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"HEREDITY AND ENVIRONMENT
IN THEIR RELATION TO CHARACTER"

A THESIS

SUBMITTED TO THE FACULTY OF ARTS
OF THE UNIVERSITY OF OTTAWA
IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

BY

JOHN W. MACLENNAN

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HEREDITY AND ENVIRONMENT
IN THEIR
RELATION TO CHARACTER

BY

JOHN W. MACLENNAN

no 81

TABLE OF CONTENTS

	<u>Pages</u>
<u>CHAPTER I. - INTRODUCTION.</u>	1 - 6.
(a) Ethics.	
(b) Importance of Character.	
(c) Scope of Thesis.	
<u>CHAPTER II.- GROUNDWORK OF CHARACTER.</u>	7 - 8.
(a) Heredity.	
(b) Environment.	
(c) Free Will.	
<u>CHAPTER III.- HEREDITY.</u>	9 - 27.
(a) Physical Inheritance	
(b) Mental & Moral Inheritance.	
(c) "Like Tends to beget Like". (Principle of Stability)	
(d) The Principle of Change (Variation)	
(c) The Curve of Chance.	
<u>CHAPTER IV.- ENVIRONMENT.</u>	28 - 42.
(a) Physical Environment. (Pre-Natal - after Birth)	
(b) Social Environment (Nature - Influence of Education - Influence of the Church.)	
<u>CHAPTER V. CONCLUSION.</u>	43 - 48.
(a) General Conclusion.	
(b) Summary.	

"SOME MEN ARE BORN GREAT - SOME ACHIEVE GREATNESS -
SOME HAVE GREATNESS THRUST UPON THEM"

CHAPTER I.

INTRODUCTION

(a) Ethics.

As this treatise is purely a subdivision of Ethics, it will be appropriate to show its relationship to that science, at the outset.

It is usual to enter on the study of any science by giving some definition of it. What, then, is Ethics, and what is the subject-matter with which it deals? All sciences consist of answers to questions. The inquisitive child who wearies his mother with his questions is on the high-road to science. He wonders, why the fire burns, why the wheels of the watch go round, what the moon is made of, and why his stomach hurts. This is the attitude of the true scientist. Newton asked himself, why the apple falls to the ground; and discovered, as an answer to the question, The Law of Gravitation.

When a science has been developed, it consists of a body of answers to a certain general question. Thus, the science of Mathematics consists of a system of answers to the question, What is the nature of number and quantity? Astronomy is an attempt to answer the question; What are the laws which govern the planets and other celestial bodies? Physiology seeks to answer the question, What is the Constitution of the human body?

Now, when we have before us, the results of such sciences as these, and when we know the answers they have

given to their questions, a further question remains to be asked. We must ask, What is the VALUE of these answers? What is the GOOD of their results? What is the value of numbers? What is the value of the Physiologist's researches? What is the good of knowing the distance of the earth from the Sun? This kind of question with regard to the value or good of their investigations is not usually asked by the sciences themselves, yet it is a question of fundamental importance.

This sort of question is one of the first that the child asks. The child is forward to ask, "What is the good of this?", "What is the good of that?". In its school work it asks, What is the good of grammar? What is the good of decimals? What is the good of learning dates? and so on. In fact, one of the child's stoutest objections is, "I don't see the good of it". Experience in the teaching profession readily proves this fact. Unless the child can see a definite and practical value for a subject at school, he will invariably raise the above objection. The child is anxious to know the value of the actions he is made to do and the knowledge he is made to acquire. His questions are often disconcerting, and we find it difficult to give any satisfactory answer. "What is the good of going to Church?", "What's the good of poetry?", "What's the good of finding the South Pole?".

The more complex civilization grows, the more difficult it becomes to explain or to understand the good or value of the actions that men perform, the aims they set before themselves, and the knowledge that they acquire. In a simple and primitive community the good of every action can be readily explained. The South Sea Islander knows what is the good of fishing - it is to satisfy his hunger. He knows what is the good of climbing for milk-cocoanuts - it is to quench his thirst. He knows what is the good of making sacrifices to

his gods - that they may send rain, or protect him from his enemies. He knows what is the good of everything he does. All his actions have reference to human life. All his actions are directed to the preservation of his own life, and those of his tribe. The good of his actions, is their VALUE-FOR-LIFE.

It is easy for the savage to see what is the good of his actions, because his ends are limited, and his aims are narrow; almost all his actions are dictated by some primitive impulse or by a desire to obtain some fragmentary end. But in a complex civilization, such as our own; the ends that men set before themselves may be comprehensive and very remote; and it is often extremely difficult to see the value of the actions they perform and the knowledge they acquire. Yet ultimately, it will be found that all the aims of man have value only in relation to life. (Chiefly for his TEMPORAL life, and partially, in preparing a foundation for his SPIRITUAL life). This is the ultimate good of all man's material and spiritual achievements, of all that he does and knows. The good of a thing is its VALUE-FOR-LIFE.

We must beware of interpreting VALUE-FOR-LIFE in too narrow a way. What has value-for-life is not simply to be identified with what is useful in a material way. (Utilitarianism). What is useful, of course, does have a value-for-life; but many things which are not materially useful also have value-for life. VALUE-FOR-LIFE is a more comprehensive term than usefulness, and includes much that is not useful. Music, art and literature, for instance, are not useful in the ordinary sense of the word, but they certainly have great value-for-life.

Everything, then, that man does is done with this end in view. Every action and judgment, has some relation to man, either here, or hereafter, and has some reference to what is good for man. But what is "THE GOOD" for man? The question, "What that good is" is the question that Ethics asks, and tries to answer. What is the aim of human life? What is man's chief end?

(b) The Importance of Character.

If we ask the plain man, "What is "THE GOOD" for man?", we shall receive many different answers. One will answer that the aim of human life is the enjoyment of pleasure, another, that it is the attainment of fame, another, that it is the acquisition of knowledge, a fourth, that man's chief end is, in the words of the Catechism: "To know, love and serve God here on earth, and after, to see and enjoy him forever in Heaven". These answers are clearly very different, but if we examine them a little, we shall see that there is one thing they all imply. They all involve a reference to man's Character. Those who say that the great aim of life is the attainment of pleasure, assume that pleasure is to be enjoyed by a person with a character of some stability. The very fact that a person has an aim at all, even though it be so low as the life of mere enjoyment, shows that he has some character. Only the man who is entirely aimless is totally devoid of character. Again, those who say that the chief end of life is the attainment of fame and honour, certainly imply a reference to character. If they are sincere in their proud ambition, they desire, not merely, that honour should be ascribed to them, but that their characters should be

such as to deserve the honour. They want to deserve it, for it is not real honour unless they deserve it. Honour is simply the outward recognition that there is something great and good about a man's character. Similarly the other two views of THE GOOD for man both have reference to character. The acquisition of knowledge naturally has an influence, either good or bad, on the development of character; the last man, with his christian view, knows that he cannot glorify God and serve him, unless his own character be good and his own conscience clear.

All these answers, then, different as they are, agree in implying that the good for man, is ultimately connected with his character. And we may state provisionally that the good for man consists in the development of a good strong character. This aim is the highest aim, any man can have, because in its realization, he will also attain his chief end.

(c) Scope.

In this treatise I will deal with the ORIGIN of Character in the tendencies and capacities which a child inherits from its parents, and the INFLUENCE of Physical and Social Environment on this inheritance - whether it be good or evil. The DEVELOPMENT of character depends to a large extent on a third factor, which increases in importance, directly as the child increases in years. In this case, I refer to free-will.

I will limit myself to the ORIGIN of character alone, and endeavour to show the Relationship of environment in the early stages of child-life. The DEVELOPMENT of

character, and the tremendous importance of free-will are not to be denied; nevertheless, it presents a complete field in itself and shall not be dealt with in this treatise. The Origin of Character, and the importance of heredity and environment, shall be considered "per se".

