THE HISTORY OF RECAPITULATION THEORY IN PSYCHOLOGY.

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in the Department

of

Psychology

We accept this thesis as conforming
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April 1984

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ABSTRACT

The history of recapitulation theory in biology and psychology is reviewed. This theory proposed that during the course of its individual development, an organism will pass through a series of stages which resemble the ancestors of its species. The rise and fall of this notion in the history of biology introduces the reader to the technical aspects of recapitulaiton theory, explains why it failed as a biological "law," and suggests reasons why the idea became so popular despite its empirical shortcomings. This section is follwed by a study of six major contributors to the history of psychology who extended the principle of recapitulation to explain the mental development of the individual. Questions raised by their accounts indicated that a more adequate approach to this notion of recapitulation at a psychological level of organization might begin from a point of departure which gives recognition to the the social nature of human relations.

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Introduction.

With the exception of Darwin's theory of evolution via natural selection, no other biological concept has had a greater impact upon theory in psychology than recapitulation theory. Indeed, accepting that the history of philosophy is intimately tied with the history of psychology, it may be said that recapitulation theory has been with psychology since its earliest beginnings. Over the course of the following discussion it will be shown that its influence is still represented within some quarters of current psychological theory, despite the fact that twentieth-century biology has shown that recapitulation, at least as a biological "law," is questionable.

What is recapitulation theory? Though the original biological term recapitulation is probably unfamiliar to most, the concept it denotes is quite well-known: that during the course of its individual development, an organism is expected to pass through a series of stages which resemble the appearance of its ancestors. Thus, Ernst Haeckel (1834-1909), a leading proponent of recapitulation, summarized this sequence of events in the phrase, "Ontogeny is a recapitulation of Phylogeny" (1876, v. 1, p. 6). Ontogeny means the development of the individual, and the term phylogeny refers to the evolutionary development of

the species. Haeckel usually referred to recapitulation theory as the "biogenetic law," according to which he expected

> that the series of forms through which the individual organism passes during its progress from the egg cell to its fully developed state, is a brief, compressed reproduction of the long series of forms through which the animal ancestors of that organism (or the ancestral forms of its species) have passed from the earliest periods of so-called organic creation down to the present time. (ibid., V. 1, pp. 6-7)

Although Haeckel was largely responsible for the popularization of this concept during the late nineteenth-century, he was not by any means the first to enunciate the principles of recapitulation theory. The history of this concept is both long and complex. However, in order to fully understand its falsity, some consideration of this history is required. The following historical review of the recapitulation idea should lend some insight into the manner by which this concept gained its widespread popularity near the turn of this century. Indeed, even though recapitulation theory is generally looked upon by contemporary biology as invalid, its former heights of popularity has made it somewhat formidable in the face of continuing criticism. As the prominent biologist, K. E. Du Brul pointed just recently, "There are still those who would Haeckel biology!"

(Du Brul, 1971; cited in Gould, 1977, p. 2). When an idea is so popular, despite its lack of objectivity, extra-scientific explanations may be sought to account for its continued acceptance. The history of recapitulation theory reveals that this concept corresponds to certain idealistic philosophical and religious traditions. These aspects of the theory will be discussed in addition to its appeal as a simple, additive model of evolution.

Further criticism of the theory stems from its own claims. Contrary to the arguments put forward by Haeckel, recapitulation is not a phenomenon which follows as a consequence of evolution. In fact, recapitulation theory suggests a static character which stands in opposition to the now generally accepted dynamic view of evolution. Recapitulation theory has encountered much criticism over its long history, as well. Historical and contemporary counter-arguments will also be discussed.

Impact on Psychology.

Before biology had finally dismissed recapitulation theory during the 1920's, the concept had already been adopted by a number of influential psychological theorists, such as: G. Stanley Hall (1904), James Mark Baldwin (1906), and Sigmund Freud (1918). Although their reliance upon recapitulation theory is

not always obvious, it will be shown that this concept played a central role in the formulation of their theories. The recapitulation concept served as an inspiration to their own theoretical outlook, and was depended upon to provide a "scientific" foundation for their positions.

The most attractive feature of the recapitulation concept in the psychological adaptation, is clearly its emphasis upon a parallel between the mental development of the individual and the development of cultural and social behaviors over the course of man's past. This parallel between the individual and society deserves to be re-examined; for it returns attention the socio-historical aspects of mental development. Consider the child in his educational years: Could it not be argued that as the child passes through a series of intellectual steps, he or she is recapitulating roughly the same series of intellectual and cultural achievements made over the course of human history? This seems almost self-evident, yet contemporary psychology rarely approaches the problem of human development with an awareness of this parallel between the development of the individual and the progress which has taken place in his socio-historical milieu. Perhaps psychologists today are unwilling to apply an old principle which, for some reason or another, is not used much in developmental psychology. Any theory suspected to have met with problems in the past is unlikely to be embraced by

contemporary theoreticians. However, in investigating the problems which have historically plagued the idea of psychological recapitulation, one gains an understanding of how to overcome some of its major difficulties.

For example, it was frequently found that while psychological adaptations of recapitulation theory correctly focused upon this theme of a parallel between individual and historical development, this was done so in a manner which strongly suggested a literal transference of the original biological principle. As a result of this traditional assumption, the concept would appeal adversely to most contemporary psychologists as an attempt to completely account for human development as a consequence of a biological predisposition. Indeed, this reaction to the idea of psychological recapitulation has been only reinforced by recent literature on the subject. For example, during the "baby boom" era of the 1950's, millions of North American couples were introduced to the concept of psychological recapitulation in Benjamin Spock's Baby and Child Care (1957). Spock outlined the notion in the following reductionistic terms:

> The development of each child retraces the whole history of the human race, physically and spiritually, step by step. Babies start off in the womb as a single tiny cell, just the way the first living thing appeared in the

> ocean. Weeks later, as they lie in the amniotic fluid in the womb, they have gills like fish. Toward the end of the first year of life, when they learn to clamber to their feet, they're celebrating that period millions of years ago when our ancestors got up off all fours. It's just at that time babies are learning to use their fingers with skill and delicacy. Our ancestors stood up because they had found more useful things to do with their hands than walking on them. Children in the years after 6 give up part of their dependence on parents. They make it their business to find out how to fit into the outside of their family. They take seriously the rules of the game. They are probably reliving that stage of prehuman history when our wild ancestors found it was better not to roam the forest in independent family groups but to form larger communities (1957, pp. 223-24).

Dr. Spock's summary view of psychological recapitulation provides a glimpse of the typical approach to this concept. From this quote alone, some of the more outstanding problems inherent in the concept may be anticipated already, such as biological reductionism, "arm-chair" anthropology, and, of course, a clear dependence upon the validity of recapitulation theory. It will be argued that the idea of some sort of recapitulation process at the psychological level does not necessarily imply that human development is biologically determined.

The history of this idea in psychology is of significant interest, not only in respect to its pervasive and lasting influence in psychology, but also as a point of departure from which a more adequate approach to this concept might begin. The intuition that there seems to be "something true" in this idea is supported by the historical fact that some of the most distinguished psychologists have presented accounts which revolve around the recapitulation theme. It is hoped that the following re-examination of the recapitulation idea in the histories of biology and psychology will reveal the kernal of truth within this appealing concept.

PART 1

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The History of Recapitulation Theory in Biology

From Aristotle to Lamarck.

As with many other ideas in modern science, Aristotle (384-322 B.C.) has been often credited with being the first to suggest that a recapitulation process occurs in the development of the individual organism (e.g., Lovejoy, 1936, pp. 58-9). However, Plato's thoughts on Forms must also be taken into account when considering Aristotle's recapitulation scheme. After all, it was Plato who originally proposed that all material things should be considered as copies of their metaphysical Form or essence, and that the whole physical universe may be thought of as one general Idea, viz., the Idea of a living creature. Plato (430?-379) described the relation between this all-encompassing Idea and the natural order of things in the following manner:

> What was the living creature in whose likeness the Demiourgos (Master Craftsman) framed the world? We must not suppose that it was any creature that ranks only as a species; for no copy of that which is incomplete can ever be good. Let us rather say that the world is like, above all things, to that Living Creature of which all other living

> creatures, severally and in their families, are parts. For that embraces and contains within itself all the intelligible living creatures, just as this world contains ourselves and all other creatures that have beeen formed as things visible. For the god, wishing to make this world most nearly like that intelligible thing which is best and in every way complete, fashioned it as a single visible living creature, containing within itself all living things whose nature is of the same order.
>
> (Plato; cited in Ross, 1953, p. 129).

Plato ranked the Forms (Ideas) in a hierarchical scheme beginning with the most general or most encompassing at the top and continuing "downwards" to the more specific categories. Aristotle, Plato's most famous pupil, carried elements of this scheme into his own system for classifying different areas of specialization in nature. Aristotle divided the biological domain into three large categories: the plants, characterized by their "nutritive" soul, were considered to be lower on the scale in comparison to the animals, distinguished by their "sensory" character (Aristotle; cited in McKeon, 1973, p. 263). The capacity for sensation was said to necessarily imply the presence of a number of other capacities or "powers" which distinguish the animals from the plants: "...if sensation, necessarily also imagination and appetition; for, where there is sensation, there

is also pleasure and pain, and, where these, necessarily also desire" (ibid., p. 186). Apart from these capacities is the "power to think" which Aristotle attributed to man. This power "alone is capable of existence in isolation from all other psychic powers" (ibid., p. 186). These statements serve to outline the three major distinctions used by Aristotle to classify the species.

Aristotle introduced the recapitulation claim where he stated that as an individual organism develops it gains the powers ascribed to each of the classes:

> Of the psychic powers above enumerated some kinds of living things,...possess all, some less than all, others one only. Plants have none but the first, the nutritive, while another order of living things has this plus the sensory... and still another order of animate beings, i.e., man and possibly another order like man or superior to him, the power of thinking, i.e., mind. (ibid., pp. 186-187)

This cumulative theme defines the essential core of recapitulation theory, in both its classical and modern formulations. In its essence, recapitulation theory has always implied an attempt to explain the development of a more advanced species as the product of lower species plus "something more," i.e., an advanced character or set of characters which distinguishes the higher species as representing a mark of

progress in the scala naturae, or "scale of being" (Lovejoy, 1936, p. 59). It is to Aristotle's credit that this central theme has not changed much since his time.

Non-Evolutionary Components.

The distinction between Aristotle's formulation and the modern approach to recapitulation was no doubt largely due to the general movement away from the archaic reference to the nature of an organism's "soul" as the final cause of its appearance. The modern recapitulationists looked, instead, for progressive differences among the species in terms of their anatomical structure, and the cause for the development of these structures was generally thought to be due to proximate causal factors. The reasons for this new emphasis upon the material nature of organic life must certainly lie with the general shift toward a more secular account of physical phenomena which marked the beginning of the scientific era. But, even before the classical version of recapitulation theory met with criticism from the relatively recent materialisitc perspective, the principle of classical recapitulation theory was doomed by a serious theoretical difficulty, specifically, its a priori character.

The term "a priori" literally means "from what is prior" (Hamlyn, 1967, v. 1, p. 140). In Aristotle's scheme, what is

prior is the essential nature of a given species, which Aristotle described as its "soul." Aristotle had used the term soul much in the same way that Plato before him had referred to the term "Form," also said to constitute the essence of an object or that which literally provides its distinctive appearance. The similarity between Plato's concept of Forms and Aristotle's souls is especially evident in the following quote:

> What is soul?--an answer which applies to it in its full extent. It is substance in the sense which corresponds to the definitive formula of thing's essence. That means that it is 'the essential whatness' of a body of the character just assigned. (Aristotle; cited in McKeon, 1973, p. 182)

Given that the character of a species represented the external or material manifestation of its inner soul, the question remains: From what source is the character of the soul derived? To ask this question implies an inquiry into the nature of that which initiates development. For Aristotle, this meant a reference to the ultimate source of movement which he assumed to exist behind the appearance of the material realm (ibid., pp. 309-311). Based on the premise that "sensible substance is changeable," i.e., that all that is material is prone to change or movement, it would follow that the source of movement cannot be of a material nature (ibid., p. 314). Thus, Aristotle concluded that the ultimate source of movement must be immaterial

and eternal, and this he called, the "first mover" or "God" (ibid., pp. 318-320). Therefore, in relation to the biological domain, it was to be assumed that God was the ultimate and proximate cause of the character of any given species.

