EDUCATION

OF

SUPERIOR CHILDREN

T H E S I S

SOME PSYCHOLOGICAL CONSIDERATIONS IN THE EDUCATION OF SUPERIOR CHILDREN

Presented to:-

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Preface.

This thesis does not purport to present anything new on the subject of the education of superior children. It deals with the more or less important factors which have to be faced if we are to meet the problem of successfully educating these children. The time has now arrived when psychology is recognized as a fundamental science in the field of education. Successful teaching is impossible without an understanding of human nature, and psychology assists in the explanation of the phenomena of human nature, and guides us in our endeavour to direct it.

An attempt is here made to show what factors are involved in the education of superior children and to show some of the ways in which psychology faces the issue. There is no final pronouncement made on the subject for the valid reason that there is so far only a limited amount of information of a convincing and conclusive nature. It is hoped that the thesis will bring out the most important issues. The thesis submits information and facts concerning the nature of the problem, the nature of the superior child and the nature of his needs. And it also suggests some ways of meeting the needs.

There is some perplexity concerning the value of special education for superior children. But it would seem

that we are justified in dealing seriously with them for it looks as if it is upon these children that we are to depend for leadership. There is some possibility that too much time is being spent and too much money wasted in dealing with and caring for children of less than mediocre mentality. It appears from the literature available that too great an emphasis has been placed on the importance of dealing with the sub-normal child. In view of the results achieved by the brilliant intellects of history it would seem that we have been paying attention to the wrong group of exceptional children. We would probably be better repaid by giving greater consideration to those children who give promise of intellectual superiority. Psychologists are probably out of their field when they discuss eugenics or social welfare but they are most certainly within their rights when they bring to light the differences which exist in mental endowment amongst school children. And they are quite justified in working to reveal what society may expect from superior children.

One of the dangers of our educational system is that we are losing sight of the superior individual in the masses. If democracy is to be fully realized, society must find a way of choosing and training leaders. Should not the school system help? The progress of society seems in a large part dependent upon intellect. We should

therefore cultivate those who give signs of superior intelligence. Mind is the great possession of mankind. Mind solves all problems. It is therefore to our interests not only to produce a high type of mentality, but to cultivate and nourish it when we get it. What is important from the viewpoint of the writer is that we should grasp the value of superior intelligence and its significance for society. Our ideals in education ought to be fashioned largely by our social needs.

The subject is a large one and the chapters herein do little more than touch on the subject matter. The writer has had little opportunity of observing any practical work done in the schools. Some visits were made to schools where teachers took an interest in the problem and observation was made of some children whose I. Q. was rated by one experimenter at 125 and 140 on three different mental tests given at the Laurentide School, Grand'mere, Que. (Kingsbury, Primary, Haggerty, Delta and Stanford Revision of Binet-Simon tests were used). But for the most part the information herein is based on the theory of educational psychologists, particularly those in America.

It will be noted that the terms used to describe children of above the average mentality are several in number, e.g., superior, gifted, bright, talented, supernormal and so forth. There appears to be no restriction

use of terms in the literature on the superior child. In all cases those referred to in this thesis are the upper percentiles in mental tests. Their I. Q.'s run from around 120 upward.

No emphasis has been given to the question of the emotional stability of superior children. This in itself is an interesting question for separate study. The facts to date seem to indicate that the superior child is both mentally and physically sturdy, sufficiently so to make it not insensible to proceed with considerations for special education of superior children.

References to bibliography will be recognized throughout the thesis by numerals in brackets.

C O N T E N T S

Chapter I

INTRODUCTION

The study of human nature is a subject of unending interest. Psychology seeks to discover the general laws which explain the behaviour of human beings. It undertakes to determine the role of the sense organs, of the nervous system, the muscles, glands and other bodily organs in every day conduct. It attempts to classify types of activity and seeks to explain these activities. It undertakes to determine what forms of action occur without learning, for example, breathing, swallowing, and the crying of babies. It also attempts to determine the principles which govern the process of learning to speak, dance, or read; to control temper or appreciate art, or to learn in any field whatsoever. It attempts to disclose the nature of differences among individuals in capacities to learn, in temperamental and moral traits, and in specialized abilities of many kinds. It attempts to account for such differences, the character of their interrelations and the significance of each in the work of the school, in vocations, or social life generally.

General psychology embraces the principles and explanations which hold for human behaviour in general. The principles are drawn from investigations in many more or less specialized fields in which the immediate purposes of study are diverse. There are studies by psychological methods in the fields of childhood, abnormal behaviour, education, religion,

business, medicine, and so forth, with many subdivisions and much overlapping in these fields. Each special field borrows facts and principles from the others and applies them to its own problem. Of special interest are the studies in the field of comparative psychology. Each study in turn contributes facts and principles to the body of the general science. The general science of psychology is a compact and systematized statement of principles based upon the studies in the separate fields.

Psychology Defined.

Broadly speaking general psychology is the science, "which deals with the facts and events arising out of the interaction between a creature (or person) and its environment by means of receptors, nervous system, and effectors." (Warren)[1]. Thus psychology is the science of behaviour and consciousness. It is the science of consciousness as evidenced by behaviour. It is perhaps best to assume that consciousness and bodily response (neural, autonomic, or skeletal) are merely subjective and objective aspects of the same thing. Anyone may know what is meant by a conscious process by appealing to his own experience - we are conscious of a stream of perceptions, memories, thoughts, feelings, and other sorts of conscious processes passing on within us. The sum total of these conscious processes we call mind.

Bodily and Mental Functions are not Separate.

While the problem of psychology is the investigation of these mental processes its purpose must not be conceived too narrowly. The mind is closely related to the body. Conscious processes cannot be

properly understood and explained without taking body processes into account. Our minds do influence our behaviour so as to bring us into more favourable relationships to our environment. The state of mind also affects the behaviour and attitude of the physical organism. The separation of our organisms into mind and body is an artificial separation. They are indissolubly connected. The mind's functions cannot be properly understood without taking into account the bodily functions nor can behaviour be fully explained apart from mental processes.(2)

The Biological View of Man.

Man can be best understood if considered as a part of the rest of nature. Biological science calls attention to the many resemblances between the bodily structure and functions of human beings and those of the lower animals. A study of the behaviour of the lower animals shows that they are governed by the same general principles of action as is man. Man's kinship with the lower animals cannot be questioned and the significance of his life activities cannot be understood except in relationship to the doctrine of evolution.(3) It is a mistake to minimise the importance of the great similarity between man's nature and that of the most highly developed of the lower animals. Differences are to be noted in the various forms of learning that taken together form the means of education. But it is probably only a matter of greater complexity in the case of human beings.(4)

Psychology is a Biological Science.

Psychology like biology may adopt as its fundamental conception for the understanding of man that which regards him like all other living organisms subject to a constantly recurring series of changes due to the necessity of adaptation to environment. All animals including man are provided with structures and functions that make it possible for them to lead a more or less independent existence. If the environment is not suitable or is inimicable to their needs they may so react on it as to change it in some cases or in others to move away into more favourable surroundings.

Environment Produces Educative Effects.

The environment of the child is very complex and varied. It includes not only the natural physical objects such as land and water, trees, stones, sky, and stars, but also objects made by man - buildings, machinery, and works of art. It includes also other persons and what they say and do and have written - for example language, science, and history. In a word the child's environment consists of everything outside himself that effects him in such a way as to change his behaviour, and it does affect his behaviour. Every individual's behaviour is effected to a greater or lesser degree by his surroundings.

Psychology the Foundation for Education.

It is the aim of education to place the child in the

best environment to insure the greatest possible efficiency in meeting his life's needs and those of his fellow men. In education there is a conscious selection of the environmental forces that are supposed to be most favourable for the child's development. This task can be successfully accomplished only when we know what the child's nature is to begin with, and what effects may be expected from the experiences through which he passes. It is in part the purpose of psychology to investigate such conditions and effects and to show how and why the child responds to the environmental forces.

Progress by Means of Social Heredity - Education.

Professor Edman reminds us that language is both a means of development of ideas and a means of conserving ideas and conveying them from one individual to another. It is only by this means that the progress of the human race has been preserved and accelerated. Each generation adds its quota of ideas to those of the preceding generations and hands them down to the next generation by means of language. The peiod of education is the period during which youth is acquiring the most fundamental ideas of the past. These ideas have gradually been arranged and systematised into subjects of study.(5)

There is evidence that there existed on the earth thousands of years ago human beings whose physical development was equal to ours of to-day(54). And as far as can be told by the size and shape of the skull the mental capacity of some of these races must have been equal to ours.

If, therefore, progress has taken place in the intervening time it is not because people differ fundamentally from those of earlier times but probably because each generation has been able to acquire the achievements of past generations and build on these foundations. Thus by a process of social heredity man preserves the learning of the past and is able to build upon this foundation for the future.

Hence education becomes essential for both the individual and for society. Primitive society with its relatively small stock of ideas and accomplishments could afford to educate the young by the more informal means of imitation and direct oral instruction of parents and teachers. But as society and its institutions and activities become more complex, organized means of instruction become necessary and hence arise institutions for formal instruction for the young and sciences to guide the teaching procedure such as educational psychology.

Educational Psychology selects from the field of general psychology those facts and principles which are of special significance to education. Educational Psychology is not a separate science from psychology. The act of living involves learning, and learning is the process of education, whether in or out of our schools. There are no distinctive mental processes that are utilized only in connection with school room learning. Hence educational psychology differes from general psychology only in the selection and emphasis of its data and in their applications to problems of educational method and organization. Psychology helps teachers

to understand and deal with their pupils. But William James said, "You make a mistake if you think that psychology being the science of the mind's laws, is something from which you can deduce programs and methods of instruction for immediate classroom use." An inventive mind must make the applications of the principles of psychology to specific circumstances. Psychology may indicate frequently that certain methods are incorrect because opposed to its principles, but it can seldom definitely determine that a single method is the only correct one. It is commonly agreed that no facts discovered by application of 'measurement to psychology' are of more importance for education than the great differences which have been found to exist between individuals in the various mental traits which have been measured. Recently, mainly as a result of these discoveries, various methods of teaching and organization have been suggested and tried out in schools. The determination of method in caring for individual differences can only be evaluated properly by the methods of educational psychology. But psychology as such cannot definitely determine all methods of education.(6)

Educational psychology is concerned with the conduct of the learner under various conditions and the discovery of principles which govern his mental processes. It seeks to explain, analyse, classify, describe and evaluate the facts of human nature and conduct so that the facts and principles of mental development may be known and used in both learning and teaching. Educational psychology sets forth the factors involved in the learning processes as well as individual and the physical factors necessary

to the acquisition of knowledge, skill and character.

The newly developed field of tests and measurements has in recent years made a distinct contribution to the field of educational psychology. Various tests both mental and educational have been formulated and standardized. These tests in the hands of experienced and expert psychologists enable the administrator of a school system to place a child in a group or class where he is able to make the most of development and progress.

Educational psychology then should enable us to understand human natures, to know something about individual differences, and the changes which take place in the development of various individuals, as well as to understand laws governing the learning process. Its purpose is to give information which will produce efficient teaching and thus help the learner to acquire more aptly information, skill and character.

It is the purpose of this paper to present some psychological considerations in the education of the exceptionally bright children, that is children of superior intelligence. Special provision for the education of the highly endowed should be preceded by the adoption of reasonable principles of selection and classification, as well as by a theory for the education of the children thus selected. Toward the first of these essential conditions an advance has been made, although it would seem that some consider mere classification as the goal. The fact of the matter is that the interest of the schools is mostly centred around the problem of classification of pupils into more homogeneous groups. While this is important

it does not involve the problem of fitting the school to the capacity of the child. If reorganisation on the basis of mental capacity is not followed by a genuine modification of the curriculum, of methods and of standards of work, there is little reason to believe that much will come of it.

As to the second condition - the need for basic educational principles applicable to the superior children - Terman indicates the poverty clearly when he says, "A book dealing sagaciously with this problem would merit and doubtless have wide popularity and profound influence."

Group education is a necessity. And it carries with it certain social advantages to the majority of those being educated. From the economic point of view it must play a part in the administration of education for large numbers of children. However, it is coming to be felt that the problem of our school systems is to determine how far it is possible to break away from the general idea of mass education and replace it with the idea of specific training. Before the days of mental measurements there were attempts to break down the lockstep of our system as in the public schools. In our larger cities it has been found that certain types of pupils could be separated to the advantage of both groups. And while we are not far advanced in the development of effective facilities for the superior child still the serious efforts which are being put forth deserve attention. But before turning to the consideration of methods and problems in the education of gifted children, it will be well to consider the matter of individual differences and then to seek some light on the matter of intelligence - which characteristic is a distinctive mark in superior children.

Chapter II

CONCERNING INDIVIDUAL DIFFERENCES

The Meaning of Individual Differences.

When we abstract those characteristics which appear common and universal to all individuals, human nature appears constant. But there are marked variations in the specific content of human nature with which each individual is endowed at birth. By virtue of the fact that we are all members of the human race we have common characteristics; and by virtue that we are individuals we all display specific variations in specific human capacities. There is strictly speaking no such thing as a standard human being. We may set up norms or standards but they will be scales from which every individual is bound to vary.

Children cannot be divided into groups in which the lines of demarcation are absolutely sharp and rigid. Whenever careful measurements of any physical, mental or moral trait have been made, continuous scales have invariably been discovered. It is open to question if any human trait or capacity breaks off so sharply that we can say, "Here is a group in which all are equal." The bulk of children are normal or average with respect to any trait. Fading away in both directions we get the exceptional children - the abnormals who exhibit extreme individual differences. Some exhibit exceptional superiority; others exhibit exceptional inferiority.

Those who are supernormal in intellect are those we regard as prodigies, precocious individuals, geniuses, and brilliant children

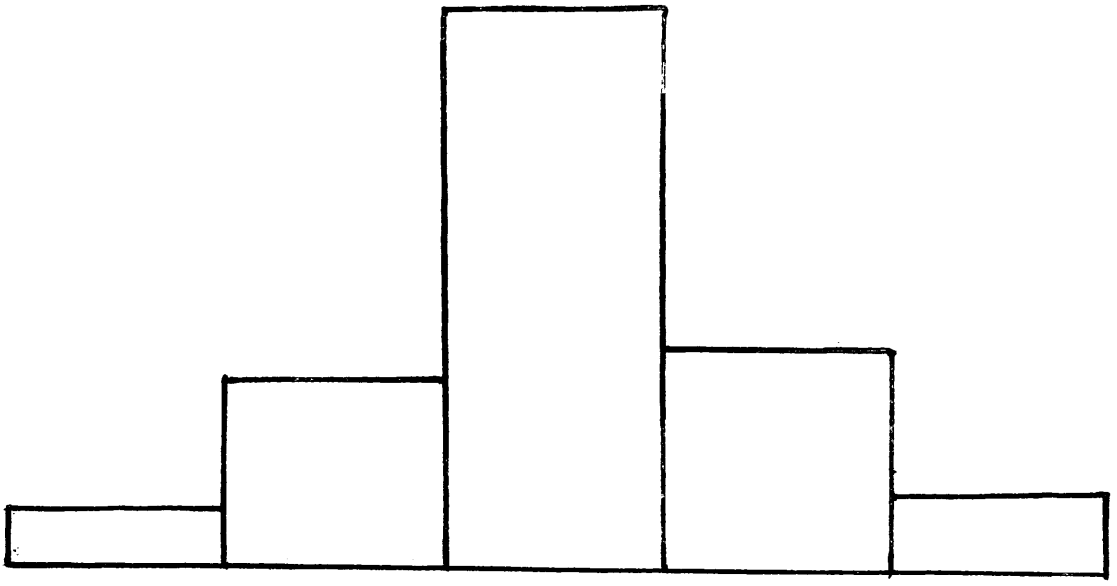
of every description.

