

The Theory of Recapitulation
in Child Development

by Carl Conrad Guise

1914

Submitted to the faculty of the Graduate School
in partial fulfillment of the requirements for the
degree of Master of Arts.

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May 15th, 1914

Approved by

Chapter I Introduction

Theory of evolution-----early advocates---
--recapitulation its outgrowth-----some general facts
-----limitations of the theory-----inconsistency
of the theory-----not all phenomena are proof-----
possible origins and development of life-----methods
of reproduction-----parent and offspring are of the
same parental stock-----Weisman's theory of germ-
plasm and of somatoplasm.

Chapter I. Introduction

The theory that the life history of the race is repeated in the life history of the individual is a direct outgrowth of the theory of evolution. The theory of evolution is, that life began as a single cell, and by a continual reproduction by fission and otherwise has resulted in the various forms that are now known. It was first advocated by Spencer, Wallace, Darwin and others, and has now become the accepted theory of scientists. Complexity of structure has resulted, apparently, as an aid to adaptation. The theory of recapitulation now holds that the life of the individual begins with a single cell and during the embryonic, the foetal and the infant period passes through essentially all of the stages of growth and development through which all of the preceding members of the species have passed in reaching their present stage. As applied to the human being, which will be the purpose of this paper, it holds that the individual begins life as a single cell, and in reaching adult development passes through the life history of many of the lower forms.

The early stages of the embryo resemble a worm, later in some features it resembles a fish, again it is difficult to differentiate the foetus from that of a calf, while near the time of birth it is very much like that of the anthropoid ape. Studies in ontogeny and phylogeny show these striking and significant likenesses. The question remains whether a causal relation exists between the facts of phylogeny and ontogeny or whether the correspondence is merely incidental.

The question concerning the repetition of the life history of the race in the individual, is worthy of attention because its solution, if the theory be proven, has the promise of giving especial and valuable aid to all who are concerned in child development. It is extremely suggestive in the study and the direction of the growth of the child, in morals and intellect, and somewhat less so in the development of the body. One writer on pedagogy says that the teacher ought to recognise that when the pupil comes to school that he is not five years old, but a thousand.

By this he meant that the child has inherited certain tendencies from his ancestry, and that his impulses to action will be determined in a large measure, and likewise his responses to stimuli will be determined or modified by these inheritances. Such an understanding of the child will add much to the efficiency of the teachers work.

The theory has its limitations. The fact that they have not always been recognized has led to many very farfetched and sometimes absurd conclusions. Dr. G. Stanley Hall, who has contributed more to the literature of the subject than any other writer, on page 144, Vol. I of Adolescence, seems not to have recognized the limitations of the theory. A test having been made of the number of taps that can be made in a certain brief period of time, it was shown that puberty seemed to mark the the chief stage of nescency for increased rate of this finger movement. From this he concludes that it was of greatly increased value at that age of phyletic development, and that from it one might infer certain modes of digging and scratching and paddling. He declares

that it is no more hazardous a conjecture than to suppose that the increased ability to grasp is a survival and a development of a power highly unfolded in arboreal life.

One limitation is that the recapitulation, in its physical and psychical aspects, does not work consistently. The recapitulation of the body is almost complete at birth, while the psychic only then begins. The changes in the body after birth, while they are noticeable, I think can not be regarded as very significant for this theory. The chief one is the change in the digestive system. The infant's food would not only be insufficient for the adult, but the adult's system would not be able to digest it. It could hardly be said that the infant is repeating the life of a milk eating race. The helplessness of the babe at birth, if it be regarded at all, rather points in the other direction, for of all the animals, he is, in all probability, the most helpless. It would seem that he is a reversion of the rule in this, rather than a representative of it.

The infant's arms are proportionately much

longer than those of an adult, corresponding to the long arms of the ape and the gorilla. This apparent disproportion need not be regarded as significant for recapitulation any more than any other apparent disproportion such as the size of the head, or of the brain. Many other facts might be brought to attention in this connection but they will be taken up in detail later.

If we are to understand the changes that occur in the succeeding generations of any life form we must know something of the possibility of the change and the way in which it takes place. So far as is known every living thing on the earth to-day has arisen from some preceding form of life. How the first spark of life began will always, probably, be a mere conjecture. Lord Kelvin suggested that it may have come from some other planet on meteoric wings. That seems quite romantic, indeed, but it does not give an ultimate explanation. Others suggest that it may have been created out of the non-living. Others say that life was not created, but was rather the Creator and that the non-living is the part that needs the explanation. Be that as it may, the exhaustive work of Pasteur, Tyndall and others effectually

demonstrated a generation ago that to-day living matter always arises from other living matter, and this conclusion is generally accepted as an axiom in genetics.

There are several ways to produce more life if there is given some living thing with which to begin. Any organism, whether plant or animal, is continually transforming inorganic and dead material into living tissue. Through the process of repair, for example, an injury to a form as highly developed as man is frequently made good, if it is not too extensive, as in the case of a skin wound. When the intake of non-living material is in excess of the out go, growth results, with the consequence that more living material exists than existed before. A fragment of a living sponge or a piece of a sea-gonia leaf is sufficient to start the development of an entire new organism. It is by a similar process that nearly all of the one-celled plants are reproduced. The same holds true of the one-celled animals. They multiply by a division into halves. Each half then grows into the size and the form of the parent cell from which it sprung. When two of these one-celled organisms are formed in this way