Criticism of this position does not necessarily involve questioning the notion of God from a scientific position. For instance, there is still the serious analytical problem of how Aristotle's "first mover," said to be immaterial, can affect the shape of things in the material realm. Similarly, the creation of the manifold of various souls by the first mover seems more than simply abstract, as this solution calls for the acceptance of a dual existence of an eternal and immaterial series of souls corresponding to each of the millions of species existing in the biological domain; this amounts to a redundant "doubling" of the physical universe.

However, the point at which this view becomes most questionable is where its problematic explanation for change is recognized. While Aristotle accepted that all material things do change, he maintained that the soul of such things are eternal. This implies that material things cannot change or move of their own accord: "It (the soul) transmits to the body the movements by which (it) itself is moved" (ibid., p. 166). In turn, the movement of the soul is directed by God, whose reasoning for moving particular souls one way and not another is left virtually

unexplained, e.g.: "The reason for which God caused the soul to move in a circle can only have been that movement was better for it than rest, and movement of this kind better than any other" (ibid., p. 170).

In effect, Aristotle's system could never accomodate an account of the natural process of evolution; for it argued that a species could only be of one particular soul at one time. Where appearances might exhibit change, this would be attributed to the introduction of another kind of soul. Thus, no transformation of a species could possibly occur; the new appearance would signify only the presence of another soul. There is no way to account for the transitional phase when a thing turns into something else; a thing is x or it is not x, and that is all. In other words, an object, e.g. a particular animal species, cannot be anything other than what its soul dictates it should be. Aristotle wrote: "It (the soul) is (a) the source or origin of movement, it is (b) the end, it is (c) the essence of the whole living body" (ibid., p. 190). Thus, his formulation cannot possibly allow for an explanation of change in the nature, either in the sense of short-term individual development nor long-term evolutionary development.

Aristotle claimed that the causal source responsible for the appearance of a given species lies outside the material realm, namely, with the soul of the organism formed in accordance with

the judgment of God. This approach draws attention to a difficulty also apparent in all modern versions of recapitulation theory. It will be shown that although both the classical and modern versions agreed that there is a progression among the species, the means by which this progression is realized was invariably attributed to factors extraneous to the biological relations which exist between an organism and its environment.

For example, Haeckel claimed that "Phylogenesis is the mechanical cause of Ontogenesis" (1876, v. I, p. 7). Once again, it is noted that the cause for the character of a given species has been attributed, not to biological influences, but to the direction of a mechanical substrate assumed to underly the biological realm. Secondly, any further examination of Haeckel's appeal to "mechanical causes" quickly reveals that his reference to ultimate extra-biological causes is just as oblique as Aristotle's assertions concerning the reasoning behind God's judgment. Thus, the proclamation above actually represents the extent of Haeckel's explanation as to what exactly causes recapitulation; no details as to the nature of the mechanical operations underlying biological development were provided at any point in his writings. As Gould (1977) observed, Haeckel referred to a mechanical causal operations

> with an ardor and insistency that demands assent by sheer repetition, rather than by any increment of profundity. The

> "right" words--"mechanical," "physical-chemical laws," "absolutely necessary causal nexus"--abound in his commentary, and they are equated with all the common virtues of reason and rectitude. (p. 79)

In sum, whether it be the unseen hand of a "Prime Mover" or the direction provided by obscure "mechanical" operations, the causal aspect of recapitulation theory has historically depended upon indefinite or otherwise idealistic grounds.

Leibniz.

By the seventeenth-century, enough evidence had been gathered to call into question the Aristotelian notion of a well-designed order in nature, a notion which had since become entrenched in Church doctrine (Mayr, 1982, p. 347). Specifically, criticism arose from the accumulation of fossil discoveries which undeniably indicated that certain species had come into existence only to become extinct at some later point in history. This situation clearly contradicts the idea of an orderly unilinear progression of species, each of which were supposedly created by God. The fossil discoveries, therefore, threatened the credibility of the natural theology espoused by the Church.

In his defence of the Church on this issue, Gottfried

Wilhelm Leibniz (1646-1716) resorted to arguments reminescent of Aristotle's discussion on souls. First, Leibniz argued that "in God there are his power which is the source of everything, his knowledge which contains the particulars of the ideas, and finally his will which is the source of change or production and acts according to the principle of the best possible" (1965, p. 155). This "principle of the best possible" was a reference to the reasoning that since God is able to act freely, He will always "do that which is the most perfect" (Leibniz, 1973, p. 25). Thus, as with Aristotle, Leibniz attributed all properties of nature to God's design.

Having accepted the idea that God created all parts of the universe, and that this creation must be perfect given the nature of the Creator, Leibniz went on to argue that organic matter represents the manifestatation of "a monad, which is that body's entelechy or soul" (ibid., p. 189). Although the body may change in its appearance, Leibniz argued that its soul is of an immaterial and eternal nature: "Thus the soul only changes its body bit by bit and by degrees, so that it is never despoiled of all its organ all together; in animals there is often metamorphosis, but never...(a) transmigration of souls..." (ibid., p. 191). The conclusion follows that the material appearance of a species should be considered as an expendable and fluctuating manifestation of its underlying essence. By

generalizing Aristotle's speculations concerning a one to one correspondence between a species and its soul, Leibniz was in a position to argue that the extinction of even a large number of similar species would still not effect the eternal nature of its metaphysical constitution.

Historians of biology refer to the position argued for above as "essentialist" (e.g., Mayr, 1982, pp. 256-258). This designation denotes the priority given to the "idea" of the species over and above its material nature. Essentialism presented a picture of nature as a closed system long ago completed in the mind of God. The essentialists' assumption that the diversity of the species reduces to a well-planned, unilinear "scale of being" is also a key element in modern recapitulation theory, according to which phylogeny describes the progression of a species as it has advanced through its various lower stages over the course of history. However, it is likely that Haeckel and other modern recapitulationists absorbed this outlook on nature, not from Leibniz, but from the brilliant French biologist Lamarck.

Lamarck.

Jean Baptiste Pierre Antoine de Monet, Chevalier de Lamarck (1744-1829) also maintained that the species could be classified

according to a progression from the least to the most perfect. In supporting this claim, Lamarck was to introduce new materialistic arguments that would be play an important role in nineteenth-century recapitulation theory. The following quote from Lamarck's Philosophie zoologique, originally published in 1809, suggested how the modern recapitulationists could avoid a reliance upon theological arguments to support their position:

> If indeed it is true that all living bodies are productions of Nature, we are driven to the belief that she can only have produced them one after another and not all in a moment. Now if she shaped them one after another, there are grounds for thinking that she began exclusively with the simplest, and only produced at the very end the most complex organizations both of the animal and vegetable kingdoms. (1963, p. 129)

In the tradition of the scala naturae concept, Lamarck assumed that degrees of perfection along the scale were to be measured in terms of perceived proximity to man. He wrote that man "assuredly presents the type of the highest perfection that nature could attain to; hence the more an animal organisation approaches his, the more perfect it is" (ibid., p. 71). The belief that man represents the culmination of nature's work was an idea which clearly fell within the framework of the essentialist outlook on nature, i.e., as a closed system; as a

well-ordered universe reflecting the perfect nature of the Creator. Thus, like Leibniz, he maintained that no species had ever become completely extinguished since this would imply error within the creation of a "Supreme Power" (ibid., p. 184).

Continuing the argument originally proposed by Leibniz--but this time, along a more materialistic direction—Lamarck speculated: "May it not be possible...that the fossils in question belonged to species still existing, but which have changed since that time and have been converted into the similar species that now actually exist?" (ibid., p. 45). This type of conversion within the species is not to be confused with Lamarck's thoughts on the transformation of species; the extinct species and the similar species in contemporary existence were held to be virtually one and the same distinguished only by minor differences in appearance. On the other hand, the transformation of species involved a perfecting tendency in nature, which produced the sequence of organisms finally culminating in the development of man. Hypothetically, this line of progression would have been much more direct, if it were not for the deviations in the character of the individual organism caused by the effects of changes in the endlessly variable environment. It was precisely this problem of deviations from the scala naturae which served as the point of departure for Lamarck's thoughts on evolution: "Now on seeking the reason of this strange

irregularity in the increasing complexity of animal organisation, if we consider the influence that is exerted by the infinitely varied environments of all parts of the world on the general shape, structure and even organisation of these animals, all will then be clearly explained" (ibid., p. 107). In its efforts to adapt to the environment, Lamarck argued that the individual organism was able to initiate the production of new anatomical structures. This principle also served as an assumption which became absolutely essential to modern recapitulation theory.

Specifically, Lamarck had proposed two points which later appeared in all modern formulations of recapitulation theory. The first was the notion of a perfecting tendency in nature, and the second concerns the appearance of new features during the adult stage of ontogeny. Lamarck wrote, "that new needs which establish a necessity for some part really bring about the existence of that part, as a result of efforts; and that subsequently its continued use gradually strengthens, develops and finally greatly enlarges it" (1963, p. 108). It should be emphasized that an adaptive response was expected to occur only in an environment that had become

> permanent for some race of animals,...their internal organisation is ultimately modified, and these acquired modifications are preserved by reproduction among the individuals in question, and finally give rise to a race

> quite distinct from that in which the individuals have been continuously in an environment favourable to their development. (ibid., p. 108)

For Lamarck, these points represented the principles by which one could explain how biological development made its way up the ladder of perfection.

In criticism, while Lamarck had innovatively proposed that a transformation of species is possible, the teleological character inherent in his evolutionary scheme sets his position somewhere between natural theology and the new science of biology. Indeed, the fact that Lamarck himself had invented the term "biology" in 1802 (Goudge, 1967, v. 3, p. 370), stands as a testimony to his intermediary position between the old and new perspectives. Thus, on the one hand, Lamarck suggested the very modern notion that enviromental factors play a role in determining the character of the species; but on the other hand, he claimed that adaptation on the part of the species was responsible for deviations from the proper a priori design intended for all biological development.

Lamarck had taken the bold step of not accepting the a priori assumptions of essentialism in toto, but he had still failed to make much progress beyond the traditional view of the biological realm as largely the product of an a priori design. It will be shown that this same idealistic perspective appears

repeatedly in the modern versions of recapitulation theory.

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Recapitulation Theory from Hunter to Haeckel

The Modern Formulations.

There is some controversy about the essentially trivial question concerning who might have been the first to present a strictly biological argument for recapitulation theory. Previous discussion has already shown that it would be extremely difficult to attribute the origin of modern recapitulation theory to any one individual. Not only has the idea undergone subtle variations since the time of Aristotle, but the idea itself should probably best be thought of as a mosaic of smaller inter-related ideas, such as the scala naturae concept, and now, Lamarck's notion concerning the inheritance of acquired characteristics, and so on. In this respect, it is likely that the best approach to this subject would be to indicate the work of the many individuals who have made contributions toward the overall idea during the course of their speculations on the development of the species.

Nevertheless, many sources on the history of recapitulation theory have confidently cited a statement made by the English biologist, John Hunter (1728-1793) as the first enunciation of the theory in modern, empirical terms. For example, Meyer (1935)

claimed that Hunter had first penned his thoughts on the recapitulation idea in 1755 (p. 381). But, Richard Owen, the comparative anatomist who published Hunter's posthumous papers, claimed that the idea came to Hunter somewhere between the years 1755 to 1793, the year of his death. The wide range of this estimation was likely due to the infamous disorder of Hunter's work; Hunter often declared that it was his greatest fear that he should die before having the chance to organize his work (Singer, 1931, p. 210). Owen's estimate, however, creates an historiographical problem, for it was during these same years that the German Naturphilosophie movement had begun to promote recapitulation theory, culminating in the specific formulation proposed by one of its members, Carl Kielmeyer, in the same year as Hunter's death, 1793.

