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A study of increasing opportunities for the "special class" boy in industry.

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A STUDY OF INCREASING OPPORTUNITIES FOR THE "SPECIAL CLASS" BOY IN INDUSTRY

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by

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INTRODUCTION.

For the past three years I have accepted daily condolences from my friends and colleagues because during that period I have been the guardian, instructor and counselor of a group of retarded public school boys. Where e'r I walk, when the discussion concerns "shop", an atmosphere of gloom and pity clouds the conversation. Salutations are always identical; "You poor thing", and invariably a reference to any member of my unique class prompts a similiar note of sadness, "Too bad, what will ever become of him?"

My first impulse has been defensive, of course. Surely, there must be some justification for detaining these boys in school. They ought not be future dependents. In what are they lacking?

It seems very necessary that I start an investigation into the resources of my charges with a hope of determining the possibility of their future success, as compared to that of their more normal associates. Results of laboratory testing places these sixteen year old boys at about a 72 I. Q. level, which classification brands them "dull". A fallacy therein in my judgment is that these have been mostly literate tests administered to boys whose handicaps are reading, writing and abstract thinking.

My own ordinary life experiences, including nineteen years of teaching, have acquainted me with the general requirements for, and the methods of attaining, citizenship. Association with employment managers for a number of years has kept me informed in the current demands of labor, skilled and unskilled. Therefore, with science supplementing common sense, I am analyzing this group with a view towards allocating them in the thoughts of their families and acquaintances from future dependents to independent, reputable citizens.

My efforts are in search of industrial employment for these mentally retarded boys who are friendly, responsive and adaptable to simple work, where size, strength and hand control would be assets.

I hope, in the course of this thesis to show, not only does industry not need persons with high literate ability to perform un-skilled and many of their skilled jobs today, but that the employment of persons possessed of the above characteristics would be more profitable.

The rapid advance of the automatic machine, the high cost of labor turnover and the nature of "mentally retarded" people would seem to favorably support my theories.

There is no question that a person classed as dull or deficient (from a literate standpoint) must seek employment

along industrial lines.

A child is fundamentally a motor being and through movement satisfies a biological need. Movements of hand and lips enable him to explore objects.

Experience shows that the mentally deficient are benefitted more by occupational training than by literary instruction. Hence my endeavors will be confined strictly within the field of industry.

REVIEW OF OTHER STUDIES.

One of the most thorough surveys written up in recent years is the one done by the University of Minnesota in 1931, (Occupations- June, 1934. Vol. 12---C. H. Koepke.)

This included a job analysis study of factories in Minnesota, industrial conditions, and their effects on employment. Such trades as printing, machinist, woodwork, metal work, stone, chemical, carpentering, painting etc. were investigated. The research was carried on by mechanical engineers acquainted with factory methods, among eighty-eight firms and representing thirty-three industries. They classified the operations found in the manufacture of various articles on machines; the type of worker able to perform such, satisfactorily; the type of machine used, and the amount of training required.

Some of the pertinent things discovered which have a bearing on my present interest are found in the following, taken from that study;

The automaticity of a machine helps to determine the degree of skill required from its operator.

The division of a great many industrial operations into small units has not only caused a shortening on time necessary to train a worker, but has also effected the qualifications a worker must have for a factory job.

That of all the operations surveyed twenty-two per cent

required a training time of less than one-half a month for their satisfactory performance; thirty-three per cent required from one-half to two months- seventeen per cent from three to nine months; sixteen per cent from ten months to two years, eight per cent from two to four years, and four per cent four years or more. If we add the first three percentages we find that seventy-two per cent of the total number of operations required a training time of less than nine months.

Trades such as printing, photoengraving, some forms of woodwork, stone, and metal work still require from one to four years apprenticeship. These, however, used to require from four to seven years of all employed in these trades, but today, long apprenticeships in the above effect only twenty-two per cent.

Industry does not want to be dependent upon trades and is constantly devising schemes for the elimination of them.

The job of the production worker or machine tender does not change with the material or the machine with which the worker deals; rather it changes with the type of skill necessary for an operation.

Seventy-five per cent of the machine set-ups in all operations were classified as being so simple that workers in the factories needed to know little about tools or machinery.

In ninety per cent of the operations no gauge, micrometer, or scale was required. The machine, not the operator, was responsible for the necessary accuracy.

Some interesting facts were reviewed in a report, The Articulation of School and Industry, by C. A. Reed, Superintendent of Schools in Minneapolis, Minn. (survey reported in Vocational Guidance Magazine, October issue, 1931.)

It calls attention to the rapidity with which capital is displacing brains through the organization of chain stores, chain banking, law firms etc. Such systems employ a few at the top who designate policies and lay out cut and dried methods for job holders. The report stressed the concern of industry toward health, safety and periodic health examinations and indicated that the schools should emphasize this phase of education more.

Too much time spent on vocational skills for those heading into industry, at an early age, seems to be the expression. This contention is argued by the fact that seventy-five per cent of the Junior High school withdrawals were in jobs which required approximately one week to learn. This study showed that dull pupils were more successful in industry than in school.

Mr. Harold P. Thomas, former head of Guidance and Research in the Springfield public schools, made a study of retarded boys found in auxiliary classes in that city. In his study

eighty-eight boys were traced through 211 jobs. The following facts were disclosed, in "The Employment History of Auxiliary Pupils," filed in the office of the Springfield Public Schools written by Mr. Thomas and printed in Vocational Guidance Magazine, 1929, Vol. Vll, pp. 245-250. Nine of the eighty-eight boys accounted for over twenty-six per cent of the 211 jobs held by the boys. Over one-third of these boys had held but one job. The boys averaged eleven months of idleness to every ten of work. The longest idle period was preceding the first job. Jobs held for six months or less accounted for seventy-nine per cent of all jobs held by the boys.

Kinds of Employment

Type of work	Boys
Factory	84
Errand	26
Store	11
Office	6
Laborer	11
Shoe Shine	10
Truck Helper	13
Garage	7
Bowling Alleys	6
Machine Helper	7
Miscellaneous	30
Total Number of jobs	211

That this survey was finished in 1928 might indicate conditions not comparable to our present date. However, there are some significant facts which seem encouraging toward the future employment of this type of boy. The unskilled and labor-

jobs, they have always had, and due to the nature of this work, being streuous and monotonous, the low-literate person will always be preferable. Along with this, eighty-four boys or over thirty-nine per cent were found in factories at a time when no previous training in school was being given to special classes. Since 1928 these same factories have broken their operations into smaller, more simple units and public schools, since 1935 in Springfield, have been offering special industrial arts opportunities for the development of dexterity and hand skills to their "Special Class" pupils, who are in the same classification as the group investigated by Mr. Thomas.

As I have been repeatedly informed by employment managers in industry that higher mentalities are not content in monotonous situations, and the tendency seems to be in the direction of repetitive operations, it would appear that opportunities should increase in industry for this mentally retarded group.

The distribution of the Army Alpha test given during the World War has been revised and reproduced by Fryer, Douglas, Vocational Self-Guidance--Lippincott, 1925. Printed in chart form in Occupation magazine, June 1934, pp. 56-57. This chart attempts to show the relation between intelligence levels and general, occupational and educational achievement.