Individual Differences Exist for All Traits.

When many unselected children of a given age are tested for any trait, large differences are found. This is true whether the trait in question is height, weight, strength, lung capacity, hearing, vision, intelligence, courage, conscientiousness, sociability, vanity or others. We can all note from time to time differences in humour, cheerfulness, evenness of temper, quality of school work, and ability to give sustained attention. Tests for all these have not been worked out, but it is significant that where tests have been worked out such as for measuring a mental trait, just as large individual differences are found for it as for physical traits like height and weight.

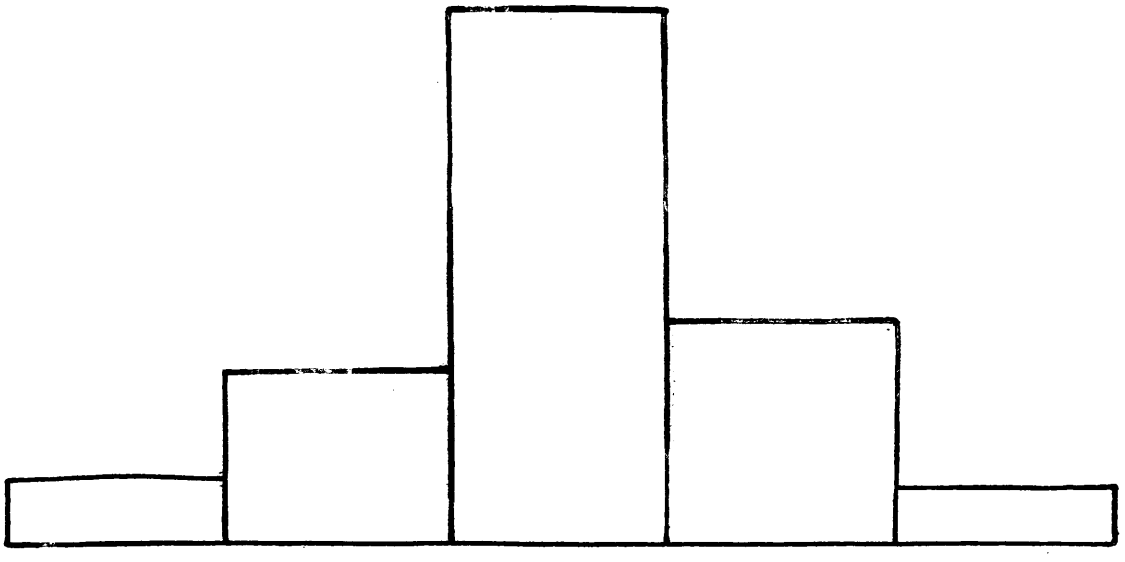
The following charts (after Terman)[29] illustrate typical individual differences in school children in evennes of temper, cheerfulness, quality of school work, and ability to give sustained attention. These graphs show the percent of pupils who were classified as - "very inferior", "inferior", "average", "superior", or "very superior", in regard to each of the traits. These are teacher ratings, and not actual measurements. Scales have not yet been devised for measuring these traits.

EVENNESS OF TEMPER



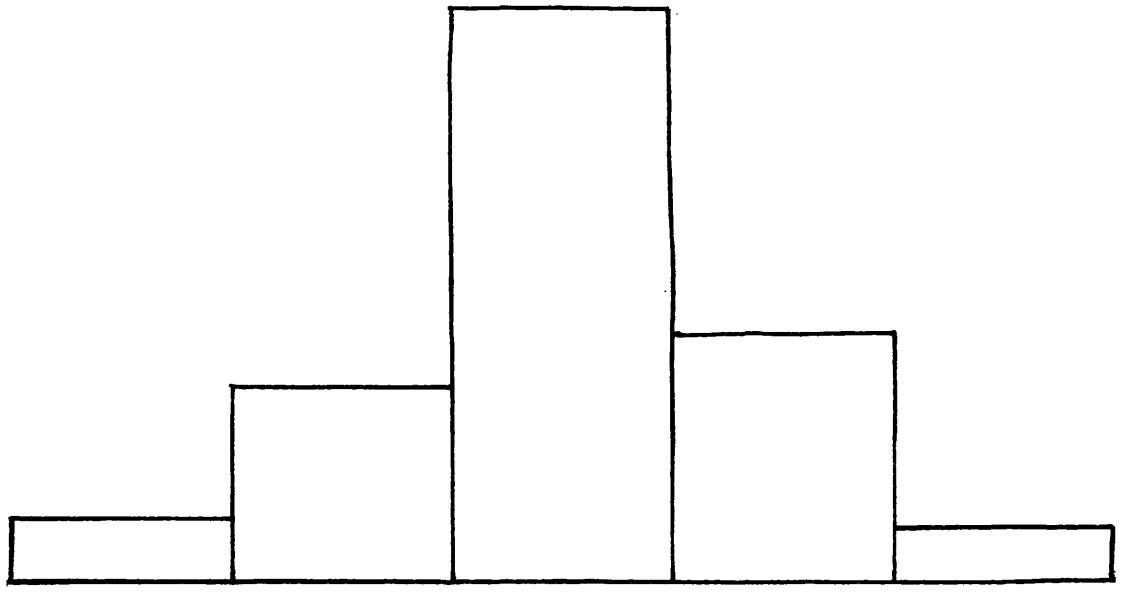
5.5%	17.2%	49.6%	20%	7.6%
Very inferior	Inferior	Average	Superior	Very Superior

CHEERFULNESS



6.8%	18.6%	47.6%	21.4%	5.5%
Very inferior	Inferior	Average	Superior	Very Superior

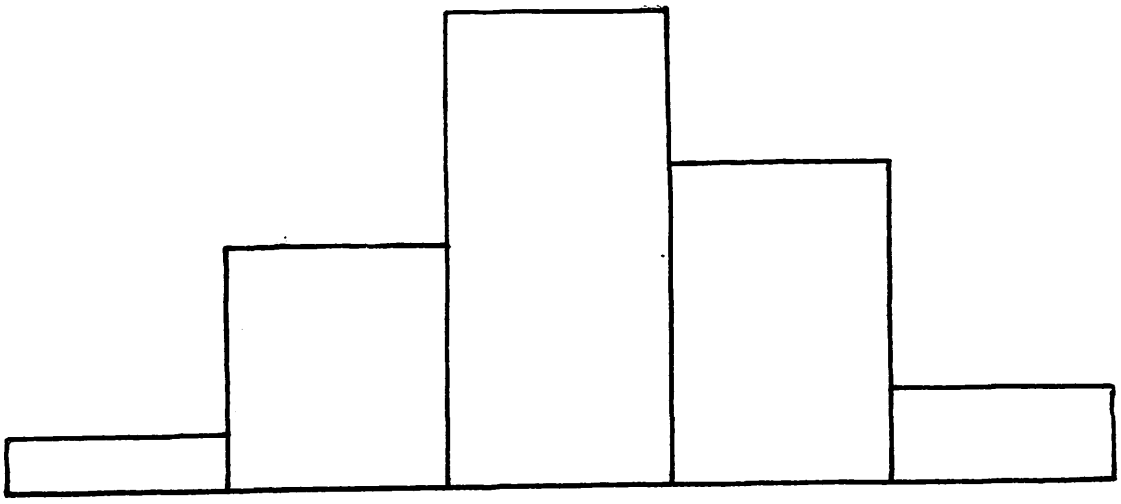
Quality of School Work



5.2% 17.9% [illegible]% 22.1% 3.[illegible]%

Very inferior Inferior Average Superior Very Superior

Sustained Attention



4.6% 21.2% 39.8% 27% 7.4%

Very inferior Inferior Average Superior Very superior.

It will be observed that there is a close resemblance in these charts. In all cases the general run of the curve is the same. Whenever separate traits have been measured or rated by teachers it is found that approximately the same divisions are recorded. They all seem to follow the same distribution whether the traits measured are biological such as height and weight, or psychological such as emotion or mental alertness.

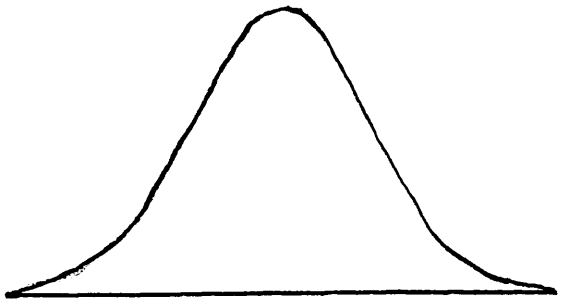
Individuals of the same age differ greatly in every trait measured or estimated. In height, weight, and strength; in susceptibility to disease, nervous stability, and mental balance; in intellect, character, and skill, and in aptitudes for special subjects or athletics, variations are always found.

The differences seem to be quantitative. People are qualitatively the same in the sense that they have in some degree the same instincts, emotions, and capacities to learn, to perceive, to remember, imagine, reason, and to be satisfied and annoyed. The physicists have analysed the 'qualities' of the tones of the human voice, of the violin, of other instruments, finding that the most subtle variations are due to the quantities of many constituent tonal elements which have been identified and measured. So with human traits final analysis will probably show all variations to be due to quantitative combinations of specific abilities which sooner or later may be discerned and measured. A human trait such as initiative, vivacity, or trustworthiness is in the case of each individual a composite of many kinds

of abilities each present in a definite amount.[7]

There are in society both the genius and the idiot, and there is every grade of intelligence between them. This can be graphically depicted thus:

Distribution of Intelligence



Idiot Normal Genius

This graph is known as the curve of probability. Biological and psychological measurements are distributed according to this curve. At each chronological age provided the number of cases is sufficiently large and the sampling is of the average run, scores range without break from the lowest to the highest. The large majority of the measurements are grouped about the centre and they drop away at first rather gradually, then very rapidly, and finally very slowly. At each chronological age children of every degree of excellence are found. The number of brilliant pupils found depends upon the standards set up for brilliancy. Care should be attached to the use of the terms, "average" "superior" and so forth, for the facts show a continuous gradation from one extreme to the other and not a distinct separation into

classes.[8]

The Causes of Individual Differences.

Among the chief causes of individual differences are probably heredity and environment; but sex, race and maturity may be contributors. The factors of sex and race are controversial.

The particular fund of human nature which an individual displays, that is his specific native endowments as they appear in practice, will be a result of these various causes. What we term individual differences are very complex with inheritance, acquisition, and environment all serving as determinants.[9]

The Factor of Heredity.

It is apparent that man's potentialities are determined by inheritance and the opportunity they have to develop through the physical and social environment. Man's prolonged period of infancy and youth together with the fact that he intentionally brings environmental influences to bear on the growing young in their training, makes the environmental factor potent in his development.[10].

The potency of inheritance in human life is well shown by Galton's studies of identical twins, twins that are of the same sex and look so alike that they are often mistaken for each other by even their close relatives. Such twins arise from the same fertilized egg. Galton found that in eighty-three pairs of identical twins that even when they were

separated in early life and lived in quite unlike environments, they remained very similar in mental traits as well as physical. Thorndike's studies of fifty pairs of twins supplements this.(11)

There is some evidence that man's physical and mental characters are transmitted in accordance with the laws of heredity that apply to other organisms, although there are some recent studies which make this a confused question.

Professor E.R. Downing, of Chicago University, points out that there seems to be good evidence that mental traits are inherited. Since half of the determiners in the fertilized egg are contributed by each parent, it would be expected that the correlation between the mental traits of a child and its parents would be .50. This expectation is realized in a number of studies. Amongst the earliest studies were those of Karl Pearson. They are being continued now with the more exact technique available for measurement and recording such mental characteristics and the results are in harmony with the earlier studies.

It is evident from studies made to date that ability runs in families. Galton in his studies of families of distinguished English judges found that the son of an English judge is five hundred times as likely to be a person of note as the son of the average Englishman. The fact of Charles Darwin's family chart will make a general statement complete.

Darwin's father was an eminent physician, a member of the Royal Society, as was his grandfather. Darwin was author of a treatise on

evolution. He married his own cousin, Emma Wedgewood, whose grandfather was founder of the famous potteries, and himself a member of the Royal Society. Four of Darwin's sons are eminent and members of the Royal Society, as are also two of his grandsons. Darwin's aunt married into another family of note, and her son, Sir Francis Galton, became the originator of the term "eugenics" and of the science that bears that name. He also became founder of the eugenics laboratory named in his honour.

Again, the history of the Bach family is well known. There were in six generations forty-seven musicians of repute, twenty-nine of whom were noted. In this case also there was much intermarriage. The close inbreeding in these two families seems to maintain the high character of a superior stock. But Professor Downing thinks there is to be expected an occasional sporadic appearance of intellectual ability in mediocre stock due to chance concentration in one individual of the desirable genes from several ancestors. And he says, "It seems equally true that the undesirable mental characteristics of dysgenic stock are heritable."(10) In illustration of this we have the two infamous histories of the Jukes and the Kallikak families. From the former group two thousand progeny has been traced, and six hundred of these are feebleminded, three hundred being paupers , three hundred prostitutes, one hundred and forty criminals, including murderers. Not one of them completed a common school education, only twenty learned a trade, ten of these learned it in prison. The striking history of the Kallikak family reveals that from a sound man who had intercourse with a feebleminded girl, four

hundred and eighty descendants who have been traced are all subnormal in intelligence. Later the same man married a sound girl, and of the four hundred and ninety-six descendants all are of sound mentality.

It is impossible to tell just how much of such transmission of desirable and undesirable character is due to purely physical inheritance, and how much to the perpetuation of favourable or unfavourable home or other social environment. However, in Wood's studies of 'Mental and Moral Inheritance in Royalty'(12) it is shown that there is clustered about an able individual a group of able relatives while mediocrity or inferiority is similarly related to the inferior individual. The environment of royalty is perhaps as little subject to variation as any and is uniformly favourable. It seems probable then that such striking contrasts as those between the Darwin and Bach families on the one hand, and the Jukes and Kallikaks on the other must largely be due to inheritance rather than environment.