A likely solution to this problem has been offered by Gould (1977), who suggested that although Hunter did consider recapitulation, his thoughts on the matter actually amounted to nothing more than the following isolated sentence:

> If we were capable of following the progress of increase of the number of the parts of the most perfect animal, as they first formed in succession, from the very first to its state of full perfection, we should probably be able to compare it with some one of the incomplete animals themselves, of every order of animals in the Creation, being

> at no stage different from some of the inferior orders; or, in other words, if we were to take a series of animals, from the more imperfect to the perfect, we would probably find an imperfect animal, corresponding with some stage of the most perfect. (cited in Gould, 1977, p. 17)

In addition to the fact that Hunter did not further investigate this idea, the speculative nature of this claim also indicates that credit for the first modern definition of recapitulation theory should probably lie elsewhere. This much is confirmed by the sentence which followed the quote above: "But all our observations can only begin at a visible stage of formation, prior to which we are left to conjecture" (ibid., p. 17). The Naturphilosophie movement would not have agreed that recapitulation is only a matter of conjecture.

Naturphilosophie.

Under the influence of idealist philosophies such as those espoused by Kant, Schelling, and Fichte, Naturphilosophie might well be approached as an early nineteenth-century idealistic reaction to the cold, lifeless eighteenth-century world-view established in part by Hume's strict empiricism and Newton's mechanical "clock-work" view of the universe. The explicit object of Naturphilosophie was to define the spiritual "essence"

of the biological realm. This largely philosophical movement attempted to find empirical proof of an a priori design in nature. Following Aristotle, its members also believed that nature had developed from the most simple biological forms toward increasing complexity, finally culminating in the development of man. This theme of a tendency or "power" in nature to organize itself in a purposeful manner played a large role in Naturphilosophie. Carl Kielmeyer, a comparative anatomist and philosopher, claimed that the "distribution of powers" which organize the overall development of nature also work in the same manner upon the development of the individual:

> Since the distribution of powers in the series of organisms follows the same order as their distribution in the developmental conditions of the same individuals, it can be inferred that the power through with which the production of the latter occurs, namely the reproductive power, agrees in its laws with the power through which the series of different organisms of the earth were called into being. (1793; cited in Holmes, 1944, p. 321)

It may be assumed that Kielmeyer's reference to "powers" corresponds to Aristotle's term, "souls." Indeed, Kielmeyer believed that if Aristotle's analysis of the species, as representing a series of progressive stages among the species, could be empirically verified, then this would lend concrete

support to the Naturphilosophen aim of defining the direction and purpose of evolution. Taking this argument one step further, it was assumed that if there is only one direction or purpose in nature, then the development of the individual must run in parallel to the general development of the species. Recapitulation theory is a logical consequence of the premise that there is a universal direction in evolution; for if there is only one path of biological development, then ontogeny must necessarily resemble phylogeny. After Kielmeyer had introduced the recapitulation idea to modern biology, he set about the task of establishing empirical support for his hypothesis. However, apart from proposing a few impractically broad generalizations, he did not succeed in this project, and did not publish any more work after these events (Meyer, 1935, pp. 385-6).

Despite the extremely speculative nature of this and similar theories proposed by various Naturphilosophs, their thinking had helped to initiate a great deal of interest in the idea of a progression in the species. In commenting on their contribution to the history of evolutionary thought, Mayr (1982) wrote: "Not only did they ask questions about time and history, but also why questions were asked increasingly often, that is, 'ultimate causations' were searched for" (p. 130). The record of clearly fantastic accounts of "ultimate cause" provided by some Naturphilosoph's, such as W. S. MacLeay's Pythagorean taxonomic

system based on the number five (ibid., pp. 202-3)., finally brought the movement into general disrepute by around the 1840's and 1850's. But in the meantime, Naturphilosphie had revealed the shortcomings of the mechanists' proximate explanations for the development of the species. Their new approach to nature undoubtedly set the stage for Darwin's speculations on the nature of the "ultimate" causal factors producing evolution.

Meckel and Serres.

Kielmeyer's thoughts on the arrangement of the species appeared again in claims made by the comparative anatomist, J. F. Meckel (1761-1833). In 1821, Meckel proposed that "the development of the individual organism obeys the same laws as the development of the whole animal series, that is to say, the higher animal, in its gradual evolution, essentially passes through the same permanent organic stages which lie below it" (cited in Meyer, 1935, p.383). The references to a hierarchy of lower and higher animals indicates, again, the assumption that there exists a unilinear direction in nature.

The reliance upon the familiar scala naturae theme was even more explicit in the work of Meckel's colleague, E. R. A. Serres (1787-1868). Serres argued that "the whole animal kingdom" should be considered,

> ideally, as a single animal which...here and there arrests its own development and thus determines at each point of interruption, by the very state it has reached, the distinctive characters of the phyla, the classes, families, genera and species. (1824; cited in Mayr, 1982, pp. 471-72).

The position espoused by Meckel and Serres represents the standard modern definition of recapitulation theory. As their position also represents the point of departure for Haeckel's version of recapitulation theory, its major propositions deserve further emphasis. First, their position suggested that in nature there exists only one path of development; a unilinear "track" ranging from the simplest to the most complex forms. The second point, which actually follows as a logical consequence of the first, is that the ontogeny of the more complex forms must entail a passage through the state of various lower forms. And, finally, their position assumes that nature represents a closed system consisting of a limited set of possibilities. This view implies, as Serres claimed, that all of nature is like a "single animal." Thus, where man supposedly represents the culmination of all species, animals lower on the "scale of being" were to be thought of as developmental arrests. The question remains, though: What would cause ontogeny to halt in its progression along the scale of being?

The explanations provided to account for the cessation of

development in ontogeny varied from one account to the next. From the quote given above summarizing Kielmeyer's position, it was suggested that such arrests were due to variations in the "distribution of powers." Serres offerred a similar explanation in the following claim:

> Since the formative force, whatever it is, has less energetic impulse (in lower animals) than in higher animals, the organs run through only a part of the transformations that they undergo in superior creatures. From this it follows that they offer to us, in a permanent manner, the organic configurations that are only transitory in the embryo of man and the higher vertebrates. (1830; cited in Gould, 1977, p. 49)

Meckel did not favour any such speculations. Instead, he simply pointed to the large number of parallels which he had observed between the embryonic structures of various species and the same structures in the adult stage of so-called lower forms and argued that these correlations would "suffice to prove that the analogy between the human embryo and the lower animls is unmistakable..." (1811; ibid., p. 47).

This point concerning an inadequecy in the causal explanations offerred by the recapitulationists indicates a serious difficulty which was never adquately resolved, i.e., the problem of what caused recapitulation to occur--if, indeed, it

did occur. Thus, the various attempts to explain why recapitulation appeared eventually resorted to assertions of an a priori and teleogical character or to no explanation at all, but simply a barrage of examples assumed to conclusively demonstrate recapitulation.

Agassiz.

The suspicion that recapitulation theory requires a certain "leap of faith" was confirmed in the account provided by the biologist Louis Agassiz (1807-1873). Agassiz extended recapitulation theory to include relations assumed to exist between extinct species and the early stages of ontogeny in contemporary "higher" species. The hypothesis that the contribution of the extinct species may be observed in the ontogenetic development of contemporary species, including the human species, represents a proposition which may be appreciated as the nineteenth-century solution to the seventeenth-century controversy raised by the evidence of extinct species. According to the account offerred by Agassiz, there was no need to negate the material significance of the fossils, nor was there any need to deny the traditional view of nature as a purposeful, well-ordered creation. He argued that the extinct species had served to forge the way to the development of the more "perfect" species

which appeared later. The assimilation of familiar idealistic assumptions was indicated where he further claimed that this general development toward increasingly complex biological forms conclusively demonstrates the presence of an omnipotent "force" moving nature. Thus, Agassiz wrote:

> The leading thought which runs through the succession of all organized beings in past ages is manifested again the new combinations, in the phases of the development of the living representatives of these different types; it exhibits everywhere the working of the same creative Mind, through all times, and upon the whole surface of the globe. (1857; ibid., p. 68)

Haeckel.

After Agassiz, recapitulation theory was then energetically promoted by the German comparative anatomist and philosopher Ernst Haeckel. Beginning in 1866, with the publication of his Generelle Morphologie der Organismen, Haeckel sought to establish the recapitulation idea as a conclusion which follows from Darwin's theory of evolution, first published in 1859. Previous discussion has already demonstrated that recapitulation theory carries a number of non-evolutionary implications, such as the view that so-called lower species represent "permanent organic

stages," as Meckel stated, and the popular notion of an extra-biological "force" as solely responsible for the character of a given species by providing it with a particular a priori "soul," or "power."

Despite his outspoken support for Darwin's theory of evolution, Haeckel's account did not vary from these traditional assumptions; therefore, his analysis of evolution should be recognized more for its support of a Lamarckian, rather than a Darwinian, understanding of evolution. According to Haeckel's own writings, evolution followed a course of development that was first explained by Lamarck and, later, only empirically substantiated by Darwin. He claimed that Charles Darwin literally inherited a Lamarckian view of nature from his grandfather, Erasmus Darwin,

> who expressed views like those of Goethe (a leading Naturphilosoph) and Lamarck, though he knew nothing of the similar efforts of these contemporaries. Erasmus Darwin transmitted to his grandson Charles, according to the law of latent transmission (Atavism), certain molecular movements of the cells in ganglia of his powerful brain, which had not made their appearance in his son Robert.
>
> (Haeckel, 1876, v. 1, pp. 96-7).

Thus, from Haeckel's point of view, any criticism of his position implied a reactionary, and likely theological,

opposition to the "Theory of Descent, as first definitely stated by Lamarck, and afterwards firmly established by Darwin" (ibid., v. 1, p. 101). As Gould (1977) noted:

> Since Haeckel is so often cited as Darwin's apostle in Germany, it is generally assumed that he preached a Darwinian interpretation of evolution. In fact, he was only evolution's apostle. Though Haeckel acclaimed Darwin, he ranked Goethe and Lamarck as his equals in the origination of evolutionary theory (vol. 2 of Generelle Morphologie is dedicated to them jointly). Haeckel's own view of evolution is a curious and inseparable mixture of all three, each in about the same proportion. (p. 80)

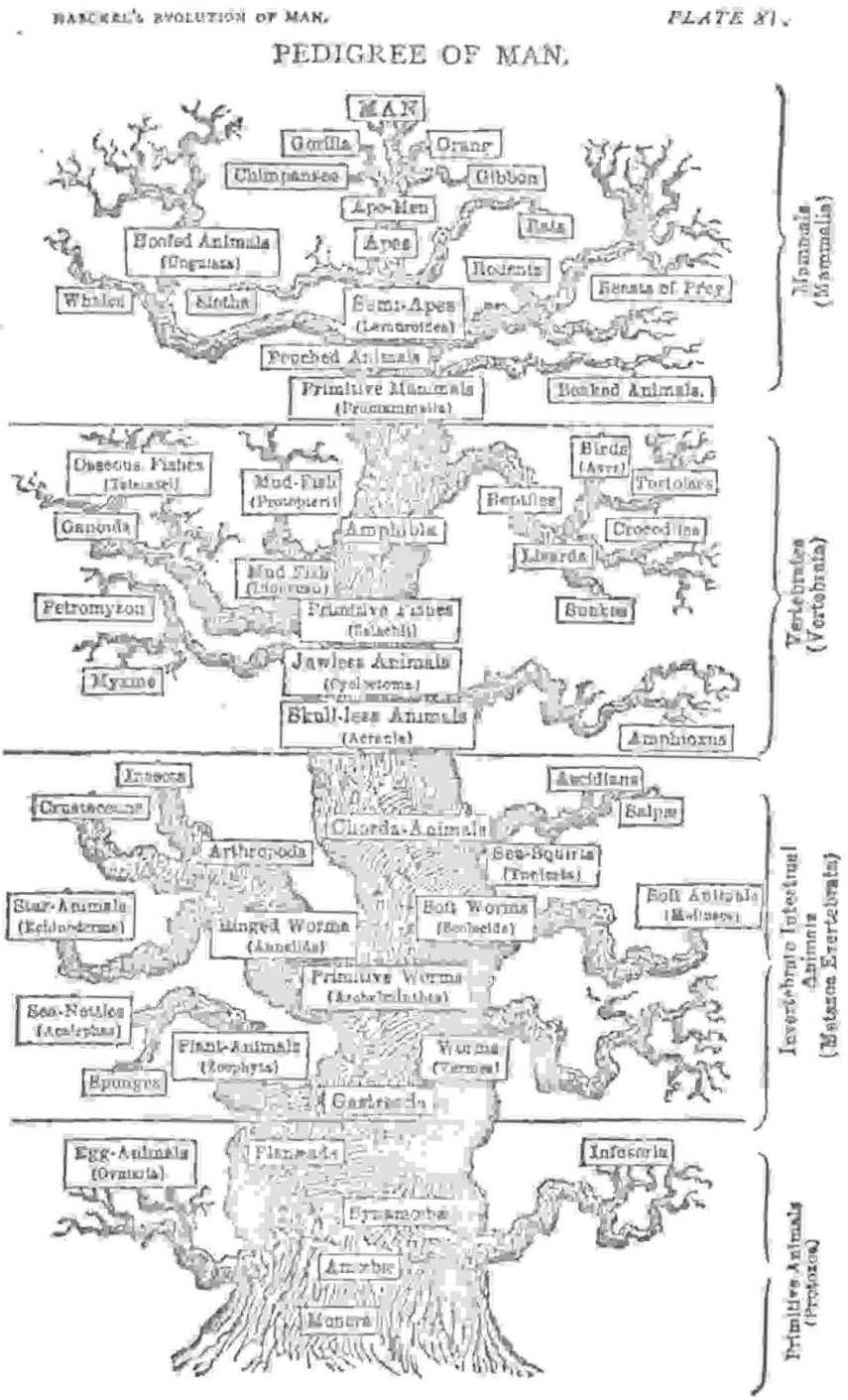
Haeckel looked to Lamarck for two important aspects of his version of recapitulation theory. First, the traditional belief that biological development could be described as a climb up the ladder of perfection. Secondly, Lamarck's principle of adaptation, which describes how a particular feature may be added to the adult stage of ontogeny (and subsequently passed on to offspring). While the Darwinists did not entirely disagree with Lamarck's thoughts on the development of the species, they placed a greater emphasis upon other explanations, such as natural selection. But for Haeckel's system, Lamarck's evolutionary theory was essential.