the parental substance along with the regulating power necessary to reorganization, goes over bodily into the next generation in the formation of the daughter cells leaving usually no remains behind. In primitive forms of this description, continuous life is the natural order, and death, when it does occur, is, as Weisman has pointed out, accidental and outside the plan of nature. In these cases it is easy to see the reason for the organic resemblance between successive generations. Parent and offspring are the successive manifestations of the same thing, just as the begonia plant, restored from the fragment of the leaf, is simply an extension of the original plant. Many modifications of the process of multiplication by fission occur, but they all agree in the fundamental principle that the progeny resemble the parents because they are pieces of the parents. For example; certain fresh water sponges, quite unlike any of their marine relatives, live from year to year in their peculiar fresh water habitats by isolating certain well protected fragments of themselves in the form of gemmules and statoblasts. These bury themselves in the muddy bottoms of the ponds or lakes and so are preserved through the

winter when the entire organism could not have lived near the surface. These however do not retain their likeness to their parent but regain it again in the spring when they grow again. In this way there is a constant unity between all the generations although there seems to be the time when something entirely different fills the interim. These illustrations are examples of the simplest forms of heredity but they are an index to the reason for organic resemblance higher up the scale. Sexual reproduction is no less plainly a direct continuation of life though in this instance two sporelike fragments out of one generation contribute to form the new individual of the next generation instead of one fragment. In all cases there is a material continuity between all generations. Offspring in this way become a continuation of a single parent or of two parents.

Weismans theory of germplasm and somatoplasm is interesting and ver helpful here. He maintains that in all bodies that are reproduced sexually, the body tissue is differientated into these two plasms. The somatoplasm includes the body tissues, that is the part of the individual that is fated to complete the life cycle and die. The germplasm is the part that is immortal and has the pow-

er to duplicate the life of the organism and to live on to give rise to new individuals. While the somatoplasm has only the power to reproduce more of its own kind, the germ-plasm has the power of developing both its own kind and the somatoplasm. It is not formed fresh in each generation nor in each individual at sex maturity, but is a continuous substance present from the beginning. This theory has not been demonstrated in many cases, but all the facts that are known concerning the action of germplasm are consistent with it. Doubtless in many of the lower forms, the entire organism is to be compared with the germ-plasm, but in the complex ones, the germ plasm is early set aside and differentiated from the somatoplasm and is not used in the immediate demands of the tissues that make up the body. So the somatoplasm at the end of the life of the individual whose body it has formed, dies, but the germ plasm that has found its new life or new body in which to live goes on through the same life cycle in a new body. Thus the one continuous line of germplasm cells goes on through succeeding generations. The life habits of a son are, then, not the same because the son is the des-

endent of the father, but rather because they are common descendents of one ancestral stock. The son bears not only the likeness of his father, but they two bear the likenesses of all the ancestors of them both.

Chapter II Embryology

Significance of embryology-----survival of
the fittest-----assumption of prehuman and prehis-
toric development-----general facts-----the skin of
the embryo-----gill slits-----tubular heart-----
impulse to swim-----the spinal column-----the brain
-----embryonic tail-----the evidence in the lobster
-----the teeth of the foetal whale.

Chapter II Embryology

The embryological and foetal life are especially significant for the study of the theory of recapitulation. The theory of evolution assumes that all life has developed from very simple forms, and the question as to whether the human form is a development from some lower forms rather than the result of a special creation as men were formerly accustomed to think is one depending upon the first. But these questions do not at present concern us over much. Many of the facts of evolution are beyond the doubt of any scientist and it is only upon these that we are at this time depending. Life in its highest forms is not the result of a spontaneous outgrowth that has reached its stage unhindered and unimpeded, but is rather the result of an age long struggle, which has left only the individuals that by adaptation or by accident survived. Where strength is the marked feature of any species, it has risen as the result of a struggle in which only strength could survive. The ability that some insects have to change their color, is given as an aid to adaptation. It is the same through the characteristics of all of the forms of life.

In the light of all the progress that man has made in the period of history in which he has been studied, it is not reasonable to suppose that in all the preceding time he was inactive and made no progress. With the evidence that anthropology has been able to offer in the late years, it would be presumptuous to say that the changes have not been very great and very significant. The fossils that have been found in many parts of the earth show that the skull has changed in a way to increase the brain capacity, the arm has shortened and the spine has curved. All of these are in line with better adaptivity to the life that man now lives. Practically all of the tools that man now has, and all of the other means by which he is superior to the lower animals are the result of struggle, and it is without doubt that he lived a much longer time without them than with them. If that be the case he must have had other features of adaptation that he does not now have.

Many features of the embryo life now correspond to the life of the lower animals, and with a study of these we can better understand human life. The embryo begins its life in the union of two cells, and these by a constant fission increase their number till the body is full formed. The different forms

that the embryo takes in the course of its development, as stated in the first chapter, are never complete forms of the life that they resemble, and as the physical life is all that then exists, no more can be claimed than that they are mere resemblances. The recapitulation of the psychic life as it is treated in chapter four, indicates that there is in the germ that is transmitted more than the mere principle of life, but what it is, has never yet been understood. The outstanding facts of the embryo life, however, whether understood or not, are very valuable and suggestive.

The skin of the human embryo is for the most part smooth and hairless, but at a certain stage of development it becomes more tough and hairy and resembles very much the skin of the apes and animals of that class. Surely such a phenomenon could have no other interpretation than that the embryo is in a stage of development that corresponds to the hairy animals that immediately precede the human. Another evidence is the presence of the gill-slits that are characteristic of the fishes, and the amphibians in the first stages of their development. It is thought that the outer ear is a ves-

tige of the embryonic gill slit. Likewise it is thought that the mouth is formed by two of the slits coming together, and that the nostrils are formed of two other. Doubtless the latter two are of other origin for when the mouth and the nostrils are formed in the normal way, there still often remain the vestiges of the gill slits on the neck. They are sometimes entirely open. Many times the ill shapen and deformed ears of those who are mentally deficient are an evidence of arrest on that plane of development.