There is another interesting point of view to be noted about heredity in McDougall's book, 'Is America Safe for Democracy'(13). He says, "our civilisation by reason of its increasing complexity is making constantly increasing demands upon the qualities of its bearers: the qualities of those bearers are diminishing or deteriorating rather than improving." This appears to be rather pessimistic. Statistics seem to show a serious decline in birth rates among the leading families. But the number of leaders who are the standard bearers of the nations is constantly being fed from below and it has been thus from the beginning.

This seems to be historically true of Canada and Australia. The streams of emigrants who left England to go to these countries were not reckoned as the intelligent peoples of England. They were of the lower social levels. And yet can it be said that leaders have not arisen from this common stock who have ~~not~~ claim to high intelligence - superior ability? The present facts prove that they have a claim. Another case in point is that of Japanese emigrants to California. These peoples were of the lower classes in Japan and yet after fifty years we find the social ladder has become operative. Some are now professional men and others are managers of businesses. America, Canada and Australia are no mere grafts from upper branches of society but are outgrowths of the common stem. It cannot be claimed that their high achievements are wholly due to the leadership of men directly descended from the upper classes. Good blood was undoubtedly in these sturdy pioneers, and good blood tells; but apparently it can stand a considerable admixture of common blood before it loses its potency. The evidence that intelligence is transmitted as a unit of character is not quite convincing in the light of our present knowledge.

The fact is readily conceded by most that heredity does play a large part in the production of feeblemindedness but its influence is more often indirect than direct. Fortunately for the human race, the fact of heredity cuts both ways. In the common or even inferior stock of a nation some strains of superior blood are present so that every now and then a

superior child is born of mediocre parents. In other words the inheritance of human ability does not always proceed on the simplest lines because the intelligent do not always produce the intelligent, nor do the dull always produce the dull. It is surely no more remarkable that mediocre people sometimes have superior children than it is that intelligent people, as they sometimes do, have feebleminded offspring.(10)

On these points of view each person must judge. There appears to be no conclusive evidence in the matter of inheritance.

The Influence of Environment.

Some claim that the intelligence of a child is affected by the character of his environment. Whilst there are some on the other hand who claim that the degree of intelligence possessed by the individual is fixed by inheritance and determined at birth; there are those on the other hand who contend that one's intelligence is a product of both factors - one's native capacity and the sum of home influence, educational training, and all other environmental conditions. The environmentalists maintain that the milieu in which a child is raised affects his intelligence to a large degree.

This divergence in view may be based in part upon the difference in the definition of the term intelligence. One may define the word in terms of measurable reactions, that is his score on intelligence tests. Or intelligence may be thought of as something behind one's performances, that is a quality of the nervous system or brain.

A group of psychologists, Freeman, Holzinger and Mitchell, at

the University of Chicago, recently made a study of the effect of environment on the intelligence of foster children. They used the Stanford Revision of the Binet-Simon Scale for measuring intelligence and the International Group Mental Test, a scale which was designed to be independent of environment of environmental influences. Their problem was to ascertain how far a child's performance on these tests is affected by environment. A subordinate problem was to find the effect of environment upon school achievement and conduct. As full information as possible was gathered concerning the education and conduct of the ~~natural of~~ parents of the children and of the children themselves. Information concerning the education of foster parents was also gathered. The chief difficulty in the investigations was that of isolating environment from inherited capacity. When the two are associated it is impossible to determine which is the cause and which is the effect. An example of this association of the two factors is found in the correlation between the amount of schooling which an individual possesses and his intelligence as measured by intelligence tests. It has been demonstrated beyond question that the individual with the greater amount of schooling has the higher intelligence. It is apparent that the mere fact of the correspondence is necessary to enable the individual to progress to the higher levels of training or that his intelligence score is determined by the amount of schooling which he has had. There is no means of determining which is the chief factor. The same difficulty attaches to the interpretation

of other correlations.

The summary of the above investigation gives the following results: (20)

1. Facts appear to indicate that improvement in environment produces a gain in intelligence (as measured by intelligence scores).
2. ~~That~~ A part of the resemblance between siblings reared together is due to the influence of a similar environment.
3. The character of the home affects the child's intelligence to a marked degree.
4. The available information on the parents of the foster children indicated that a large percentage were of defective mentality. If heredity were the only factor in the determination of intelligence, it would be expected that their children would be decidedly below the average. It was found, however, that their mean intelligence quotient was practically equal to the standard for children in general. This seems to point clearly to the influence of environment on intelligence.
5. The influence of home is further shown by the fact that there is a correlation between early placement and intelligence and a slight relationship between the child's intelligence and the length of time he has spent in the foster home.
6. In spite of poor heredity (morally defective parents) few cases of serious misbehaviour were found among the foster children. It seems probable, therefore, that environment has been a factor in conduct.

The Influence of Sex and Sex Differences.

We should not confuse individual differences due to the fact of sex with those due to divergent training given to each sex. In scientific experiments to determine sex differences in mental traits there have been careful attempts to eliminate everything but the factor of sex itself.(5)

The question as to the relative intelligence of the sexes is one of perennial interest and great social importance. The ancient hypothesis, took for granted the superiority of the male. With the development of individual psychology, however, it was soon found that as far as the evidence of mental tests can be trusted the average intelligence of women and girls is as high as that of men and boys.

If we accept this result we are then confronted with the difficult problem of finding an explanation for the fact that so few of those who have acquired eminence in various intellectual fields have been women. Two explanations are given.

1. That women have become less eminent than men due to lack of opportunity and stimulus.
2. That while average intelligence of the sexes may be the same, extreme variations may be more common in males.

It is said that there are more eminent men than eminent women and statistics show that there are more men than women in institutions for the mentally defective. Hence it is said that women are grouped closely about the average, while men show a wider range of distribution.

But it should be recalled that Terman tested one thousand children[29] and found from their Intelligence Quotient that:-

1. When the Intelligence Quotients of boys and girls were treated separately there was found a small but fairly constant superiority of the girls up to the age of thirteen years. At fourteen, however, the curve for the girls dropped below that of the boys.
2. The superiority of girls over boys is so slight that for practical purposes it would seem negligible.
3. Apart from the small superiority of girls the distribution of intelligence in the two sexes is not different. The supposed wider variation of boys was not found. Girls do not group themselves about the median more closely than do boys. The range of the Intelligence Quotient including the middle fifty percent is approximately the same for the two sexes.
4. When the results of individual tests were examined it was found that not many showed very extreme differences as to the percent of boys and girls passing. In a few cases, however, the difference was rather marked.

The results of studies made show that intellectual differences between the sexes are small. The differences between boys and differences between girls are as great as the differences between boys and girls.

Race as a Factor in Individual Differences

When a child states his race he has stated one of the most important facts about himself, important in its bearing upon his physical makeup, his personality, and his spiritual and mental outlook.

The imprint of race goes deep into individual natures and causes many mental conflicts within individuals and between social groups. Race directly and indirectly produces differences so great that business, marriage, friendship and almost every feature of human civilized life have to take into account and make allowance for a person's race. There are distinct psychological differences between Jew, Oriental, Anglo-Saxon and Black, especially when a member of one race is situated in the midst of another race.

The factor of racial inheritance seems important in causing differences in physical and mental traits. But as yet we do not know how much of the existing differences are due to remote ancestry, nor just what mental differences do exist between the races.

The Influence of Maturity.

The supposition that increases in ability due to a given amount of progress toward maturity are closely alike for all children except the very superior and abnormally retarded seems false. The same amount and kind of teaching may produce very unequal results in different children. Inner growth varies according to the original nature that is developing. Maturity is not the main factor in differences found among school children. But one must remember the fact that children of seven differ vastly from children of fourteen in psychological respects as well as physiological development.

Just how important a factor each of the above causes (heredity, environment, sex, race and maturity) for individual differences may be has not

been fully determined.

Broadly speaking individuality appears to have its root in psycho-physical dispositions both inherited and acquired; and the educational influence of experience moulds these dispositions in countless ways. As a result individuality manifests itself in modes of dependency upon the group to which the individual belongs, and also in modes of independence. While every individual possesses both these traits some are more docile than others. Docility and assertiveness express themselves in many different ways, so under one set of circumstances an individual will be docile and under another set of circumstances he will be assertive. Furthermore, the circumstances that occasion this variability are not alone the external conditions of behaviour, but also the internal conditions of inherited and acquired dispositions.(10)

The greater the likeness between members of the same family and their unlikeness to members of other families despite similarities in training suggest the importance of ancestry as a controlling cause of differences. Among children of the same family there is greater similarity in physical traits, particular abilities, mental and moral achievement, and greater likenesses between twins than ordinary siblings. But even with twins individual differences exist in various traits to a remarkable degree.

Investigations thus far seem to indicate that environment is not as potential a cause of differences in intellect as is near ancestry. As yet attempts to measure the influence of one element in environment have not been entirely successful. No adequate means of avoiding complications involved by different natures has been discovered. Either teaching or

feeding two different individuals in exactly the same way may produce widely different results. If lack of training or poor training were the cause of differences, we should expect that identical training would reduce differences. Individuals differ not only in special traits but in complex traits, such as intelligence. They possess not a single intelligence, but many intelligences, mechanical, social and abstract.(31) Each so-called type of intelligence involves the presence, in a high degree, of a group of different traits. Behaviour then is due to original nature and individual differences. Individual differences in turn may be due to heredity, environment, race, sex and maturity.

Significance of Individual Differences.

The fact that individuals do differ has serious consequences for social life. It means that while general influences may be drawn from wide and accurate observations of the workings of human nature these inferences remain general and tentative, and if taken as rigid rules, and are sure to be misleading. Theories of educational and social reform certainly do gain from the general laws that can be formulated about original human traits, fatigue, memory, learning capacity and the like. But to be applicable they must take into account also the variety of individual capacity and interests. We can waste an enormous amount of time, energy and money, trying to train a person to be an engineer when he has no mechanical or mathematical gifts. We will not only save time and energy, but promote happiness if we can train individuals so that their specific gifts will be

capitalized at one hundred percent. They will be unproductive and unhappy when they find themselves in activities or social situations where their genuine talents are given no opportunity and where their defects put them under a handicap. They will be more useful to society and more content with themselves when they are using to the full their own capacities.

Characteristics of the Gifted Child.

In the first place it is not true that the mentally superior are usually physically inferior. A study of the relations of the physique of school children to their educational achievement was recently made in Manchester, England. Only two out of eighty-five children of good scholarship were below the average in physique, while sixty-eight out of one hundred and seventy-one poor students or nearly forty percent were below the average in bodily measurement. (Report o f the Directors of Physical Education, Massachusetts, Department of Education).

As regards physiological traits and health, Professor Terman found they are usually above par. "There is no evidence that the superior are weak, undersized and nervously unstable." Deviations from the norm are slight as compared with intellectual deviations. Superior children show a marked physiological acceleration in height and weight. Bird T. Baldwin has done work on this problem. He found that superior children have a stronger hand-grip than others. Experiments seem also to prove that talented children are superior in motor ability. The illusion that bright children are inferior in motor capacity is probably due to the fact

that the very bright are the youngest in the classes and have been contracted with older children in motor performances. But motor capacity correlates with physiological age - not with mental age.

Disposition [18]

Superior children compare favourably with unselected children in disposition. After judging results from both parents and teachers, Prof. Terman found that they are above the average in character. Professors Coy, Root, Race and Jones are in agreement but Miss Gillingham concluded they were lazy, inaccurate, unhappy and lacking in judgment in social relations; that they presented a difficult moral problem, were conceited and ego-centric. Her findings may have been due to a peculiar group of children or the findings may have been based on different tests from those used by other investigators. The children she tested were Jewish.

Mental Traits.

There are certain characteristics which stand out in superior children. The most frequently mentioned and easily observed is their brilliance. They assimilate information with ease. They are noted for quick reaction time. Their ability to absorb the same amount of material in a fraction of the time required by a normal child is quite striking. They remember more of what they learn and desire to excel.

They are also distinguished for their power of sustained

attention, their mental endurance and their tenacity of purpose. They stay with a problem a longer time and persist at the task to be solved. They are able to work longer without fatigue.

Another mental characteristic is their intellectual curiosity and initiative. They seem to have a type of mind which investigates, takes the initiative, and has an appetite for learning. The writer has observed that after telling a story these bright children will become curious to learn further about all the incidents related and on request will recount accurately the details of the story which they have heard. They usually have efficient methods of study. This depends, of course, on training mostly. As a group the gifted children are more imaginative. They possess a keener sense of humour and seem specially gifted in linguistic attainments.

Contrary to the prevalent idea that mental superiority manifests itself almost exclusively in an inordinate interest in reading, investigations are in agreement on the versatility and vitality of interests found among superior children. Gifted children have been found to be interested not only in one but in many things. Their interests include manual arts, sports, nature study, science, music, drawing, mechanical devices and so forth. In fact their interests seem to run the whole length and breadth of human endeavour and activity.

The ability to generalize is another common trait among them. They are logical, quick to grasp underlying principles, quick to observe and

associate similarities and to foresee results. Quick to see the point and adapt themselves rapidly to novel situations.

They seem to be further characterized by broadmindedness, tolerance and a detached impersonal attitude towards problems.

Superior children are also competent in self criticism. They know when they do not know a thing. Certain investigators are of the opinion that they have an adult attitude of self criticism of persons and things.

Special talents are found amongst them. As yet no tests have been worked out for measurements of these. But in music superior children, from teachers' reports, seem as a group to be more competent in the theory and technical aspects of the subject though not necessarily in the matter of performance. Socially these children are at their ease in nearly all situations. They mix well and they are morally sound in their social behaviour. As a rule they tend to associate with their mental equals but they mingle easily with all children and are generally popular in school and on the play-grounds. In home life they seem to be agreeable and they share personal responsibility in a sensible manner when they are under sane parental guidance.

It would seem from most reports that gifted children are not only superior in intelligence but apparently in all respects. They seem to be superior mentally, morally, socially and physically. And their high intelligence appears to be accompanied by superior temperament as well as stability and stamina of character.

It should be remembered however that there is no definite line of demarcation between a normal standard and a superior child. For practical purposes the difference is one of degree of development and not of quality. The normal standard child is not an average child but is one of normal all-round development - physically, mentally, morally, socially and educationally. The superior children are in the upper percentiles for the distribution of normal standard children. Probably the best means of classification would be to designate all children of rounded, accelerated development as superior, and those of special development as gifted or talented in a special phase of development... for example superior in development, gifted in intelligence, talented in music. However there is no careful use of terms in the literature which has appeared. The words superior, gifted, supernormal, talented, bright are used with pretty much the same meaning.

The present concept of the term superior child should probably be enlarged to include a more uniform development, which takes into consideration not only the mental capacity but the unity of the child's personality. The concept should include the physical, mental, social and educational development of the child, in addition to the relative development of special gifts or abilities in any one of these.