CHAPTER II.

THE GROUND WORK OF CHARACTER

If we examine the ground work of character, we shall find that at any stage in the child's development, his character is what it is, in virtue of:

(a) The original inheritance which he has received from his ancestors. (Heredity).

(b) The modifications and alterations produced in his original inheritance, by the influence of environment.

(c) Free will.

In some children, the sinews of character may be due to heredity rather than environment; in others, the environment may have exercised the dominant influence. But in every case, the two factors are involved. Character cannot be produced in the child by heredity alone. The child is not supplied at birth, with a ready-made character, which environment can do nothing to alter or modify. On the other hand, the mind of the infant is not simply a piece of blank paper, on which the environment can make any mark it pleases. All character arises from the interaction of both heredity and environment.

But this is not all there is to say about character. Even in its earliest years, the child does not submit to be passively by these two great influences. "The child is not simply a mass of clay at the mercy of the hands of Heredity and Environment. The child himself takes a hand in the process of making his character" (Free-will). He reacts to the formative influences to which he is subjected, and as his system of purposes grows and his will-power develops, he definitely, though at first unconsciously, undertakes the task of fashioning his own character. Thus, the three great

factors in character building are heredity, environment, and free will. These will be represented in the saying: "Some men are born great - some achieve greatness - some have greatness thrust upon them".

"Some men are born great" - this emphasizes the importance of heredity. "Some achieve greatness" - this involves the activity of a man's will. "Some have greatness thrust upon them" - demonstrating the factor of environment. But we must guard against supposing that any man's character is produced solely by heredity, or solely by environment, or solely by free will."

In the following pages I shall consider the significance of heredity and environment in their relation to character. I have already emphasized my reasons for eliminating the aspect of free-will from the discussion.

CHAPTER III.

HEREDITY

(a) The Physical Inheritance of the Individual.

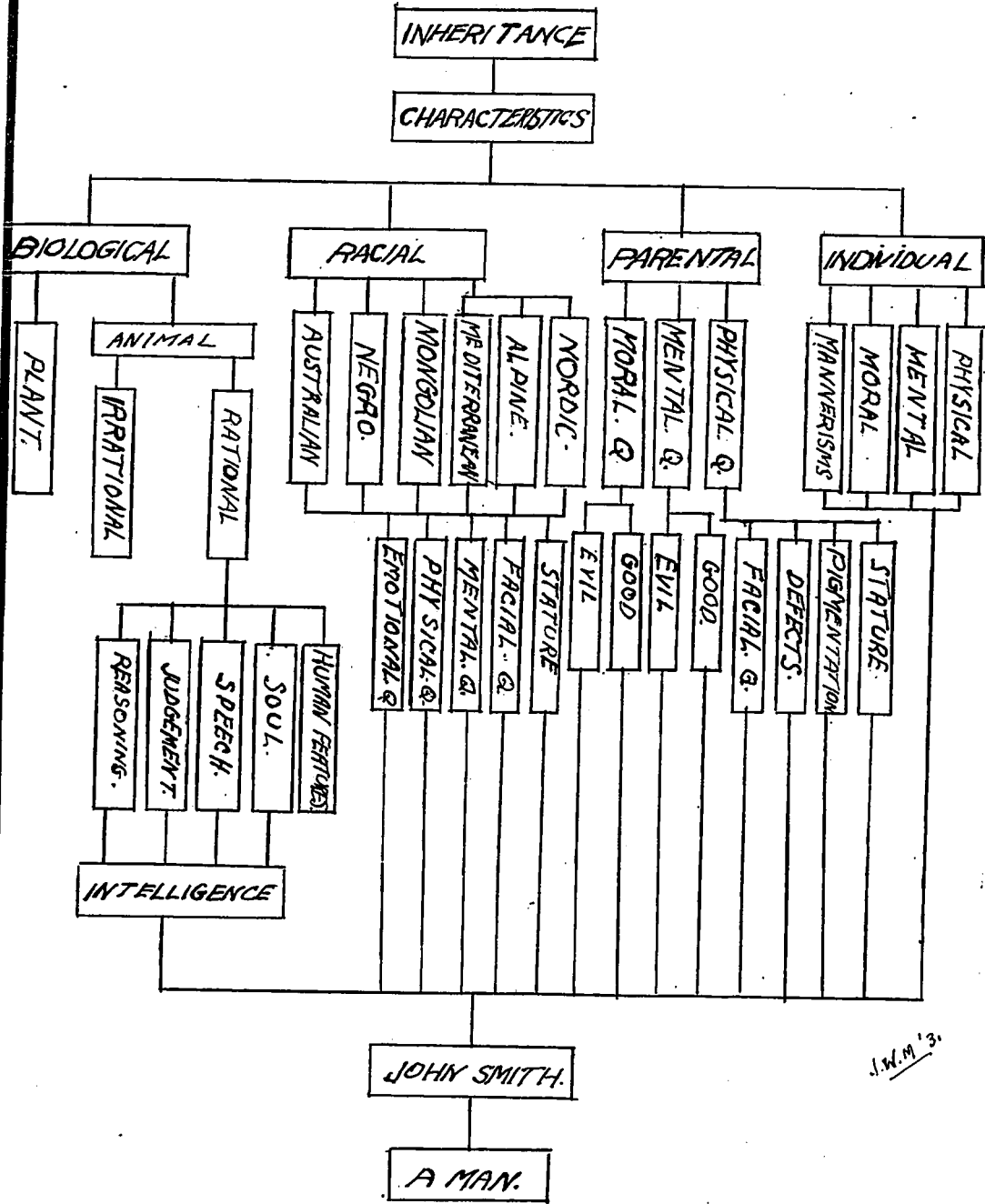
All character has a physical basis. Every child has a body, and without a body it could have no character. (Confining, of course, our summary, to temporal life. The body and soul constitute "the child". The absence of either factor implies "no living child".) In studying the development of character, we must therefore first examine the meaning of Physical Heredity.

Heredity has been defined as the genetic relation which binds one generation to another. It is not only complete at the moment of our birth, but at the moment of conception, when the male sperm comes in contact with the ovum of the female; when the tiny female cell, one one hundred and twenty-fifth ($1/125$) of an inch in diameter, unites with the male cell, one three-thousandth ($1/3000$) the size of the female cell. The period of gestation is not to be confused with heredity - it is a period of environment and will be considered under that heading.

Heredity therefore is the genitic relationship of generations; and the inheritance of the individual includes all that he is, or has, to start with, in virtue of this genetic relation. The importance of heredity is recognized in phrases that have become household words. "A chip off the old block" (Tel père tel fils) suggests the essential continuity of one generation with those which precede it; and "Blood will tell" illustrates the popular conviction that the past generation determines the development of the present.

What exactly is included in the inheritance? For example, let us take the inheritance of John Smith and

analyze its contents; (See illustration below) the contents with which this typical individual John Smith, starts life.



J.W.M. '31

(a) First of all, it contains the general characteristics of his common humanity; the general qualities that belong to him in virtue of the fact that he is a human being, and not a bird or a fish.

(b) In addition, it comprises the features which belong to the race of which he has been born a member. If he be of Celtic parentage, his inheritance will contain the inheritance of the Celtic Stock. He will be fiery, but not with the passion of the Italian; he will be imaginative, but not with the mental symbolism of the Oriental.

(c) It will also include all those more particular characteristics, which he has inherited directly from his parents - peculiar features in which he resembles them, and which mark him off as their son. (Facial contrasts - stature - hair - eyes - pigmentation - physical defects, etc.)

(d) And lastly, it will contain some elements which it is impossible to assign to any definite quarter. These characteristics will be found in his inheritance, and in his alone. They are peculiarities and idiosyncrasies which belong to him alone, and which differentiate him from all other people, even from his parents or brothers.