The tubular heart and the circulatory system that so much resembles the heart and the circulatory system of the fishes is a suggestion that the foetus passes through what might be called the fish stage. Tests have been made with infants a few hours old by putting them in water. The impulse is to move the arms like fins and try to swim.

The spinal column of the infant and of the embryo is not curved in the S shape of the human adult, but has the single curve of the apes and the gorilla. The brain, also, of the embryo at the seventh month of its development has the convolutions that are the characteristic of the baboon and

not of the human. Some times the spinal column even at birth is yet extended into a tail like that which is seen in early embryonic life only much smaller. The metamorphosis in this case is the same as in the tadpole. Children have been born with tails three or four inches long.

This recapitulation of the ancestral life is seen not only in man, as an example from Metcalf's "Organic Evolution" will show. "The lobster has the posterior part of the body long and well developed, using it in swimming, and by its aid the lobster is able to leap through the water considerable distances. We call this portion of the body the abdomen. It is filled with powerful muscles, and is divided into seven parts, or segments, which move freely on one another. In six of the segments are ganglia of the nervous system controlling the action of the muscles of the several segments. The crab appears to be very different. There does not at first sight seem to be any abdomen at all. But turn the crab on its back, and we see on the under side a small structure clinging close to the other side of the body which when closely examined shows the same division into segments that we observed in the body

of the lobster. It is the abdomen of the crab, but much reduced in size, and almost functionless. It contains no nervous ganglia and is very different apparently from the abdomen of the lobster. But when we come to study the embryology of the crab, we see that it passes through a stage when it has an elongated abdomen with ganglia in six of its somites. This lobsterlike stage in the development of the crab is a reminder of the fact that the crab has descended from ancestors resembling the crab."

Another example that bears out the same idea is that of the whale, which in the foetal stage has fully developed teeth while the mature animal has none at all. Like wise the foetal salamander has gills that certainly can be of no use to it in that stage of life, and as it is born fully developed, and born into life as a land animal it has no use for the gill slits later.

Chapter III Vestigial Organs

The large number of vestigial organs-----their
 use to the body-----the thymus and the thyroid-----
 the veins-----the vermiform appendix-----hernia-----
 shape of the pelvis----- upright position-----strength
 of the arm-----position of the great toe-----fear---
 reversions of types-----club feet-----rotundity of
 outline-----beauty-----voracity-----jealousy.

Chap. III Vestigial Organs

The presence in the body of a number of organs to which no needed function can be ascribed has been explained by the theory that they are the vestiges of what was to the race at one time useful organs. There is a wide difference of opinion as to how many of the organs of the body are in this class. Bolton in his discussion of the theory of recapitulation in "Principles of Education" claims that there are one hundred twenty such in the human body. But obviously many have assigned certain organs to this class before their real function was fully known, and so have made the number larger than it should be. This example will make my meaning clear. Morris, in his little book called "Man and his Ancestor," in a discussion of these vestigial organs speaks as follows concerning the Thymus and Thyroid glands. "Two other structures common to most of the vertebrate animals exist in man, though they render him little or no service. These are the Thymus and the Thyroid structures---The Thyroid gland has a somewhat similar origin, it beginning as an ingrowth from the lower section of the pharynx and extending down to the lower part of the neck,

-----So far as appears, both the glands are useless or nearly so to man; or if the Thyroid performs any useful service, it is a minor and obscure one. Such functions as it may have could probably be performed by some other organs, while it is positively detrimental as the seat of goitre." Again in speaking of the valves of the veins, he says, "They exist where they are useless for their apparent purpose and are absent where they are useful". This could be said, in part, of the valves of the intercostal veins, in which, when the body was horizontal, they would have been a positive benefit.

Such a statement as Mr. Morris makes concerning the Thyroid surely has not been made in the light of the present knowledge of that important organ. It may be regarded as a vestigial organ but it cannot be said to be "useless or nearly so". As a matter of fact it is a very useful one. It is not understood exactly what its function is, but its removal, even when diseased, is always followed by the most disastrous results. If it is removed from children the mental powers will not develop, almost always the result is idiocy if it be removed early, and imbecility if it occurs later. If the Thyroid

is removed from a mature person of ordinary intelligence, it frequently occurs that the mental powers are lost and they revert to imbecility.

It seems that the vermiform appendix is in every sense of the word useless. If it has any function, and some reputable physicians claim that it has, it must be a minor one. Thousands of operations are performed every year for its removal and there seems to be no function of the body impaired. It is the seat of the frequent and often fatal disease, appendicitis. It does not seem at all probable that nature in an unhindered course of events would place in the body an organ doing so little good and capable of so much harm.

The disease, hernia, is one that is suffered almost wholly by man. It is one that he is enduring in his struggle to retain the upright position. In the animals that still go on all fours the weight of the intestine is still carried on the strong muscles of the abdominal wall, and only in the case of particular accident do they suffer rupture. In the human body the weight has fallen on the thin membrane that forms the lower abdominal wall and causes the rupture. Doubtless in time, this will

by nature be a much stronger membrane and will support the weight that rests upon it without the serious results that now so commonly follow. The shape of the pelvis has also changed as man has assumed his upright posture, for in the lower animals there is no such great distinction between the male and the female pelvis as exists in the human being, for, in the quadruped "the act of parturition is comparatively easy, the pelvis offering no serious hindrance". In the human the bone is also used for support and the consequence is the characteristic suffering and sometimes death.

The erect posture with its accompaniment, walking upright, that seems to be learned, is in reality, largely inherited, says Prof. Kirkpatrick, and "other nervous connections and muscular connections are less a matter of experience than is usually thought". In support of this contention he cites the unique experience of his own daughter in learning to walk. She had never tried to walk until seventeen months of age and then one day suddenly seeing upon the table his cuffs and wanting them, she climbed to her feet to reach them and having secured them walked away.