Sufficient has been said in this chapter to establish the fact of individual differences and in view of the fact that there is such a variation between different children it seems only common sense to aver that we cannot hope to meet the needs of all children with one standard system of training for all

alike. If there is one lesson we can learn from the certainty of individual differences it is that we cannot hope to turn out standard products by a uniform process of education. If there are serious differences in capacity and ability amongst children it would seem to be ordinary common sense to meet children on their proper levels and make special provision for those who give evidence of needing particular attention because they are superior, gifted and talented far above the average child. How this can be done will be dealt with later on. Meantime we shall consider the meaning of intelligence which is regarded as the chief characteristic of superior children.

Chapter III

CONCERNING INTELLIGENCE AND THE SELECTION OF SUPERIOR CHILDREN

What makes superior children distinct from normal children ? The most ready answer to this question is that they are superior in mental ability and capacity. They have more intelligence it is said. But what is intelligence ? Cases have often been cited in which illustrious men and women were diagnosed as failures by their teachers while in school. Many men and women who later became authorities in their fields were called mediocre as pupils. Charles Darwin was considered by his masters and by his father as below the common standard of intellect. Robert Fulton was called a dullard. Pasteur was not at all remarkable at school study. Many men and women who are to-day national and world figures could be cited who had a poor school record.

Doubtless these cases are a minority and doubtless also biographers do exaggerate, nevertheless such cases as the above are numerous and sufficiently important to be given recognition. The fact is that the mental abilities of many pupils are widely misjudged in school, and the abilities displayed are either unperceived or misunderstood because of arrseted development, poorly suited courses, stereotyped curricula, and a general lack of sufficiently broad means for estimating ability. This is not claiming that all I.Q.'s are misjudged, but it indicates that there is a danger of them being so judged. But while it is true that the abilities of children may be misjudged,nevertheless it seems assured that by a series of present day psychological and educational tests we can be pretty certain of the

intelligence calibre of the subjects tested.

A definition of intelligence will never substitute for mental tests as a means of classifying children. But it may be helpful in giving us an idea of the nature of this characteristic of superior children and better enable us to recognize the traits of mental capacity for which superior children are distinguished.

What is Intelligence ?

Psychologists have been measuring an alleged something which they call intelligence without being very greatly concerned with defining it. In this respect they are like the physicists and chemists who have been explaining physical phenomona in terms of invisible and indivisible atoms, electrons and protons, without hafing demonstrated the existence of these hypothetical entities or without knowing exactly what they are. Similarly the psychologists have been employing a similar abstraction rather naively without prior attempt at definition. Intelligence testing, however, has now reached a stage of critical reflection and there is much discussion about the nature of intelligence. A review of all the material in books, monographs and discussions is impossible here, all that can be given is a review of some of the important views current at one time or another.

Intelligence has been identified with knowledge, cognition, some aspects of intellect functioning (for example attention, concentration, discrimination, synthesis, reasoning and so forth) with the sum total of traits which may be regarded as intellectual in contrast to instinctive, emotional, or

temperamental traits, and with general mental adaptability as determined by the objective criterion of successful adjustment to external situations.

Concepts of Intelligence[36]

Binet's Conception of Intelligence.

Binet did not leave any exposition of his doctrine of intelligence. His views on the subject seem to pass through a process of change. Intelligence is not "a single indivisible function", but a sum total of mental functions. In his early thought the emphasis was placed on the simpler ingredients. Intelligence is formed by the combination of all minor functions of discrimination, observation, and retention. In the later writings he placed emphasis on the higher mental processes, attention, adaptation, judgment, understanding abstract relations, and invention. "Intelligence manifests itself in the best possible adaptation of the individual to his environment." "The basic factor in intelligence is judgment - good sense, practical judgment, initiative, the ability to adapt oneself, to judge well, to comprehend well, to reason well these are the essential activities of intelligence."

Intelligent action requires the voluntary direction of attention to the problem, keeping the problem in mind, selecting the proper means for attaining the chosen end, and the evolution of the reactions in order to determine whether they are adequate (self-criticism). Apparently the ground on which the Binet-Simon tests are based is that success in app-

rehending, responding to, judging and criticizing the material contained in the scale is proportional to success in dealing with other types of material. It should be noted that the tests in the scale are not limited to the measurement of judgment or the four activities referred to as the "primordial functions of intelligence" (direction, comprehension, invention, and criticism), but includes perception, weight and colour discrimination, attention, memory, imagination, and information or knowledge of various kinds.

Meuman, Robinghaus and Ziehen.

According to the view of these authorities, intelligence is a relating of combining activity. Intelligence synthesises fragments into a unity. Its essence consists of bringing together a multitude of independent concomitant impressions into a unitary meaningful whole.

The Biological Definition.

Intelligence has perhaps been most frequently defined biologically or functionally in terms of the purpose which it subserves in the economy of life. It is ability to learn or to adjust one's self to the environment. According to H. Woodrow, "It is the capacity to profit by experience." J. Peterson says, "It is a mechanism of adjustment or control." W. Stern thinks, "It is the general capacity of an individual to adjust his thinking to new requirements." Briefly the biological view of

intelligence is that it is the ability to deal well with novel situations.

Thurstons's Theory.

This theory elaborates the biological theory. Mental life emerges from the vague feelings of unrest of the inner self which manifest themselves in consciousness as impulses and instincts. "Consciousness is the life impulse in the process of becoming conduct;" it is, "unfinished action". The conflicts of impulses that are rather well specified constitute consciousness in a functional sense. Mental life is "action in the process of being formulated." "Every mental state is biologically to be conceived as unfinished action." Mental states are "ideomotoril and they tend automatically and impulsively to express themselves in action." A percept is almost ready to precipitate in action, ideation, conception, imagination, and the higher mental processes are only loosely formed "and need further definition before they can issue into overt action." Intelligence is defined according to this point of view as, "the capacity to live a trial and error existence with alternatives that are as yet only incomplete conduct." Its develppment is marked by the capacity to select fruitful adjustments without trying incomplete actions in overt form. An "intelligent adjustment is one that is executed only after having been anticipated mentally." The basic function of mind is the anticipation of experience. There are various degrees of intelligence:-

1. Overt, random, trial and error reactions, without conscious guidance.
2. Control of reactions by perceptions - "perceptual intelligence."

3. Control of reactions by noting common elements and general principles, that is, ideational or conceptual intelligence.

Phylogenetically intelligence begins with the perceptual intelligence of animals. In man it reaches the stage of the "imaginal anticipation of experience." The big test form of intelligence involves conceptual thinking or thinking in terms of universals. Its genesis is traced to the "differentiation of the exploring functions of the receptors." It proceeds, "from particulars to universals." But the intelligent act, the intelligence at work, always proceeds vice versa. Intelligence is a capacity "superimposed on the ideomotor tendency." It, "implies the inhibition of a motive at an undefined stage in order to make it focal in its incomplete form." It inhibits and modifies our instinctive behaviour and unifies our reactions. It is, "the capacity to make impulses focal at their early unfinished stage of formation." It is, "the capacity for abstraction which is an inhibitory process." Its development results in increasing control of future action and increasing protection to the organism. Rational behaviour involves, "deliberate trial and error choice by anticipating the consequences of overt fulfilment of the impulse."

Freeman attempts to render the functional concept more definite defining intelligence as, "the capacity for successful adjustment by means of those traits which we ordinarily call intellectual" - such as quickness of learning and of apprehension, and the ability to solve new problems and to perform tasks presenting intellectual difficulties. "Intelligence is measured by the facility of pattern formation among ideas, or facility in

the organization of thought." The intelligent person can both break up old ways of thinking and develop new ways of thinking in adjustment to the demands which the situation makes upon him. This definition aims to give due weight to various factors of intelligence such as memory, analysis, synthesis, discrimination and learning.

Thorndike's Theory - Extension of Multiple Factor.

According to the multiple factor theory of E.L. Thorndike "the mind is a multiple of particular capacities all of which may be independent of the other." It follows that intelligence can be measured only by an assortment of tests. In a recent critical review of the various conceptions of intelligence, Thorndike points out that intelligence can be measured by many kinds of materials - real objects, real or imagined qualities or relations, acts, words, ideas - because intelligence can be tested by the products of its operation. It may be measured by the difficulty of the tasks it can perform, by the number of tasks it can do at each level, and by the speed of performance. High level of performance is more important than speed, or than wide range on an inferior level. He calls attention to the fact that, "selective, relational, generalizing and organizing ability," are as important as the principles of educing of relations and correlations which Spearman considers possess the highest claims to the name of intelligence. From the standpoint of its function, intelligence enables the individual to make correct, good or successful responses. "Intellect is concerned with facts, being the ability to see and learn the truth, to get true knowledge and use it to the best advantage." The good or the correct response will be

obtained

by the better intellects more often than the poorer."

Koh's Analytic - Synthetic Theory.

"The functional definitions tell us what intelligence does, not what it is, while the combination theory over-emphasizes the synthetic activity at the expense of the analytic." This is S.C.Koh's opinion. Intelligence is both an analytic and synthetic activity in every stage of manifestation. It is, "the ability of an individual to analyse and synthesize." More basic activities than "adaptation, analysis and synthesis are the mechanics of intellectual behaviour - adaptation to changing situations is but one of the many results."

Spearman's Conception.

Spearman criticized various conceptions of intelligence on the score that they do not define psychological process at all, and that no actual use is made of the definitions. He develops the view that the definition of intelligence must be based on the psychology of cognition. All cognition originally springs from experience - that which is immediately lived or apprehended, and that which is educed from the apprehended characters. It can be reduced to three principles:-

1. Any lived experience tends to evoke immediately a knowing of its characters and experiencer.

2. Experience of two or more characters, "tends to evoke immediately a knowing of relation between them," whether the relation be real (such as cause and effect) or ideal (that is likeness and difference - the chief source of numerous well-known mental tests).

3. "The presenting of any character together with any relation tends to evoke immediately a knowing of the correlative character."

The latter is educed from the very nature of the characters initially presented. Many tests employing, "thoughts," are based on the eduction of correlates, such as the supplying of opposites, completing sentences, answering questions or applying rules. An indefinite number of relations and correlations can be derived from a character and its relations.

"The experiential form of learning is represented by the first principle, but the non-experiential form, the educing of relation and correlates represented by the second and third principles, is the most important from the standpoint of modification of behaviour."

All cognitive operations resolve themselves into these three principles (supplemented by five quantitative principles) which have been identified with the processes of perception, the apprehension of relations between objects and the transition from the idea of an object and a particular form of relation to an idea of a second object. The essence of intelligence, however, "consists in the apprehension and employment of relations and corre-

latives. Stimuli, environment and situations constitute only a portion of the cognitive field.

The Concept of J.E.W. Wallin.

He holds that intelligence is a complex of of lower and higher cognitive activities which are more or less closely interrelated and interdependent because of similarity of processes and the integrative activity of the neural mechanism. These cognitive activities are initiated, modified and directed by non-intellectual factors of an affective and conative nature. Intelligence begins with the awareness of qualities (attributes) in the environment and of the conditions of the body and their relations, proceeds to the formation of concepts and judgments and culminates in the application of conclusions to new situations and in rational responses to non-instinctive and unaccustomed situations. Intelligence represents the sum total of all "intellective" activities - that is, perception, recall, discrimination, analysis, synthesis, comparison of present with past experiences, selection and so forth, - some of which are more important than others. In any given situation, the less reliance placed on instinctive, habitual or accustomed reactions, the greater the demand on intelligence. Hence more intelligence is required to meet novel situations successfully. Again, the more quickly the situation is mastered the more intelligent is the learner.

It would seem then that intelligence is a complex of functions including perceptions, memory, association of ideas, attention to ends, imagination, analysis, assimilation of old with new, of old with old, and new with new elements, an understanding of situations, whether ideal or real, selection, adaptation of means to ends, invention, the manipulation of symbols or things, the apprehension of manifold connections and possible solutions, critical evaluation, and reasoning. It may be general capacity or specific talent.

Kinds of Intelligence.

Although intelligence may be a general capacity and a talent or a specific capacity, there may be different manifestations of intelligence. Thorndike recognizes three kinds:- social intelligence - the ability to get along with people; mechanical intelligence - the ability to deal with things; verbal intelligence - or the ability to comprehend language and to express one's self by written or spoken word. One might similarly speak of concrete and abstract intelligence. These distinctions, however, refer to phases or aspects of intelligence rather than to separate types of intelligence, and do not affect the basic concept. Intelligence, whatever the nature of its inner constitution, is an instrument of control and a mechanism of adaptation to the changing requirements of life.

Certain it is that the term general intelligence is sorely in need of definition. By the average person and even a large number of specialists in educational measurement, it seems to be accepted at face value to mean just what it says. But is it not a loose use of terms that

permits us to use the name general intelligence to designate mental traits which are painstakingly limited to the literary academic tasks of our present intelligence tests ? Are we not misleading when we say that he - only he has general intelligence who with paper and pencil can effectively do such things as for example solve simple arithmetical problems, state the opposites for each of a list of words, fill in a number of deleted sentences, decide whether a given number or word is identical with another, or write the seventh letter of the alphabet, or state whether alliteration is the form of pentameter, or give the greatest possible number of words in one minute which rhyme with "pay" or any combination of such tasks that may occupy the thirty to forty-five minutes given to an average intelligence test ?

What sort of mentality has the individual who makes a low score in such tests but who when he quits school can organize a gang that is next to indissolvable ? or who can start a stalled motor-car left by those of higher I.Q.'s? or What shall be said of those who rate low in I.Q.'s, who hold fairly high paying positions ? There are many such cases. And who shall estimate their general intelligence ? To say that they are not possessed of general intelligence is to fight over words. Can we consider their case closed, however, simply because on intelligence tests they rank low ? It is a question what the intelligence tests measure; a question of what we mean to include under general intelligence. It surely is more than examination ratings and teachers' appraisals. Intelligence tests measure only what each test is calculated to measure. And at the outside limit general intelligence should only be reckoned on the total results of a large

number of different tests and even at this should be reckoned with caution.

Many who have given serious thought to education have been wont to exalt intelligence at the expense of knowledge. There is a distinction between wisdom and learning, intelligence and knowledge, mental power and mental content.

The cry for intelligence was acute in the first part of the twentieth century. The elementary schools had just recovered from the cramping effect of annual examinations and had begun to breathe more freely. Intelligence became a cult and a quest. Teachers aimed at it, inspectors looked for it, administrators encouraged it. The educational psychologist began to investigate intelligence and to seek means of measuring it. But it soon became evident that it was necessary to define the term. It is not enough to say that intelligence means ability as distinct from knowledge, capacity as distinct from content, power as distinct from product. Binet saw this difficulty and accepted knowledge as one of the many marks of intelligence.