The intelligence groups have been divided into the following eight different classifications;

a. very superior	18 up-mental age
b. superior	16.5 to 17.9 mental age
c. high average	15.0 to 16.4 " "
c. average	13.0 to 14.9 " "
c- low average	11.0 to 12.9 " "
d. inferior	9.5 to 9.4 " "
d- very inferior	7.0 to 9.4 " "
e. useless	0.0 to 6.9 " "

Being concerned at present with the classifications which apply to my own group, I have checked their mental ages as estimated by our school department laboratory and find a range from 8.6 to 12.9. According to Fryer's chart this would include the low average, inferior, and very inferior. Chart #__1__ suggests occupations available for this group.

On the basis of actual occupations followed by boys who have left the retarded class, I am inclined to add a few jobs found under Class "C" (average), mental age 13.0 to 14.9. The following would be within the abilities of many "special class" boys: concrete worker, auto truck chauffer, bricklayer, barber, cobbler, and lathe hand (production).

Chart # 1.

CORRESPONDING INTELLIGENCE - ACHIEVEMENT VALUES

********** ACHIEVEMENT LEVELS **********	Intelligence Groups	C- Low Average 11.0 to 12.9 Mental Age	D Inferior 9.5 to 10.9 Mental Age	D- Very inferior 7.0 to 9.4 Mental Age
	GENERAL	Intelligence for some skilled routine work Semi-skilled and low-skilled occupational level	Intelligence for simple routine work only Requires unusual amount of supervision; unable to understand written directions Unskilled occupational level	Intelligence for very simple routine work only Lacks self direction entirely Lowest unskilled occupational level
	EDUCATIONAL	Ability rarely sufficient for elementary school graduation	Ability limited so that individual usually drops out of elementary school before fifth grade	Ability limited so that individual is rarely capable of advancement beyond third grade elementary school
	OCCUPATIONAL (EXPECTED SUCCESS AS)	Hospital attendant Mason Lumberman Watchman Shoemaker Sailor Structural steel worker Canvas worker Leather worker Packer Fireman (Stationary) Porter Textile worker Sheet metal worker Laborer (Construction) Domestic servant Laborer (Factory)	Fisherman Laborer (Unskilled) Loader Lifter	Laborer (Simplest work)

HISTORY and GROWTH of RETARDED GROUP.

The early school set its rate of learning according to the speed which the average child could attain. Under this system, a child was expected to move at least as fast as this imaginary average pupil. After years of concern over classroom clogging by the number of pupils repeating grades, the schools, of necessity, began setting up and experimenting with various types of tests with a hope of culling out those incapable of "keeping up with the parade."

As early as 1898, the first "special class" was formed in the Springfield, Massachusetts, public schools, under the direction of Miss Frances Cheney. This was followed two years later by one in Worcester, Massachusetts. From then on the idea of segragating the extremely low mentally, in public education, spread throughout the state. Most of the pupils selected were border line cases, those just a step outside the institution. Through increased emigration, greatly involved industrial and business conditions, and enactment of child labor laws, society became more complex. Soon it was realized that a more universal and definite policy must be established to care not only for the feeble-minded but the dull as well.

In 1919, the Massachusetts General Court enacted the following legislation regarding the establishment of retarded classes in the schools of the state:

Chap. 71...Sec.46... The school committee of every town shall annually ascertain, under regulations prescribed by the department of mental diseases, the number of children three years or more retarded in mental development in attendance upon its public schools, or of school age and resident therein. At the beginning of each school year, the committee of every town where there are ten or more of such children shall establish special classes for their instruction according to their mental attainments, under regulations prescribed by the department. A child appearing to be mentally retarded in any less degree may, upon request of the superintendent of schools of the town where he attends school, be examined under such regulations as may be prescribed by the department of mental diseases.

Purposes of State Law. (as published in "Manual on Regulations" under direction of the Departments of Education and Mental Diseases).

The fundamental purposes of the law are: (1) to discover those children of school age who are so retarded in mental development that they can derive but little benefit from the regular academic work of the schools; (2) to provide for those children a practical type of training and supervision which will enable them, so far as possible, to become self-supporting members of society; and (3) to make possible the study of children who show lesser degrees of retardation, but who are no less in need of advice and guidance.

The rapid and consistant growth of "special classes" in the state warrants attention. The following figures, taken from state reports indicate the rise in enrollment throughout Massachusetts in a recent five year period:

In 1932, 398 classes enrolled 6,523 pupils under 404 teachers.

In 1934, 554 classes enrolled 8,840 pupils under 558 teachers.

In 1937, 608 classes enrolled 9,974 pupils under 608 teachers.

A gain of over 52% during a period in which every other phase of public education is at its peak or on a decline should be sufficient justification for a careful study of this problem.

NATURE OF BOYS CONSIDERED IN STUDY.

(Taken from records of Springfield Public Schools)

A study of records within a unit of 94 "special class" boys disclosed the following facts, some of which likely contributed to their retardation:

Physical Defects,

of 94 cases 27 had defective sight
" " " 18 " " " hearing
" " " 51 " teeth in need of attention
" " " 19 " infected teeth extracted at school clinic
" " " 9 " enlarged tonsils
" " " 45 " had tonsils and adenoids removed.

During the year 1938, " at which time a cafeteria was opened in the Chestnut Street School to be supported by Federal funds,) of 58 cases in one unit, 14 were pronounced, by the school physician, as being undernourished and allowed to eat luncheons prepared under the supervision of this Federal Project. Two boys were given breakfasts as well.

A study of thirty boys recently transferred to the Junior High School "special class" showed the average number of children in their homes, to be supported, was 4.16 per family; thirteen of the thirty families were dependent for support on some form of city or federal relief and ten of the thirty boys were regarded as undernourished and assigned to the federal

nutrition cafeteria for noonday luncheons.

The large majority of so-called retarded boys found in the public schools today, if they are able to reach the average sixth grade, (these are the types in whom I am interested,) have enough capacity not only to get along as respected citizens but are able to attain success in many trades or vocations in which they seem to possess certain aptitudes. A correlation between academic and industrial arts subjects will tend to enhance their literary ability. Such boys are potentially capable of self-support and self-management.

Among the causes for retardation as found in these groups are: Physical Defects, such as malnutrition, obstructed breathing or infectious conditions and Mental Backwardness caused by a certain amount of deficiency in the cellular tissue of the brain, lack of cultural environment, absence from school and frequent transfers.

Adequate instruction will tend to erase backwardness caused by educational or social neglect. Backwardness caused by physical defects may sometimes be restored to normality by improvement of the physical condition, necessary remedies and corrective exercises. Even the strictly mentally deficient boy, while not able to be restored to normalcy may have his behavior conditioned through habit, trained for certain routine forms of employment and made a reasonable success.

THE SCOPE OF THIS STUDY.

The basis of my experiments, judgments, and predictions deal directly with boys who are or have recently been under my care. However, my interests are toward all boys included in the "special classes" of the Springfield Public Schools, especially those above fourteen years of age. (These aretthe boys old enough to be found in the junior high school "special classes"). This would add about sixty more persons who ought to gain from an investigation such as this, at the present time.