I would not insist, as does Dr. Quantz, in Dendro Psychosis (AM. Jour. Psy. Vol. IX, 455) that "the erect posture has been brought about chiefly perhaps through curiosity." He came to the conclusion through noticing that the gorilla, if he wishes to see more distinctly the approach of the hunter, rises to the upright position. He claims that this is a comparatively recent acquisition of man as is evidenced by his inability to maintain it with comfort for any length of time, and the desire to rest by sitting. His farther suggestion that is offered for proof, the fact of ones instability when sick, is not a valid one, for even the four footed animals are subject to the same thing.

The babe during the first few years of his life reveals much of his heritage. His arms are strong and his grip is much stronger, proportionately, than it will ever be again in his life unless he practices it. He can then grasp a stick and sustain his own weight for a considerable period, as much in many cases as five or six minutes. Such a phenomenon can have no other meaning than that he has yet a power that he had ages ago when his life depended upon his power to cling to the tree or the hair on his

mothers breast. Again when he clings, his legs do not hang down from his body but are bent at the angle characteristic of the quadrupeds. The great toe of the baby's foot is not in the position that is gradually assumed later on, or that it has in the normally developed foot, but stands at right angles to the others. The same position is seen in the apes and the gorilla. Closely related to the fact that the baby can cling so tightly and sustain his weight with his arms is the other fact that it causes a peculiar fear and discomfort to him if he is suddenly lowered. It can hardly be maintained that the child is in any way conscious of the danger that is incurred in the rapid descent, but seems thoroughly plausible that he has an instinctive fear of the thing that at one time in the race history likely would have meant death. It is also claimed that a babe has a peculiar fear of a crackling sound or the feeling of fur or any of those things that would reasonably seem to be the things that would have been disastrous to his ancestors of a very remote time.

Among the common reversions that are seen, which indicate clearly a going back to the original

types are the ordinary cases of idiocy and imbecility. Often in the case of an idiot child, the ears are not as far up on the head as in the normal body. This indicates that the child during the foetal life had by some means or other been arrested at that immature stage of development. The ears in the embryo are much lower down on the neck and gradually find their normal location which they have attained at birth. When an arrest of development occurs they are found not having finished this transformation. Cases have been known to science in which there was an ill-shaped and immature ear on the cheek of the patient. Sometimes the embryo gill-slits are left at birth so that a probe can be inserted through them. Another common reversion is club feet. They are a tendency toward the hoofs of the lower animals.

There are many things in the life of the child which are so commonplace that they are never recognized as having for the study of genetic psychology so much of significance as they really contain. We think of them as merely incidental, which they are now, but once they meant life to the individual. A paragraph in "The Child: A Study in the Evolution of Man", page 231, by A. F. Chamberlain, contains so many of

these that it will be quoted in full; "In his sketch of 'The Primitive Child', Dr. Louis Robinson seeks to explain many of the physical and mental peculiarities of the infant of to-day from the inheritance of traits and characteristics developed under the stress of the environment of primitive life. Among these are: the rotundity of outline almost universal among very young children——young monkeys had to be rather spare so that their mothers could carry them easily about the trees; the human child waxed fat in times of plenty, when food was abundant (so when food was scarce and the parents grudged to the offspring the latter might live on), hence the voracity of the child (and its tendency to pick up everything and put it into the mouth——in earlier times the child had to live on the debris of the food on the floor of the cave and around the resting places); infantile beauty, for in times of trouble and of flight the best looking children would be snatched up and carried away; the astonishing 'vocal capabilities' of the modern infant, since it is a well known fact that 'all young creatures, unless hungry, will remain silent for hours', and, as a matter of self preservation, the human infant learned to cry

and to howl, for purposes of food, and to prevent being overlooked. Moreover, in the primitive times, the squealing of the infants (like the barking of dogs to-day) contributed to the vigilance on the part of the primitive community. Fear of strangers, terror of wild beasts, fear of the dark, jealousy (the primitive child had often a hard time to get any thing to eat) and many other peculiarities of the modern child had their origin in the facts and the necessities of the environment of the earliest men—indeed, Dr. Robinson holds that 'every trait, physical and moral', of the young human being can be traced back to its fore runner in the offspring of the cave men, and his immediate successors or predecessors, a statement which is more of a truism than an exaggeration".

The wily and sagacious nature of the infants of tribes of Indians is well known. They seem to have inherited the subtle and shrewd nature of their forebears.

Chapter IV Psychic Recapitulation

The disproportionate size of the brain-----its
impotency-----the age of imagination-----the age of
inquiry-----age of storm and stress-----egocentric--
--the wanderlust-----desire to hunt and fish-----de-
sire to kill birds-----cruelty-----adolescent games-
-----theft-----extreme claim of a writer.

Chapter IV Psychic Recapitulation.

The psychic recapitulation is no less interesting nor less significant than the physical. In many points it may be regarded as more so. The infant brain is, in proportion to the adult size, almost the farthest developed organ of the body, being exceeded only by the eye and the suprarenal capsules. In its function it is the least developed. From a table compiled by Vierordt we see that while the lungs increase 20 fold, the skeleton 26 and the muscles 48 fold, the brain increases only three and seven tenths fold. (Physiol. des Kindesalters 254). Even with this disproportionate size of the brain the child at birth may be said to be without mind as he is without moral nature. He has a few well defined instincts, only those however, that are necessary to his life such as sucking. In this respect he is not by any means the equal of the other so-called lower animals which are able, in many cases, to care for themselves completely at birth.