The proportion of this comprehensive inheritance that is due to the various generations of the child's ancestors has been calculated; Sir Francis Galton in "Law of Ancestral Inheritance" has shown "that on the average in every inheritance the two parents together contribute one-half, the grandparents between them one-quarter, and so on in the regular series $\frac{1}{2} - \frac{1}{4} - \frac{1}{8} - \frac{1}{16} - \text{etc.}$ This law holds good on the whole, but it gives no guidance in dealing with particular cases.

(b) The Mental and Moral Inheritance of the Individual.

We have seen that physical qualities are inherited. Are mental and moral characteristics inherited in the same way?

Does the child inherit his father's mental and moral qualities, as he does his eyes and hair?

(a) Mental. Much evidence has been collected to show that mental ability is transmitted from parent to off-spring. School teachers in London were asked to report on such characteristics in their pupils, as popularity, vivacity, ability and handwriting. Information was collected with regard to the resemblance of the scholars to their parents in these respects, and as a result of the enquiry it was clearly shown that "the degree of resemblance of the physical and mental characteristics of the children is one and the same", or, to put it otherwise, "we inherit our parents' temper, our parents' conscientiousness, shyness and ability, as we inherit their stature and span." An ideal example may be had from four succeeding generations of the Darwin family:

- (a) Erasmus Darwin, F.R.S.C.
- (b) Dr. Robert Darwin, F.R.S.C.
- (c) Charles Darwin, F.R.S.C.
- (d) Charles Darwin, Jr., F.R.S.C.

Mental characteristics of this type produced identical results in each generation.

(b) Moral. Similar investigations have been made with regard to the transmission of moral characteristics. One of the most interesting of these studies is Sandiford's (Ontario College of Education) account of "The Kolbeck Family". Kolbeck married two women; the first, a woman of poor standing, and of extremely low moral character. Sandiford traces the history of some 1100 descendants of this first union. The bad traits in the female were probably of far greater strength than the good traits in the male, for the statistics prove that the descendants show nothing but ignorance, insanity, idleness,

drunkenness, crime and prostitution, combined with extraordinary fertility. The greater majority traced through seven generations were criminals and paupers. Of the total number of men, less than twenty were skilled workmen, and of these, ten learned their trades in State Prisons. But it is not only the pure black strain that persists in this way. The same man, Kolbeck, took for his second wife a woman of good breeding and high moral character. A study of these descendants shows that of the 1200 of them with regard to whom information is available, not a single one was a criminal or a pauper, while the family had adorned every department of learning and activity in the United States. (Lawyers, Judges, Politicians, Novelists and Professional men.)

These and similar studies, make perfectly clear the remarkable persistence of mental and moral characteristics from one generation to the next. There can be no doubt that they do persist. But the real question is. "Are these characteristics really inherited"?

On the whole it seems probable that precise mental and moral qualities are not inherited like physical characteristics. Because certain mental and moral characteristics persist from one generation to another, it does not follow that they are inherited. They may simply develop anew in each generation under the influence of the early environment. The members of the Kolbeck union grew up in unfavourable conditions, while the members of the second marriage probably all enjoyed good surroundings in their early days. In most cases it is to the influence of the early home environment rather than to that of heredity, that the persistence of precise mental and moral characteristics should be ascribed.

Yet, it is certain that we can and do inherit tendencies and capacities in the mental and moral realm. We inherit Instincts, Temperaments and Dispositions, and most of all Capacities.

A. INSTINCTS: These are forms of nervous mechanism which enable us to act usefully, without having learned. The instincts are the chief raw-material in the formation of character, for environment would have no effect on our lives if it were not for the instincts. Long before the child is capable of forming definite purposes and consciously willing its conduct, it acts instinctively. Human instincts, are important because they are capable of modification and development, and thus continue to form an integral part of character, even at its highest levels. Many of man's highest ideals are firmly rooted in primitive instincts. However, we should beware of thinking that because it can be shown that our ideals and aspirations are very closely related to the primitive instincts that they are therefore any the less lofty and noble. The ideal of motherhood is none the less sacred because it is grounded upon natural instincts - nor is the church any the less a noble institution, because its appeal is based upon instincts which are common to mankind. (Fear and Love of the Supreme Being). If man's noblest aspirations have grown out of instinctive wants, and his highest institutions have been formed in response to persistent instinctive needs, the proper conclusion to be drawn is, not that these ideals and associations are, after all, mean and poor, but that the instincts from which they have developed are themselves valuable and worthy.

It is important in tracing the relationship of heredity to character, to make a short survey of the instincts.

(a) Instincts are inherited - they form part of the congenital endowment with which the child starts life. On their origin they are not influenced by the child's experience. They belong to the child before he has any experience at all. He is not responsible for having them. It is characteristic of what is instinctive, that it does not require to be learned.

(b) Everyone, except the mentally deficient, has all the instincts. It may be true that certain instincts do not manifest themselves in conscious life, (fear - sex - etc.), nevertheless, they are all present and operative in normal life. Their influence may be detected in conduct in disguised forms. When repressed, the instincts may give rise to nervous and moral diseases.

(c) Each instinct is directed towards a certain biological end: Flight, towards self-preservation; Sex, towards reproduction; Maternal, towards the care of the young.

(d) These instincts, though latent at birth, are not all active then, but emerge and become dynamic at certain ages. In the individual each of the instincts remains dormant until the time comes for its emergence on to the stage of conscious life, and during this period it actively dominates the conduct and determines the character. (E.G. At one phase, the boy is possessed by the hunting instinct - this gives way to the "collection" stage - this year he is loyal to "his gang" of boys - next year he will abandon the gang, to pursue a "pretty face". At each stage and at each phase of life, a new impulse springs into activity.

Some writers have enumerated about thirty human instincts. It will be enough for our purpose, to consider only a few of the most important.

(1) One of the earliest forms of instinctive behaviour is that prompted by fear. In its earliest hours the infant displays fear on the occurrence of any loud noise, and instinctively shrinks from it. Along with this we may take the instinct of repulsion.

(2) The child instinctively opposes anything which arouses its anger. At first, it has to be content to express its anger in cries, but later on, this becomes pugnacity -

(3) Curiosity soon appears. The interest of the child is excited by objects which are novel to it. This expresses itself, first in the roving of the eyes, and later, in the attempt to grasp the strange object with the hands.

(4) The closely related instincts of self-assertiveness and self-abasement are exhibited in its relations with people and particularly with children of its own age. It tends to "show off" or "brag" - tendencies which are often encouraged by the applause with which parents and friends greet its early attempts to walk and talk. These displays alternate with fits of shyness and bashfulness, which result immediately from the instinct of self-abasement.

(5) The gregarious instinct also appears early in the life of the child. Its instinct of friendship is a special form of this. Children naturally herd together for their games.

(6) The instinct of acquisitiveness is not long in making its appearance in the normal child. Nearly every child makes a collection of something - stamps, cards, eggs, pictures, coins, etc., simply for the pleasure of collecting and without any definite purpose.

(7) The instinct of sex does not emerge until the child has reached the adolescent stage, though premonitions

of it may occur in very young children. It frequently appears under disguised forms.

(8) The parental instinct is also late in making its appearance. But it is certainly anticipated in the natural affection of the little child for her dolls.

As the child rises above the merely instinctive level, and develops conscious purposes, he comes to will his actions, and his behaviour becomes conduct. Instead of instinctively acting with a view to self-preservation, he forms definite purposes, definite purposes, directed to the complete realization of his powers. His instinctive modes of behaviour are organized and developed to contribute to the comprehensive ends which he sets before himself as those which it is his duty to achieve in fulfilling his "ultimate end".

The instincts constitute the raw-materials out of which our lives and characters are built, "the talents which are given to us, useless in themselves, but useful in the purposes to which they may be devoted." Being charged with emotional energy, they are dynamic forces, which not only give strength to the passions, but power to the will.