There are other psychologists who look at the question differently. Spearman in England and Thorndike in America resort to mathematical research. They submitted specific mental abilities - the ability to add, memorize, sort cards and so forth to certain rigid tests and carefully marked the results. Then they compared the various scorings and found the correlation between them. And from similar statistics the two men arrived at different conclusions. Thorndike concluded that the individual abilities were entirely independent - that there was no such thing as general intelligence, but only particular intelligences. For may

not a child be intelligent at geometry and stupid at history, brilliant at memory and bad at subtraction. Spearman, on the other hand, concluded that there was a certain dominant factor common to all the specific abilities "G" - a central fund of intellective energy, to which the term general intelligence or general ability might be applied fittingly.

It is said to be a matter of common observation that a man who is good at one thing is good at most other things. Cases of one-sided ability are not common, rather rare. Generally a wise man is wise in all things; a fool is a fool all around. P.B. Bullard says, "It can be proved mathematically that there is a positive correlation between all forms of native ability; they always tend to hang together."(46) Why should this be ? Why should mathematical ability be positively correlated as it is with linguistic ability ? Even if we make every allowance for such operations as might be conceived to be common to the two abilities, we still fail to account for the whole relationship. There still remains an unexplained nexus. We are forced to assume a general factor common to all the multifarious operations of the mind, a factor with which each specific ability is, in its own measure, charged and energized. This common fact Spearman reasons to be intelligence. And he further concludes that this central factor cannot be cultivated. It is born with one, and can neither be improved by schooling nor dulled by neglect. "Intelligence is mother wit, and mother wit is a matter of heredity."(21½

It is clear that general intelligence cannot be directly tested for it can never be found alone. It is always embedded

in specific abilities. But it can be tested indirectly. And this is done not by one test nor by two tests, nor is it accomplished at one sitting or two sittings for mental examinations. Intelligence testing is not so simple a matter. It is a laborious process testing many abilities - as many as possible and by a process of mathematical analysis extracting the common intellective factor or element. After years of labour Cyril Burt proved that while almost any kind of ability was a presumptive sign of intelligence, some abilities were much safer signs than others. He says, "Of all the tests proposed those involving higher mental processes, such as reasoning, vary most closely with intelligence."(50)

But whatever our concept of intelligence it seems to be agreed that superior children are endowed with a mental capacity which is distinctly above the average.

The Measurement of Intelligence - Selecting Superior Children.

The function of mental tests is to facilitate the task of those who, by means of training, are endeavouring to assist each person to find the place in society for which his mental and emotional equipment best suit him. The most important preliminary purpose of a psychological examination is the determination of the level or degree of intelligence by some acceptable measuring device - a test of general intelligence by some acceptable psychological tests for backward, average and superior children.

We want the tests to measure inherent ability, intellectual strength or portentialities. Strictly, however, this is not possible except at life's beginning. We can only measure intelligence as affected by accumulated experiences and the ability to profit by such experiences.

The genuine mental test depends for its value upon its universality. In testing ability as in testing knowledge it is always best to set a fair number of questions. To base judgment on one test, however good that test may be, is extremely precarious; and when the test itself is suspected no verdict at all can be reached. Each test must itself be tested and the results interpreted in accordance with the laws of probability. We cannot afford to rely on any single criterion or on any single test in the hands of the average teacher as a basis for evaluating a cross section in the entire school,life of a child. Tests, scales or judgment are but single shafts sunk into the complex nature of a developing child and the devices used - perhaps only occasionally-may be misleading and misrepresentative of the rich deposits which they are supposed to examine. Educators are just beginning to appreciate the fact that the selection of gifted and superior children for school advancement is a very intricate scientific problem. It is important from the practical educational point of view to have methods of analysing the problem and to formulate principles on which a rational system of selecting superior children for instruction and promotion may be based.

The methods of selecting superior children vary. It is not possible to say how many different methods are used. This is due to the

fact that different schools have different methods of selection and the methods tabulated here may only represent a certain group of schools. It must be remembered that there is no final standard test which will alone win approval from all psychologists. Hence there is a tendency for an experimenter to use combinations of tests and he may use different tests within the same school for children of different ages. So it is quite probable that criteria other than these mentioned are being used. The methods of selection in vogue may be summarised in tabulated form if allowances are made for the existence of one or more methods in a particular school system.

Methods of Selection.[18]

1. Intelligence examinations (psychological).
   (a) Group Tests.
   (b) Individual Tests.
   (c) Individual and Group Tests.
2. Teachers' Recommendations.
3. Scholastic Standing.
   (a) Standard Tests.
   (b) School Marks
   (c) Special Examination.
4. Probation.
5. Chronological Age.
6. Social Development.
7. Parents' Permission or Advice.
8. School History and Pedagogical Age.

9. Demonstrated Ability.

10. Effort and Concentration.

It can be readily understood that when there is no standard or universal test there will be all possible combinations of the methods outlined above. For example:-

1. Scholastic standing plus psychological tests.
2. Psychological test, teachers' recommendations, and scholastic standings.
3. School marks, educational tests, psychological tests, effort.
4. And so forth, that is, any other reasonable combination.

These methods show that there is little uniformity in selection and there seems to be no concensus of opinions as to the age or grade in which differentiation of work should take place.

A review of placement of school children within the school system after their selection shows that there has been little conscious recognition of the differences which should govern the purposes of selection. In a majority of cases the children seem to be selected for an advance in school grade, that is, acceleration by skipping a grade or by rapid advancement through a grade. In some cases the selection is for segregation into special classes or special schools; for transfer within the grade to an advanced division; for supplementary work; for an enriched course of study; for more intensive work in the same subject or for more drill.

Really the fundamental principles governing the selection of

superior children should be determined by the purpose for which the selection is made. These aims or purposes will be dependent on the type of child and on the type of organization in the school system, on the curriculum and methods of instruction and on the personal and social environment of the child, the home, and the school.

If talented children are to be recognized in school training the conception of education must be broadened. School systems have too often valued highest the things which require to be taught. They have arbitrarily rated abstract thinking above concrete thinking. They have praised the ability to use words to the exclusion of the ability to manipulate people and things. They have provided opportunity to acquire knowledge and have offered too few occasions to 'make knowledge' in the pragmatic sense. But the child is the centre of reference for all school work and the gifted child deserves special consideration.

As a practical preliminary step for locating possible children of superior ability, a group ~~an~~ intelligence test is usually given; or the teacher may be asked to name the brightest pupils; or again the school marks may be compared or the youngest children in the class may be selected.

In a large school system general directions are usually necessary to the school principals in regard to double promotions or rapid acceleration.(18) The suggestions refer to such problems as:

1. Numerical limitations. That is not more than ten percent of a class.
2. The final mark. That is over eighty percent.
3. Physical condition of the child.
4. Maturity.
5. Growth.
6. Wishes of parents.
7. Desire of the pupil to remain in a particular school rather than go to a segregated school or to another school at a long distance.

When selecting superior or gifted children for school advancement or for the enrichment of their courses, B.T. Baldwin thinks four tests are necessary:-

1. Test for physical growth (stature) and physiological age (maturity) and anatomical development.
2. Intelligence tests and general mental development.
3. Educational tests, achievement, and scholastic accomplishment.
4. Teachers' judgments and ratings.

Whatever tests are applied in the selection of gifted children ~~they~~ should be checked constantly and followed up persistently by the school authorities and careful attention should be paid to the progress which the accelerated child makes. If his progress continues in a manner which seems to meet his capacity, and if the child attains in his new circumstances a record which satisfies both pupil and his supervisors without handicapping

health or sociability, the chances are that the psychologist is justified in his judgments regarding his selection on the basis of psychological tests, and should continue to provide some distinctive method and curriculum for the education of such children.

Chapter IV.

CONCERNING CLASSROOM PROBLEMS.

After having tested and discovered children of super normal intelligence, the next issue is to proceed to do what is proper in the matter of educating such children. There are some attempts being made to adjust both subject matter and methods of instruction to meet the capacity of brilliant children. This is by no means a universal tendency. For instance, in the Province of Quebec there is scarcely any interest in the problem. Even the Protestant Board of School Commissioners in Montreal does not employ a psychologist. There are but three schools known to the writer where any intelligence testing is being carried on scientifically. These are the McGill Nursery School, Montreal, the Shawinigan School at Shawinigan Falls, and the Laurentide School, Grand'mere, Que. An attempt is being made to introduce psychometric examinations into certain of the Montreal Catholic Schools by the University of Montreal. However, in America and Germany there is considerable progress being made, and there we find widespread attempts to adjust the subject matter and methods of teaching to the varying needs and capabilities of children. Those in charge of public school systems are coming to see the advisability of making a more flexible arrangement and a more careful adjustment to the varying attitudes and capacities of school children. It is to be hoped the day is not far off when a respectable pedagogy for the instruction of superior children will be available and recognized.

The arguments in favour of special educational provision for bright children are both social and individualistic. From the former standpoint, society cannot afford the loss entailed upon it by the incomplete development of its most able and competent members. On the individualistic side every child has a right to that kind of education which is best suited to his powers and his needs. And there is this moral question also. It is as important for the bright child to acquire correct habits of work as for the average or dull child to do so. Whereas in the ordinary class the brightest children are likely to have from a fourth to a half of their time to loaf, and rarely have the opportunity of working up to the limit of their powers. The consequent habits of indolence, carelessness and inattention which are so likely to be formed under such conditions, might be avoided by the provision for such children of special courses such as would fit their peculiar characteristics.

There are a great number of different flexible promotion schemes in graded schools. The earliest one dates far back to 1868. It was based on a short interval system of promotion by which pupils were promoted every five weeks with an arrangement which made it possible for the few best pupils in each section or class to be united with the class or section next above them. Enthusiasm for special endeavour with gifted children became strong in 1900 and has since been increasing. Until now the attitude is that of making special provision for the children, even to the extent of organizing special classes or even special schools.

One of the best known schemes for flexible grading is the Double Track Plan developed in Cambridge, Massachusetts. This plan was a modification of the last six years of a nine year course. Coach teachers were employed to aid those pupils who seemed unable to do the work in the regular time, as well as to aid in the progress of those who appeared capable of doing the work in less than the allotted six years. On one track the course was divided into six sections, on the other into four; each section covered a year's work. Those pupils who took this work in six years were classified in regular grades, while those who took it in four were classified in four grades,- A.B.C.D. Pupils promoted to the grammar schools began the first year's work together, but after two or three months they were divided into two sections, upon the basis of their ability. The upper section, composed of the brighter pupils, completed one-fourth of the course of study in the year, while the other division completed only one-sixth. It was also possible for the pupils to change from the fast to the slow track or vice versa, at the middle of the course, and thus to finish in five years.

This plan was modified into the Cambridge plan which is as follows: The basal course of the plan is eight years in length, and each year, except the last, is divided into three grades. The last year comprises only

two grades, which makes a total of twenty-three grades for the eight years. Each of these grades covers the work of about three months, except in the eighth year where the grade is five months on length. Supplementary to the regular course there is a parallel course which covers the same subject matter in six years. In this course there are seventeen grades, so that the work assigned to each grade is about a third more than to the corresponding grade of the regular course. If a pupil fails to carry the work of his grade, he is asked to repeat only three months' work. If he is in the shorter course and fails to keep up, he may transfer to the regular course, with a loss of not more than two months' time; or if he is in the basal course and able to do more than is there required of him, he may be transferred to the supplementary course, with not to exceed two months repetition of work at the transfer. So many are the opportunities for passing from one course to the other, that the rate of progress may be varied to meet any need.

Plans for flexible grading have become quite popular in a large number of American cities. And many cities have adopted a plan of some sort for the advancement of gifted children. Many school systems have made combinations by picking out from two or three of the different schemes those features which seemed best suited to the local needs.

The traditional and probably the most common method of dealing with the supernormal child in the school has been merely to let him skip a grade or a class. The most extensive study of this procedure and its results

is one made by Mr. B.C. Hoskinson.[17] He studied eighty-four college students and forty-four school children all of whom had been permitted to skip at least a half year of the regular school course. Of the college students sixty-seven had skipped a whole grade. Of the whole group eighty-one per-cent had gifted ancestors; eighty-three percent had healthy parents; ninety percent were healthy children; ninety-three percent were regular attendants; ninety-three percent were able in school work; eighty-eight percent had been urged by school authorities to gain time in this way; only three percent ever repeated a grade; eighty-seven percent thought that skipping the grade had been advantageous to them; and, in seventy-five percent of the cases the grades skipped had been below the seventh. As a class these accelerates were found to be rapid readers, quick learners, earnest, industrious and able to concentrate. They were given to exploration of material on their own account, were kept in good condition at home, and had a good attitude toward the school instilled into them by their parents. The advantages to the individual most often named were the saving of time and the opportunity for keeping busy and interested. Disadvantages mentioned were the disturbance of social adjustments and, less often, difficulty in keeping up with advanced work. In concluding his study, Mr. Hoskinson recommends that the best ten percent of pupils be allowed to skip in grades below the seventh, if health be sound with some provision to bridge the gap if only by a few hours of special assistance at home or at school.

The plan of permitting the brighter pupils to skip a part of the course has the advantage of being easy of operation, for it does not inter-

fere with any system of grading or promotion which the particular school has adopted. It is objectionable, however, in that it offers nothing by way of constructive detail and does not partake of the nature of a positive program, rather having the appearance of a makeshift.

The way in which the objectionable features of special promotion which involves the skipping of any part of the course may be greatly lessened, consists in shortening the promotion interval, so that the amount of subject matter to be made up is correspondingly lessened. On the other hand it is clear that if the interval be made very short, many more special promotions are necessary in order to make a gain of a year or a half-year in the course, and consequently many more, though slighter, adjustments must be made.

An examination of the different plans of grading and promotion, including the various plans for special promotion or skipping of classes, will show that each of them makes some special provision for capable children in one of the following ways:

(a) They do more work in the same time than ordinary pupils,
(b) They do a different type of work with no gain of time,
(c) They are allowed to do the same work or slightly differing work, but in less time.

It might seem at first as if among these differing arrangements there might be found one that would fit ideally the needs of the gifted child, but while they are better than no arrangement at all, they do not seem to afford the best kind of adaptation of school work to the child whose performance is above the average. The schemes for flexible grading, because of the desire on the part of the teachers and principal to maintain something like an equality

of numbers in the membership of different classes, operate in such a way as to make the selection of rapidly advancing pupils too broad, unless a considerable number of different groups is provided within each grade; while in the schemes for skipping grades selection is too likely to rest on mere accident. These plans are all at fault too in that they make only indirectly, at best, any contribution to the pedagogy of the gifted child. If defective children are entitled to special educational treatment and special study for the purpose of discovering what methods of instruction are best adapted to them, why are not children who are just as far removed from the average, but in the other direction, just as much entitled to special educational opportunity and a special pedagogy ? All the arguments for special rooms for the subnormal can be made to apply just as effectively in defense of similar arrangements for the gifted child. Some educators are seriously considering the need for special classes for gifted children. Some have already been established.