In the development of the child from this helpless and mindless infancy to his maturity which he reaches fully by the twentyfifth year, and practically by the twentieth, he lives again in his mind

all of the stages of the growth of the race from its intellectual infancy to the stage that it has now reached. The age of the first appearance of imagination that occurs in the child at the age of four or five years, when he first begins to construct his own ideas, when he begins to tell of incidents that have not happened, and then immediately correcting himself. His first lies, says G. Stanley Hall, are the birth pangs of the imagination. The child at this age is generally fond of stories, and finds great delight in stories of fairies and other impossible things. The age of the awakening imagination corresponds to the time in the phylectic development before there was any kind of writing, when religion was all myth and magic, and the tradition of the tribe was all handed down from one generation to the other by being told. This, in the child, is followed by a time of insatiable thirst for information, when there seems to be an overpowering desire to know things. Strangely enough, many of the questions of the child at this age are not concerning the things which immediately concern his welfare, but are rather of the nature of the questions that concerned the people in the first attempts

that the race made to get information. They studied first the stars and the sun, and speculated as to what was just over the edge of the earth. After this age comes that of adolescence. It is marked distinctly with the signs of recapitulation. Adolescence presents the most important time in the development of the child, his physical and psychical changes are greater than any other period of his life. There seems to be a need of an almost entirely new adjustment of his emotional, intellectual and social life.

G. Stanley Hall in speaking of the physical and the psychical changes that take place during this period says; "It is worthy of the grand old but much abused word 'regeneration' ". It is in reality a new beginning, a new generation. No new cells are formed but Starbuck thinks that many come into activity for the first time. Whether or not that be the cause, the phenomena of new appetites and new desires, new experiences and new thoughts are very evident. These new processes are evident in nearly every phase of adolescent life. They are particularly evident in the social, the economic and the emotional sides of the child life.

As to the social recapitulation, some things are very evident and in order to assume the right atti-

tude to the child it is necessary that they be understood. The child is essentially ego-centric. "In all his experiences the individual is the unit. In his infancy those around him are to all intents and purposes designed for his care and his happiness. When his comforts are provided for, and his own wants supplied he has no further concern for those around him. To the ordinary boy of five years his father is the man who fixes his toys when they are broken, and who furnishes the nickels to buy the candy or other favorite indulgence". So says Prof. R.A. Schwegler in a class room lecture on "Adolescence". His words are very suggestive in explanation of many of the attitudes of the child, even to those who are not willing to take the statement word for word. As a fact many children are very sympathetic, and cannot distinguish their pains for those of others, and suffer for one quite as much as for the other. Yet as a general statement it is true, and the pains of others do not mean much to him. He is recapitulating the history of the race at a time when all of the wants of the race were of a physical nature. The life consisted in securing enough food for the body and shelter to protect it from the elements

and from enemies. This must have been the life history of the race for millions of its years before it came to the intellectual maturity that it now enjoys.

Almost suddenly in the child life all of this changes. The experience, instead of having the individual as the unit, now change to a social unit. The affections become objective instead of subjective. The changes during this time are so marked and so significant to the individual that the description of the process in his Psychology of Religion, Starbuck calls it a time of "Storm and Stress".

This is the time in the young life when the "Wanderlust" takes possession and there comes that passion, often uncontrollable, to run away from home. It is clearly the repetition of the old race habit for it is in no way connected with the things that are of immediate effect. The run-away boy cannot be accounted for by his environment. It is not an uncommon thing to find that one who runs away to come from the most comfortable surroundings and from a home where there was every inducement to stay as far as material things are concerned.

Often this period is marked by a strong desire

to hunt and to fish, or to rob the nests of birds and to kill the birds. The first of the propensities often tends to continue through life. The anglers keen delight is surely not found in the fish that he catches for the delight is just as keen where there is no tangible result, and it is the mark of a true sportsman to fish when there is no catch. The hunter hunts from a far different motive than to secure the game that he catches, and often he protects the very game that he hunts. A large part of mans pleasure now is in living again the things that were a necessity to man at one time in the race life. Boys are some times condemned for throwing at birds, usually such a delight is attributed to what may be called "innate meanness" but Mr. Thistleton Mark in his book called "the Unfolding of the Personality" explain the fact that big boys throw at birds in the following quotation from page 75; "It is most probably because they were checked from some such exercise when they were little boys. If we provide targets, with interesting features according to taste, we are making timely use of a ready-made impulse in the direction of hand and eye coordination. We are also doing something to justify

ourselves in trying to train ourselves in trying to train 'good little boys that do not throw at poor little birds'. There is a time for the target and a time for the word building sheet; a time for mud and a time for the pen holder; a time for the following of one's own devices, and a time for the doing of set tasks." Mr Dooley wonders what a boy thinks of us. For he says, "We fire him off to school about the time that any one ought to be out of doors. He has to sit there most of the pleasant part of the day, and every time that he tries to do any thing that seems right *to him*, his keeper swoops down on him---toward evening, if he has repressed all his natural instincts, he is allowed to go home and chop some wood---and so it goes". The things that "seem right to him" at about that age are to most of the mature minds essentially somewhat pagan. They are only the vestiges of what was once the whole life cycle of the man.

Compayre says that the "alleged cruelty of the child when he tortures animals is, at bottom, only ignorance". Many modern criminologists think that a certain amount of cruelty is normal to all healthy children. It is not the cruelty that is normal

to them but curiosity, and curiosity combined with ignorance, which is necessarily characteristic, are sufficient to account for all that in the child appears as cruelty.