In Haeckel's account, all changes in the anatomical

structure of the individual organism can arise from only two processes: (1) the recapitulation of ancestral forms and (2) adaptation to environmental pressures. Now, according to the mechanics of Lamarck's theory, a new adaptive character can be formed only where "a great and permanent alteration in the environment...induces new habits in these animals" (Lamarck, 1963, pp. 107-8). Since the developing organism is virtually in a state of continuous flux, the condition of "permanence" necessary for the production of new adaptive characteristics does not exist; no new developments can therefore be expected until the organism has reached its adult form. This fits in well with Haeckel's account which described ontogeny as, first, passing through a series of ancestral forms, and secondly, propelling the course of evolution by developing a new adaptive feature sometime during the course of adulthood. Accordingly, the moment of progress in evolution is where an adaptive character appears during the adult stage of the most advanced species.

However, after establishing the nature of one of the primary tenets of Haeckel's "biogenetic law" (his own designation for recapitulation theory), the question arises as to whether or not this principle truly implies evolution. Owing to the Haeckel's mixture of traditional recapitulation themes with Lamarckian evolution, this question is difficult to answer in any direct manner. On the one hand, the Lamarckian aspect of his position

does allow for the transformation and eventual "branching off" of a new species. But, on the other hand, what does this mean for those lower species which continue to exist; are they now for some reason incapable of further development? If so, is it to be assumed that the process of evolution had come to a halt at the point where this process had finally produced the human species? This much appears to be the conclusion offered by Haeckel's work. On the following page is a reproduction of one of Haeckel's infamous "geneological trees" depicting the history of evolution according to recapitulation theory.



(from Haeckel, 1876, v. 2, p. 147.)

The Additive Nature of Recapitulation Theory.

Although Darwin's evolutionary theory argued that man has evolved from less complex species, this does not imply a complete agreement with the additive model espoused by Haeckel. The sheer simplicity of this model was satirized in Garstang's comment that "a house is not a cottage with an extra storey on top" (1922, p. 84). In other words, Haeckel's position on evolution presented merely another version of Aristotle's scala naturae concept depicting all the species as if lined up along a ladder of perfection.

Modern recapitulation theory would not be completely undermined by exposing its ties to the idealism of the scala naturae concept. This association has been attenuated in order to make explicit its abstract character. The positioning of a direct line of ascent from amoeba to man implies far more than than just a vestige of archaic anthropocentrism; it also reflects the idealistic assumption that there must exist a single path of development in nature. Thus, the embryologist Karl Ernst von Baer surmised that recapitulation theory is "necessarily bound (to) the view of a unilinear scale of animals" (1828; cited in Gould, 1977, p. 56). However, this criticism would not have disturbed Haeckel; his mentors, Lamarck and Goethe, had both explicitly maintained that a pattern which described a ladder of perfection actually does exist in nature.

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Modern Criticism of Recapitulation Theory

Cuvier.

Nineteenth-century biologists critical of the recapitulation idea also emphasized the association between it and the idealistic scala naturae concept. This line of counter-argument was first provided by Baron Georges Cuvier (1769-1832) who, as early as 1812, demonstrated that the entire range of species could not possibly be considered as belonging to the same ancestral lineage. Specifically, Cuvier argued that the species could not be reduced beyond four distinct phyla. Thus, in contrast to the all-encompassing "geneological tree" depicted in Haeckel's illustration (see p. 37), Cuvier correctly argued that there is simply no evidence to support the view that the phyla of vertebrates, for example, is not descended from the invertebrates. The four phyla described by Cuvier are described as follows:

1. Vertebrata; animals with a spine.
2. Mollusca; soft-bodied and usually hard-sheiled.
3. Articulata; "jointed" animals, e.g., insects.
4. Radiata; animals with ill-defined nervous and muscular systems, e.g., the amoeba. (Singer, 1931, pp. 227-231)

Cuvier also strongly argued against the view that the diversity observed among the species could be completely accounted for in terms of single anatomical structures. This was a reference to another claim maintained by the recapitulationists, including Haeckel. Cuvier countered that any particular anatomical feature could only be understood in relation to the organism's overall structure; anatomical features appear in coordinated clusters for the single purpose of providing the organism with a means for carrying out its primary adaptive function. It was this functional view of species development which led Cuvier to formulate his "principle of correlation," which stated that the anatomical features of a given organism will always act as parts of an integrated whole (ibid., pp. 223-227). Cuvier confirmed the validity of this principle during his own paleontological studies of fossil species uncovered in the Paris Basin. At that time, he boasted, "At the sight of a single bone, of a single piece of bone, I could recognize and reconstruct the portion of the whole form from which it would have been taken" (1814; cited in Mayr, 1982, p. 460).

Von Baer.

Independently of Cuvier, the comparative anatomist and

embryologist K. E. von Baer (1792-1876) arrived at the same conclusion that there are four different grand families of species in nature. This conclusion was derived from the very same source which the recapitulationists assumed to prove their position, i.e., the early development of higher species. Von Baer's observations of the embryological development of advanced species indicated that there is simply no possibility that the vertebrates are the descendents of the invertebrates. Moreover, he found that as a general rule the very first stages of ontogeny actually serve as the point of departure for all subsequent development, e.g., that a vertebrate embryo will resemble nothing else than the immature appearance of its adult form. This serious criticism of recapitulation theory was essentially side-stepped in Haeckel's writings some seventy years where he wrote that

> the chain of our earlier invertebrate ancestors is much more difficult to investigate and much less safe than this tree of our vertebrate predecessors; we have no fossilized relics of their soft, boneless structures, so paleontology can give us no assistance in this case. The evidence of comparative anatomy and ontogeny, therefore, becomes all the more important. Since the human embryo passes through the same chordual stage as the germs of all other vertebrates, since it evolves, similarly, out of two germinal layers of a

> gastrula, we infer, in virtue of the biogenetic law, the early existence of corresponding ancestral forms, vermalia, gastrada, etc. (1902, p. 84)

The sophistic elements of this argument deserve further attention. In the quote above, Haeckel first negated the improbability of an invertebrate ancestry by suggesting that while no empirical evidence supports this view, nor can any empirical evidence be found which can disprove it owing to the soft structure of the invertebrate anatomy. After establishing this point, he then argued that proof of the recapitulation of invertebrate forms can, therefore, only be found by investigating the ontogeny of vertebrates where the appearance of other vertebrate forms will be found. This point is, of course, irrelevant to the dispute at hand, but it served to introduce the suggestion that what will also be found is the recapitulation of the other ancestral forms such as the "vermilia" and the "gastrada." However, both of these species--if they did, in fact, exist at one time--would have belonged to the class designated as the Radiata, according to Cuvier's classification scheme. Thus, the only reference to the invertebrates in vertebrate ontogeny presumably lies somewhere within the "etc." of Haeckel's last remark.

According to von Baer, there is simply no empirical evidence to support Haeckel's claim. Von Baer argued that "the vertebrate

embryo is, at the beginning, already a vertebrate; at no time is it identical with an invertebrate animal" (1828; cited in Gould, 1977, p. 56). A weaker version of recapitulation theory might suggest that a developing organism will recapitulate only those ancestral species which belong to its phylum, e.g., that a vertebrate embryo will pass through stages which resemble only its vertebrate ancestors. Perhaps in anticipation of any move to adopt this weaker version of the original claim, von Baer presented counter-arguments which seriously challenged the possibility of intra-phyletic recapitulation.

Following Cuvier's conclusions regarding the priority of an organism's functional aspect, von Baer argued that the ontogeny of an organism belonging to one species is likely to be so qualitatively distinct from another that any comparison which intends to rank order their differences must be considered suspect (1828; cited in Gould, 1977, p. 56). For example: How could it be reasonably argued that the development of the wings of a maturing bird should be ranked lower than the development of the limbs of, say, a member of the cat family? The two series of development involved, resulting in either the formation of wings or quadrapedic limbs, are both extremely complex; it is difficult to conceive how one could claim that the development of wings is somehow less advanced than that of the limbs. More importantly, both sets of features are well-suited to the primary functional

character of each species. Therefore, to rank their respective ontogenies as higher or lower is tantamount to a preference for one function over another; in this case, the cat's functional abilities of running, jumping, and so on, would be assessed as somehow more "perfect" or more advanced than the bird's flying. Though the functions carried out by these species are different, this does not automatically imply that some functions are in any way more advanced than others. Historically, judgments of this kind typically resorted to an unjustifiable anthropocentric view of nature, where those functional abilities perceived as most similar to the behavior typically characteristic of the human species was classified as being the most advanced along the evolutionary scale.

Neoteny.

Based on his own embryological research, von Baer concluded that ontogeny describes a general pattern which is quite opposite to that suggested by recapitulation theory. Instead of passing through the adult stages of ancestral species, he observed that the developing organism tends to retain the juvenile features of its ancestors (Mayr, 1982, p. 473). In other words, the embryologist should expect to find the developing organism progressing from its initial stage as an almost undifferentiated

form toward increasing levels of specialization. Recognition of this now generally accepted law did not arrive until Charles Darwin (1899) praised von Baer's insight in the following terms, "von Baer has defined advancement or progress in the organic scale better than any one else, as resting on the amount of differentiation and specialization of the several parts of a being, when arrived at maturity, as I should be inclined to add" (p. 167).

As von Baer's position represents a critical point in the history of recapitulation theory, a further examination of his analysis of recapitulation theory would be appropriate. The four statements below from his writings serve as a succinct summary of his criticisms against the recapitulation idea:

1. That the more general characters of the large group of animals to which the embryo belongs appear earlier in the development than the more special characters.
2. From the most general forms, the less general are developed and so on, until finally the most special appear.
3. Every embryo of a given animal form, instead of passing through the state of the other definite forms, rather becomes separated from them all.
4. Fundamentally, therefore, the embryo of a higher form never resembles the adult of any other animal form but

only its embryo. (1828; cited in Mayr, 1982, p. 473)

Von Baer's principles allow for a more accurate explanation of those anatomical appearances said to demonstrate recapitulation, such as the phenomena of "gill arches" in the neck region of the ten week-old human embryo. Accordingly, the appearance of such gill arches cannot realistically be identified with the same gill arches found in the adult stage of certain fish species. They are more than likely similar to the state of gill arches appearing in the immature or "juvenile" state of a fish's development. This does not describe a recapitulation of the adult structures of ancestral species, but just the opposite, i.e., a retention of the juvenile features of ancestral species. In the case of the human embryo, its "gill arches" could now be accounted for as a retention of a juvenile characteristic of its ancestors, and that from this common foundation the fish and the human embryo are expected to diverge in their respective ontogenies. This is supported by observations which, true to von Baer's position, verify that at no point does the human embryo truly resemble the adult appearance of the fish or any other vertebrate. In contrast to what would normally be found in the adult fish, the gill arches which appear in the human embryo lack a great deal of the specialization that would be required before making the claim that they truly resemble the gill arches of the adult fish.