As my personal contacts are among outstanding "key" shpos in this Connecticut Valley district, the accumulated information should be of definite local value.

I am also mindful of the general department of our trade school which is established on a system of short unit courses. In these courses an attempt is made to develop proficiency in small operations. I hope that within this report may be found information which might aid in the establishment of a policy or the adjustment of the trade school general department curriculum. My present opinion would favor the encouragment of this department for the "masses" of the trade school, reserving the definite trade courses for those gifted with a higher inborn intelligence and craftsmanship.

I have tried to broaden the scope of this investigation by consulting outside industries and studying reports of their findings, where an earnest endeavor has been made, in labor relations.

RELATION OF PHYSICAL EDUCATION PROGRAM TO THIS STUDY.

Recalling the objectives of secondary education as outlinded by the Committee on the Reorganization of Secondary Education, Education Bulletin (1918), # 35, pp. 11-15, it is interesting to note that of these cardinal principles, health appears first. This committee recommended health instruction, inculcating health habits, programs of health activities, and the promotion of health interests throughout the community.

The schools of the country immediately developed many types of health programs to satisfy the above recommendations. However, since 1918, courses have been broadened to include industrial and occupational hygiene and safety education.

Because it appears that poor health and low mental ability go hand in hand, I feel that it not only advisable but necessary that an outline on health and physical education be established specifically for "special classes". Surveys show that many mentally retarded pupils come from homes where hygiene and sanitation are not considered important. This condition is usually accompanied by cases of malnutrition , which means potential disease, infection and literate retardation.

As the majority of boys in "special classes" seem to possess similiar physical and mental traits, a more narrow but

but definite course of study would seem preferable to the comprehensive program designed to accomodate all types.

General laws of health and sanitation should share much of this program with a hope that desirable practices of personal cleanliness and hygiene will formulate lasting habits in the individual. This will make for social efficiency and self-development.

We must not lose sight of the fact however, that we are hoping to make "special class" pupils self-supporting in industry. Their success will depend upon physical and not mental development. To meet the demands of today's industry, we must develop a person who is able to cooperate and get on with his associates; who is active and graceful; and one who has a good muscular coordination.

Recent publications are inclined to include body mechanics, hygiene, general health and sanitation under the heading of Health Education. They seem to dislike the term "physical education". However, for our "special class" pupils, being prepared for a place in industry, physical development and physical education express exactly what they need.

Our first job is to educate them in the demands of industry regarding physical adeptness. Make them "physical conscious" by the use of pictures about the room of good and poor posture forms; illustrations of sound and infected teeth. Show illus-

trations of rugged, healthy looking boys; place a full length mirror in the room; a height chart on the wall with a pair of scales nearby; a line painted acrossed the floor which they might follow balancing some object on the head; movies of themselves in action where they are able to compare their appearance with someone else or any other device which will constantly keep physical fitness uppermost.

Before ever entering a gymnasium, with a class, a teacher should review the type of work to be undertaken with them and emphasize the particular value in that work.

All games and activities should be planned carefully with each participant placed in the group where he can get the greatest amount of benefit toward the improvement of his definite need.

I have been experimenting with varied activities in physical development, hoping to find the most profitable exercises. Never forgetting industry and its requirements, I have employed wholly the type of game which might erase clumsiness and awkwardness, thereby improving general appearance; the game designed to accomodate many boys, aiding the shy and encouraging cooperation; the exercise which defintitely develops a good muscular coordination especially in the hands. The following are a few activities which are serving the purposes of development in aiding these boys to take their place in the modern shop.

ROPE SKIPPING.

Among the foremost of simple exercises for the promotion of health and physical development is rope skipping. It can be enjoyed by all ages and mentalities. It may be used as a light conditioning exercise or made very strenuous. Some of the beneficial effects are:

1. All muscles of the body are brought into play
2. The size and power of the lungs are increased (rope skipping encourages deep breathing)
3. Muscles of the feet and ankles are strengthened, hand muscles are made flexible
    a. development of foot muscles tends to tighten ligaments raising the arch of the foot
    b. develops balance
    c. lightness of step
4. Increases power of endurance.

Routines in rope skipping may be varied, thereby eliminating monotony.

Being constantly used as a "conditioner" by runners, football players and boxers especially, it makes an appeal to boys of sixteen years of age. Practically every benefit derived from this simple, inexpensive activity will aid considerably in the physical preparation of a boy for industry. The strength and power of all body muscles; the agility necessary around moving machines and the coordination of muscles essential in perform-

ing operations on the present day automatic machines are improved by this very valuable exercise.

REFERENCE: Rope Skipping..Newmarch...A. Brown & Sons, Ltd.

INDIAN CLUBS.

Due to the passing of calisthenics in the public school health program, Indian Clubs seem to have lost their place. At the suggestion of Mr. L. L. Derby of the Physical Education Department of the Massachusetts State College, I attempted their use as an exercise for "special class" boys. Because of the inherent awkwardness and extreme lack of coordination of these boys, Indian Clubs were a little beyond them as a class. However, as an advanced exercise for the better developed physically, found within this group, the Clubs offered innumerable benefits.

Bearing in mind the type of physical being preferable to industry, I suggest as great a use of Indian Clubs as possible with "special class" boys for the following reasons:

1. Develops a rhythm, which tends to abolish awkwardness
2. Can be made pleasing at the same time beneficial
3. Routine may be varied to eliminate tedious or monotonous motions
4. Though activity may be simple every muscle of the body can be exercised, concurrently.
5. If desired it may be used as a vigorous exercise by exaggerating movements

6. The use of Indian Clubs involves some mind and body coordination
7. Indian Club swinging has many corrective features
8. Proper style through use of Indian Clubs will tend to develop weaker muscles rather than, as in many exercises, overdevelop stronger muscles. This feature means better coordination.

HANDBALL

According to Robert Ripley, handball is of Irish origin and the oldest of all games played with a ball.

In my search for pleasurable exercises, which might contain definite hand values for "special class" boys, I contacted the Physical Education Department of the Massachusetts State College. At the suggestion of Mr. L. L. Derby of that department, I adopted one wall hand ball. While I have not devised any test to prove the extent of its value to individuals, I have done a great deal of observing and feel assured of its worth. I should be inclined to recommend this game for the following reasons:

1. It is suited to all types of mentalities
2. It is one of the simplest and most pleasant ways of getting a good "work-out"
3. It may be played strenuously or leisurely
4. It offers an opportunity to use both hands (use of

both hands definitely needed in industry)

5. It is conducive to better postural development
6. Develops agility
7. Has considerable carry over for other sports (muscle development, foot work)
8. It is inexpensive
9. May be played inside or out
10. Accomodates 2, 3, or 4 players to each game
11. Rules and scoring very simple

Reference. Fundamental Handball..Bernath E. Phillips..Barnes & Co

BADMINTON.