The initiatory rites of many secret orders and college fraternities can be explained by a reference to the fact that the human mind repeats essentially the race history. There is a strange resemblance to the initiation of the youth into the tribe of savages. The victim is frightened and threatened and made as uncomfortable as he can be made, some times he is injured. Every effort is made to increase mystery, and often when it is all over they left under the severest threat, sometimes of death, if they reveal the fact that it was all a fake. How like a college fraternity with its sham and horseplay. Among the games that are most commonly indulged in by adolescents, games of contest far out number all the others. In the years preceding adolescence the games are generally those in which sides are taken. The individual plays for the entire group and less stress is laid on personal encounter. Football has gained its prestige because of the opportunity that it offers for personal encounter, and it is claimed by many

that it has its charm in the opportunity that it gives for secret rough playing.

The tendency to associate in gangs is very marked. Every gang has its leader, someone who has earned his title to the place by the force of his arms or by the more subtle and more effective force of his nature. Generally his leadership is an undisputed one, for each leader has his followers and whatever contest there is between the gangs themselves. The games that are chosen at this time of life are the games wherein one group is striving against the other, rather than games of personal encounter. Not infrequently the individual will surrender his personal gain or honor for the sake of the crowd. So he lives again the group life of his ancestry, and fights again their battles for them, and gives up his own pleasures for the good of the tribe or the clan.

This period is also marked by a considerable increase in the number of crimes against persons and property. About three fourths of them are for theft. Of the two hundred and twenty five cases that have been brought into the juvenile court of Douglas County, Kansas, over one hundred and twenty five were

accused for crimes against property. Of the number that were convicted, it was the opinion of the examining physician, that the crime was the result of bad training or of bad environment in all the cases except one, in which he regarded it as "inborn". In many of these, the theft was merely the manifestation of the normal instinct of collecting or of possession. In others it was the result of over development of the instinct of possession due to its suppression to an unusual degree at the time of its first appearance. In a tabular comparison of the crimes or delinquencies of youth (Adolescence Vol. II G. Stanley Hall) The maximal age for incorrigibility is fourteen. At fifteen most of the convictions are for petit larceny, at sixteen the highest number is for grand larceny. Crime is the result, says Dr. Hall, of the great difficulty which youth finds in making adjustments to the social surroundings. And the second reason is the reversion to nomadic life, "in the evolution of the anti social life of crime, comes resistance to the institution of property".

Most of boys crimes are not the result of a native tendency to do an unlawful or a criminal thing. They are only the working out of an instinct in-

herited from the time when it was the necessary thing to do. As late in the history of the human race as the time of the ancient Spartans, the boys were taught to steal, and in all historic times it has been a legitimate way to obtain a livelihood. So after all if heredity has any influence at all in the determination of character, it seems more like the natural than the unnatural thing to do.

Schneider, who has written the story of the human and animal will, observes: "Remarkably constant and obstinate is the inheritance of the instinct for apple stealing and apple nibbling which manifests itself so strongly in boyhood. Although for generations past the apple has been only an accessory of food, and education has been working against this predilection of youth for plundering orchards, the sight of the fruit arouses in the young human being such a strong desire and so great an appetite that the instinct often overcomes all notions of danger, even when the apple is still green and unpalatable. And who is there in his adult age does not remember the great pleasure which, as a boy, he had in scaling his neighbors fence and filling his pockets with apples? There is no other food, the

sight of which awakes in a boy so strong a desire as does the apple, and we are led to conclude therefrom that our savage or animal ancestors must have been given especially to eating apples, a view that gains support from the fact that, with primitive peoples, as with monkeys, the apple is the chief article of food. "So writes A.F. Chamberlain on page 256 of "The Child; A Study in the Evolution of Man".

I have written the quotation from Schneider which seems to have the approval of Chamberlain in his book, in order to show to what extremes the writers upon the subject, and especially the ones who are writing in its defence, are willing to go. I cannot take the argument of the paragraph seriously because of its manifest absurdity. The reference to "The predilection of youth for plundering orchards" is a rather startling one. I feel safe in the assertion, although no proof is at hand, that at no place where orchards are cultivated has the propensity of boys to steal apples been noticed. It is exceedingly unfortunate that the theory of recapitulation, so suggestive in its content, and so valuable in the explanation that it offers for many of the problems that confront the psychologist, should in this manner be travestied.

Chapter V Sources of Material

Too much of the material from one source

-----Munsterbergs criticism-----E.W.Shuler's
criticism-----Holl's explanation of the apparent
reversion of processes.

Chapter V Sources of Material

One of the chief sources of weakness in the discussion and the advocacy of the theory of recapitulation is the sources of the material upon which it is based. A very large portion of the material has been gathered by the faculty and the students of one university. The method largely used, is to send out questionnaires. These are given into the hands of teachers and parents and governesses and the observing is done by these. Often they are careless or incompetent and the results have no value. In attempts to discover the mental advance of the children, the observations have been made by fond parents and by those prejudiced in favor of the child. Often too the work has been done by those who regard the matter as a joke and their answers are made as ridiculous as possible. Many of the conclusions that have been drawn have come from data that Dr. Munsterberg objects to as not being "scientific". He suggests that it is not scientific botany to find out in whose yard there are cherry trees and in whose there are apple trees and in whose the plums prevail. Neither is it psychology to know which child prefers rag dolls or which man prefers clay pipes, or which boys

flirt with their eyes. That is often what is done. The Pedagogical Seminary in "A Study of Dolls" brings out the fact that out of exactly 845 children, 191 prefer wax dolls, 163 paper dolls, 153 china dolls, 144 rag dolls, 116 bisque dolls, and 69 rubber dolls. The conclusion of the whole matter, which is absent from the article, would doubtless hold some suggestion of some stage of growth through which we have passed when the characteristics of the wax doll were present.