B. CAPACITIES. Our capacities include all that we are capable of becoming in intellect, in morality, in art, and even in religion. We do not inherit specific abilities, but general capacity. The son of a woman who is strong intellectually or morally, may not be strong in exactly the same way as his mother, but he is likely to be strong in some way. The son of a great mathematician might not be a great mathematician, but his general mental capacities will probably be above the average. The child does not inherit the special ability or peculiar virtue of his parents, but he does inherit general capacities and

general tendencies, which may express themselves in one way or another. The way in which they develop is determined by environment and free-will.

The capacities which we inherit form a limit beyond which we cannot advance.

(a) In the physical realm, the limit of capacity is readily recognized and our physical heredity sets up absolute barriers, beyond which we cannot pass.

(b) In the mental realm it is true that the extent of our (mental) acquisitions is limited by our inherited intellectual capacities. The teacher cannot make a first-class mathematician out of a student whose inherited capacity is mediocre. But we usually suppose that we have reached the limit of our mental capacities, long before we usually have. Most people regularly live much closer to the limits of their physical strength, than they ever approach that of their mental powers.

(c) In the moral realm, we practically never reach the limit of our capacity, for good and evil. Every child is born with unlimited capacities, either for good or for evil. He inherits no fixed endowments either for goodness or for evil. Capacities and tendencies are what he inherits. If his parents have been vicious, their sins will be transmitted to him; not as a complete second edition of their vice, but as a general weakness towards it. The virtues of his parents are not transmitted to him as specific virtues, but as general health-of-mind, and power of resistance to evil. His actual moral life, his thoughts and deeds, his convictions and habits, are of his own acquisition. All his morality is attained and achieved. Conduct is not inherited; it is self-consciously made. Capacity is an inheritance: CHARACTER IS NOT AN INHERITANCE BUT AN ACQUISITION.

C. LIKE TENDS TO BEGET LIKE.

(First Law of Heredity - The Principle of Stability)

Heredity involves two aspects, as is illustrated in "Evolution" by Thompson and Geddes. "The hereditary relation is such that like tends to beget like, while at the same time, opportunity is afforded for the individual new departures which we call variations. Both the tendency to persist and the tendency to diverge (variations), are included in the hereditary relation, so that it is confusing to make an absolute antithesis between heredity and variation. Heredity, seen in its fullest sense, is the larger concept and includes both inertia and divergence, both continuance and change. Whatever be the terms used, there are two complementary facts: that like tends to beget like, yet that every new creature has in some way an individuality of its own". Both these truths are illustrated by the fact of common experience, that the child is like its parents in some respects, and differs from them in others.

The principle that "like tends to beget like" is responsible for the fundamental identity of humanity from one generation to another. The biologist explains why like tends to beget like, by the theory of "the germ-plasm". The part that the germ-plasm plays in securing the similarity of one generation to the next has been well explained by Wiseman. "In the development, a part of the germ-plasm contained in the parent egg-cell is not used up for the construction of the body of the offspring, but is reserved unchanged for the formation of the germ-cells of the following generation? Certain germ-cells are specially set aside to perform the function of reproduction. These cells have not been exhausted in body-building, but have preserved intact, the full inheritance which the individual has received, ready to be passed on to the succeeding generation.

This undying germ-plasm is the "principle of continuity", from one generation to the next. It guarantees the persistence of the same characteristics. It secures the stability of the race. The steadying influence of heredity has been corroborated by an abundance of statistics. The conservative tendency of heredity always works in the interest of mediocrity. It follows a curve (The curve of chance), which holds good under all conditions. (This "curve of chance" will be discussed at the end of this chapter.) It is constantly operating to bring men and women back to an average type. This may be illustrated from evidence with regard to height. It was found that fathers 72 inches in height had sons whose average height was 70.8 inches; while fathers 66 inches in height had sons with a mean height of 68.3 inches. In each case, the average height of the sons, showed a tendency to return to normal. The fact to which this evidence bears witness is true of all human powers and capacities. The dominant tendency in heredity is for men to revert to the normal or average. What then has prevented heredity from reducing all mankind to the same dead level? The answer is found in the fact of Variation.

D. SECOND LAW OF HEREDITY. (The Principle of Change).

"Even though like tends to beget like, there are always variations". Variation, as we have seen, is simply one aspect of heredity. It is the tendency to diverge, as contrasted with the tendency to persist. Both tendencies spring from the same source. (Germ-plasm). The changes in individuals are really expressions of the vitality of the germ-plasm, just as their persistent similarity is. The the fact of variation is due the diversity of the world of life. No two living creatures are exactly alike. Every fir differs from its neighbour; no two oak-leaves are exactly similar.

Much greater are the differences in human beings, even though they be of the same family. Variation is responsible for all progress and for all degeneration. No advance would be possible if offspring had always resembled their ancestors.

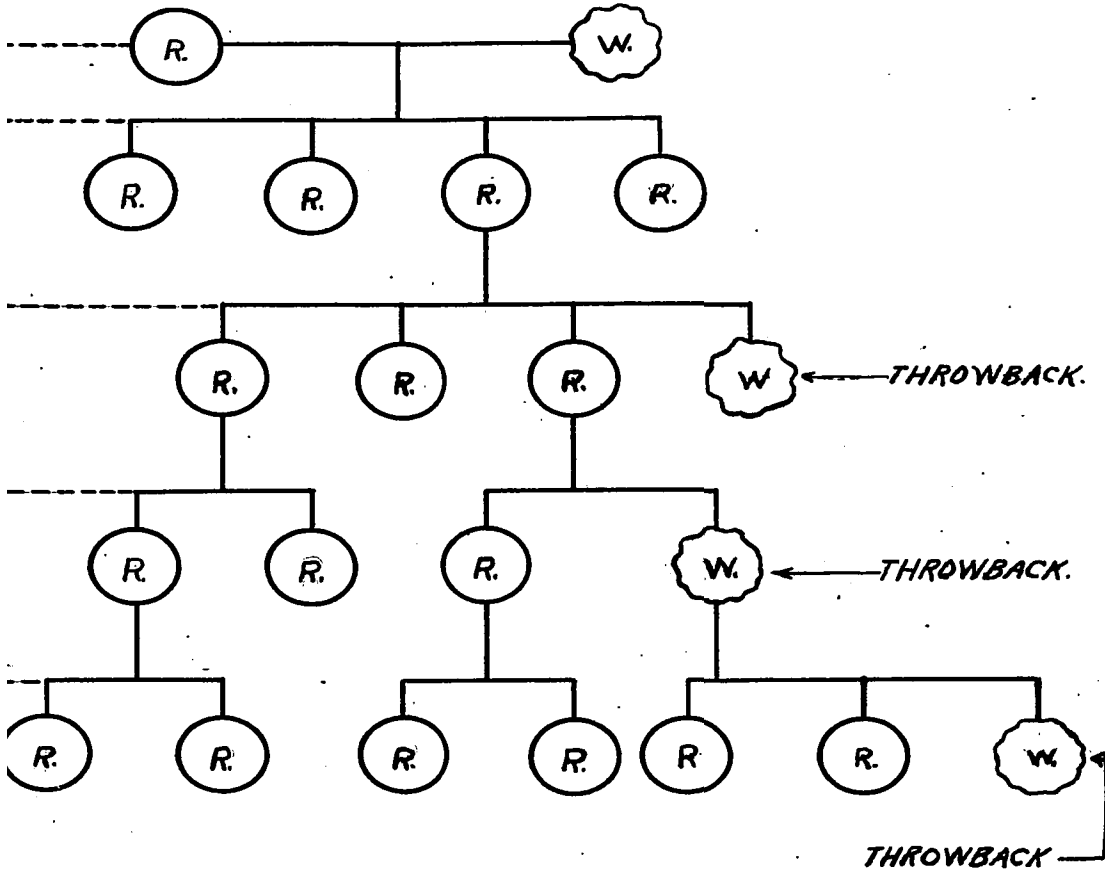
Variations are usually divided into two main kinds. Between these, there are important differences.

(1) Some variations are inborn.