In further support of von Baer's position, the "gill arches" in the human embryo are completely non-functional until its development begins to "separate" from this moment of vague resemblance. Subsequent to this stage, the "gill arches" undergo an inward folding process which continues until they gradually assume the shape and function of the highly specialized human Eustachion tube (Holmes, 1944, p. 381).

Support for von Baer's position has continued up to the present. In recent discussion, lists of neotenous features are often provided at some point in the presentation of arguments supporting neoteny. The following is a typical example of such lists which indicate the number of juvenile features that characterize the human species:

1. Retention of cranial flexure.
2. Long neck.
3. Forward position of foramen magnum.
4. Absence of brow ridges.
5. Absence of cranial sutures.
6. Thinnness of skull bones.
7. Orbits under cranial cavity.
8. Flatness of face (orthognathy).
9. Retarded closure of cranial sutures.
10. Large volume of brain.
11. Small face and large braincase.

12. Roundheadedness (brachycephaly).
13. Small teeth.
14. Late eruption of teeth.
15. Globular form of skull.
16. Hairlessness of body.
17. Lack of pigment in some groups.
18. Thin nails.
19. Non-rotation of big toe.
20. Low birth weight.
21. Prolonged dependency period.
22. Prolonged growth period.

(Montagu, 1962, pp. 326-327)

Further Empirical Difficulties.

Verification of recapitulation theory was eagerly sought by a large number of embryologists during the fifty year period which followed Haeckel's popularization of the concept. With a sense of bemused perplexity, the English biologist Julian Huxley commented that during this time, many biologists appeared to be more interested in observing the results of evolution rather than attempting to clarify the larger issue of how such results came about in the first place. Huxley wrote that "within a dozen years from the publication of The Origin, biology had become an

evolutionary science, though by a strange irony most biologists concentrated mainly on comparative anatomy and embryology, with the cultivations of forests of evolutionary trees" (1965, p. 81). If a new interest in comparative anatomy and embryology had suddenly appeared shortly after 1859, it was more than likely due to the popularity of Haeckel's "biogenetic law." An ambitious prospect lay before those biologists who operated according to the principles of recapitulation theory; for if it proved to be true, then it would be possible to trace the entire evolutionary history of any species by simply conducting a close examination of the forms which appear over the course of various ontogenies.

However, contrary to Haeckel's claim, recapitulation theory did not solve the "riddle" of man's origin. The first major difficulty encountered by the embryologists involved distinguishing between the various hypothesized phylogenetic stages. This difficulty was aggravated not only by the minute scale of the embryo, but also by the lack of an opportunity to conduct an adequate comparative analysis, owing to the large gaps in the fossil record at that time. Haeckel frequently attempted to resolve these difficulties by simply filling in the gaps with species which he had literally invented. The construction of these species was said to be based on observations of the ontogenies of various species. Indeed, Haeckel defended the dubious existence of the first five species, including the primal

"Gastraea," thought to be the common ancestral stock of all animal life on the grounds that their vestigial presence is evident in the ontogeny of all contemporary species (see fig. 1). The embryologists found that this practice of constructing species became a matter of interpretation rather than verification (Oppenheimer, 1973, p. 57).

By far the most prevalent and disturbing problem was the complete absence of some phylogenetic stages in ontogeny which one would normally expect to appear given the recapitulation claim. Haeckel responded to this difficulty by arguing that to accomodate all phylogenetic stages within the comparatively short span of ontogeny would be impossible. Embryologists should expect to find that "several evolutionary forms have, therefore, usually dropped out of originally unbroken chain of forms" (Haeckel, 1876, v. 1, p. 7).

In addition to these difficulties, Haeckel was forced to account for stages in ontogeny during the appearance of the organism which in no way resembled the appearance of any other species in the past or present, imaginable or otherwise. It will be recalled that Haeckel's explanation of evolutionary progress entailed the addition of new features to the final stage of ontogeny, the adult stage. The production of new features was assumed to be mediated by a Lamarckian process involving the development of new adaptive features in response to the

organism's needs. In his later writings, Haeckel explained that "ontogenetic disturbances" in ontogeny, i.e., where the appearance of features are clearly unrelated to any possible phylogenetic influence, must be the result of the embryo's own individual efforts to adapt in response to its environment, a process called "cenogenesis" (Haeckel, 1876, v. 1, pp. 10-15).

However, the introduction of cenogenesis not only placed a greater strain on the explanatory power of recapitulation theory, but also called into question its theoretical integrity. The problem may be approached analytically: If it is accepted that adaptation on the part of the developing organism may occur during the early stages of ontogeny, then it is also to be accepted that ontogeny could follow two patterns of development, recapitulation or adaptation. But these two patterns of development are mutually exclusive if they occur during the pre-adult stage of ontogeny; since one could not reasonably expect the embryo to develop a new adaptation to its environment, and then, somehow shed this new feature as the next stage of phylogenetic influence is introduced. In addition, the entire likelihood of cenogenesis opposes Lamarck's principles of adaptation as a response to "permanent" environmental constraints forced upon the organism. Not only is the embryo in a state of remarkably rapid transience, but the womb can hardly be considered an environment which would normally force adaptive

responses on the part of the embryo. Haeckel's suggestion that adaptation may occur during the embryonic stages of ontogeny effectively served to remove the last shred of credibility from recapitulation theory.

Twentieth-Century Criticism.

With the advent of genetic studies during the first quarter of this century, the theoretical positions held by both von Baer and Darwin gained a great deal of empirical support. For example, it is now generally accepted that the development of the human embryo will remain characteristically human throughout, as von Baer argued; since its course of development is directed by the inheritance of nothing other than human genes. Darwin's seminal ideas on the relations between intra-species variation and natural selection were further supported by the discovery that such variation could occur through genetic mutation. The phenomena of genetic mutation also carried critical implications for recapitulation theory in that its not infrequent appearance would preclude all subsequent stages of phylogenetic influence.

Most importantly, genetic studies had provided the key to a greater understanding of the mechanism which mediates hereditary influences. At last, the diversity of the species could be explained in substantial terms, instead of having to rely upon

abstract assertions such as Haeckel's empty slogan, "Phylogenesis is the mechanical cause of ontogenesis" (1876, v. 1, p. 7).

Conclusion.

Recapitulation theory depended upon the assumption that biological development was essentially additive in nature. In this way, both ontogeny and phylogeny could be seen as constructed according to a well-ordered design. While twentieth-century views on evolution do not advocate that all is chaos in the natural realm, the over-riding ideology of a supreme purpose behind evolution is no longer held by most biologists. This is due largely to a recognition of the contribution made by chance in evolution.

Darwin's theory, in combination with what is now known about genetics, has brought about the generally accepted explanation of the development of a new species as due to the effects of gene mutation upon ontogeny. Although in most cases genetic mutation is fatal, in other cases, it may produce a phenotypic distinction that would allow the mutated organism a greater likelihood of surviving the many environmental pressures facing its species. Given that the greater likelihood that such an organism might be able to better reach the age of reproduction than other members of its generation, and given due consideration to the dimensions

of the species' genetic character, it is possible to account for the transformation of species solely in terms of various material factors.

It is ironic to note that this account of evolution suggests that ontogeny plays a more significant role than phylogeny in determining the character of the species. As one twentieth-century critic of recapitulation theory put it: "The phyletic succession of adults is the product of successive ontogenies. Ontogeny does not recapitulate phylogeny; it creates it" (Garstang, 1922, p. 99).

-5-

"Down's Syndrome" and Recapitulation Theory.

The ubiquity of recapitulation theory had become established in both biological and psychological literature long before Haeckel made the notion one of the most well-known theories in the history of biology. For example, several years before Haeckel's books were to be published in English, a paper by Dr. J. L. H. Down entitled, "Observations on an ethnic classification of idiots" (1866), proposed an extension of the biological principles of recapitulation theory to encompass mental development, as well. Down's use of recapitulation theory for this purpose was quickly adopted by mental care institutions throughout England. The persisting use of the diagnostic term, "mongolism," introduced by Down in his paper, attests to pervasive influence of his approach, even to this day. It also suggests the willingness on the part of Down's contemporaries to accept the recapitulationist assumptions upon which his classification scheme was constructed.

Down's attempt to classify various degrees of congenital mental retardation was made in response to questions regarding the diagnosis of one state of congenital idiocy which may perhaps be less severe than another. Recapitulation theory provided a unique solution to this problem. First, since one of the tenets

of recapitulation asserts the existence of a graded series of organisms ranging from the least to the most complex, Down believed that he had found a correspondence between this principle and various grades of mental development. In keeping with the racist standards of his day, Down also believed that there was a correlation between race and mental ability. In combination, these points led him to propose that the degree of mental retardation observed in cases of congenital idiocy is related to the point at which ontogeny had become arrested during its progression through various lower ancestral forms.

Accepting the false proposition that the human races developed in an evolutionary order, Down argued this suggests the "possibility of making a classification of the feeble-minded, by arranging them around various ethnic standards" (1866, p. 260). Down's classification of idiocy essentially revolved about the following general rule: the earlier the arrest in ontogeny, the lower the place in human evolution and the greater degree of mental retardation expected. Thus Down wrote that "among the large number of idiots and imbeciles...a considerable porportion can be fairly referred to one of the great divisions of the human family other than the class from which they have sprung" (ibid., p. 260).

Before entering upon a more detailed discussion of Down's hypothesis, it would be appropriate to give some attention to the

social milieu within which his proposals were first presented and later widely supported. The following discussion concerning the historical background to Down's paper is not intended to exonerate the racist implications of his classification scheme, but rather to facilitate a better understanding of his theory. Indeed, taken out of its historical context, Down's use of recapitulation theory in this capacity would appear extremely crude, if not simply absurd.

Outline of Nineteenth-Century Racism.

During the time that Down's paper appeared, Victorian England was undergoing a revival of certain racist standards which had commonly prevailed throughout the long history of the British slave trade, a period extending from 1553 to 1807 (Awolowo, 1968, p. 6; p. 161). It is likely that the economic and social effects of the immense slave trade industry influenced the racist attitude of most Europeans during Down's time.

Ume (1980) presented an account which details how the slave trade was instrumental in boosting the capital necessary to set the wheels of the English Industrial Revolution in motion (pp. 95-100). He supported this hypothesis by indicating the extent of the profits made from slave labour:

In 1701, the British export of cotton goods and yarn stood

> at a little more than 23,000 pounds, and in 1800 the total annual return was nearly 5.5 million pounds. The high production from the cotton industries was dependent upon the supply of raw cotton that came from the West Indies and Americas, where labour supply depended entirely on slaves from Africa. (ibid., p. 95)

Another notable example of the impact of the slave trade in England was the shipping boom of the eighteenth-century. Of all British slave ships sailing in 1755, 237 were from Bristol, 147 from from London, and 89 from Liverpool (ibid., p. 97). Records of Liverpool's economic profile during the years 1795-1804 show that the slave trade had penetrated almost every aspect of its industry; everything from the building of ships specifically designed for carrying slaves to the manufacture of chains and ropes for yoking the slaves in their cargo holds. All this was in response to a burgeoning slave industry; economic figures from the previous decade, show an estimated gain of 2,360,000 million pounds of profits made from a total sales of 303,000 African slaves within that ten year period (ibid., p. 96).

By the beginning of the nineteenth-century, over 4 million slaves had been exported to the Caribbean region alone (ibid., p. 100). Many more were sold to interests in the United States and South America, particularly Brazil. Figures for the annual quota of slaves imported to Brazil during the year of 1849 were

estimated to be near 54,000, and thousands more were imported into the United States during the 1850's and '60's (Curtin, 1964, p. 317). In sum, the slave trade was a phenomenon which changed the economic and demographic face of the earth on a scale which finds no parallel in history.