Badminton is an English game which dates back to about 1890. Since the World War (1918), it has grown in popularity on this continent, especially in Canada. Though it has been used out-of-doors it makes a better winter game as the shuttle being light is greatly affected by the wind. In my search for enjoyable games, which might promote the proper physical development among "special class" boys, I have selected badminton in a somewhat simplified form. Our equipment is crude and "homemade"; using solid paddles instead of racquets and simple stands with a cord across instead of a net. We do use the regulation shuttle. Our court is smaller, which allows many courts to be set up in a gymnasium at one time. I selected this game for the following reasons:

1. It is fascinating
2. It is simple to learn

3. May be used as a light or vigorous exercise
4. A game in which every part of the body participates
5. Develops quickness of the eye
6. Induces prespiration and cleans pores of the body
7. Encourages quick decisions and craftiness
8. Requires instant body action and develops foot nimbleness.
9. Our extremely small court demands speed of the participant.

I have not stressed the various strokes, stance, or finer points of the game. I want it especially as a volleying game. I know that if these "special class" boys are to enter industry, they must develop speed, coordination and grace. I can see just such results as coming from badminton.

VOLLEYBALL

Volleyball goes back to 1895. It was invented by William Morgan, former director of the Y. M. C. A. at Holyoke, Mass. Mr. Morgan was in search of a game that would accomodate a great number of players within a small space.

This game I find is especially suited to "special class" boys. Many are shy and have never participated in games of a physical nature. This is clearly recognized from their awkwardness on the floor or in handling a ball. My definite reasons for adding volleyball to the list of suggested physical activi-

ties for "special class" students are:

1. To aid social adjustment
    a. an opportunity for new class members to become acquainted
    b. a good start for the boy who is shy
2. To foster team work
    a. cooperation
3. To inculcate a sense of fair play
4. It aids simple coordination and skills
5. Each person has an opportunity to participate
6. Rules and scoring are simple

BASKETBALL

Basketball is the invention of Dr. Naismith and had its origin at Springfield College in the year 1892. It is universally popular and the greatest of all indoor sports. Because so many boys have become acquainted with this game through attendance at the Y. M. C. A. or boy's clubs, it is imperative that it be accepted and added to our list.

There are many boys in "special classes" who are poorly developed and equipped with no sense of coordination. For them, orthodox basketball does not serve the desired need. Various dribbling, passing, shooting, and handling games better aid the coordination and hand skills essential for industry. For the better developed physically, a short but fast game of basketball is very desirable. In the general use of basketball, I can see the following advantages:

1. It develops coordination
2. It develops skill through
    a. passing
    b. shooting
    c. receiving
    d. timing
    e. dribbling
3. It encourages team play
4. Demands that player readily make adjustments according to rules and restrictions
5. Aids general physical development

Reference: Mason & Mitchell---Barnes & Co. Publishers.

PROCEDURE.

The development of this thesis was begun within the classroom. Here, the Stenquist mechanical ability tests (two forms) were given by the author and the results compared with the original Stenquist tests that had been given to "average" classes.

Reports concerning the literate and concrete I. Q. and emotional stability, were obtained from the Research Laboratory.

A personal check was made with industry where repeated visits and lengthy discussions were enjoyed. As industry suggested the necessity of coordination, grace and hand manipulation in the individual, a good program of physical education was needed. Under the guidance of the Physical Education Department of the Massachusetts State College, a development of the above characteristics was attempted through suitable games. Posture, breathing and exercises for hand and arm development were stressed. Results of achievement were measured by observations of teachers,parents and the boys themselves.

The tabulation and discussion of data culled much of the subjective material, adding to the soundness of the thesis.

Table #_I_ shows the results of Stenquist mechanical ability tests as given to a group of 88 "special class" boys at the Chestnut Street Junior High School.

TABLE I

RESULTS OF STENQUIST MECHANICAL APILITY TESTS

Two forms given to 88 Mentally Retarded Boys

Test #1			Test #2		
Raw Scores (No. right)	T-Scores		Raw Scores (No. right)	T-Scores	
95-1	88-1		70-3	86-3	
83-1	82-3		69-1	85-1	
82-2	81-2		67-1	83-1	
81-1	80-5		64-2	80-2	
80-1	79-3		62-2	78-2	
78-4	78-4		61-2	77-2	
77-1	77-3		60-3	76-3	
76-2	76-8		59-1	75-2	
75-4	75-5		58-4	74-3	
74-1	74-5		57-3	73-3	
73-1	73-3		56-2	72-2	
72-5	72-1		55-1	71-3	
71-7	71-3		54-2	70-2	
70-5	70-7		53-5	69-2	
69-2	68-3		52-3	68-3	
68-3	66-4		51-5	67-5	
67-1	65-2		52-4	66-4	
66-4	63-2		49-3	65-3	
65-2	62-6		48-2	64-6	
64-2	60-2		42-4	63-4	
63-1	59-3		46-3	62-4	
62-3	58-2		45-2	61-6	
61-2	56-3		44-2	60-4	
60-1	53-1		43-6	59-2	
59-2	50-2	M. -69-76	42-1	58-2	
58-4	48-3		41-1	57-3	
56-2	47-2	Md.-71-68	40-3	54-1	
53-2	N-88		39-2	52-1	
52-1		Q. -68.73	38-3	50-2	
50-2			36-2	49-4	M. -64.64
49-4		Q. -77.55	35-1	45-2	
46-2		3	33-2	39-1	Md.-65.65
45-3			31-2	N-88	
44-2			30-3		Q. -64.66
42-2			25-1		
39-1	M. -62.32		18-1		Q. -73.14
36-2			N-88		3
34-1	Md.-64			Q. -41.80	
33-1					
N-88	Q. -51-48			Q. -56.8	
	Q. -71.68			3	
	3				

TABLE II

RETARDED GROUP				JUNIOR HIGH SCHOOL GROUP			
Concrete I.Q.		Literate I.Q.		Concrete I.Q.		Literate I.Q.	
123-1		93-1		128-1		127-1	
107-1		87-2		118-1		123-2	
106-1		85-2		117-4		122-1	
105-1		84-1		116-2		118-1	
103-2		83-3		115-6		117-2	
100-6		82-1		113-1		116-2	
99-2		81-4		112-2		115-1	
98-2		80-3		110-6		114-1	
96-5		79-4		109-2		112-1	
95-2		78-2		108-7		111-2	
94-2		77-4		107-4		110-1	
93-3		76-7		106-1		108-6	
92-4		75-3		105-2		107-2	
91-1		74-3		104-1		106-1	
90-5		73-5		103-1		105-1	
89-1		72-4		102-3		104-1	
88-3		71-4		101-1		103-1	
87-2		70-1		100-13		102-1	
86-1		69-3		99-1		100-11	
85-7		68-1		98-2		98-2	
84-3		67-2		97-1		97-1	
83-1		66-2		95-1		96-2	
82-2		65-6		94-1		95-1	
81-4		64-5		93-1		93-2	
80-1		63-3		92-1		92-2	
79-2		62-1		90-1		90-3	
78-1		61-3		89-3		89-1	
77-1		60-4		88-1		87-4	
76-2	M.-86.80	59-3	M. -72.88	87-2	M. -101.32	86-3	M. - 94.816
75-3		58-1		86-4		84-3	
73-1	Md. - 87	57-1	Md. -72	84-2	Md.-102	83-1	Md.-96
72-4	Q	56-1		82-2		82-3	
71-7	Q.-75.72	55-2	Q. -63.72	81-1	Q. - 91.32	81-2	Q. -82.88
70-1	1	54-1	1	80-1	1	80-5	1
69-3	Q.-95.80	42-1	Q. -77.64	79-2	Q. -110.44	78-1	Q. -107.20
68-3	3	N-94	2	76-3	3.	77-1	2
66-1				N-88		76-1	
64-1						75-1	
63-1						74-1	
N- 94						73-1	
						72-1	
						71-1	
						69-1	
						68-1	
						66-1	
						63-1	
						62-1	
						61-1	
						N-88	

The Stenquist test is designed for normal classes as a measure of general mechanical aptitude. The results of these tests given to hundreds of children throughout the country, indicate a wide range of intelligence regarding mechanical things. I have given this test many times to groups of "special class" boys, eliminating the time factor.