In Louisville, Kentucky, they have what is called an "opportunity class" located at the Normal School.(17) A careful selection of bright pupils is made. All who were considered fit for enrollment in it were tested with the Stanford Revision of the Binet-Simon Scale by the Director of the Psychological Laboratory and none with an intelligent quotient less than one hundred and twenty were accepted. The primary aim in this room is not to gain time, though progress is more rapid than normally made, but rather to furnish an abundance of cultural material and to give the pupils a greatly enriched course. In addition to the regular subjects, foreign languages are taught by conversational methods. The class room is well furnished with desks of moveable

type, large, round, low tables and small chairs, a piano, a Victrola, and a good assortment of pictures.

In the Southal Elementary School, Manchester, England, there has been in use for some time a very effective combination of flexible grading and special classes for bright children, which deserves notice,-- (17) a plan that is both practical and easy of administration, and might well be introduced in this country for further trial and experimentation.

In this school which enrolls eight humdred pupils, the brightest thirty coming up from the Kindergarten at the beginning of each year, are placed in a special class known as Special II, to do grades I and II in one year. The rest of the beginners are enrolled in three groups - good, medium and weak, with chances for transfer upward. At the end of the year the pupils in Special II are promoted to the regular third grade, where they have a comparatively easy time for a year. A few of them who are exceptionally able, however, go to Special IV, there to do grades III and IV in the next year. Of the pupils who do their first year's work in the regular first grade, a few of the best receive promotion into Special III, where the work of grades II and III is done in one year. In other words, whenever it is possible, it is arranged so that the supernormal pupils are promoted to a special class where they will gain a grade by doing two years' work in one. The typical group of accelerates begins its school progress in Grade Special II, is promoted to Grade III and then to Special V, where it does the work of Grades IV and V in one year. The promotion from Special V is to Grade VI which is followed by Grade VII; and as a result of this arrangement the seven years' work is done in five. When there

are not enough bright pupils to form a special class, they are allowed to skip a grade and go to the one beyond, receiving, if necessary, special help in making up any part of the course that has been missed. Altogether four methods of promotion are used. 1. Promotion at the end of the school year by the formation of a special class to work through two grades in one year; 2. promotion at the end of a year by skipping a grade; 3. promotion after the term examinations; 4. promotion at any time. Sometimes besides this, at the end of the half-year, the pupils in each of the first four grades are divided into two sections, and the pupils in the upper section go ahead as fast as possible in order to get as much of the work of the next grade done as they can.(55)

An interesting method of assisting the progress of bright children is reported from Rockford, Illinois. The Jackson School of that city has departmental work in the fifth to eighth grades inclusive. The staff includes a special teacher who is in charge of a room to which the very bright pupils go for recitation. Within two months, forty-seven pupils had been assigned to this teacher. These pupils recited once a week in each study, such as languages, geography, history, arithmetic and so forth, but they had a lesson assigned daily for study in each subject. On Monday the teacher covered the ground of the five days' language study. On Tuesday the five days' work in geography was gone over, and so on. Besides this, the pupils did the daily work of the class to which they had been promoted, thus doing a year's work in half a year. It will be seen that in effect this scheme is a form of the special promotion plan, modified to make a definite provision

Sufficient has been said to show that various experiments have been tried and are on foot to meet the problem of educating the gifted child. The great need is for the school systems everywhere to undertake such work under the guide of competent psychologists. A great deal of testing has been done in the United States on gifted children who are under observation. And practically all experimenters are convinced that bright children excel the ordinary children both in mental and educational examinations. For example, in the experimental room at Urbana, Ill., Professor Whipple ran a series of experiments. It was understood that the pupils of thisroom were to follow the regular course of study, use the same text books and be held to the same requirements as other pupils in corresponding grades. It was not the purpose of those in charge of the experiment to crowd the children in an attempt to see how much ground they could possibly cover, but to give opportunity to work up to their natural pace.

In order to determine points of strength or weakness in each pupil individually, they were tested on the Stanford Revision of the Binet-Simon Scale and their I.Q's. noted. These ranged from 99.3 to 146.6. It should be recalled that Terman classified intelligence quotients above 140 as representing near genius; from 110-120 as superior intelligence and 90-110 as average intelligence. After this test was recorded, the various achievements of the children on other tests were checked with their I.Q. records. Tests for ability in handwriting, spelling, arithmetic, composition and language and so forth were given. Tests were also given in logical memory reasoning, word building. The results were markedly consistent and by and large they go to show that bright children excel ordinary children both in

Tests were also given in logical memory, reasoning, and word-building. The results were markedly consistent, and by and large, they go to show that bright children excel ordinary children both in

educational tests and psychological tests. From these results Professor Whipple is of the opinion that the differences are due ~~to a great extent~~ largely to heredity, rather than to training, for these children had differing I. Q.'s but were all taking the same work. Whipple goes further and states, "the evidence of all the tests strongly suggests that the intellectual differences between bright and mediocre children are of such an amount that they practicaly may be considered qualitative as well." (The 19th Year Book of the N.S.S.E.) At any rate the results of the test indicate that gifted children have mental powers which are sufficiently different from those of average children to make it probable that the pedagogy of gifted children must include a special adaptation of method to their peculiar needs.

Teachers and Equipment.

It is poor psychology to select the children with care and then to put a poorly qualified teacher in charge of them. Preferably the teacher should be a university graduate, one trained in psychology, and his teaching efficiency should be above the average. In scholarship, sincerity, integrity of character and purpose he should rank high, and it is desirable that he should not lack resourcefulness and initiative. It goes without saying that personality is a big factor, animation, enthusiasm and leadership are necessary to inspire children to engage their full powers in their work. (See page 99 - 19th Year Book II).

Next to desirable teachers the physical equipment of the schoolroom is important. Suitable furniture, library and educational apparatus are essential to the best work. Conditions affecting health, in fact every psycho-physical aspect needs attention. Ventilation, light

heat, and conditions producing fatigue are all problems requiring careful consideration if the best work is to be accomplished. Careful watch for any symptoms of nerve strain or other indications of weakness is imperative.

Methods of Teaching Gifted Children.

It would seem that this phase of the work has so far received but little attention in comparison with that which has been given to plans for organization, suggestions for programs of study, and discussions of the special aims to be attained by the segregation of the brighter pupils. Very much more too has been written about results which have been attained in special rooms for superior children than about the methods by which they have been secured. Modifications of teaching method seem advisable in the conduct of a special room, or class for children of better than normal ability.

After an inventory of the pupils' mental equipment, characteristics, strength and weakness has been made, the teacher is then in a position to determine what qualities are required to be developed, for example - concentration, self-control, adaptability and continuity of work. Self helpfulness is developed by doing nothing for a child which he could do for himself; accuracy, thoroughness and continuity are developed by not allowing pupils to work in a desultory manner or to have work unfinished. Miss Flora Unrich[17] found she could develop concentration by practising work when recitations were going on. In order that no pupil would develop habits of indolence, she saw to it that when any assigned task had proved too easy, they were at once provided with

additional material difficult enough to enlist a deeper interest and call out greater efforts. A large percentage of her pupils succeeded in doing two years' work in one. The gain she believed was made possible "by avoiding all mechanical teaching, appealing to the reason and judgment of pupils, reducing all drill to a minimum, studying carefully in advance the year's entire course and selecting kindred facts and subjects. This made much correlation possible, and prevented dissipation and side-tracking of the pupils' energies by presenting such material when it could be effectively assimilated." (A year's work in a superior class. Unrich, Psy. Clinic, 1913). Other features which were stressed were free and independent expression, power of initiative, careful self-censorship, conscientious effort, confidence placed in the pupils, individual instruction and adjustment of work to individual needs.

In this connection it is interesting to find amongst investigators of the problem some light on the effect of practice and individual differences. The concensus of opinion is that high initial ability is no barrier to profit by training. To quote F.L.Wells, Am. Journal of Psychology 23, "A superior performance at the beginning of special practice is not necessarily, or even probably, attained at the sacrificed prospects for further improvement. A high initial efficiency may carry with it many or more prospects of improvement under special practice than a low one. It was not because the favoured individual had had more of the general experience enabling him to meet the experimental situation better, but because he possessed the native ability to profit more by such experience, general and special, past

and future. Not practice but practicecability is responsible for the superior position of such an individual; and in the broader spect not education but educability."

It would seem from the experiments carried out thus far with superior children in separate room work that certain methods of teaching characterize the instruction of these children. One common modification is the reduction in the amount of drill, as compared with ordinary school-room procedure. The amount of reduction ranges in the various reports from 25 to 50 percent. This seems to follow a priori. Since gifted children grasp, principles and concepts more quickly than ordinary children do not so much drill is necessary in their education. While gifted children must have a certain amount of drill in the skill subjects, care should be taken that they are not required to drudge through long lists of exercises in order to 'fasten' principles which are already understood and known by them. The fact that the bright child is quicker to 'see' things than other children are goes to indicate that he needs less drill than they do. Experimental evidence is at hard to show that practice increases differences in performance. (The Leal School experiments in the city of Urbana, Ill.). It is a corollary to this that practice is more efficient in the case of able children, and hence less of it is needed to attain the set standard.

Formal review is another form of drill. What has been said about drill applies equally to formal review. It is the opinion of Professor Whipple that the best kind of drill for superior children is a

short intensive one, and he feels that there should be rather frequent reviews of that character, instead of less frequent, more formal, and

longer ones. Such reviews it seems are most valuable when given at a suitable time, for a clearly understood reason, and after careful planning - never for the purpose of using up time, and just as less drill is necessary for gifted children so it seems less review is needful.

Observers report that bright children need less explanation when being taught. Less attention is necessary to detail in the development of a new topic. Explanation does not have to be entered into so minutely, nor have to be repeated as with ordinary pupils. They grasp so much more quickly that time can be saved. One teacher puts it this way. "They get it at one exposure." It appears that the time necessary for bright children to grasp a situation is from thirty-three and a third to fifty percent quicker than is the case with other children. (19th Year Book, N.S.S.E.)

One of the chief purposes of separate rooms is to give gifted children the opportunity to work as diligently as ordinary children. Hence too much explanation on the part of the teacher would defeat the chief aims of such a room. Furthermore if the program of the special room involves a saving in time, economy in teaching must be recognized as well as economy in learning. Any time spent in explanation of what is already clear or in consideration of details which the children can work out for themselves is causing defeat to the purpose of such rooms. Is it not also true that it is conducive to reasoning and intellectual discipline to put things not too plainly ? If the teacher troubles to explain every detail - there is little room left for the pupil to exercise his intelligence or reasoning, for it becomes merely a matter of absorbing what details are given and then committing

them to memory. But in such a process of learning the child does nothing

in the way of exercising his intelligence or reasoning powers. He does not even learn the habit of enquiry nor does he learn how to associate his learning with the practices which will cause him to retain what is learned or evaluate what has been taught. To be truly taught a child's interest must be aroused. The child should exercise his judgment by pursuing facts. Effort should be a vital part in learning. Hence it follows that everything need not be fully explained in order to achieve good teaching. It is probably an error in teaching to make facts too plain. For there is then nothing for the child to do. It is only by hard work, application, digging, and pursuing leads, that we learn. Putting things beyond a child's head, provided it is related to the past experience is probably a good method in teaching, especially in teaching gifted children. Furthermore there are many ways of looking at a thing, and several ways to arrive at a conclusion. Allowing the child scope to ferret out his own conclusions and to do it his own way is probably the essence of good pedagogy if we are anxious to develop independent thinking and reasoning.

This leads us to a consideration of method in providing for the development of initiative, self-reliance and free expression - much desired traits in a complex society such as we live in. Through the separate rooms these characteristics can be developed more easily. The children are required to get information for themselves through silent reading. Then emphasis is placed upon their ability to discuss what they have read. For example, in history a certain child is responsible for a certain section of

work. The child studies the subject as a whole, selects the essentials and presents these to the class. He is taught to get reasons for his selections, and knowledge enough to answer any question. Dependence on self is thus cultivated. Another illustration is that of a pupil in the "opportunity class" of Miss B. Marshall of Louisville, Kentucky, Normal School. In a geography lesson one of the boys took a pointer, went to the map and gave a well-planned discussion of the hardwood timber region of his State, the different variety of trees found there, and the methods of putting the lumber on the market. The class asked him questions which he answered. Then he took charge of the class asking them questions connected with the lesson. To all intents and purposes he taught that lesson to the class, and was undoubtedly far better informed and far more self-confident as a result. Lessened drill, lessened explanation and augmented initiative are the most important features of method as adapted to the special rooms for gifted children.

There are two other important principles. One is "application", that is the endeavour to encourage the pupils in all possible ways to make use of the knowledge already acquired by them in obtaining more knowledge. This step seems to be taken easily by gifted children, and it facilitates matters in teaching. Professor Whipple tells[17] of how this was done where arithmetical principles were taught as closely as possible with their applications. "In a Fifth Grade arithmetic book cancellation was treated as a separate topic, having a section devoted to an explanation of the principle involved and a list of problems for drill. But before the section of the book had been reached opportunity was seen for the introduction of cancell-

ation, and it was explained to the class, somewhat casually at first, as a method of saving time in connection with a certain problem. This process was repeated, until after the class had seen the method used a few times they were perfectly able to use it for themselves, and consequently it was possible to omit almost all of the section of the text-book which dealt with that subject." The conventional treatment of the child who goes ahead of the lesson in his recitation is to restrain him. However, it can be seen that advantage is secured by allowing children to anticipate advance matter in this way. It prevents waste of time later in teaching. It gives the teacher a chance to discover what connections already formed in the child's mind are available as means of approach to new material. And it creates a sense of achievement in the minds of the pupils themselves.

The other principle of instruction is the effort to teach by principles instead of by detached facts. For instance a geography text-book will treat the difference in rainfall between the British Columbia Coast and the Prairies by mentioning simply the fact that there is a loss of moisture during the passage of the clouds over the Rockies - the principle is not explained. Now when the principle is explained, the class is able to deduce the direction of the prevailing winds from the text's simple statement of the difference in rainfall on the sides of any high mountain ranges. And Similar methods can be used in the whole curriculum.

Discipline.

Closely connected with methods of teaching is the question

of discipline. The testimony of those who are engaged in giving instruction to special groups of bright children is practically unanimous to the effect that no disciplinary troubles are encountered. While bright children sometimes cause trouble in ordinary rooms, because of the lack of employment, when they are placed in a room where they have plenty of work to occupy their attention, and where they must exert themselves to keep up with their fellows their idleness gives place to industry and they cease to give trouble on the score of donduct. The writer knows four superior children and their family relationships. Three of these are boys, one is a girl. The girl, who is the eldest, fifteen years of age, and the youngest boy, eight, are both indhstrious and well behaved children. The other two are lazy, most impertinent and misbehaved. All are from different families. In each case the attitudes and behaviour of these children can be traced to the parental influence and home training. Good discipline seems to be correlated positively with intelligence. The training at home or school determines the social demeanour of the children.