Social Repercussions.

The racist attitudes which formed as a consequence of this economic activity became apparent in the opinions of that time. There was a marked racial bias even within the current scientific literature. Indeed, a number of racist policy-makers turned to the biologists of the day to support their claims concerning "innate" intellectual differences among the races.

About the time that Down published his ethnic classification scheme, England was reviewing the state of its plantation workers in the Caribbean and West Africa. The British had abolished slavery in 1807, and since that time most of the ex-slaves had been working under new wage labour regulations. However, even with the "emancipation" of the slaves, there was still a problem of motivation on the part of the plantation workers. Productivity was, in fact, so low that many of the plantations in the Caribbean and West Africa were nearing bankruptcy.

In 1846, the Secretary of State, Sir Henry George Grey

(third Earl Grey), recommended a comprehensive program to alleviate this situation. Grey had been in high level diplomatic posts in Africa during England's first years there, and on the basis of this experience he argued that it would be necessary to impose a stiff taxation index upon the ex-slaves in order to overcome their "innate love of ease" (Grey and Barrow, 1847; cited in Newbury, 1965, p. 208). The reasoning behind this scheme was based on the popular belief that the people in the northern, temperate regions had become naturally industrious because they faced the challenge of a difficult climate. But in the tropics, where all of man's needs were assumed to be readily fulfilled by a plentiful environment, it would be necessary to invoke an "artificial" challenge, such as the imposition of a severe tax system (Curtin, 1964, p. 455).

Grey was merely one of many who pointed to "natural" racial inferiorities as the primary cause of the economic difficulties experienced by the plantations. The factors actually responsible for their financial situation are still not well understood, although some of the following factors are worth consideration: (a) the competition with other North and South American plantations still using slave labour, (b) the lapse from the manufacturing turn-around as plantations adjusted for the new wage-labour means of production, and (c) the shortage of workers following the movement of many slaves, who once freed, left the

plantations to work their own farms in surrounding areas (ibid., pp. 334-340). Apart from these purely economic factors, it is difficult to see how one might expect high productivity from an individual who had been once kidnapped and then forced to work the rest of his or her life in what would be the equivalent of a modern day labour-camp. Meanwhile in England, most people were satisfied with the simple explanation that the races which belong to the tropics are inherently lazy and backwards.

This prejudice was the subject of Thomas Carlyle's "Occasional Discourse on the Nigger Question," written in 1849 (ibid., pp. 378-381). His article was well-known in the United States as a definitive statement in support of the re-establishment of slavery. According to Carlyle, the role for the Negro as slave was a matter of natural design, i.e., that God gave the Negro inferior mental abilities so that they may better serve the Caucasian: "That, you may depend on it, my obscure Black friends, is and was always the Law of the World, for you and for all men: To be servants, the more foolish of us to the more wise..." (Carlyle, 1849; ibid., p. 380).

In 1852, the politician and writer Benjamin Disraeli was applauded in British Parliament for his call to revoke the "Abolition of Slavery Act of 1807" (ibid., p. 381). Disraeli supported his position by referring to The Races of Man (1850), a book written by the widely respected comparative anatomist,

Robert Knox. Despite the fact that most of the text is inundated with dogmatic assertions, the Races of Man was considered by many to be a purely scientific account of the natural differences existing between the races. Knox spearheaded a scientific racism movement in biology that was to last until the turn of the century. References to his books may be found in works by Herbert Spencer, British philosopher and founder of Social Darwinism, and in some places within Charles Darwin's otherwise cautious writings (ibid., p. 378).

Down's Racism.

Given this background, Down's ideas are less likely to resemble the wild speculations of a single racist. This point gains more support from the fact that Down's knowledge of other races was obviously second-hand. In fact, his descriptions of other races appear to have relied upon a book by J. F. Blumenbach, The Natural Variety of Mankind (1865). For example, the following description of the typical Negro is taken from Blumenbach's text:

> Ethiopian variety. Colour black; hair black and curly, head narrow, compressed at the sides; forehead knotty, uneven, malar bones protruding outwards; eyes very prominent; nose thick, mixed up as it were with the wide jaws; alveolar edge

narrow, elongated in front; upper primaries obliquely prominent; lips very puffy; chin retreating" (1865, p. 266).

In comparison, Down described the physical symptoms of idiots of the "Ethiopian variety" as "presenting the characteristic malar bones, the prominent eyes, the puffy lips, and retreating chin. The woolly hair has also been present, although not always black" (1866, p. 260).

Down also applied Blumenbach's five-fold racial classification system as the basis of his own analysis of the varying degrees of mental retardation. Blumenbach's own system was based on the following hierarchical scheme: First, he argued that the Caucasian variety must have been the "primeval" race, since the typical Caucasian "displays...the most beautiful form of the skull, from which,...the others diverge by most easy gradations on both sides to the the two ultimate extremes (that is, on the one side the Mongolian, on the other the Ethiopian)" (1865, p. 269). This scheme forms a triangle by which "the remaining two (races) occupy the intermediate positions between that primeval one and these two extreme varieties; that is, the American (Indian) between the Caucasian and Mongolian; the Malay between the same Caucasian and Ethiopian" (ibid., pp. 264-5). The arbitrary nature of this and most other racial classification schemes is illustrated by the fact that of the five orders described by Blumenbach, only his term Caucasian has survived to

this day. Nevertheless, it was to this particular scheme that Down turned when deciding upon an "ethnic classification of idiots."

"Mongolism."

It will be recalled that Down's classification scheme attempted to provide an explanation of the varying degrees of congenital idiocy via recapitulation theory. In supporting this position, he was compelled to argue for the relatively novel view that the races fall into a continuous, progressive sequence. Thus, Down stated that "the various races are merely varieties of the human family having a common origin" (1866, p. 262). Support for this claim was indicated by the ethnic varieties of idiots born to parents of "European descent" where such cases were assumed to represent "examples of retrogression" (ibid., p. 262).

Blumenbach asserted that the Caucasians represent the "primeval" race. In stating that idiocy is a result of a "retrogression," did this mean that Down believed the most severe cases of idiocy would resemble a typical Caucasian? As might be expected, Down departed from Blumenbach's system on this point. And, since he maintained a recapitulationist view of evolution, the races could not follow Blumenbach's triadic scheme; instead, the primeval race would have to be followed by a linear sequence

of races, each one slightly more advanced than its immediate ancestor. If idiocy and its accompanying "ethnic features are the result of degeneration," (ibid., p. 261), then the most severe cases of idiocy must resemble the earliest human race.

In keeping with the popular racism of the time, Down's descriptions of the various grades of idiocy were presented in the following order. First, he noted that not all idiots degenerate to the degree that they assume the features of another race, and, therefore, one must expect "numerous representatives of the great Caucasian family" (ibid., p. 269). But, in light of his hypothesis, such cases were not of primary interest to Down, and he did not elaborate any further on this type of idiocy. He then proceeded to describe his ethnic classification scheme beginning with "examples of the Ethiopian variety" (ibid., p. 260). Down's description of this type has been already provided above. The reader was further reminded at this point that such cases are the result of degeneration to another race, and that, as such, idiots of the Ethiopian variety actually represent "specimens of white negroes, although of European descent" (ibid., p. 260).

The next class of idiots described were of the "Malay variety," who "present in their soft, black, curly hair, their prominent upper jaws and capacious mouths, types of the family which people the South Sea Islands" (ibid., p. 260). This

category was followed by a brief description of idiots who resemble American Indians, described as "analogues of the people who with shortened foreheads, prominent cheeks, deep-set eyes, and slightly apish nose, originally inhabited the American Continent" (ibid., p. 260).

Finally, climbing the "ladder of perfection," Down reached the rung once widely considered to be just below the Caucasian race, "the great Mongolian family." He gave "special attention" to this type owing to the "fact" that "a very large number of congenital idiots are typical Mongols" (ibid., p. 260). Despite their numbers, Down's description of this type of idiocy was limited to his observations of just one boy whose age was not provided. Included among these observations were items not usually associated with the general appearance of the "typical Mongol," such as: hair of a "brownish colour," "large lips," and a long tongue which is also described as "thick, and much roughened" (ibid., p. 261).

In terms of their mental development, Down believed that idiots of the Mongolian variety could not progress beyond mimicry. Down wrote: "They have considerable power of imitation, even bordering on being mimics. They are humorous, and a lively sense of the ridiculous often colours their mimicry. This faculty of imitation may be cultivated to a very great extent,..."(ibid., p. 261). However, Down also cautioned that

"Whatever advance is made intellectually in the summer, some amount of retrogression may be expected in the winter. Their mental and physical capabilities are, in fact, directly as the temperature" (ibid., pp. 261-2). Presumably, the mental capacity of the Mongolian idiot would be at its peak during those periods which most closely approximate the tropical climate assumed to be typical of their natural habitat.

Twentieth-Century Views on "Down's Syndrome."

As ludicrous as Down's account may appear, the subject of a causal relation between race and mental deficiency has not yet been entirely dismissed from psychological literature. The first paper read at a centenary conference marking the publication of Down's 1866 paper, focused upon statistics showing that the correlation between Orientals and "mongolism" was no higher than any other racial group (Matsunaga, 1966). It is surprising that such a demonstration would be considered necessary at a time when the genetic foundations of mongolism had been known for years. Perhaps, in light of the pervasive appeal of pseudo-scientific racism, such a demonstration was considered necessary.

One of the most outstanding examples of pseudo-scientific racism in psychological literature may be found in F. G. Crookshank's The Mongol in our midst (1931). The extent to which

Crookshank embraced Down's classification scheme is especially evident in his attempts to resolve some of the questions raised after the publication of Down's original account. For example, on the issue as to why most would classify congenital idiocy only by the term "mongolism," Crookshank explained:

> Today the racial Malays and the Amerindians (American Indians) are generally recognized as part of the Mongolian division of humanity. Hence it seems convenient, if we are to speak of imbecile mongoloids to import not merely those who resemble racial Mongols, in the restricted sense, but all those who resemble any branch of the Mongolian division of humanity. (1933, p. 12)

For obvious reasons, Down cannot be criticized for his lack of understanding about the effects of chromosomal disorders. Although the Austrian botanist Gregor Mendel had coincidentally introduced his principles of heredity in the same year as Down's 1866 paper, it would not be until 1959 that Mendel's insights would facilitate a sufficient account of mongolism (Gould, 1980, p. 161).

The actual cause of congenital idiocy, or mongolism, has been demonstrated to be due to a relatively frequent genetic mutation involving the "non-disjunction" of the twenty-first chromosome pairs (in humans) during the process of meiosis. Meiosis describes the development of the sex cells, i.e., either

sperm or egg cells. In the normal meiotic sequence, pairs of chromosomes containing genetic information from each parent line up along the diameter of the developing cell. Then, both sides trade one half of their pairs. Next, the modified pairs divide and travel to opposite sides of the cell. Finally, the entire cell itself divides along the diameter producing two separate cells with each containing a full complement of the genetic information from both parents.

This complicated process usually occurs without error, but in one out of every thousand cases, the twenty-first pair of chromosomes on one side of the diameter fails to disjoin. As a result, one sex cell will contain three chromosomes where it should only have two. Children formed as a result of a union with a sex cell containing a "trisomy" on the twenty-first chromosome are expected to suffer a number of developmental abnormalities, including an unusually weak heart and severe mental retardation (Curtiss, 1968, pp. 221-3).

Theoretical Difficulties.

Criticism of Down's account would be appropriate where he claimed that cases of congenital idiocy among Caucasians are "examples of retrogression,...of departure from one type and the assumption of the characteristics of another" (1866, p. 262).

This claim may be immediately discounted on the grounds that it depends upon the validity of recapitulation theory, which has already been shown to be false for reasons given in the first section.