Environment has had no influence in their production. They are inherent in the constitution of the individual, and belong to it at birth. These variations appear abruptly in the child. They cannot be accounted for by the habits or surroundings of the parents of the child in whom they make their appearance. Biologists call these variations, discontinuous variations or "sports". They have collected much evidence to show that these discontinuous variations occur on a large scale among plants and animals. In human beings also there are instances. The child who is born with great musical abilities, may be the son of parents quite devoid of them. Nearly every genius is a "sport" or discontinuous variation. When once discontinuous variations have occurred, they may be transmitted to offspring, and thus they become a permanent heritage of the species.

Mendell and Brumm experimented with plants and animals in 1864. They studied the characters, one at a time, counted the results and drew up a proportion. The first series of experiments was with peas. (The round and the wrinkled variety). The results were as follows:-

R.-ROUND.
W.-WRINKLED.



Roundness was discovered to be a dominant characteristic, while wrinkledness became recessive, and at a certain stage "X", they all behaved as dominant ones. As the occasional recessive characteristic made itself apparent - it was called a "throw-back". Throw-backs are common today in humans and lower animals. (Pigmies - Albinos - Angora Rabbits, etc.)

Experiments were carried on with rabbits, fowl and guinea-pigs, flowers, mice etc.; and the results were always the same. The dominant and recessive characteristics were brought to the fore and at a certain stage, the recessive characteristics disappeared.

Burbank also conducted similar experiments in United States, and met with results, which are practically identical with those achieved by Mendell and his contemporaries.

(2) Other variations are acquired.

They are not born with the child: the child acquires them during its life, by interaction with its environment. They are developed by the child under some external stimulus, such as climate or injury. Thus, they show the direct influence of environment. If a child be brought up in a tropical country, he may acquire a sallowness that may last for life. Through injury he may lose the use of one limb, and another may develop abnormally to offset the loss. The Swiss mountain-climber has built up a system to cope with the rarified air, and the conditions under which he works. The child may acquire a new nationality or religion, may take to drink, may learn to gamble and swear. All these new acquisitions are acquired characters. Among biologists, the question whether such acquired characters can be transmitted, has aroused the keenest controversy. On the whole, there is a balance of authority for the view that no convincing evidence of their transmission has yet been forthcoming. We shall assume in what follows (Environment), that the biological view is correct; i.e. "that acquired characters are not transmitted".

E. THE CURVE OF CHANGE.

When variations are measured in a few individuals, we obtain results which are rather irregular. A graph can be constructed in these cases. (Fig. I.)

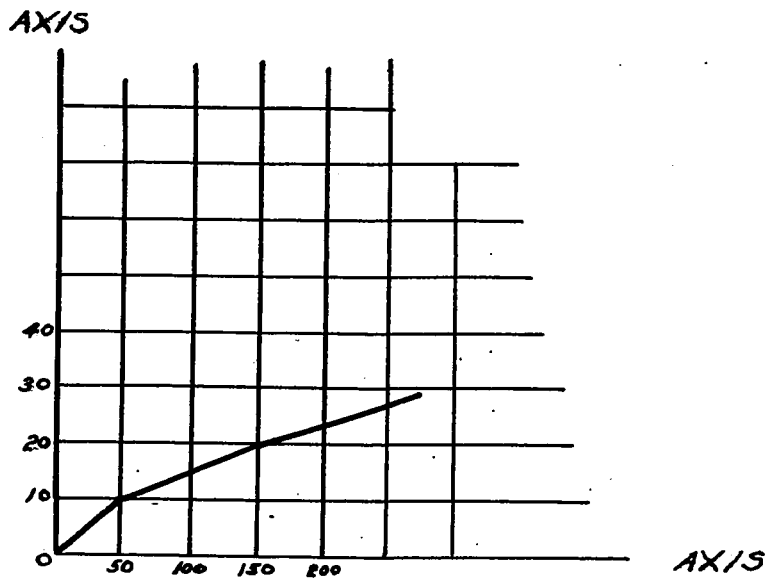


FIG. I.

Along one axis, we show the numbers examined, and on the other the results obtained.

In this example:

10 men - score of 50.
20 " - " " 150.

In each case a dot is placed at the intersection of the two axes and finally all these dots are joined to give the complete graph. This will be the normal distribution graph.

When the same measurement is made for larger numbers, this line becomes more smooth. (Fig. 2.)

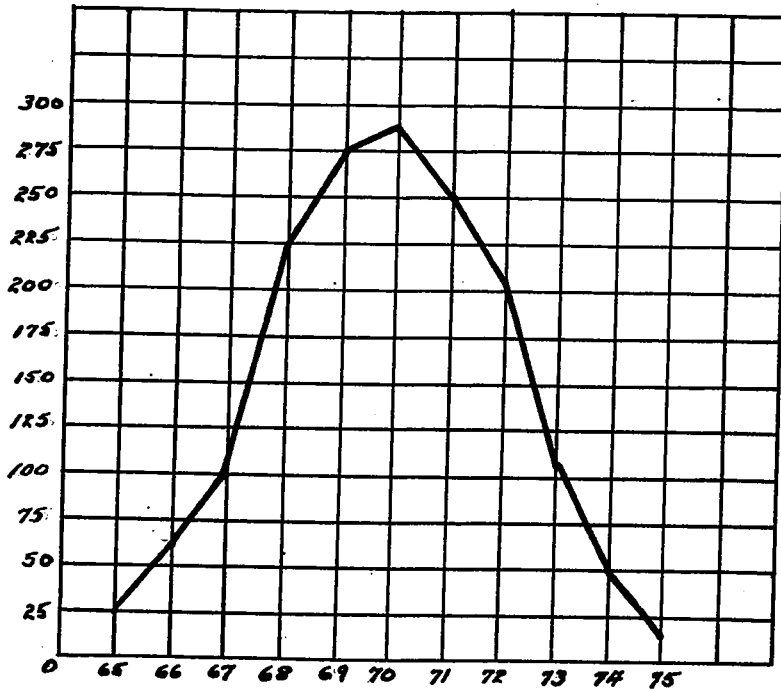


FIG. 2.

Graph for height showing distribution.

<u>No. Examined</u>	<u>Results (Inches)</u>
25	65
60	66
100	67
225	68
275	69
290	70
250	71
215	72
110	73
50	74
15	75

We gradually approach a theoretical probability curve which is known as the "Curve of Chance". This is shown in Fig. 3.

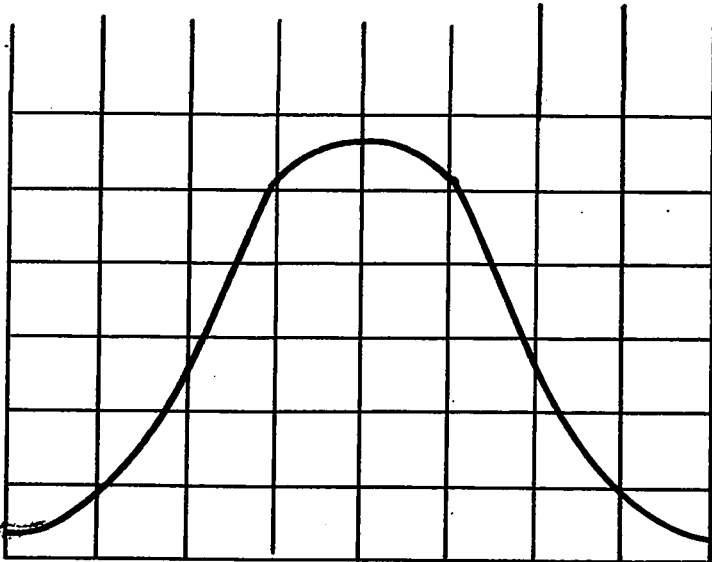


FIG. 3.

"THE CURVE OF CHANCE"

Differences among individuals in any given trait are due to two factors.

(a) The contributions of heredity.