Contrary to the impression entertained by some, segregation of superior children does not inevitably develop in them undemocratic ideas and attitudes. Quite the opposite, for it would seem there is more opportunity for the development of the feeling of superiority on the part of the bright child in the regular room than in the special room. Under ordinary conditions, the superior child stands out conspicuously above his fellows, his superiority is acknowledged by them, often to the point of resentment, and he is keenly

aware of it. When a question has gone round the rest of the class without receiving an answer the teacher turns in relief to him with an air of finality. Such opportunity for display does not come to the child in the special room, for here he is among real competitors, and in place of being always in the lead he must often exert himself to keep up with the rest. Of course, it would not be out of place for a teacher to watch closely for the beginnings of vanity and egotism in order that he may check them promptly. This is successfully done by comparing the work of the child who needs to be corrected with that of some other pupil of superior, or at least equal, ability in that particular line. It is easier for a teacher to hold such tendencies in check in a room where the pupils are of about equal ability than in a room where the bright children are conspicuous by their superiority.

Chapter V

CONCERNING A CURRICULUM FOR SUPERIOR CHILDREN

The first condition to the future success of a child is to have the necessary aptitude. No amount of taking pains can atone for lack of aptitude. The schools cannot fashion a great poet, painter, engineer or musician out of a child who has no native capacity for literature, mathematics or art. All that education does or can do is to assist the natural faculty; it can never supply it. Even the moral qualities depend on innate tendencies. Whether a youth will follow the path of virtue, dissipation or vice, will depend at least as much on the organization of his brain cells as on any subsequent training. Frequently there is not enough regard to industry, energy, perseverance, self-reliance, force of character on which success in life depends. The usual motive for learning which is put before children is that of passing examinations.

So long as examinations determine the ranking of pupils, and the belief is held that training the memory trains the mind, a tenacious memory will remain the most serviceable mental gift for a pupil to possess. Originality will count for little. It is doubtful if the superior child can always reveal its power under the ordinary Public School organization. It is more certain that the present system is not likely to fan any spark of genius

but rather likely to permit it to die out. H. Hollander[47] thinks that there is "a great disproportion at the present time between the scarcity of adult genius and the high frequency of early promise," and he is inclined to blame the condition upon the school systems.

It is quite true that originality of thought is of little help in most examinations, which rather require the assimilation of facts and figures and others' opinions. The clever child has generally more reflective talent than memory. Memory alone is of little value. Encyclopaedias should not have to be learned by heart to serve as a mnemonic ballast to our brain, but we should be taught where to find them and how to use them, so they can be consulted when needed. The value of education is not so much to be tested by the quantity of knowledge acquired as by the capacity for using knowledge. That is, by the extent to which the knowledge gained has been turned into a faculty, so as to be available for the requirements of life and for the purposes of independent investigation. The mind of the child is not so much to be crammed with facts causing intellectual indigestion, but the child should be taught to observe systematically, to record accurately, to compare, group and infer justly and to express cogently the results of these operations. This would advance him far in the direction of plain, clear thinking.

We may remind ourselves at this point about the laws of transfer. We learn by doing. And it is doubtful if we can learn one thing by doing another. If the memory be trained in arithmetic it does not follow that it will equally

respond to poetry; or if trained in Latin, it will not necessarily be equally good in History. The same applies to observation, discrimination and other mental traits. If we wish a boy to observe Stock Exchange prices, we must teach him to observe Stock Exchange prices, not teach him to be an observant tally-man at a cannery. If a boy is to be a commercial traveller there is little sense making him conversant with theories of air currents.

Every system of education must be defective which has no reference to the characteristic talents of the scholars, who though they may show little interest in certain subjects of the curriculum, may possess a turn of mind which will some day lead to discoveries. The fact of individual differences explains attitudes as well as aptitudes, and we must strive to meet the child's needs. The earlier we are able to recognise the innate dispositions, the sooner we can aid their right use and educate the child according to the pursuit for which he seems best adapted, on the right choice of which his success and happiness depend. If children were directed early to subjects of study and lines of activity to which they are best suited, it would enhance the prosperity and material good of future generations and greatly increase the happiness of the race, and perhaps diminish poverty and crime. The earlier we can diagnose the bent of a child, according to which we can shape his education, the better the prospects of that child.

It is quite evident from all investigations made so far with gifted children that more rapid advancement for the bright child is desirable. This is important. But grade skipping is far from an ideal or complete

solution of the problem. The real need is for a differentiation of the curriculum and of methods such as will give to every child the type of educational diet from which he can derive the maximum nourishment. To deal, however, with all children of proved mental superiority as if rapid promotion were the only way to deal with them is to confess poverty of resources and ingenuity. To select certain children for rapid advancement and to push them ahead of their fellows with the sole object of covering the present school curriculum in a shorter space of time is not going to improve the situation. My contention is that the present curriculum itself is not suitable and the current methods of teaching are not scientific. We need an enriched curriculum and a more natural way of teaching - a more natural way such as the project method.

An enriched curriculum may be brought about in several ways. In many schools it is done by giving more work like that of the general course. Thus the brighter pupils cover more ground. They work out more problems in arithmetic. They translate more pages in French. They do more detailed study on the various topics. In stenography they take more words per minute and so forth. Some schools enrich by adding whole new units of materials. Miss Helen Davis in Jackson, Michigan, [51] covered not only the ordinary History course, but in addition a larger background, for example, her regular text "The Story of the World" begins with the Siege of Troy" - but in her "opportunity class" she began with the dawn of history and studied prehistoric man, the cave-dwellers, early Egyptian, Phoenician and Babylonian history and the contributions of each.

A second modification of the instruction which enriches the course of study for brighter children is in the method of presentation. In science for example the same numb of topics may be taken by two groups of pupils, but more time is spent by the superior group in suggesting and discussing probable methods of performing experiments, in applying the principles illustrated by the experiments and suggesting other experiments that might follow, while a similar amount of time is being spent by the inferior group in review work, in following careful explanation and working out simple problems adapted to their understanding. Since gifted children are superior to others in quickness of observation, in wealth of associated ideas, in power of discrimination and in reasoning ability and the attempt is made to adapt instruction to this difference.

In Cleveland, Ohio, H.B. Bixby enriched his curriculum[18] for superior children by not attempting to follow the regular course of study. A free road was opened for teaching to these children what they seemed to need. Special instruction was given those who showed special talent in art or music. In French, emphasis was placed upon the conversational side of the language. Effort was made to bring the children in line with the activities of the community - and to make these serve as a basis for further classroom instruction. To this end excursions were made to many industries. Visits were also made to civic centres as well as museums and art galleries. These as well as concerts, lectures and plays have been made the basis of illustration and instruction in his class room. Miss L.Stedman suggests the following ways

of enriching the curriculum:-(37)

1. A curtailment of the time allotment of the various subjects to from one-half to two-thirds the time required in the average class room.

2. Reduction of drill, explanation and development.

3. Definite instruction in how to study independently.

4. Development in the child of a scientific attitude towards his own progress and of a scientific method of attacking problems.

5. Opportunities for all forms of creative work - writing of plays, poems, s stories, etc., presentation of pageant.

6. Instruction in foreign languages.

7. Opportunities to ~~hear~~ *see* especially good motion pictures and spoken plays.

8. Opportunities to hear eminent lecturers, political leaders, or specialists in any line.

9. Trips into country under guidance of a specialist in nature lore for the purpose of studying animals and plants.

10. Visits to commercial and industrial institutions.

11. Visits to libraries, art galleries, museums.

12. Provision for symmetrical development by permitting the child to abandon for a time work in which he excels in order to concentrate on skills in which he is lacking.

13. Provision for special physical exercise for the child of delicate physique or for the bookish child who is disinclined to participate in play or physical activity.

14. Opportunities to work out social and civic projects for the purpose of developing group consciousness and quickening the child's awareness of his obligations to the school and the community

15. Special courses in music, art, dramatics and other special subjects for the purposes of meeting the needs of children possessed of aptitudes for technical or aesthetic vocations.

16. Definite training in leadership through voluntary assumption on the part of the child of responsibility for the successful culmination of school activities, student government, etc.

17. Definite provision should be made and concessions granted regarding programs and school attendance of children highly gifted in music, dramatics, art in order that general education and preparation for a career may continue at the same time.

18. Special courses in all phases of manual work adapted to the physical development of the child should be provided.

19. The social subjects should stimulate the child to use the research method and to read widely in correlated subjects. They should ordinarily revolve around some central project creative in nature with which the entire group is concerned. It is expedient that they create a need for efficient use of the tool subjects.

In view of the fact that there seems to be such a gulf between high school graduation requirements and university freshmen requirements, it might be well that special curricula be written which would provide a larger and better foundation for university training. And advanced children could spend extra or spare time upon this work.

There is another group of people who would enrich the curriculum by the use of projects. They see the problem of curriculum-making for superior children very differently. To them providing more work and more difficult work is not an adequate solution. They are concerned with the complete development of children and base the activities of the curriculum on driving dynamic interests. They strive to utilize the interests of children by "life situations" in the school.

A good example of this kind of work is found with Mr. B.B. Rohan, Appleton, Wis.[18] He and his staff formed "interest clubs" in the

seventh and eighth grades. Attendance was voluntary, interest was keen. These clubs consisted of Teachers' Clubs for those interested in becoming teachers, a Forestry Club for the study of forestry, a Newspaper Club, Auto Mechanics Club, Radio Club, Industries Club and an orchestra. The purpose is to give bright children something to do in which they have a special interest, so that during spare time in the class-room they will not be without work. The teachers aim to stimulate purposeful reading. The clubs meet for forty-five minutes each week out of school hours. During this time the interest is so aroused that it carries back to the classroom where books pertaining to the interests are available. When the child has spare time, he may have access to them. Problems are set during the meetings of the clubs, so whenever a bright pupil is free from his regular work he may work on a personal problem. He always has something to do, and it is something he likes to do. It is a joy when students enter their work with enthusiasm and experience a feeling of satisfaction which comes from tusselling with a piece of work that one enjoys mastering.

One of the most baffling problems which we face in organizing the curriculum and methods of instruction is that of taking advantage of the driving purposes in children. The writer is of the opinion that the problem of the curriculum can best be solved by the project method of teaching. Of course it goes without saying that the success of this method depends entirely upon the fitness of the teachers employed. But if we are careless in the main as to the selection of teachers for ordinary school work we should exercise particular care in selecting teachers of excellent qualifications to deal with superior children.

TEACHING BY PROJECTS[42], (49)

Project teaching is not so much a distinct method in contrast with other methods which teachers have used, as it is a principle. The project concept is a natural outgrowth of such doctrines as natural education, apperception, transfer, correlation, motivation, self-activity and problem solving. All are more or less contributors to the present day theory of teaching as pepresented by the project method. Likewise the values represented by such teaching techniques as story-telling, drill, objective illustration, socialized recitation and the like are not lost but enriched by the viewpoint under consideration.

The theories which have led to project teaching are not of recent invention. The history of education reveals the fact that even primitive educational methods were based on the idea that education is life. The little savage learned how to live by living. His school was a miniature portrayal of the life of the more mature members of the tribe. There was a reality about the experiences which later periods of society seem to have lost. Education has been removed from daily life and taken into classrooms.

But there has come an insistent demand for restatement of educational principles. The amount of material which a child is expected to digest is staggering. It is a question whether the child must have every possible experience which has proved beneficial to someone in the past or whether he should have a few typical experiences entered into more intensively and with a feeling of reailty. The practical demands of life insist

that education should fit him to carry on a specific task and to make a definite contribution to the life of society. The project concept represents the answer of many educationalists to these combined demands. Its advocates believe it can make for the motivation of drill and will assure that the skills represented by our present subject-division of the curriculum will be obtained. Besides providing all the desirable knowledge at present obtained in the traditional schools and under more favourable circumstances.

What is the Project Method ? It is the name for what happens when ~~when~~ an individual or a group sets about accomplishing a purpose, and in carrying it out brings about changes in his or their knowledge, skills, habits or attitudes. If the undertaking is worthy and the changes desirable we call the activity educative. We should recognize, however, the distinction between desirable and undesirable projects. Bad projects, if successful, encourage participants in one occupation, just as do good projects.

The project method means providing opportunity for children to engage in living and satisfying worth while enterprises - worth while for them. It means guiding and assisting them to participate in these enterprises so that they may reap to the full the possible benefits. The project method is a way of living, living by your own wits and in co-operation with others; it is a way of learning - almost "the" way of learning certainly so far as self-directed activity is concerned - and it is a way of teaching, of conducting the educative process, shaping the educational environment.

Value of the Concept of Project Method.

The service which the project method may render is in synthesizing and uniting many of the good ideals about teaching which are current in our day. The great part of human learning takes place during the conscious pursuit of ends. The self is active; motives are operative; problems arise and are attacked; new experience is interpreted, if at all, through old. The search for solutions proceeds inductively, while deductive application is made of what has already been learned and promises aid in the present emergency. Groups are socialized. They cherish purposes known to be common and cooperate in organized fashion to accomplish the end. Finally, good citizenship, the qualities of the leader, moral character and ideals are all cultivated in the only way they can effectively be cultivated through intelligent, purposeful activity leading on to satisfaction with the good and dissatisfaction with its opposite. The project method is a view of life and of learning as well as of teaching, capable of infinite variety of application and rather the basis for a technique than a technique itself.

In the old method of teaching the teacher's technique determined not only that something would be learned but 'what' would be learned, hence there was developed a "Mind-set", appropriate response, resulting satisfaction or dissatisfaction and the consequent strengthening or weakening of the tendency to make that particular response to that situation. The project attitude is one of expectancy towards a desired goal. In the process of helping the pupils to find their goal, the project teacher takes an important step

towards insuring the desired outcome. School life is sure to be richer when made up of hearty purposeful activities. The project method gives greater opportunity for social experience, for initiative, choice and self-direction. It encourages children to take school life in earnestness and seriousness, as the objectives for them are made real. The ~~real~~ business of living is made a part of the method. Under it the school is a place to live a full, earnest, joyous life. Furthermore, co-operation between pupil and pupil, pupil and teacher, home and school, is secured by the project method. Some have affirmed that the resulting freedom from friction makes for better mental and physical health of all. The project as used in teaching is a unit of activity carried on by the learner in a natural and lifelike manner, and in spirit of purpose to accomplish a definite, attractive and seemingly attainable goal. In the project the learner participates in the planning and direction of his own activities towards the accomplishment of the goal, and for that reason experiences a feeling of ownership and responsibility for the success of the activity.

Upon examination the project as just defined possesses the following characteristics:

1. The activity is a unit.
2. The activity is carried on in a natural and lifelike manner independent of logical divisions of subject matter, free from academic artificiality and formality, and in a natural setting.
3. The learner approaches the task in an attitude of purposefulness, as it is a self-imposed task rather than one imposed arbitrarily by the teacher or the course of study.