A rather severe review of the theory of recapitulation occurs in the Ed. Rev. for 1912 on page 191, by Mr. R. W. Shuler and deserves some consideration. The writer there claims Haeckel's theory is now discredited and that there is a universal revolt of European biologists, and that none of them would to-day assert it. The criticism carries with it a tone of sarcasm that greatly lessens its value. The critic says that it would be "criminal to hint" that Hall's theory is false, an assertion that Dr. Hall would not admit. The article says farther that the theory has only come as "an opening sky" to the teacher who might find it a help in the arrangement of the schedule. It has indeed done that.

It helps mightily in the arrangement of the schedule, but not in the manner in which the article suggests, by teaching figures, pictures and signs and so on to the present system. Nor by teaching the Freshman that the sun is a 'chariot of fire', the Sophomore theory of Ptolemy, the Junior the Copernican theory, and the Senior the modern one. It means that in the last of the grade work a large amount of memory work will be done, that in the high school the science will be extensive and not intensive. It means that many of the children's lies are what Dr. Hall calls the "Birth pangs of the imagination"; that the boy's truancy from school should not be attributed to his 'innate meanness', but to the necessity of the lives of his progenitors in the ages when they were all truants, if going away from home was truancy. The criticism says farther that "the brain processes of the savage are the same as those of the mature educator, the difference is in the training," and farther that the savage can explain the universe about as well as man did four hundred years ago. All of which is true, but the criticism has not thoroughly comprehended the theory. It is not that man is repeating the lives that were lived

four hundred years ago, but that he is repeating what went on in the life history thousands and perhaps millions of years ago. It is not a question as to whether Aristotle would be equal to the modern philosopher, but, if a specific case must be used, whether he would be equal to the Spey man of the Pithecanthropus of Java, discovered by DuBois in 1891.

The most pertinent criticism of the theory is the point raised by E.W. Shuler (Ed. Rev. Vol. 44 pg. 191) as to whether or not the late development organs in the individual indicates the same late development in the race. I have no doubt that it does. The sex function as it now operates is a matter of very late development in the race. It is explained in the following quotation from Albert Moll (The Sexual Life of the Child, pg. 83 et seq.) "The processes of detumescence and of contractation may manifest themselves primarily in childhood as associated conscious sensations, by far the most common event is for the processes of contractation to appear separately, before those of detumescence, ---- this seems rather remarkable in as much as we must assume that in the phylogeny of our species the processes of detumescence appeared earlier. Originally,

in the earlier ancestral types, reproduction was affected by fission or gemination (simple division or budding) without any necessity for conjugation with another member of the species, and the reproduction by gemination by gammatation corresponds to the processes of detumescence, to the ejaculation of the spermatazoa by the male. But although in most individuals the processes of detumescence make their appearance in consciousness in a secondary manner, it does not follow that in the ordinary course of development they are also secondary. They do not, indeed, enter so early enter the sphere of conscious-impulses, but there is a considerable amount of evidence to show that important processes are going on in the external genital organs before consciousness is directly affected by these processes".

By the word "contractation" he means here that part of the sexual life that is a characteristic of the higher developed life forms. It seems to be, in a way, a reversion of the manner in which the phenomena are generally apparent, as in the ordinary course of events it would come after detumescence. It does no violence to the theory as the fact has so many other reasons by which it should be explained.

Chapter VI The Significance of the Theory

Its significance for the making of the curriculum-----influence of our terminology----- the teaching of writing-----the child's natural way-----religious education-----the theory of religious growth-----the adaptability of the bible to the recapitulating mind-----the reasonableness of a boy's misbehavior-----education of the instincts by parents-----possession and ownership-----thieves-----misers-----kleptomaniacs----- paupers and rich men.

Chapter VI The Significance of the Theory
for Parents and Teacher.

One critic of the theory, Mr. E. W. Shuler, in Ed. Rev. Vol. 44 pg. 191, says that the theory of recapitulation came as an opening sky to the teacher. While he meant it in sarcasm, he came nearer the truth than he thought. His suggestion that the knowledge of the race be repeated to the individual in the same crude way that the race obtained it, is not a legitimate implication. It is true that the way that the race has obtained its present knowledge represents the types of thinking that the child experiences in his mental growth. He suggests that if we are to follow the light of the theory that we will teach the child writing first by pictures then by signs and by symbols. To be sure we will not teach the signs and the pictures, but rather will recognize their value to the child mind and make such use of them as the nature of the mind would require. He suggested the study of astronomy that was described in Chapter five. The modern teacher in his attempt to give the pupil a conception of the sun ought to know the the difficulty that is experienced by the child is due to the ancient racial conception of

a 'chariot of fire' that is in the mind obstructing the formation of the new idea. It is not a fault nor a mark of hopeless stupidity for the freshman to think that the sun goes around the earth. If the truth were known and frankly confessed we would all find ourselves where the race was four hundred years ago. To all of our thinking and for all practical purposes the sun does go around the earth. We live and talk just as though it does. We say that 'the sun goes down', 'the sun comes up' and so on. We know better, to be sure, but it is more than a habit that makes us use those expressions. Only a few minds that are more advanced in those fields are the ones to which the earth 'comes up' in the evening, and 'goes down' in the morning. As a matter of fact we are still living in the days of Ptolemy in our "astronomical minds". Some day in the course of the evolution of the human mind we will doubtless see these relations of the sun and the earth as they are.

Both Mr. Shuler's terms, and mine used in the criticism, have been too specific. The repetition of the psychic life is not in the thoughts nor the ideas that enter the minds of the individual, but in the types of thinking. In the mind, both of the

child and the savage, there is a tendency to describe all of the experiences of the life in the terms of those things that are close at hand and are easily defined. The ancients probably used the term 'chariot of fire' because of the suggestion that came from the looks of the sun and the fact that it seemed to move. Even though the modern child recognized the apparent motion of the sun, he would give it a different name that would correspond to something in his own immediate experience. So the likeness occurs in the tendency to conceptualize, and to define in the realm of one's own experience all that comes in the range of his senses.

