fairly well with Beta Examination; while the Barr mechanical ability scale displayed a predominantly curvilinear relationship to the intelligence scale and to Beta total, Test 4 of Beta, and the Stenquist test, owing primarily to the fact that Barr mechanical ability ratings of 2.00 or above correlated positively with the other variables, and those below 2.00, negatively. Otis, Beta, the New Stanford and the Thurstone tests intercorrelated rather highly, and appeared to measure very largely the same general factor, while the New Stanford test correlated more highly with general intelligence than with formal educational attainment. Doubt was cast upon the extent to which mechanical ability tests of the form board type measured mechanical ability as freed from a general intelligence factor, the relationship of the form board test to general intelligence being as high as or higher than the relationship of the former to its criterion.

A joint study of employed and unemployed clerical workers showed that for these groups there were significant although not extreme differences. The employed workers tended to be older, better educated, to have more clerical ability, and to be more stable emotionally, more self-sufficient and more dominant. When each group was divided according to those below and above age 30, the majority of significant differences disappeared, owing mainly to automatic increase in the size of the standard error of

the difference with decrease in the size of the populations. The absolute differences, however, changed little in size, but displayed in some cases a somewhat different character for the two age-groups. In the case of those under 31, education seemed to be a strong mark of differentiation between employed and unemployed groups; while for those over 30 no discrimination on this basis could be made. Conversely, intelligence differentiated employed and unemployed above age 30, but was of no significance for those 30 and under. For both age groups there appeared to be probable differences in clerical ability, emotional stability and dominance, while for those above age 30 there existed a certain difference in self-sufficiency, the employed group being markedly more self-sufficient.

Cases were not sufficient in number to permit the study of single occupations and to maintain at the same time the statistical validity of differences. The cases were therefore grouped according to the Taussig scale, with a sub-division of Taussig Grade B into three classes, technical, clerical and sales. Treatment of the data showed that formal education, general intelligence and tested educational achievement followed a consistent trend downward with occupational grade, but with much overlapping between adjacent grades. Clerical ability did not appear to be the peculiar property of the clerical group, and clerical test scores followed the same general occupational trend as intelligence, to so great an extent in fact, and with the knowledge of their usual high inter-relationship, that it was doubted whether clerical ability was being measured to any appreciable degree as a specific trait apart

from general intelligence.

It seemed probable that the sales group of Taussig Grade B was more emotionally stable and more dominant than other groups, and that the upper class technical workers were more self-sufficient than others. These measured differences in personality traits were however probable rather than entirely reliable. Mechanical ability, as measured by the Stenquist Mechanical Aptitude Test I and the O'Connor 'Wiggly Blocks' Test, varied somewhat with general intelligence as regards its inherence in members of the various occupational grades, but in the main appeared to be the property of the technical and mechanical groups.

It may be concluded that in general, with the use of tests such as were employed in the present investigation, broadly defined grades of occupations may be fairly reliably differentiated as regards measurable psychological characteristics, but with a great degree of overlapping between groups. The actual degree to which the psychological demands of these occupationsl groups may be expected to be differentiated is probably greater than the present data would show, inasmuch as this study dealt with unemployed workers, whose degree of adjustment to their work would be expected to be even less than for employed individuals. In the case of the latter, discrimination as to degree of adjustment to the demands of their work (as, for instance, by trade tests, efficiency ratings or production records) would probably serve to accentuate the degree of measured distinctness of the demands of different occupations or occupational grades.

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APPENDIX 'A'

McGILL UNIVERSITY

MONTREAL EMPLOYMENT SURVEY

N.B.—This information is not required in any way for official purposes, but only in order to understand your particular problem.

Name ..... Age ..... Date ..... 1932.

Address: No. and Street .....
District .....Age ..... years.

How long have you lived in this district? .....

PARENTS.

	Mother	Father	Number of your brothers	Number of your sisters
Country of birth	.....	.....		
Racial origin (e.g., Scottish, Jewish, etc.)	.....	.....		
Has he or she taken out naturalisation papers?	.....	.....	.....	.....

OCCUPATION(S) OF FATHER	Length of Time followed	Place in which followed
1.....	.....	.....
2.....	.....	.....
3.....	.....	.....
4.....	.....	.....

PERSON INTERVIEWED.

A. Country of birth ..... Religion .....
Racial origin ..... Married or single .....
Born in city, town or country? ..... Dependents
How long have you lived in Canada? ..... Children Other
How long have you lived in Montreal? ....
If you have lived in Montreal less than six months, what was the last place in which you lived for six months or more? .....
When did you leave this last place? .....