But apart from this difficulty, there remains Down's illogical suggestion that cases of congenial idiocy represent an arrest of ontogenetic development at the stage of some race "lower" than Caucasians, e.g., that "a very large number of congenital idiots are typical Mongols" (ibid., p. 260). If the Orientals and all other presumably "lower" races typically behaved as if afflicted with congenital idiocy, then they would surely not have been able to survive until the present time. Down obviously knew that the other races still exist. This fact alone implies that they were able to adapt efficiently to their environment. If this much had been accepted by Down and his followers, then further thought would have soon revealed that in order for any sizeable human population to survive, certain social and economic needs would demand their consideration. These large-scale social needs call for an intellectual capacity that must be capable of reaching beyond the level of simple "mimicry."

Some of Down's contemporaries actually investigated the issue while travelling in Asia. After having observed symptoms of mongolism in children born to healthy Oriental parents, they

argued against his notion of "degeneration" to another race. This situation led one of Down's supporters to coin the term, "Mongol Mongolians," but as similar observations pertaining to other races and other species accumulated, it became increasingly difficult to defend Down's theory (Gould, 1981, p. 167).

Conclusion.

Down's entire hypothesis rested upon an invalid generalization from available ontogenies, i.e., his patients afflicted with trisomy-21. Primarily on the basis of some dubious similarities in appearance between his patients and that of other races, Down assumed that there must also be a causal relation between the two. Recapitulation theory suggested the possibility of a developmental arrest in ontogeny; that both physical and mental development had discontinued at the level of races lower than that of the Caucasian race. In keeping with the tradition of the recapitulation idea, what was meant by lower or higher positions in the scale of being corresponded to perceived proximity to the ranker's own position. Thus, the races were described from the "bottom up," i.e., from the Negroes (Ethiopians) up to the Mongolians (Orientals); from the least to the most similar of Down's own race.

Down's classification scheme was not constructed upon

biological or anthropological data; rather, it was shaped to conform with his own particular needs, i.e., to describe and explain congenital idiocy. Haeckel constructed his phylogenetic record of the development of man in a similar fashion. Where Haeckel had invented species in order to give more support to his vision of phylogeny, Down falsely associated non-Caucasion races with mental retardation in order to explain levels of congenital idiocy. In both cases, falsification was empirically demonstrated by pointing to observations which contradicted their generalizations.

Down's ideas would probably not have been accepted so readily if it were not for the prevailing prejudices toward other races, a social phenomena augmented by a general lack of familiarity with other races. Certain economic factors were also cited as a probable source of the negative attitude held toward the races which inhabit the tropical regions.

Clearly Down's account cannot be simply dismissed on the grounds that it is racist. Instead, an attempt has been made to disprove Down's hypothesis by indicating the logical and empirical counter-arguments which demonstrate that his ethnic classification scheme does not correspond to the actual nature of the non-Caucasion races. In the following sections, it will be shown that this is a problem shared by most other accounts of psychological recapitulation. Thus, there will be occasion to

return to this error which most seriously flawed Down's particular use of recapitulation theory, i.e., that of a lack of empirical support for certain anthropological and psychological claims concerning other races and cultures.

-6-

Wilhelm Preyer: Recapitulation Theory and A Priori Cognitive Categories.

The German physiologist and psychologist Wilhelm Preyer (1841-1897) was one of the first to approach the problem of mental development in a scientific manner. A memorial centenary conference was held in his honour at the University at Jena in Germany in 1982. That year marked the publication of Preyer's most significant contribution to psychology, a comprehensive handbook on child development entitled, The Mind of the Child (1882; American edition first published in 1888). Preyer's objective attitude to his subject is clearly evident in this pioneering work. Preyer's scientific attitude toward observation and experiment was undoubtedly the result of a brilliant educational career. His curriculum vitae details a wide range of scientific studies instructed by some of the most remarkable scientists of the nineteenth century, e.g., Preyer's instruction in chemistry was given by R. W. Bunsen and his instruction in physiology was obtained from Emil du Bois-Reymond and Helmholtz (Schmidt and Becker, 1981, pp. 247-254). As a result, empirical character of Preyer's books is comparable to later twentieth-century developmental accounts such as those provided by Arnold Gessell and Jean Piaget.

However, at the theoretical level, Preyer's work presents a number of serious difficulties owing largely to its dependence upon recapitulation theory. Again, in biological terms, recapitulation means that over the course of its individual development, an organism is expected to pass through a series of forms which resemble the adult appearance of its ancestors. In psychology, this same principle has been said to also apply to mental development. Thus the theory of psychological recapitulation suggests that over the course of a subject's mental development, the subject is expected to pass through a series of psychological stages which resemble the cognitive level of those ancestors who contributed to the mental evolution of the species. This is a perfectly reasonable position, unless it also assumed that psychological recapitulation necessarily implies a literal extension of a biological predisposition. On the contrary, the human infant does not inherit "memory traces" of various ancestral experiences which will be automatically repeated during the course of development; such experiences are recapitulated, but through the process of learning and education. Talyzina (1981) addressed this subject where she claimed that

> the development of individual is no longer the result of an unfolding of the experience of their species generated internally through heredity, but of an assimilation of external social experience that is embodied in means of

> production as well as in such objects as books and in language. Man is not born with already developed thought processes and with knowledge of the world nor does he discover anew the logical principles that govern thinking and those laws of nature that are known to society. He acquires this by assimilating the experience of earlier generations. (p. 36)

The materialist position upon which these statements are based does not imply that the subject's biological aspect does not contribute to psychological development. But, as Leontiev (1981) argued, the individual's "inherited, biological characteristics ...constitute only the necessary conditions for these (psychological) capacities and functions to be formable" (1981, p. 423); the subject's physiological aspect alone cannot sufficiently account for the complexities of human development.

It will be shown that Preyer did not make this distinction in his account of mental development. Although Preyer allowed that infants will attain most of their knowledge through personal experience, he argued that experience itself requires certain a priori conditions; not the mere biological conditions which allow consciousness, but the biological inheritance of actual ancestral experiences. Insofar as Preyer claimed that these inherited experiences are necessary to provide the form or structure which makes meaningful experience possible, his position may be

compared to theoretical aspects of Piaget's work. In turn, their shared views on this subject of innate or a priori cognitive structures may be traced to Kant's philosophy. The following discusion will, therefore, focus upon how Preyer imported a priorism into his recapitulationist view of mental development, the continuation of this theme in Piaget's theory of "schemata," and how their similar views pose certain problems of an epistemological nature.

Preyer's Developmental Theory.

Preyer developed a stage theory which described human ontogeny as a series of mental stages. The patterns of behavior which characterize each particular stage are distinguished by their different sources of motivation. Each stage was assumed to provide the foundations for the next stage. Preyer described each stage in terms of its dominant behavioral characteristics, the maturity of the sense organs and the complexity of response patterns. These aspects of the infant's development were collectively referred to as "patterns of behavior," or "movements." Preyer described four different stages of "movement": "impulsive," "reflexive," "instinctive," and "deliberate" movements. Each of these types of "movements" are outlined below.

"Impulsive movements" referred to those behaviors which Preyer described as spontaneous or automatic. The examples he gave of such behaviors were the excited arm-waving activity of small children as they eat or random arm and leg movements (1973, v. 1, pp. 201-210).

"Reflexive movement," the next type of behavior, was thought to serve primarily a physiological purpose. In contrast to the impulsive movements which represent the first step toward a mastery of bodily coordination in relation to time and space, reflexive movement was assumed to be only indirectly related to psychological factors (ibid., v. 1, pp. 211-216). This distinction is not always self-evident. For example, Preyer disagreed with a minor point in Kant's writings where the latter claimed that an infant's urgent crying was probably due to its frustration at not being able to effectively coordinate its movements. On the contrary, Preyer argued that urgent crying was merely a "reflexive" response to some physiological discomfort such as an uncomfortable lying postion (ibid., v. 1, p. 213). Other examples of these purely physiological responses offered by Preyer were sneezing and blinking (ibid., v. 1, pp. 214-215; p. 225).

Next, Preyer's description of "instinctive movements" detailed a sequence of unconscious, but purposeful, behaviors working in a coordinated manner toward a particular goal. These

movements were described as "complex," and their automatic performance suggested to Preyer the influence of a primitive source of motivation (ibid., v. 1, p. 230). It is at this point in his account that Preyer explicitly adopted the recapitulation idea in order to explain these movements "distinguished...from all other childish movements by their complete coordination and their consecutive character--one might almost say, by their logic" (1894, pp. 53-4).

The instinctive movements were supposedly guided by inherited "simple general ideas" (1909, v. 2, p. 210). Preyer's explanation as to how these ideas were originally formed follows Lamarck's theory of evolution:

> Instinct is inherited memory. What one's ancestors for an inconceivable series of generations found especially useful and valuable for the preservation of themselves and those belonging to them, they preferred: so that among the defensive and other innate reflexes certain movements were more easily inherited than all others, simply because they occurred far more frequently. (ibid., v. 2, p. 208)

Now, according to Lamarck, new inheritable features can only be formed over a long period of time, i.e., where a relatively stable set of relations exist between the organism and its environment. These conditions do not apply to the early stages of ontogeny when the organism is undergoing a number of changes

which preclude the possibility of new long-term habits. Thus, where Preyer has stated that the infant exhibits movements which have been inherited from "one's ancestors," this must necessarily be a reference to the infant's adult ancestors. In other words, Preyer has argued for psychological recapitulation; that during the course of individual development, the infant is expected to re-enact patterns of behavior formed on the basis of actual ancestral experience while those ancestors were in their adult stage:

> The mind of the new-born child, then, does not resemble a tabula rasa, upon which the senses first write their impressions, so that out of these the sum-total of our mental life arises through manifold reciprocal action, but the tablet is already written upon before birth, with many illegible,...traces of the imprint of countless sensuous impressions of long-gone generations...we perceive what a capital each individual has inherited from his ancestors...(ibid., v. 1, p. xiv)

Again, once the infant has passed through the more primitive impulsive and reflexive movements, the infant is said to then exhibit "expressions of instinct" and, since Preyer defined instinct as "inherited memory," he has suggested that ontogeny recapitulates phylogeny at the psychological level.

It may be assumed that the recapitulation process would

continue to have a lasting effect upon ontogeny, since Preyer claimed that these "simple general ideas" form the basis for the next, and final, stage of development, the stage of "deliberate movements." This stage is characterized by the behavior of the infant acting in accordance with new concepts which relate to the infant's own needs and desires. The ability to form new concepts, however, is made possible only through the fundamental ability to distinguish objects in their temporal and spatial relations. Does this ability derive from the infant's discovery of these properties through the guidance of others who tend to him or through his own interactions with objects in his environment? On the contrary, Preyer claimed that the ability to perceive objects in the context of their spatial and temporal relations is automatic; "it is, as Immanuel Kant discovered, present in man 'as he now is' (Kant) before the activity of the senses begins..." (ibid., v. 2, p. 212).

A priority has been established by these statements, e.g., that the idea of space and time precedes the infant's actual encounter with these phenomena. In agreement with similar claims made by Helmholtz and his ideas of "unconscious inference," (ibid., v. 2, p. 212). Preyer stated that "wordless ideas, wordless concepts, wordless judgements, wordless inferences, may be inherited" (ibid., v. 2, p. 213). In other places this assertion was made more forcefully. Following the mechanistic

thinking of the nineteenth-century associationists, Preyer added that "new (not hereditary) concepts arise only after new perceptions, i.e., after experiences associate themselves with the primitive ones by means of new connecting paths in the brain..." (ibid., v. 2, p. 214). Thus, the "wordless ideas" passed on from the infant's ancestors provide the infant's sensory experience its basic structure or form. A new idea cannot "arise before perceptions exist--i.e., before sense-impressions of various kinds have been co-ordinated in time and space" (Preyer, 1894, p. 135). Once more, this implies that the infant will recapitulate psychological states which resemble that which may be found in the adult stage of the infant's ancestors:

> Indeed, the inferences that attach themselves to the first concepts will resemble those which were developed in the mother or will be identical with them; these concepts have, then, hereditary properties (1909, v. 2, p. 214).

This notion of a fundamental a priori basis for sensory experience, of inherited "ideas" which provide the foundations upon which infants construct their "new ideas" about the world, may be more readily understood in comparison to similar propositions put forward by Piaget in this century.

Similarities Between Preyer and Piaget.