Being quite positive, through laboratory tests and daily association with these boys, that their literate ability is exceptionally low, I felt that in any tests, where printed directions were involved, they would need more time than the average for comprehension. Being anxious to discover their mechanical sense and general knowledge of mechanical devices, I allowed four classes or approximately 130 boys to work at these tests with no mention of the time element. All members of a class began the test at the same time and each individual indicated the actual time he finished. This was checked by the examiner. An average showed a need for an added five minutes to the first test, making it fifty minutes rather than forty-five; the second test indicated a need for eight minutes making the time for respective sections of the test fifty-eight minutes rather than fifty, as suggested in Stenquist Manual.

On the basis of the above, I gave the test (both forms) to this group of 88 boys, the results of which may be found in Table #__I__.

The original distribution of scores, (form #1), on which the validity of this test was based, include 1130 cases with an age range from eleven years six months to fifteen years six months. Form #2 was based on results of 1087 cases, with an age range of ten years to fifteen years six months.

The average chronological age of the 88 cases in Table #_I_ being fifteen years four months, I shall make my comparisons with the fifteen year six months group of Stenquist.

Form #1.

The median of raw scores (number right) in Stenquist group was 42, while the median of this "special class" group was 64.

The median T-score of the Stenquist group was 56 while the median T.score of this "special class" group was 71.68.

Form #2.

The median of raw scores (number right) in Stenquist group was 36, while the median of the "special class" group was 49.36.

The median T.score of the Stenquist group was 55, while the median of the "special class" group was 65.65.

The explanation might be in the following factors; the original group was larger and might give a truer picture; this "special class" group, not being literary minded, are very like-

ly to be more mechanically inclined; most of them have come from homes where there has been no money for repairs in the household, so, of necessity, they have had to be self-sufficient; many have lived near garages and small shops where they have spent a great deal of time observing and tinkering with the many fascinating mechanisms to be found in such places; then there is the time element which would be an advantage. However, over and above all the factors which seem to favor this "special class" group, I was exceptionally well satisfied with the results and using these forms with their daily hand work to supplement my own judgment, I am inclined to feel that though they are all low in literate ability, at least the upper half excel in mechanical aptitude.

Table # II is merely a comparison of a "special class" group of boys found at the Chestnut Street Junior High School, Springfield, Mass. and a group of normal students in the same school. It is printed herein to aid a reader inggetting a clearer picture of the "special" or retarded group.

These comparisons are based on tests given at the city of Springfield school department laboratory. I used all results available which included 94 cases in the retarded group and 88 cases in the regular junior high school division.

The figures paint a dark picture for the "special clas" group, especially in literate ability. A median of 72 against

96 and a mean of 72.88 against 94.81 theoretically might suggest the success of the junior high group in industry if their competition is to be found in the retarded group. The concrete I. Q. picture is encouraging and this actually appears to be more important to industry.

A STUDY OF INDUSTRIAL PLANTS FOR JOB SITUATIONS SUITED TO THIS TYPE OF BOY.

It was originally planned to conduct this investigation through use of the questionnaire. However, because of the lack of actual studies by industrial people, this idea was discarded in favor of personal contact. There is no doubt that personal visits are more valuable and authentic than questionnaires.

As few scientific means of measuring have been employed in industry, one might consider material resulting from shop visits as being subjective. Because they are the opinions of men of experience, entrusted by industry to employ and stabalize labor relations, I should be inclined to judge them with favor. Results of my visits to industrial plants are contained separately in the section to follow.

Being curious what demands "big industry" made on the schools, regarding necessary literate ability, I addressed a communication to the Ford Motor Company, Detroit, Michigan. As no studies had been made by the factory, my letter was referred to the superintendent of the Henry Ford Trade School of Dearborn, Michigan. A copy of his reply which follows, very likely bespeaks the general opinion of this internationally great motor company:

Edward J. Whalen
Chestnut Street Junior High School
Springfield, Mass

Dear Mr. Whalen

Your letter to Mr. Bennett regarding the education of boys with mechanical skill but lacking literate ability has been referred to us.

Our company has made no direct studies of this subject so what I shall say should be taken as my own opinion merely.

In our organization not more than about 25% of the work requires any considerable period of training. Men who are to be successful as die or toolmakers, electricians, draftsmen, or laboratory workers must undergo years of training and experience. They must be mentally keen and should readily master such subjects as Chemistry, Physics, Mechanical Drawing, and Trigonometry.

On the other hand very little that a prospective factory worker might learn in academic schooling would be of direct benefit. It seems to me that the aim of education should be twofold; to try and give a boy and girl an insight into things that will broaden their mature life and help develop their hand skills without attempting to earmark them for some business or occupation they may never enter.

Comparatively few students in the grades of high schools have any fixed desires to determine future work.

Three-fourths of the work in a large factory is routine and requires little preliminary training. Most normal boys could master the necessary skill to do the work in a few hours or days.

The majority of men wish routine work and resent change. The minority only desire to earn their living by thinking and most of these prefer to think in ruts.

What business needs more than skills is men with ideals and personalities that do not clash with their associates.

Comparatively few men are discharged for incompetence. A far larger number lose their jobs because they cannot or will not cooperate.

Let us teach our children to first work and play safely, orderly, accurately. Then the time element must enter, for no matter how skillful a man may be, unless the job is completed in a reasonable time the world can not use him. For the very few there is a further step--originality--finding better ways and new things.

If we can prepare young people to enjoy life in its phases of recreation and work we shall have done more for them than if we try to mold them for some particular job. Let them learn from us that work is a privilege and not a punishment.

(Signed)

F. E. Searles
Supt. Ford Schools.

The Henry Ford Trade School was opened October 25th, 1916, with six boys and one instructor. The present enrollment is kept at about eighteen hundred with always a waiting list running into the thousands.

Boys are enrolled between the ages of twelve and fifteen and graduated between eighteen and nineteen. They may upon graduation accept employment at the Ford factory but they are free to go elsewhere if they so desire. The boys receive one week of academic training to each two weeks of shop practice. The nature of the shop activity consists of repair work on tools and the salvaging of machines brought in from the Ford plant. The boy is paid for all shop time at from twenty cents per hour to a maximum of sixty-five cents per hour. In addition he receives two dollars each month which is placed in a bank for him by the company and kept so long as he is a member of the school.