B. Regular Occupation .....
(Give details: if "labourer", state kind of work usually done).
If your occupation has not given you steady work over last 3 years, i.e., you have usually been unemployed for a time between jobs, put X here .....

If your employment has been part-time (i.e., regular but only part of the week) during any part of the last 12 months put X here .....

How long is it since you last worked at your Regular occupation? .....

C. EDUCATION AND TRAINING.

Age on entering regular day school ..... Last grade or standard completed

Age on leaving regular day school ..... in regular day school .....

Reason for leaving regular day school.
(Mark by X the answer(s) fitting your case, after reading complete list).

1.	To take business course	11.	Desired to be at work .....
2.	To learn a trade	12.	All your friends were working .....
3.	Illness or accident to yourself	13.	Had chance of good job .....
4.	Family moved: time lost from school	14.	Older than most of pupils in your class .....
5.	Father unemployed	15.	Lost interest in school .....
6.	Father died (or invalid)	16.	Not doing well at school .....
7.	Family needed your financial support	17.	Trouble with teacher or principal .....
8.	Parents could not afford to keep you at school longer	18.	Other reasons (specify) .....
9.	Thought further schooling not needed		
10.	Had finished school		

Educational or training institutions attended, etc.

Type of School	Name of School	Location of School	Dates of Attendance	Did you finish courses?
Elementary (Public School)				
High School				
University or College				
University Extension (evening)				
Business School or College (day)				
Business School or College (evening)				
Technical School (day)				
Technical School (evening)				
Correspondence Course				
Other types, day or evening (e.g., trades school, barber college, art school, telegraphy courses, etc.)				

What school subjects, if any, did you like best? .....

.....

If you have ever served regular apprenticeship give details:—

Trade ..... Firm .....

No. of years ..... Dates .....

D. (a) **Employments from time of leaving school TILL AGED 20**

	Occupation	Industry or Employer	How Obtained*	Duration (give dates if possible)
1				
2				
3				
4				
5				

***How obtained.** Specify according to following list:

1. School or teacher's help
2. Parents
3. Friend (s)
4. Personal search
5. Advertisements
6. Employment agency (specify)
7. Some other way (specify)

D. (b) **Occupational Experience (SINCE AGE OF 20)**

	Occupation	Industry or Employer	Where?†	Approximate Dates	Average Monthly Earnings
1					
2					
3					
4					
5					
6					

†Give city or district: If in Montreal, give street address.

Have you ever wished to enter any other occupation in the past? If so, state occupations for which you think you are fitted: .....

E. Reason for Present Unemployment.

N.B.—Mark with X the reason which best fits your case. If you think more than one reason necessary, mark the second reason by figure 2. Read them all before giving your answer.

1. Slack **month** in regular occupation .....
2. Firm reduced staff owing to **depression** .....
3. Firm **closed down** or bankrupt .....
4. Your type of labour not required owing to **new machinery or other equipment** being adopted .....
5. Discharged because **considered too old** .....
6. Displaced because **juvenile or female workers** doing work at cheaper rates .....
7. Left voluntarily to find **better-paid** work .....
8. Left voluntarily to find **more suitable** work .....
9. Left because otherwise dissatisfied with **conditions of work** .....
10. Lost job after period of **sickness** .....
11. Permanent disablement or other physical handicap (see below) .....
12. Other reason (give details) .....

Would you describe your last loss of your regular job as "discharge", "lay-off", or "left voluntarily" (D. LO, or V.)? .....

Have you had any serious illness or other bodily incapacity, which has prevented your regular employment since the age of 20?	**Nature (specify)**	**Duration (give dates)**

(IF MARRIED).

(a) How long have you been married? ..... years.

(b) Is your wife usually a wage-earner? ..... If so, at what occupation? .....

Approximate number of weeks she worked during 1931 .....Average monthly earnings **during 1931** $.....

Amount, if any, expended during the year, for any domestic help $.....

(c) Has your wife been forced to seek work **since January 1931** because of your unemployment? .....

If so, at what work? ..... part time or full time? .....

Approximate number of weeks she worked during 1931 ..... Average monthly earnings **during 1931** $.....

(d) **Children in Family.**

Age	**Sex**	**Living at Home?**	**At School**	**Left School but unemployed**	**IF AT WORK** **Occupation**	**Average Monthly Earnings**	**Years spent at school**	**Present grade, or grade at leaving**
1						$		
2						$		
3						$		
4						$		