(b) The contributions of environment, that is, the contributions of physical and social surroundings, of education and experience.

The theoretical curve of chance has a number of mathematical properties which have been directly or indirectly utilized.

If we take the theoretical curve, and divide the base line into five equal parts, between which vertical

lines are erected, the areas will contain the following percentages of the cases: (Fig. 4.)

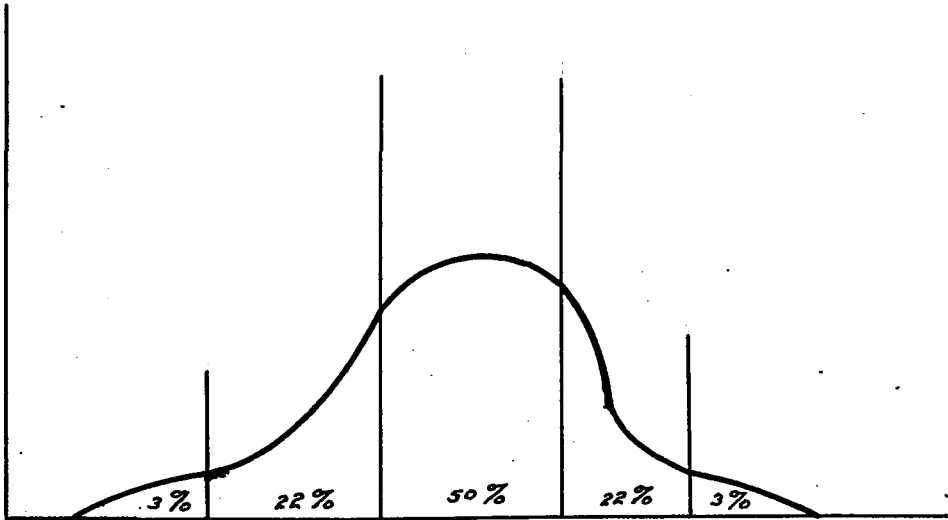


FIG. 4.

THEORETICAL DISTRIBUTION IN THE PERFECT CURVE.

It is not to be expected that the results of all measurements will coincide exactly with the above, nevertheless as the number of measurements increases, the results are always more similar to this theoretical distribution.

(For the preceding data on The Curve of Chance, I am gratefully indebted to Prof. Sandiford, of The Ontario College of Education.)

CHAPTER IV.

ENVIRONMENT

A. Physical Environment.

The environment is in some way or other, the cause, or at least the occasion of, all the ACQUIRED characters, which the individual develops - but it is more than that - the living creature owes its existence to its environment. The physical environment includes air, earth, light, heat, water, food, climate and so on. From this environment all living beings, including man, derive nourishment and warmth and without it, life and growth would be impossible.

(1) Pre-natal environment.

What is known about pre-natal influence makes it improbable that many anatomical and functional differences which appear at birth are congenitally acquired. With severe illness, emotional disturbances, malnutrition, alcoholism and other serious misfortunes of the mother, the child may be affected. The child may suffer in this stage, directly through the mother's impoverished and poisoned blood. It may be affected and directly harmed by infectious disease or injuries before birth. All these facts seem to prove merely that there is a certain pre-natal environment which influences the child during the period of gestation.

(2) After Birth.

The tremendous importance of the direct influence of the physical environment on living creatures is most clearly shown in the case of plants and animals. Two or three illustrative points may be mentioned.

(a) In some cases the environment exercises a regular recurrent influence, and the living creature falls

into step with it. For example, certain tropical plants have become so influenced by the regular alternation of a twelve-hour day and night, that they uniformly respond to it by opening their leaves during the day, and closing them during the night. Again, the brown stoat, regularly becomes the white ermine during the winter months. Animal mimicry is merely an adaptation to environment.

(b) Where the environment is not regular in its influence, the temporary alterations in the organism to which it leads may be simply adjustments of longer or shorter duration. The warm-blooded bird or mammal can, within limits, adjust its heat-production and heat-loss, so that the temperature of the body remains the same, whether that of the environment rises or falls.

(c) In some cases, the environment may make a permanent and indelible impression on the living creature. A change in the environment, be it sudden or gradual, may occasion modifications in the organism which will remain with it as permanent acquisitions. A storm may blow a tree permanently out of shape; and a few years in the tropics may tan a man for life. In such cases, the environment has led to the development, by the individual, of "acquired characters".

(d) Yet, the importance of the environment should not be unduly magnified. We should not think of it as an iron fate. In most cases, it does not actually cause changes. It only elicits and restrains. All it does, is to afford the occasion on which the creature itself changes. Even in the instances of "protective mimicry" in animals, where the influence of the environment is most immediately apparent, the environment only supplies the stimulus in response to which the organism changes itself. "A green frog,

if he is not among green leaves, but among dull, colourless surroundings, ceases to be bright green, and becomes a sombre grey. Put him among foliage again, and his green soon returns. It cannot be said that the green foliage has caused his colour to change. It is more correct to say, he has the power of changing his colour to suit his environment. If the frog happens to be blind, no change of colour takes place; so that it is only by the help of the eyes and the nervous system that the change is effected. " (Headley: "Problems of Evolution" - Page 49) Thus, even the lower animals have some say in their development; they are not absolutely at the mercy of their environment.

When we come to man we find that his command over his environment is much more complete than that of the lower organisms. Plants, being restricted in motion, have no power at all to change their environment. Animals, being restricted in soul and will and intelligence, can move from one environment to another, but they can do very little to alter their environment. In general they must adapt themselves to their surroundings. Man is superior to the lower animals in his capacity to adapt himself to his surroundings (environment). He can live at the Equator or at the North Pole; he may exist at sea-level, or at an altitude of many thousand feet; he can travel thousands of miles on the land, on the sea, in the air, or under the water. And man, is the only animal that is able, on a large scale, to adapt his environment to his own particular needs. The Hollander makes his country by building dykes to shut out the sea; the Englishman makes the desert fertile by damming the Nile and irrigating the land; the crude attempts at Engineering by the early Egyptians to the gigantic mechanical enterprises of today, bear mute testimony to the fact that, "Man makes his environment his slave".

B. SOCIAL ENVIRONMENT.

(1) Nature of Social Environment.

Character is acquired by the child through interaction with his environment. Environment means more to the child than to any other creature. The child's relation to his environment is a growing relation; and the child is the only animal that has a social environment. Great as is the influence of physical environment, that of the social is much more profound and extensive. The presence and significance of this environment of moral and intellectual forces is not yet fully recognized - for it is an environment which we cannot see or touch. We can indeed point to some of its manifestations in ideas and ideals embodied in prose and verse, in music and painting, in Church and School, and above all, in Society itself. But we cannot measure it or tabulate it. Yet it means more to us than any other. From the child's earliest hours its influences have been playing on him. It is present always, and counts, because of its constant pressure. But because its relation to us is so ultimate, and because it has so informed the very structure of our minds, we do not usually distinguish its influence upon us, from the activities which we suppose we originate ourselves. In fact, we do not think about it at all, and if "environment" happens to be mentioned, our thoughts fly immediately to the physical world.

There is none of our experience which is not permeated by the social environment.

- (a) From his environment, the child derives the language he speaks.
- (b) All his manners and customs are accepted from it, without question and without reflection.
- (c) His political opinions and religious beliefs have been largely supplied to him by it.

- (d) His mental and moral life consists largely of opinions which he has accepted on the authority of the society in which he lives.

He simply takes for granted the validity of his beliefs and customs. He takes them to be as fixed and certain as the rising and setting of the sun.