I mention these few facts regarding the Henry Ford Trade School to show that it is a sizable and progressive institution. I should be inclined to accept the opinions of a superintendent of such a school as being very valuable.

The pertinent remarks in Mr. Searle's letter which seem to conform to my own theories, and the opinions of many employment managers throughout this Connecticut Valley district, are first, that there is little that the prospective factory worker can get from academic training which might be of direct benefit; second, that three-fourths of the work in a large factory is routine and requires no preliminary training; third, the majority of men wish routine work. Manufacturing today is based wholly on repetitive operations. Repetition breeds monotony which is more acceptable to the dull than the brilliant.

For one who might care to follow an interesting comparison of the behavior of opposite abilities in modern industry, I would suggest the book, "F. O. B. DETROIT", written by Wessel Smilter and published by Harper Brothers. The author depicts the daily routine of two men in a modern automobile plant. One, of not too high mentality, concerns himself only with the fact that he is employed; the other, a good thinker, is constantly irritated by the simplicity and monotony of his daily repetitive job.

Studied Westinghouse Manufacturing Company,
East Springfield, Massachusetts, plant.

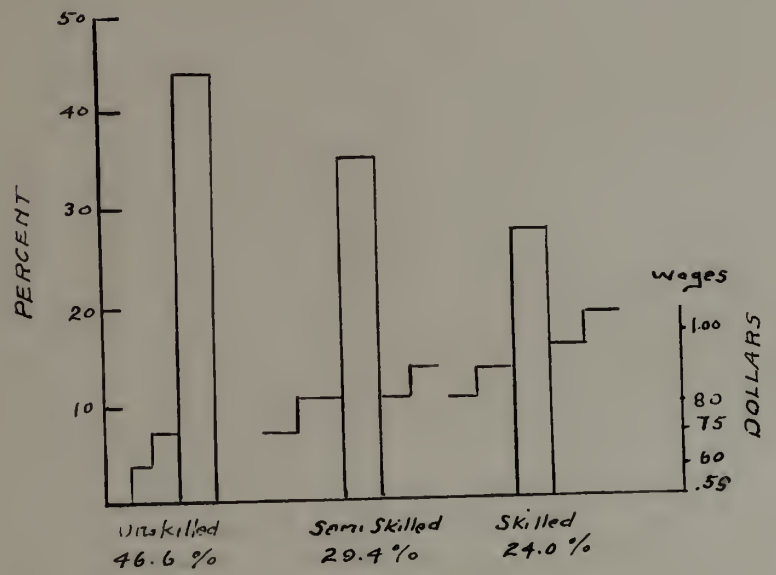
Advised by Supervisor of Industrial Relations.

Manufacturers of motors, air-conditioning units, refrigerators and many other sundry electrical appliances.

In a study of labor relations this company classified types of labor in the factory and the salaries paid within the various groups.

Chart #II shows a distribution according to differences in skill and salary levels as revealed by a survey completed in June, 1937. Figures compiled from charts published in "Social Problems in Labor Relations", Pignors, MeKenney & Armstrong, authors and McGraw-Hill publishers.

CHART II.



The UNSKILLED workmen included, common laborers, trade helpers, washers (of parts of machines), packers and loaders, janitors, handlers of materials and repetitive assembly jobs.

The SEMI-SKILLED workmen included carpenters, tinsmiths, millwrights, assemblers, spot welders, milling-machine operators and engine and lathe operators.

The SKILLED workmen included tool and die makers, jig borers, radial drill operators, electricians (first class) pattern makers, millwrights (first class), and steam fitters.

It was interesting to note in this study that some among the semi-skilled and unskilled could neither read nor write, but most of this group had completed the eighth grade. Skilled workers were generally equipped with a senior or trade school background.

Informal discussions with foremen and supervisors resulted in about the same conclusions found in other industrial plants. Operations are gradually broken down into simple units capable of being completed by the semi-skilled and very often by un-skilled labor. As the machine becomes more accurate, the operator needs less ability as the necessary precision is inherent in the machine.

It will be noticed in chart #_II that these two groups of semi-skilled and unskilled comprise 75.2% of the workers. It is very evident that industry is favoring these classes.

I inquired as to how various mentalities reacted to the monotonous, repetitive type of operations as carried on in this Westinghouse plant. Their surveys showed that high school graduates worked willingly and efficiently on simple operations until certain techniques had been developed. From then on it was boredom and discontentedness until they were allowed to take the next step higher. Those of lower mentalities, even trade school graduates who had been trained on many types of machines, were content to accept a job on a lathe, drill or any other piece of equipment and remain on that, even though more advanced opportunities were presented. In other words the lower the mentality, (capable of operating a machine), the more contented a worker you had.

Intricate machines and expensive materials were usually handled by those of higher mentality as experience had judged them more careful and through better planning not so wasteful.

Suggestions as to means of saving time and money through new devices, added attachments to machines, short cuts or any other ideas that might aid in meeting competition, were rewarded with cash bonuses as an incentive. Many employees were hesitant however, at this offer, as it often affected the status of a neighbor. Perhaps an ingenious idea for which a man received a small award would be the means of displacing the one responsible for that idea.

Studied United States Envelope Company, Springfield, Mass.
Under the direction of the Superintendent.
Shop employs 600,--- women 250 --- men 350.
Qualifications necessary for employment determined by personel director. (personal interview or recommendation).

I found this factory to be highly mechanized and modern. The following tradesmen were employed:

Printing-- 7 compositors, 4 pressmen (plater and cylinder)
Machine-- 4 machinists, 8 helpers and apprentices
Woodworkers-- 3 for cabinet, carpentering and repairs

The remainder of men employed throughout the shop were in charge of running automatic machines or assigned to oiling, cleaning and making adjustments on the many envelope, box, folding and cutting and printing machines operated by girls. Stock clerks and laborers, classified as semi-skilled or unskilled, were in evidence in every department.

After my study of this plant, I have come to the following conclusions; versatile mechanics are more in demand than the ones definitely trained to follow a single trade; the chances of following a trade learned in school are very small as industry has changed so many trades into operations; trade school preparation is advisable because of the general mechanical sense derived from meeting many situations in machine construction; the main purpose in training a boy to work in a

factory such as the United States Envelope Company however, would be the development of versatility and dexterity.

Studied Fisk Tire Company,
Chicopee Falls, Mass.

Advised by Personnel Director.

Shop employing 1800 men.

Qualifications necessary for employment determined by personnel director. (Usually personal interview).

I found that the only tradesmen employed were those included in the maintenance department, which never exceeded more than twenty men. The actual trades represented were electrical, wood, plumbing, steamfitting, and machine.

I discovered that the tire-maker in days past had to be a man of considerable ability. A few years ago the making of a tire required judgment, skill and an extensive amount of planning, measuring and cutting. Today, tire making is an assembling process. Materials are manufactured and cut to size by other departments and merely put together by the tire-maker. I was assured that a literate ability was not essential in 80% of the jobs found in this factory. That a person with only a very general amount of intelligence could be trained to efficiently perform the job of tire-maker in six to eight weeks. His routine has been definitely planned by the company's efficiency engineers.

Included in this training is the stance of the worker, the most efficient position for his tools and the development of habits conducive to safety.