4. The activity has definite attractive and seemingly attainable goals. The activities of the learner grow out of the purpose or goal.

5. The learner marshals his own activities and plans and directs them, assuming responsibility for his efforts and the success of his activity.

6. The nature of the activity is such that the degree of success it attains is apparent in an objective way to the learner, and is not dependent upon the judgment of the instructor.

THE ROLE OF THE TEACHER IN THE PROJECT METHOD.

It is many-sided and not a cut and dried procedure. The teacher's business is to organize situations so as to call out desirable responses and make them satisfying. In doing this the teacher will play many rôles. The project teacher must be versatile, leader, judge, listener, task-master, guide, examiner, friend, coach, umpire, as the occasion may require. He will anticipate but will not arbitrarily determine the next moves of the pupils. The situations must be mainly planned. Subject matter is nothing but selected experience and the more closely it is connected with some phase of present life the better; for example, a room to be decorated or a family in need. The teacher brings the subject matter home to the pupils, arouses expectancy, suggests possibilities, presents the grounds for intelligent, purposeful action, often suggesting what the action should be.

The Approach.

The set of the pupil's mind will largely determine both what responses they will make to a given situation and also whether these responses will be satisfying or not. Hence the teacher must be concerned with the best approach to a new situation. His duty is to identify as exactly as possible the real nature of the anticipated experience and then

to point the minds of the pupils towards it. Ingenuity and forethought will often enable the teacher to find his leads. The purpose or the end in view is the most important factor in the project. It stimulates zeal, determines the choice of means, guides the activity and provides the final measure of success. It warms the mind to action and makes it most effective. It makes school work intelligent instead of merely formal.

Projecting includes practical as well as intellectual activities and in both planning is an important factor. Project teaching requires more than supervision, it requires a technique of its own. The teacher's part in planning is to call attention to the need of it and to provide the opportunity. He will call out suggestions from all quarters. He will warn of difficulties, challenge the judgments, suggest improvements, hold to the chief purpose, insist on definiteness and secure a clean-cut decision. Everyone concerned will appreciate the plan for he will have assisted in its making and will have been aware of all the considerations involved. Perhaps the teacher's most important function is to help the workers see wherein they succeed or fail and why. The element of skill - method - is a prominent factor. Growth in an enterprise almost enevitably brings interest. We like to do the thing we can do well. Once the ideal and the habit of sound learning are established there will be no further complaint of lack of ~~information~~ interest. The learner craves the chance to try his hand. He likes to play the game himself. Show him how. Let him try it.

Judiciously and tactfully criticize his effort and shorten the period of adjustment. These are the main steps.

THE PSYCHOLOGY OF THE PROJECT AND ITS VALUES:

The classroom activities of the traditional school student appear anything but purposeful and absorbing. The students evince little or no interest in the intellectual work of the school. One of the features of the project method is that the attitude of the student usually changes to one of interest and application and one of responsibility for the work. The change is not hard to account for. One important cause is that the very definiteness of the goal, intrigues and challenges. The value of definiteness in assignments is important. The project is a good example of definite assignments, one self-assigned. A second reason for the increased interest and effort is the fact that the purpose is the student's own. He does not approach the task under compulsion, with the unfavourable attitudes of one coerced or of one grown accustomed to habitual obedience. This phenomenon may be attributed to the operation of the 'Law of Readiness'. Activity is not pleasurable and interesting entirely on its own account. What is pleasurable at one time, or under certain circumstances may not be so at another under other circumstances. Whether given subject-matter will be interesting depends upon subjective factors as well as the nature of the subject-matter itself. Among these subjective factors is what is called 'Mind-set' -,purpose or direction of mind. Experience which fits in with the individual's set or purpose and furthers it, gives satisfaction and is eagerly

watched for and seized upon. Experience which does not fit in or contribute to one's present purpose is avoided, unless it is very interesting or unless it fits in with strong purposes, and if forced upon one is an unwelcomed distraction and annoys. The "purposing" of a given project furnishes a "Mind-set" which transforms books or activities, which ordinarily may give annoyance, into objects giving real satisfaction.

Another source of the interest-provoking power of project work is the fact that it engages some of the most powerful natural drives of human conduct - the craving for achievement, the desire for self-expression and self-direction, the desire for manipulation and construction, the desire to know and to settle states of doubt and uncertainty, the so-called instinct of curiosity and the desire for approval of one's achievement. The way to harness human energy is through these drives, which select for individuals what activities they will be engaged in. The very presence of coercion, compulsion or bribery makes intellectual achievement of a high order an impossibility.

A third factor making for a high degree of interest and application is the opportunity for the planning and directing of the activity by the student. It is only natural that we take more interest in our own undertakings than in those in which we are but privates in the ranks. The change from an uninterested perfunctory learner of lessons to an interested and animated worker frequently takes place when the project method is introduced, the difference of attitude in the learner being the same as the difference

between the farm hand and the same man when he becomes farm owner.

A fourth source of interest in project teaching is the opportunity offered to see definite tangible progress towards a goal which has assumed importance in the learner's eyes. The fact that progress may be readily and objectively noted serves to generate enthusiasm, as well as to prevent discouragements or dissatisfaction with tasks in themselves unpleasureable. Added to this there is the fact that there is always the prospect of consummation of the objective set.

Still another cause for superior interest in the project is the realization on the part of the learner that the activity is real and life-like, - like those of men and women - not merely a classroom exercise. The pupil's appreciation of the importance of what he is doing is enhanced by the fact that the activity is carried on in a natural life-like setting. Perhaps continued effort on the part of the learner is stimulated by the realization that responsibility is definite - if he fails, the failure will be obvious and individual. The learner cannot take refuge in numbers and obscurity as in the orthodox schoolroom work.

Projects and the Law of Intensity.

Because of the definite purpose and increased interest the learner is in a much more favourable condition for learning. Much more intense states of mind accompany the learning activity. The eargerness with which the student attacks the problem lessens the effects of distractions, makes for vividness, reduces the amount of repetition necessary for learning and contributes to its permanence. It seems safe to say that children remember the content learned in projects longer than similar material learned under

less favourable conditions of interest, purpose and attention.

Projects and the Transfer of Learning.

The project method tends to organize subject-matter around problems similar to the manner in which it would be employed in out-of-school life, and by so doing bridges the gap between knowledge and its practical uses. Training in the technique of teaching, evaluating and organizing subject-matter for the purposes of projects is practical training for life.

The Project and the Teacher-Pupil Relations.

The project method usually leads naturally to socialized class activity and supervised study. A very different and improved teacher-pupil relation is possible as a result. In the project method the pupil sets his own tasks; they are not teacher-imposed; as in any other form of supervised study the teacher acts as guide, counsellor and helper. The old challange between pupil and teacher may be eliminated. Instead of arousing resentment, rebellion or perfunctory compliance, there is engendered co-operativeness, confidence and interest.

The Project and Training for Initiative.

Under the traditional type of class procedure, assignments are more or less uniform and restrictive. The job is laid out, either by direction or implication, for the student. There is no choice or

opportunity for originality or initiative. The charge that schools sometimes destroy and choke initiative and individuality is not without basis. A more or less standard response is encouraged, if not required. Whereas the project method obviously is training for individuality and initiative. Each step permits of self-expression. The child throughout does the planning of the project and executes it as well. Habits of initiative are inculcated; because of the increased responsibility placed and chance for initiative opened, students soon learn to rely upon their own resources. They come to expect to direct their own affairs.

The project activity provides for an act carried to completion as over against the passive absorption of information, and to the development of the problematic situation demanding reasoning rather than merely the memorization of information. It provides a natural method of learning, making it possible for pupils to gain under the most favourable circumstances that part of their economic and social inheritance which it is the business of the school to give them.

To illustrate the project method let us consider a teacher before his class. The teacher has a knowledge of what work must be covered so he endeavours to assist his pupils in choosing their project. He, however, gives them the say in what they shall attempt. They spend some time in deciding upon a worth while activity; it may be that they conclude to make boats. Then they must plan some procedure. The style of boat, size, etc., is agreed upon. It may be that the end of the project shall be to have a race between the models when finished. A class of boys would eagerly take this up. They

must build their boats to plan. Hence they learn how to do mechanical drawing. They must secure their own materials for construction. They learn to do arithmetic and get experience in buying. They do the actual work on their models learning the use of tools and the principles of construction. They look up information on all matters pertaining to boat-building. From time to time the teacher asks different boys to give talks to the class on certain features of the work. They learn public speaking. They may keep accounts of prices involved, thus learning book-keeping. They learn to make up reports on the work by keeping a daily record of the progress of work. In this way they learn composition and grammar. Finally, they race their boats and gain knowledge necessary to navigation. They may also learn about trade routes and foreign shipping, and from this turn to geography for the next project.

DANGERS, LIMITATIONS AND OBJECTIONS TO THE PROJECT METHOD:

There are five types of objections:-

1. It breaks up the organisation of subject-matter.
2. There is a large amount of non-educative activity in the procedure.
3. It is difficult to discover projects which will develop a purposeful attitude in the pupils.
4. Increased skill is required in teaching, initiating and managing projects.
5. Drill and other necessary types of teaching not incidental to project teaching would be lost.

In answer to objection number 1, it must be replied that the value of a complete and logical organization of subject-matter has

without doubt been overestimated, and skill in selecting projects will reduce this objection to a minimum. It is not desirable to have all subject-matter of the same level of difficulty. Nor is it necessary to hold teachers too closely to fixed courses of study. Standardized instruction is not looked on with favour. It is not intended that the use of the project will necessitate any complete disregard of the emphasis desirable to be placed on various portions of subject-matter.

In answer to objection number 2, it may be said that while without doubt some planning and dicussion might be eliminated the importance of the student proposing and student planning should not be underestimated. There is educational value in such activity and were there not, the activity makes an indirect return in the way of increased student interest and responsibility.

To the third objection it can be stated that with time not only will hundreds of projects be tried out, and their teaching technique be tried out, but complete courses of study in terms of projects, in most school subjects will become available.

To those who object that increased teaching skill is required the answer is yes. Project teaching naturally requires greater skill than does the making of text-book assignments. In the hands of an immature, weak or lazy teacher project teaching will be a failure. But fair evaluation of the method and its worth can only be made after sufficient practice has been had with it, to insure a degree of proficiency comparable to that attained with older and more standardized teaching methods.

The fifth objection to project teaching is that drill and other necessary non-project types of teaching will be lost, that is, drill to fix information, establish habits or perfect necessary skill. The answer to this objection is that project-teaching does not necessarily ignore nor neglect these outcomes of teaching. Information is as well fixed as by repetitions in drill. Skill projects, memorizing projects and appreciation projects are not only possible but should be employed. Projects may involve drill for skill or memorizing. The use of projects does not preclude the use of other methods if they seem desirable.

In evaluating the dangers and objections to the project method, let us remember if project methods have their difficulties, that the older methods are also difficult to employ successfully and that these older methods frequently bring poor results. In fact it has been the poor results from the orthodox methods which in a sense caused educationalists to develop the project method.

Whatever the method of instruction and whatever the curriculum used in the education of gifted children the point to be kept in mind is that society is anxious to capitalize the intellectual powers of super-normal children. It is a question of the development of the abilities of the individual, and our school authorities should be given freedom to work out experiments which will provide programs of training the conspicuously gifted in whatever constructive direction their interests may be. It is a matter of developing each individual to the point at which he can make his greatest contribution to society and at which he can secure the greatest possible enjoyment.

Chapter VI.

SUMMARY AND CONCLUSIONS.

1. Psychology has as a part of its field a particular interest in gifted children. It is held that superior children have as much right to special care and special provision as inferior children.

2. Individual differences being established, it seems a wrong procedure to be putting all children through a standard system of education without making allowances and provisions for individual variations.

3. Intelligence appears to be a mental capacity with which we are born. Thorndike seems of the opinion that there is no such thing as general intelligence but only particular intelligences - mechanical, social and verbal. Spearman on the other hand assumes intelligence to be a general factor common to all operations of mind; that this factor cannot be improved upon or dulled by education or neglect. Whatever our theory of the nature of intelligence may be, it is agreed that superior children are those whose mental endowment and mental capacity is without doubt far in excess of the average child.

4. The selection of gifted children will be safe only on the basis of frequent and different mental tests. The greater the number of mental tests the greater the accuracy in selection. Only experts should administer the tests.

It appears from most reports that the selection of superior children is made by mental tests, supplemented by teachers' judgments as to ability.

strength of character and physical stamina.

5. The present methods of meeting the needs of gifted children in the schools are two. (a) Speeding up, that is skipping grades. (b) Broadening or enriching the curriculum. A combination of both methods might serve with advantage for some children. Educational speculation seems to favour enriching the curriculum, but there is no agreement as to what the subject matter should be.

6. One of the serious problems in the education of superior children is that of providing them with sufficient liberty in the choice of a curriculum which will permit them to follow out their individual interests. Solutions to this difficulty seem possible through 'opportunity rooms', 'interest clubs', the project method of teaching and opportunities for extensive reading.

7. The project method would seem to be the best way of teaching superior children because through it learning takes place wholeheartedly. The full interest of the pupil is obtained and at the same time purposeful activities are pursued which are related to life experiences. There is also wide opportunity for socialization and wise individual instruction. The greatest difficulty is that of a suitable technique. This should become less of a problem as projects are continuously initiated and recorded and as capable teachers are secured.

8. The ideal method of educating gifted children would probably be that of individual instruction. There are, however, values of socialization

obtaining in the public school which should not be underestimated, but the processes of individual instruction and socialization may be conducted simultaneously.

9. One of the most important factors in all plans dealing with the education of superior children is that of providing qualified teachers who are capable of meeting the demands of the situation created by these gifted children.

10. Superior children should have special attention because of the large social measurements involved. Society needs first rate brains and our educational methods should do all possible to give society the benefits of superior intellects.

Progress in civilization depends to a large extent on superior intelligence. We look for leadership in all the arts, crafts, and professions, from those of superior mental capacity. Hence the justification of special work with gifted children. From studies made to date it is evident that superior children become superior adults. Therefore we should probably look for scientists, professional men and leaders of industry from the ranks of the superior children.

Whether some of this ability should not be directed to the manual trades, or, to put it differently, whether unskilled labour should be drained of all first rate intelligence is a disturbing social question, but cannot be considered here. Those who are chiefly given to the construction of programs of education for children of superior intelligence can co-operate with industry for what seems best to society at large.

Finally, some seem to object to special education for superior children

on the grounds that it is undemocratic. The reply to this objection is that all children are not mentally equal. Biologically all are unequal. It is hard for a psychologist to define democracy but perhaps one acceptable definition might be that it is a condition of affairs in which every human being has opportunity to live and work in accordance with inborn capacity for achievement. It is therefore the business of education to attempt to provide for the various capacities of children of differing mental status, fitting them for their place in society.

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