In the teaching of writing, Baldwin observed carefully the learning process of his own children, and particularly the pictures that they drew. The striking likenesses that one can easily observe between the pictures that the child drew at about thirty months of age, which, having been done without a copy, would be a fair graphic reproduction of the child's conception of a man (due allowance being made for the lack of skill in the child's hand) and of those that have been preserved from the life of primitive man, are valuable in the explanation of this

fact. The wise teacher knows that the trouble with the child is not altogether in the lack of skill in the hand, but that the child's concept of the thing that he is trying to draw has not developed beyond the stage that is so crudely represented by the picture.

In acquiring skill in writing, it would be following the child's nature more closely, I am sure, if we did follow the method suggested by Mr. Shuler, pictures signs and so on. We simply make a short cut and put the modern system in his mind. Why do our minds labor with such difficulty at, and so few of us use, systems of short hand? It is because our minds are not yet at the place where they can use the short line as the representation of an entire phrase. The logical step in the development of writing is the use of the symbol for an entire phrase instead of a symbol for a sound.

The place in education where the use of pedagogical method has been most lacking, and where the theory of recapitulation has as much to offer as in any other field, is in the field of religious education. There seems to be a close parallel between the religious development of the race and the child more evident than the others. Religion has come to

the world largely by revelation a little at a time, and that is the way that it comes to the individual. The child's idea of the world and of God are much the same as the ideas of the savage, in fact they correspond almost exactly. To both the world seems small and flat. To both God is a big man, with all of the good and all of the bad intensified. All of his actions are, for both, thought to be just what a man would be in the same circumstances. Both think that God needs to be conciliated. Both think that he can be bargained with. Primitive man apparently liked blood and strife and war. He had no word for mercy and knew no pity. The boy likes "stories that reek with gore", says Dr. Hall, and the stories of the bloody battles of the Old Testament, and the sometimes wicked heroes that play so prominent a part in the scenes that are there depicted, form the very best of literature for the Adolescent, in the development of his religion. The Bible ought to be taught just as it is, with all of its stories, its wonders and its miracles, its myth and its mystery.

Adult piety cannot be put upon youth, neither can adult conceptions of youth nor of religious duty. Hall's book on "Youth, etc" says; "Something is amiss

with the lad of ten years who is very good, studious, industrious, thoughtful, altruistic, quite, polite, respectful, obedient, gentlemanly, orderly, always in good toilet, docile to reason, who turns away from stories that reek with gore, prefers adult companionship to that of his mates, refuses all low associates, speaks standard English, or is as pious or as deeply in love with religious services as typical maiden teacher or the *a la mode* parent wishes. Such a boy is either undervitalized and anemic and precocious by nature, a repressed, overtrained, conventionalized manikin, a hypocrite as some can become under pressure thus early in life, or else a genius of some kind with a little of all of these".

The parents interest in the question comes from a different angle. Generally parents entrust the education of their children to the public. It has been done in that way so long that it is not now considered in any way essential for the parent to be able even to help in the education of the children. However in the other elements of the child's life aside from education there is need on the part of the parents of real scientific knowledge. For instance: the child has an instinct for collect-

ion and for possession. At three or four years this instinct begins to show itself. It may be observed as it develops, in the strange collections of articles that children are apt to make; shells, stones, whether useful or not, generally not, that must be hunted and are not too common. Children like to have some things of "their own", their chair, their cup or plate, or a favorite toy. If the instinct for collecting is too much suppressed when it is developing it is apt to manifest itself later in the exaggerated form that is seen in the thief. A form that shows itself under abnormal conditions is called kleptomania. The kleptomaniac is one whose desire for collecting is not restrainable, they cannot make a proper distinction between their own property and that of another.

The suppression of the instinct of possession produces, when it reappears in an exaggerated form, the miser. One to whom the possession of what is valuable is a source of joy. The object is not prized for its value for use, but for its own sake as a possession. This instinct is one that in childhood ought to be cultivated with great care.

Much of the success of the after life de-

pende upon the ability to live well, and the ability to live well depends in turn upon the ability to collect and to possess the means of a livelihood. I do not know that experiments have been made upon this instinct in this particular field but it is safe to say that they would produce far-reaching results. It seems that in the animal world, where the instinct has had free development, without the unnatural influences that surround man, that there are no freaks such as we now see in the human species. The person that is not able to provide his own food, and the one on the other hand that is just as bad, who lays up enough for himself to keep many with needs corresponding to his own, and still tries to collect more.

So the theory enters in a vital way in to the training of the child, and needs to be understood by those who attempt the training of him. It is full of suggestion as to the interests that may be utilized, and the impulses that ought to be encouraged and those that ought to be restrained or repressed. The recapitulation of the physical life furnishes much more data for the explanation and the correction of the abnormal cases that are seen. Many of the

defectives are made so because they have been retarded on a plane of development, that progress in a natural way would have lifted them above. In the diseases, to which we have become heir in the course of development, nothing will avail, to be sure, but more evolution.

In the mental development, it is easy to give too much authority and too much weight to the apparent evidences that recapitulation has to offer. The child is more than a machine, and is capable of far more than his instincts lead him to do. He is able to repress his instincts or to encourage them. Of the adolescent, much more can be said. He can do all that the child does and in addition can do many things mentally that have no relation to the life of his ancestors. Many of his activities are the same as the activities of his ancestors but there is no causal relation. He is to be recognized as an individual and many of his actions, indeed most of them, will be determined by the stimulus that comes from the immediate environment, modified in innumerable and immeasurable ways by his own past life.

The end.

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