It is quite necessary that a person entering such a field as this come equipped with a physical dexterity. Graceful motions of the body and equal cleverness with both hands seem to be assets.

The tire industry is of such a nature that many unskilled laborers are necessary.

Studied Gilbert & Barker Manufacturing Company, West Springfield, Mass.

Advised by Personnel Director.

Manufacturers of oil burners, oil tanks, gasoline station pumps and air-conditioning units.

This company has made no definite studies contrasting literate backgrounds with various factory jobs.

The employment is done through personal interview. Back ground and experience are related on customary printed forms.

The employment manager in this plant seemed to be capitalizing on the "depression", by boasting of high grade employees even on menial types of labor. However, he admitted that labor conditions were abnormal and under ordinary circumstances the hiring of college graduates for simple laboring jobs would result in constant labor turnover. This he agreed was costly.

I found this man, delegated to advise me, to be very cordial. I judged from his many years of service in the field of employment, that he was well qualified. His arguments, however, were somewhat inconsistent. According to his own statement he is always on the watch for a man who can think a job through regardless of the nature of the work; one capable of good planning. Later, after visiting the factory and interviewing foremen, I found that like most modern factories in industries, all shop jobs are cut and dried. There was little opportunity for thinking.

I did find that this company encouraged outside study and goes so far as to share the cost of tuition. This, of course, is very laudable as it encourages those with some background to advance.

Theoretically, perhaps the ideal shop might be one which could boast of a high mental caliber among all its employees, but in practise, whether in industry or any other organization, "They can't all be captains, some have to be crew." A contented crew is one that is not superior in intelligence to its officers. Menial labor and repetitive operations are ideal only to those of the low brackets of intelligence.

Regarding the boy of low literate ability, I was assured by a foundry foreman, that his department furnished many suitable positions. The foundry offers opportunities for many laborers who are physically strong, rough wood workers for crating and shipping, sand blasters and even apprentices to molders.

In the factory these boys could be easily trained to do packing, crating, painting, jobs of a repetitive nature in the machine shop, tarring of tanks, washing of parts and a few assembling jobs.

In maintenance, such work as janitoring, yard laborers and garage helpers would furnish employment capable of being done efficiently by boys possessed of a good mechanical sense but a low literate ability.

Studied General Electric Corp. (Pittsfield, Mass. Division.)
Advised by Rating Superintendent.
Manufacturers of motors, refrigerators and other sundry electrical appliances.

One of the sectional lectures at the Hampden County Teachers Convention, October, 1938, held at Springfield, Mass. was given by Mr. R. A. Hitchcock. With the use of "printed" slides, the lecturer explained the method of rating skilled and unskilled laborers within the General Electric Corporation. I absorbed as much as possible, talked with local employment managers regarding their knowledge of the General Electric system, and then went to the Pittsfield plant where I spent a great deal of time with Mr. Hitchcock, rate superintendent. I feel greatly indebted to him for the generous amount of time and information I received.

The General Electric Corporation is one of the few companies that have made any appreciable study comparing employee characteristics and job evaluation. In their desire for proper adjustment for the man to the job, they have already spent eight years.

In analyzing a job at the G. E. plant the following factors are considered; the necessary mentality and skill required to perform the job efficiently; the responsibility which accompanies it; the mental application required; the physical application and the working conditions.

Mentality is considered as a complement to skill and the pre-requisite mental basis necessary to shop training for the normal development of skill required on a job.

Skill is thought of as "trade knowledge" and the ability to apply it. That is, a person who performs an act skillfully must possess manipulative dexterity and be able to make mental adjustments properly to control his movements to what ever end he desires. He must be able to visualize his objective so that he might be able to direct his movements properly.

To complete the picture, a definition of semi-skilled and un-skilled would be in order here.

The semi-skilled person is one who from a standpoint of accuracy and precision must be proficient in his work, yet he differs from the "skilled" worker, in that his work is of a repetitive nature. Industries modern production methods have increased the enrollment of this group tremenduously. Incidentally, it has tended to decrease the number of skilled mechanics.

For unskilled work, training is not necessary. It is usually simple, laborious and repetitious requiring principally muscular energy.

Responsibility regards the actual amount of care involved in doing a job. It considers not only the waste of the product created by a small error, but the value of intricate tools and expensive machinery used in the manufacture of the product. Neglect would likely cause a considerable amount of damage to a very costly machine.

Mental application suggests applied effort and deals with jobs which cause for concentration and intelligent planning. This is a direct contrast to the repetitive operation where accuracy is inherent in a machine and initiative has no place.

Physical application concerns the extent of continuous exertion and physical effort needed to perform a job such as lifting, pulling, etc.

Working conditions as a consideration in the treatment of a job is influenced by any disagreeable conditions to which the worker is subjected. It deals usually with the common laborer. His job being one which does not demand mentality or skill, is rated according to the hazards or undesirable conditions.

Each occupation has been judged according to the above characteristics and evaluated accordingly. The salary rate is based on the number of points a particular job can command from the standpoint of mental ability, skill, responsibility, mental application, physical application, and working conditions.

To this number of points is added a constant of 400. The total value of points will give the relationship between the various jobs and aid in setting an equitable rate. In giving a concrete explanation of this particular method, I

shall contrast the job which has the highest rating with one which has a medium rating and one which has the lowest rating.

Die makers- 1st. class (Taken from G. G. Rating sheet)

Skilled workmen with highly diversified experience, making difficult dies with very close tolerances, able to lay out a job and do a job from start to finish with little or no supervision, and using all types of tool room equipment. Able to calculate angles and distances. High responsibility for accuracy and finish.

Sand Blasters. Enclosed Room. (Taken from G. E. Rating sheet)

Sand blast tanks, regulators and subway transformers up to twelve feet in height, both inside and out. Work done in special sand blast room and operator wears respirator, hood and other health protecting devices. Also sand blasts clamps and other miscellaneous parts. Must watch condition of sand, maintain pressures and adjust nozzles for best cleaning. High health hazard. Operators only allowed work on this occupation for six months.

SWEEPERS. (Taken from G. E. Rating Sheet)

Sweep shop areas, clean shop wash rooms, remove refuse, some care to see that valuable material is not thrown away. Lowest type of common labor, requiring very little training Highly repetitive work. Does not handle or move material.

Table III.

	Diemaker	Sand Blaster	Sweeper
Mentality	100	10	0
Skill	350	45	0
Responsibility	60	10	0
Mental Application	40	10	5
Physical "	20	45	35
Working Conditions	5	100	0
Constant	400	400	400
Total	975	620	440

It will be noted in Table #III that the die making trade demands a good mentality and exceptional skill. There being no heavy laboring or hazards encountered in the performance of diemaking, physical application and working conditions get a comparitively small number of points.

In the occupation of sand blasting, because of the high health hazard, working conditions receive 100 points while mentality, mental application and respnsibility receive only 10 points each. Some skill is required in the adjustment of sand blasting devices while physical application obviously should get a substantial consideration.

Sweeping is one of the most simple forms of common laboring. It requires light physical application. Mental application in this occupation receives 5 points principally as a reward for a bit of common sense.