But there comes a time in the life of every individual when the conditions in which he has been brought up, appear no longer adequate. The orthodox explanations of science and politics and religion no longer satisfy him. Doubt has seized hold of his mind. He determines to prove all things for himself. (Reformers). Sometimes a whole community begins to question the authority of its manners and customs, its laws and institutions. Some great national perplexity arises, and the old ways of life prove insufficient. The gradual growth and the slow progress of moralization begin to suggest that the old beliefs are inadequate and the old customs unworthy. But even when the individual criticizes his environment most severely, he criticizes it because he is its own child. The society really uses him to criticize itself. The great reformer is always a thorough child of his time. It is precisely because his environment has saturated him so completely that he turns upon it in criticism.

It follows that environment is potent to counteract or encourage the hereditary tendencies which every child possesses, and whose persistence has been already illustrated. We all know how influential the bad environment is, in corrupting good tendencies. It is an unhappy truth, that the environ-

ment of low neighbourhoods (slums) slowly but surely weakens the mental and moral strength of nearly all who enter them. Perhaps our thoughts are apt to dwell too much on this drab aspect of the operation of environment. But on the other side of the shield we have a brighter picture, and one that is no less true. Environment can exert a mighty power in restraining and repressing evil proclivities, and eliciting and confirming tendencies to good. "The records of charitable societies show that about eighty-five percent (85%) of the children of paupers and criminals who are placed in good homes at an early age become good citizens" (Kirkpatrick: "Fundamentals of Child Study")

Our attitude towards our social environment is a double one: (a) On the one hand our attitude is receptive. There is little that we possess that we have not received from our environment. Our dependence on it is so complete, that apart from it we should be incapable of any rational or moral activity. The material of most of our mental and moral acquisitions is derived from it.

(b) But we are not utterly passive creatures, absolutely at the mercy of our environment. Our attitude towards it is also re-creative. All the material which the environment supplies, whether the material be physical or spiritual, must be re-made, transmuted, and re-created, before it can become a permanent possession of the soul. Just as the tree assimilates and transforms all the material which it receives from its environment, so also, the individual elaborates and re-creates all the endowments which his environment so lavishly bestows on him.

SOCIAL ENVIRONMENT (Cont'd.)

(2) Influence of Education.

The influences of education form part of the social environment of the child. The power of the social environment in general, has already been emphasized. In education, this power has been focussed and concentrated. The value and effect of education should not be underestimated.

"I think I may say, that of all the men we meet with, nine parts of ten are what they are, good or evil, useful or not, by their education. 'Tis that which makes the great difference in mankind". (Locke: "Some thoughts concerning Education".)

We must recognize that the influence of education is limited in two respects.

(a) As we have seen, there is no convincing evidence that the individual transmits to his offspring, the special qualities which he has himself acquired during his life. Therefore, from the standpoint of heredity, the influence of education, is largely confined to the individual.

(b) Again, the influence of education may be limited by other forces which, along with it, constitute the social environment. The teacher may indeed manipulate the rest of the environment to some extent; but he can rarely secure that the environment as a whole will second his aims. The unfavourable environment of home and compan-

ions may counteract all his efforts

Yet, in spite of these limitations, the dynamic influence of Education can hardly be over-estimated. It is the teacher's duty and privilege to utilize all the help that heredity and environment can give. He can do this as follows:

A. Heredity:

It will add to the fascination, as well as to the usefulness of teaching, to study the heredity of the individual child. To do this, it is necessary to know something about the child's parents. In the rural school this is quite possible; in the city school it is rarely possible, except in isolated instances, for the teacher to meet the parents of his pupils. In some kindergarten schools, opportunities are provided for teachers and parents to meet. This experiment might usefully be extended to all elementary schools. If one looks at the matter sanely, it is one of the most absurd things in the world, that parents and teachers, the two groups which have the most profound influence on the development of the child's character, should work in entire ignorance of one another's aims and aspirations for the children.

Under the present conditions, the teacher must usually be content to study the child alone. He should certainly do this. As education becomes more and more systematized, there is great danger that an artificially mechanical scheme may ignore the individual differences

between children. The teacher must seek to counteract one of the necessary evils of the system by trying to understand the individual child, and by helping it to develop in accordance with its own individuality towards the fullest realization of its capabilities. If he understands the child, he may be able to arouse dormant hereditary capacities, to repress tendencies to evil as they emerge, and to encourage and confirm the strong and well-balanced powers which promise most for the child's personal welfare and social influence.

B. Environment.

The teacher himself, forms a most important part of the child's social environment. He may use that environment, including himself, for the purposes of education:

(1) He may use the environment by way of EXEMPLIFICATION. Nothing has so much influence over children, and especially young children, as an example to be followed. The example appeals to the child's primitive tendency to imitate. The teacher may utilize this tendency, by drawing the attention of the children to examples that are worth imitating - these will be encountered in the teaching of History, Literature, Christian Doctrine, etc. Incidentally, the teacher himself should strive to be an example for his pupils to imitate.

(2) The environment may be used to shape the character by way of SUGGESTION. This mode of influence is so quiet and pervasive that we rarely think

about it, and perhaps for that very reason it is all the more potent in effecting results. Nothing conduces more to the formation of good reading habits in a community than the institution of an attractive library, so arranged as to suggest in every detail the pleasures of reading. So, to influence the growth of the religious spirit, churches should breathe an atmosphere suggestive of the Divine Presence. Similarly, if the children are to make most of their school-life, the subtle suggestion must be conveyed to them that it is pleasant. With a view to this, the teacher may seek to make the class-room as pleasant a place as possible. For some reason, the word "suggestive" has come to mean "suggestive of evil". Thus we speak of a "suggestive action", or "suggestive situation" or "suggestive novel or play". But we should remember that actions may be suggestive of good quite as readily and distinctly as they suggest evil.

(3) Suggestion and exemplification will not do everything. Education must also utilize the environment by way of INSTRUCTION. Instruction must always be the chief method of the educator, for it alone is definite and systematic. In giving moral instruction, there are three things which the teacher should constantly bear in mind:

(a) It is necessary to be positive.

Negative precepts have less power behind them than positive principles. The fundamental characteristic of the child is his activity. Hence the importance of telling him "what to do" rather than merely "what to avoid".

(b) The importance of the environment of nature should be emphasized. The children should be encouraged to understand the lessons of Nature, that they may assimilate her teaching, and become like her, constant, true, quiet, and strong.

(c) The teacher should emphasize the value of associating with the best. Most children are naturally sociable; they do not require to be told to associate with one another; but they do need to be told to choose the best of their companions to be their friends. And in this connection reference may also be made to that companionship with the best minds and hearts of the world, which we enjoy in Reading.

In these and many other ways, the teacher may seek to select the elements in the child's environment which will be most beneficial to his character, and, by a study of the child's hereditary tendencies, direct those influences into channels where they will be the most potent for good. However, before terminating this section, we must consider two facts:

(1) Human nature, and especially "child nature" is like Mary of the nursery rhyme, "quite contrary". The child is very apt to want to do things precisely because he is told not to, and to be disinclined to do them precisely because he is told to do them. This fact has always to be borne in mind when

giving moral instruction. It is one reason why, with some children the indirect influences of suggestion and exemplification are more direct, than direct moral instruction. This is where the teacher's study of the individual child will be invaluable.

(2) The second point is this:

It is right that the teacher should magnify his office; but he should beware of thinking that he is "making" or "building" the child's character for it. That, he cannot do.. The teacher may, in a multitude of ways, give advice, warning, and encouragement, and thus may exert quite an incalculable influence on the development of the child's character; but as a matter of fact, it is the child himself who makes his own character. And from the very first, the sense of responsibility should be laid upon the child.

SOCIAL ENVIRONMENT.

(3) The Influence of the Church.

The influences of the church form part of the social environment - not only of the child, but of man. It is a voluntary society, and a man may be a member of it or not as he pleases. A man not merely chooses to be an adherent of some particular religion, and a member of some particular denomination, he chooses whether or not he will be connected with any religious society at all.

Participation in the activities of all other institutions is obligatory.