Every job in the factory has been given a rating simiiliar to those reviewed in this chapter. Such ratings are analyzed and set by a rating committee representing four

General Electric plants. The opinions of shop foremen have contributed greatly to what appears to be a very equitable plan. I have considered 58 jobs which have been summarized.

Conservatively, 75% of the boys with whom I have been acquainted in "special classes", could easily fit into 30% of the jobs found in this plant. Among such jobs would be the following Table # IV, taken from the G. E. Summary Sheet.

Table # IV

OCCUPATION	M	S	R	MA	PA	WC	TOTAL
Sand Blast	10	45	10	10	45	100	620
Drill Press	30	120	20	20	20	5	615
Spray Paint	30	90	25	25	25	20	615
Truck Driver	30	90	40	25	15	5	605
Welders (repetitive)	30	80	15	15	35	5	580
Assemblers	20	80	15	10	40	10	575
Watchmen- patrolmen	35	60	25	20	15	10	565
Punch Press	25	65	20	15	25	15	565
Punch Press (repetitive)	20	60	15	15	25	15	550
Assemblers-conveyors	20	70	20	15	25	0	550
Truck Drivers, inside	20	60	20	20	20	0	540
Chip, Grind & File	10	40	5	10	40	20	525
Drill Press, simple	10	45	10	10	30	5	510
Assemblers Bench, simp.	10	30	15	10	30	0	495
Laborers	5	20	5	10	40	0	480
Janitors, office	20	20	10	10	15	0	475
Sweepers, factory	0	0	0	5	35	0	440

JUSTIFICATION OF RETARDED BOYS IN INDUSTRY.

(As viewed by the author)

The consistant increase in student enrollment in the colleges and universities has made brains a drug on the market, as desirable opportunities become fewer. The daily advance in machine precision and efficiency is robbing the skilled worker of his chance for natural expression and causes a loss of satisfaction he once enjoyed through excelling. From the viewpoint of this type of worker, the machine is constantly creating "useless jobs".

Conceived in the brain of man and the result of his handiwork, the machine, once completed, becomes the master of the man. Could anything be more irksome or injurious to a healthy mind than acting as assistant to a machine as it daily performs its repetitive operations?

Numerous inquiries from those in the average and higher brackets of intelligence reveal a common answer regarding their performance of routine labor. They accept any type of employment wholly for mercenary purposes until able to avail themselves of a better opportunity. They are never content with monotonous routine. This conditionmeans constant labor turnover which is costly and rules them undesirable.

Those of the lower mental levels, who possess at least an average ability in concrete processes, are often desira-

able for routine work. Monotony being in keeping with the inactivity of their mental powers, it would seem logical to suppose that in tedious "cut and dried" mechanical operations, where abstract thinking and initiative are unnecessary and unwelcome, those boys would find employment.

Present day labor, being seasonable and spasmodic, breeds anxiety and nervous tension. To the already highly trained sensitive mind, it means a state of constant unrest.

The abnormal mind, seldom fired with the spark of ambition, usually accepts conditions as they exist with little protest, while irregularities often tend to unbalance the reasoning and bias the judgment of a recognized normal person.

The mongrel dog trained by means of kindness and processes of repetition comes to be admired for his intelligent acts. The boy likewise, who has reached the average sixth grade, is capable of being taught if necessary through this same process, to efficiently perform routine labors which are ever increasing, being an integral part of present production methods.

"Labor Turnover Loyalty and Output"...by Colvin (published by McGraw Hill Co.....Foreword Pg. Sixth.

Intensive training can lay a foundation from which we can secure mechanics of various kinds in a very short time

and such schools are of great value to industry and to the community.

This training, however, has not had the desired effect on reducing labor turnover. Nor is the cause of changing from one factory to another always the result of higher wages. Sheer monotony and the desire to do something different has much to do with it.

Interest in one's work makes it an inspiration to better things; lack of interest turns it into drudgery, to be borne under protest and for as short a time as possible.

RECOMMENDATIONS.

As "special classes" have apparently become an institution in Massachusetts, future employment possibilities for this group warrant further study.

I would suggest a very exhaustive investigation of representative industries be made throughout the state. Such study to treat industry in its broadest sense, including all forms of occupations where these young people might find employment. Logically, this should be done under the direction of the State Department of Education, Division of Special Classes.

Available courses in horticulture and landscaping in city schools would appeal and enhance opportunities for this type of boy.

There is need for a good general department in the Trade School, definitely designed to develop these young handicapped pupils in proficiency, coordination and hand skills.

There is a great need for helpful written material in all phases of "special class" work. The few books that have been printed are very elementary, designed to aid the old "auxiliary" group.

SUMMARY AND CONCLUSIONS.

The great difference in the normal group and the "special class" group is the superiority of the normal class in the command of the three R's.

It will be noticed that only twenty out of fifty-eight jobs at the General Electric Plant receive more than fifty points for mentality on their rating sheet.

Hand skills may be developed irrespective of mental ability. This is evidenced by the excellent art and craft work done by boys of low mentality. Seventy per cent of the boys found in "special classes" do very creditable work in drawing. Even in institutions such as "Belchertown" where literate I. Q's hover around fifty, one is able to see remarkable hand work. Incidentally, two of the lowest mentalities I have had in class (I. Q's 61 and 64) were clever tricksters, capable of putting on a thirty minute show.

Mr. Searle's of the Ford Motor Company School indicates that the tendency of industry is toward routine and that the little skill needed may be acquired in a few hours or days. If this be true, certainly shop work is not complicated. Being a school man, meeting the demands of such an industry, I should be inclined to respect his judgment.

At the Westinghouse Plant, operations are gradually broken down into simple units until they can be efficiently

handled by unskilled labor. A Westinghouse magazine stated their new electric razor contained 103 parts. This indicates a stamping and assembling process. Westinghouse, like many factories offer those capable of improving efficiency, by suggestion of new ideas or added devices on machines, substantial bonuses. Ironically enough such devices usually displace the inventor because he has improved the machine so that the job can now be done by one with a lower mentality.

The United States Envelope Company asks for men with a "machine sense" and reasonable manipulative ability. Industry has changed trades into operations.

I was assured at the Fisk Tire Company that literate ability was not essential in 80% of their jobs.

Our experience with mechanical ability tests, showed that the scores of the "special class" exceeded those of the original group of average children. Considering the modification of the time element, it is reasonable to state that the upper half of the "special class" at least equal the average of the normal group in mechanical aptitude.

The Minnesota survey showed that the division of operations into small units has shortened the time of training the worker, as well as lessened the qualifications necessary to do the job. Accuracy is now inherent in the machine rather than the individual.

Mr. Reed, superintendent of schools in Minneapolis, found that dull pupils were more successful in industry than in school.

I never enjoyed seeing a child who was "dull", yet I do not pity him as I did before this investigation. There is no doubt but his chances of employment in industry are continually improving. When mental ability was necessary, little could be done for this type, but if physical ability and coordination suffice, we can salvage this boy, make him self-supporting and useful to industry.

Industry is rapidly eliminating the whole trade in favor of many operations.

Competition makes the "production" method necessary in industry.

Physical development is out-weighing mental development, as a necessity in industry.

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