The child must be a member of some FAMILY; and a citizen of some STATE; and when he is old enough, he must go to some SCHOOL. The family, the state and the school are institutions under whose influence he is bound to come. (Exceptional cases for school and state are possible, but so few as to be negligible). But with the church it is different. Unless his parents have chosen to associate themselves with some religious society, the child will never receive that training which the church is peculiarly well fitted to give. There is no doubt that the child who is debarred from learning the lessons which the church has to teach is being severely handicapped for the strength for the moral life. At all times, the Church has exercised a profound moral influence; and in two ways:

(1) The Church has done more than all the other institutions put together to cherish lofty ideals; ideals which are capable of becoming in the characters of those who are inspired by them, not the empty visions of a day-dream, but dynamic forces with a real driving power towards good. There is all the difference in the world between sentimental visions and operative ideals. A sentimental vision is blind to reality, and seeks to live in an unreal realm, from which all misery and evil have been excluded. But an operative ideal is firmly grounded on a basis of "things as they are". It recognizes that this is not the best of all possible worlds,

and it is convinced that all moral progress consists in the attempt to attain an ideal goal (The Ultimate End). The ideal is itself the force which demands loyalty to its claims, and which directs the whole process of moral life. It supplies motives for conduct, it is an incentive to action, and though it is never completely realized, it is the source of all man's moral endeavour. Such an ideal, loyalty to which is suffused with a passionate enthusiasm for "the good" and "the true", is rarely found in one who has not been influenced by the Church. Religious ideals are not only more intense and dynamic than others, but they are more comprehensive. A noble enthusiasm for humanity organizes man's life as a whole, and inspires his every thought and deed to be serviceable to its comprehensive ends. His interests become unified, and his purposes systematic, for all are regarded as having worth, only in his governing ideal.

(2) In particular, the Church inspires its members by precept and by example with the spirit of loyal service. Whenever the Church fails to inculcate the duty of loyal service, it ceases to deserve the name. It is not a real Church unless it seeks to enlist all its members in the service of "the good cause" of the world". This is service and the highest kind of service.

The reason why the Church is so successful in instilling the spirit of loyal service is not

far to seek. It demands loyalty, not to an abstract idea, or to a vague cause, but to a PERSON. Now the child, (and not only the child), naturally tends to personify his ideals. While an ideal in the abstract has no meaning for it, a Person excites its interest, claims its respect and influences its actions. Hence, the child is readily attracted to such an ideal figure as Jesus, and willingly takes up an attitude of personal loyalty to Him. This Person, the child is taught, claims from it, loyal service which need not be given in any special calling, but may be rendered in performing the duties of any worthy occupation.

I have been led rather far afield in showing the influence of the Church on Social environment, nevertheless, it has such an important bearing on the life and character of the child, I feel that the digression has been justified.

CHAPTER V.

CONCLUSION

A. GENERAL

How far is our frank recognition of the importance of environment and heredity compatible with moral responsibility? Is it not the case, it may be said, that you have ascribed half a man's character to heredity and the other half to environment? If that be so, what right have you to hold that man is responsible for his character and conduct? Does not moral responsibility vanish?

There is no reason why we should give up our belief in moral responsibility. We do recognize the tremendous importance of heredity and environment, but we should not think of them as if it were possible to portion out character between them. We should avoid thinking of heredity and environment as if each excluded the other. It is not true that the more we attribute to environment, the less we must ascribe to heredity, and vice versa. Life and character imply their interaction. When the influence of the one increases, it does not follow that the influence of the other must decrease. On the contrary, the richer the inheritance with which the child starts, the greater the influence the environment may exert. If religion be introduced into the environment of a reptile, no results will be forthcoming - but

religion in the environment of a man may lead him to change the whole course of his life. Yet, however potent the influence of heredity and environment in their interaction, they do not absolutely determine the child's life and conduct. Character is chiefly a product of the will. The child gradually makes his own character. It is his own, and he alone is responsible for it.

Environment will not absolve a man of responsibility for his actions. Environment may provide temptations and difficulties, or strengthening associations and friendships, but from the moral standpoint all that this means, is that it is supplying the instruments with which the individual himself will carry out the process of character-building. The child's environment exists to be used, and as he grows up, he more and more acquires the power of reacting upon it. Whether he makes good or bad use of it depends ultimately on him alone. Parent, or teacher, or friend may point out how it should be used, and what elements in it should be assimilated, and what avoided, but in the end, the responsibility for choosing between the right or the wrong rests with the individual himself. It is the privilege and prerogative of man to be, so far as his character is concerned, a creature of his own making. "Man is the architect of his own destiny".

But, it may be objected, if no acquired characters are transmitted, if all that we gain in toil and pain during our lives is doomed to perish with us,

is not our responsibility a purely personal and private matter? Our mental and moral acquisitions, it may be argued, have no significance for the race, because they cannot be transmitted to our offspring. Does not this remove the chief incentive to responsibility? No! It does not; and that, for three reasons.

(1) Responsibility to ourselves.

With the denial of the transmission of acquired characters, our sense of our responsibility for our actions is increased. We cannot blame a previous generation for our shortcomings. In the physical realm, indeed, the results of vice may be perpetuated (both physiological and mental diseases), but the child of the most dissolute parents may acquire moral strength. So far as morality goes, every child starts life with a clean, or almost clean slate. Proclivities to good and evil it does inherit indeed, and it is the privilege of the educator to be always on the look-out for proclivities, to encourage or to restrain. But these are merely tendencies. In some cases they may, indeed, be very strong, and may greatly further or retard the child's moral progress. But they do not absolutely determine the child's character. Heredity is no inscrutable fate to destroy the child's moral strength before he has begun to use it. We are "the architects of our own destiny", our deeds are really our own; we alone are responsible for them.

(2) Responsibility to our neighbours.

But our responsibility for our actions

does not end with ourselves. Our actions do not terminate in themselves. They form part of our neighbour's social environment, and may exert a profound influence on him. Hence the sphere of our responsibility is far wider than the immediate consequences of our deeds. Every individual's character and conduct constitute a portion of his neighbour's social environment. Example is better than precept, and there is no greater influence for good on the community than the upright man. This is a peculiarly sobering reflection for all engaged in the educational profession, and particularly for those in the elementary stage. For hours every day, the teacher's words and deeds and manner form a most important part of the child's environment. Every action of the teacher is viewed by the child under the microscope of the class-room. Throughout the most impressionable and receptive years of the child's life, the teacher's character is one of the chief formative influences to which it is exposed.

(3) Responsibility to posterity.

Our responsibility also extends, at least to some extent, to posterity. For, though the next generation will not inherit specific virtues and specific abilities, it certainly will inherit general capacities. Our mental and moral qualities may be inherited by the next generation as tendencies and proclivities. Now, as we have already seen, our characters are not absolutely determined by the tendencies we inherit, and of course it is also true that the tendencies inherited from us by our offspring will not inevitably and irrevocably fix their characters. But, just as we were helped in the

moral struggle by inherited tendencies to good and handicapped by inherited tendencies to evil, so the next generation will be assisted or retarded in the task of the making of character, by the kind of tendencies they inherit from us. Thus, though we cannot transmit our acquired characters as such, we have a real responsibility towards posterity. The more diligent and conscientious the present generation is in developing special abilities and specific virtues, the higher is likely to be the general level of ability and uprightness in the next.

B. SUMMARY.

We have traced the origin and early development of character, and examined in detail two of the elements which go to constitute it. We found that the ultimate groundwork of character is supplied by heredity - but this groundwork would remain simply a formless aggregate of blind tendencies and empty capacities, if the environment were not allowed to influence it. We considered the influence of the physical and social environment, and particularly the influence of two of the world's greatest institutions, the Church, and the School, as part of the environment of the child. We have briefly traced the rudimentary instincts which form the basis of the great institutions of moral life. In conclusion we have shown that heredity and environment are the raw materials in the hands of man, and he alone is responsible for his character and conduct. As a result, there is a moral

- 48 -

obligation which extends not only to himself, but to his neighbours and to posterity.

- Finis. -