Preyer argued that certain inheritable "ideas" provide a basic structure to the infant's knowledge about the material realm. There is a close similarity between this notion and Piaget's concept of "schemes" which has been defined as a

> unit of structure (organized activity); 'whatever is repeatable or generalizable' is a scheme. The earliest structures are relatively simple; they are often referred to as reflexes. Later, largely as a result of reciprocal assimilation and accommodation, schemes are more complex--more mental--and it becomes increasingly appropriate to think of them as "coordinations," "strategies," "plans," "transformation rules," "expectancies," and so on. (Phillips, 1981, p. 17)

Although Preyer's account of the appearance of instinctive movements in ontogeny as the recapitulation of ancestral experiences, might have been presented in a less sophisticated manner than Piaget's concept of schemes, the central notion of inheritable cognitive predispositons remains similar in both accounts. For example, Preyer claimed that the new-born child already possesses a fundamental a priori knowledge of the world, such as an understanding of temporal and spatial relations: "Of all the higher functions of the brain, the ordering one, which compare the simple, pure sensations, the original experiences,

and first sets them in an order of succession...this function is one of the oldest" (1909, v. 2, p. 212). Piaget continued this line of thought where he claimed that "there is a parallelism between the progress made in the logical and rational organization of knowledge and the corresponding formative psychological processes" (1970, p. 13). Piaget also agreed with Preyer on this point that there must be older and newer "higher functions" and that the oldest would likely appear earlier in ontogeny that than the more recent developments in human thinking. Thus, Piaget wrote:

> The most fruitful, most obvious field of study would be reconstituting human history--the history of human thinking in prehistoric man. Unfortunately, we are not very well informed about the psychology of Neanderthal man or about the psychology of Homo Siniensis of Teilhard de Chardin. Since this field of biogenesis is not available to us, we shall do as biologists do and turn to ontogenesis. Nothing could be more accessible to study than the ontogenesis of these notions. (ibid., p. 13)

Piaget's account differs from Preyer's in that where the latter argued for a direct causal relation between phylogeny and ontogeny in terms of inheritable physiological change in the brain structure, Piaget has argued only for a parallel between these two lines of development. The element of a priori

determinism in Piaget's account lies with his suggestion that these two lines of development must travel in the same direction. This position harkens back to the history of recapitulation theory and the argument that, if there is but one path of biological development, then the development of the individual must resemble the development of the species in general. In actual fact, the course of evolution has not been so unidirectional, as the the facts of extinct species and the sheer diversity of past and present species clearly indicate. There does appear to be a stronger case for unilinearity in the development of logic, at both the phylogenetic and ontogenetic levels. However, to suggest that this development is predetermined is to over-emphasize the qualitative changes in the development of logic while ignoring the quantitative processes which prepare the way for such changes. Just as the historical progress made in man's knowledge of logic did not suddenly appear with the passing of centuries, the progress made in logic by the child is not an inevitable, predetermined course. More on this subject will be taken up later in this chapter.

An a priori position on the fundamental elements or "structures" of knowledge is attractive in that provides a solution to the problem presented by the infant's ability to understand rapidly the complexities of the perceptual field. The rich diversity of stimuli that surrounds the new-born would

appear to call for the propostion that there must be an innate cognitive capacity which allows the subject to organize sensory stimuli.

In 1789, the idealist philosopher Immanuel Kant presented this very proposition as a first principle in his Critique of Pure Reason (1905). He added that without an innate capacity to perceive temporal and spatial relations, meaningful sensory experience would be impossible:

> It is therefore not merely possible or probable, but indubitably certain, that Space and Time, as the necessary conditions of all our external and internal experience, are merely subjective conditions of all our intuitions, in relation to which all objects are therfore mere phenomena, and not things in themselves, presented to us in this particular manner. (1905, p. 84)

In their writings, both Preyer and Piaget clearly indicate a general agreement on this point. But, however attractive Kant's solution may be, both philosophy and psychology has since demonstrated that this claim concerning a priori cognitive structures which unconsciously guide perception is not a necessary assumption. Furthermore, a sufficient explanation of how the individual gains an understanding of temporal and spatial relations is available without recourse to the abstract assertions originally proposed by Kant, and presented here again

by Preyer and Piaget.

Criticism Specific to Preyer's Account.

In approaching the general a priori argument presented by Preyer, it should first be established that he claimed that experience may be genetically passed on from one generation to the next. This much is explicit in Preyer's claim that

> no man is...a mere upstart, who is to achieve the development of his mind (Psyche) through his individual experience alone; rather must each one, by means of his experience, fill out and animate anew his inherited endowments, the remains and activities of his ancestors (1909, v. 1, p. 15).

By suggesting that the course of the infant's development is structured by "the remains and activities of his ancestors," Preyer extended the principles of recapitulation theory to cover the speculative notion of inheritable mental categories which supposedly serve to guide the young child's more particular sensory experiences.

In light of the fundamental role played by sensory experience within Preyer's developmental theory, one would expect a thorough account of the mental categories which give sensory

stimuli their "form" or "structure," to borrow from Piaget's lexicon. However, at no point in Preyer's extensive studies on mental development, did he provide grounds for his proposals concerning such inheritable mental predispositions beyond vague references to recapitulation theory, such as in the statement cited above. Preyer did provide a great deal of scientific evidence for minor claims relating to particular instances of one of his four types of "movements," but did not do the same for this major theoretical claim. It is suggested that this omission is due to the abstract nature of the claim concerning inheritable modes of thinking.

The fact that recapitulation theory has never been a sound biological principle, as previously demonstrated in the first section, therefore, presents a profound challenge to Preyer's account of mental development. But, apart from the strictly biological fallacy inherent in his premise, there are, in addition, a number of problematic epistemological assumptions underlying Preyer's assertion concerning a dependence upon cognitive guidelines provided by "the imprint of countless sensuous impressions of long-gone generations." These same criticisms may also be applied to many similar neo-Kantian claims concerning an a priori basis for experience, such as found in the position put forward by Piaget.

Representional Perception.

By giving primacy to an a priori understanding of sensation, e.g., the ability to order sensations in relation to space and time, the writers above have suggested an essentially subjectivist theory of perception. Discussion above alluded to Kant as representing the philosophical source of this line of thought on perception, but truly the problem stems from Locke's empirical premise that all knowledge is derived from our sensory experience of the world. It is necessary to give some attention to the historical development of thinking on perception and to outline the major positions in order to reveal a major epistemological error inherent in the recapitulationist views espoused by Preyer and Piaget. Their dependence upon the idea that the infant's cognitive capacities carries the "the imprint of countless sensuous impressions of long-gone generations" (Preyer, 1909, v. 2, p. xiv), is a consequence of the subjectivist premise that sensations are merely atomistic representations of objects perceived by the observer.

For Locke, perception of the object was the result of a chain of events beginning with an object, then, the particular stimuli emanating from the object, next, contact with the sense organs, and, finally, the various brain processes which produces the image of the object within the mind. There would appear to

be a number of intermediary steps between the perception of the object and the object itself making the possibility of an accurate assessment of the object unlikely. Thus, on the same empirical stance which Locke had intended as a justification for scientific activity, Bishop Berkeley noted that if the observer knows only images of objects, then there is no way to show that objects actually exist. Hume followed this conclusion by suggesting that the common sense understanding that things do exist is induced by the association of certain stimuli repeatedly appearing in sequences; but again, these "habits" of perception are dependent upon the observer and not the object. This leaves the question of causal relations at a difficult point; for how can it be claimed that one event caused another, if that their relation is based on the manner by which the observer perceives this sequence?

Kant answered the difficulties left by empiricism by arguing that there is an a priori understanding of objects which guides man's perception of the world, e.g., an innate predisposition to perceive objects imbedded in temporal and spatial relations. However, Kant's position also presupposes the notion of a contemplative passive subject in contrast to a variable material realm. This implies a relation of independence between the subject and object; where the subject's understanding of the objective world is assumed to be based on a set of operating

principles which may differ from what exists in actual reality. This sceptical conclusion is a consequence which inevitably follows from the premise that the subject deals only with "images" or "representations" of objects, and not the objects in themselves. As to the actual nature of material reality, Kant said: "How things may be in themselves, without regard to the representations through which they affect us, is utterly beyond the sphere of our cognition" (1905, p. 198).

Criticism.

The first question that may be put to this position is this: If not from the subject's practical associations with the objective realm, how did these a priori modes of perception originally come into being? Preyer's answer, that an infant's first sensory experiences of the world are linked to an inherited "imprint of countless sensuous impressions of long-gone generations," may be appreciated as an attempt to support Kantian epistemology on the biological grounds provided by recapitulation theory. But it still does not resolve the question at hand; his suggestion that the infant's perception of the world is guided by the vestiges of ancestral experience, would perhaps have been more acceptable if he had also provided an account explaining how the infant's ancestors gained their understanding of the

objective world, e.g., how the primitive mind came to understand time and space.

This same criticism applies to Piaget's concept of "schemata," which serve to guide the infant's sensory experience of the world. It is to be assumed that the mental representations of objects will only make sense once alligned with the frame of reference provided by an a priori scheme: "To know is to assimilate reality into systems of transformations" (Piaget, 1970, p. 15). But where did these schemes originate? Various advocates of Piaget's position seem unconcerned by the possibility that the notion of "schemata" may amount to nothing more than pseudo-scientific dogma:

> In fact Piaget's constructivist position is quite radical and knows no absolte beginning or end. There is no rock bottom knowledge datum which comes from outside and on which the child builds. Rather at the very lowest level the infant is already biologically equipped with internal schemes which give structure to what becomes a "known" content. The growth of these schemes is the development of intelligence. The scheme as an instrument of assimilation is always the primary fact in Piaget's viewpoint. (Furth, 1980, p. 3)

Direct Perception.

What is needed to account for how the subject comes to know the world is not some inheritable property in the brain--whether it be vestiges of ancestral activities (Preyer) or a priori cognitive "structures" (Piaget)--but simply that external state of the objective world itself, which the brain and the entire human body is involved in assimilating. Since Darwin, the relation between the sensory equipment of an organism and its environment can be explained in terms which emphasize their necessary inter-relation. The subject and object should now be recognized as two moments in the same material process. Leontiev (1981) stressed that

> any reflection of the objective world in psychic phenomena is nothing other than a function of a material, corporeal subject which itself is a particle of that world, in other words, that the essence of the psychic lies in the world of objective relations and not outside it. (p. 19)

The materialist position, upon which Leontiev's statements are based, does not imply a literal "copy" theory where all that the information inherent in an object may be assumed to be wholly comprehensible at the moment it is perceived by the subject. On the contrary, this position maintains that the activity of perception is developmental in nature; knowing is the assimilation of reality as it undergoes its transformations.

Thus, the materialist philosopher V. I. Lenin noted that it is not the perception of the object which is expected to change, but the subject's knowledge of it:

> There is definitely no difference in principle between the phenomenon and the thing-in-itself, and there cannot be any such difference. The only difference is between what is known and what is not yet known. (1927, p. 99)

These statements imply that the infant will gain an understanding of, say, the nature of water as he discovers that a hand can be immersed in it, that it can be easily displaced, that it can be drunk, and so on. All these discoveries are made possible through a perceptual process which continually and actively explores the nature of the objective realm. In sum, perception cannot be understood as the result of a series of events emanating from the object and ending in the mind of a passive entity, but as an ongoing activity describing the movements of the infant's entire physiology involved in real interactions with whatever object is given his attention.

Conclusion.

Nineteenth-century materialism, in conjunction with Darwin's evolutionary theory, is able to demonstrate the redundancy of Preyer's suggestion that the infant's initial understanding of an

object is guided by inherited cognitive predispositions passed on from ancestral experience; for what matters is not in the brain, but what is in the objective realm. From the moment the infant encounters the object, it is the object which provides information concerning its nature, including its temporal and spatial relations.

This same emphasis on the properties of the object apply to Piaget's concept of "schemata"; there is simply no need to resort to assertions regarding a priori "structures," or "transformation rules," etc., because the structures of an object are found in the object itself. The discovery of the various complexities inherent in any material object are expected to take some time. For example, over the course of their interactions with an object, infants come to apprehend the object's capacity to remain the same quantity even though its appearance has undergone some superficial changes. This insight into the permanent properties of objects is not dependent upon the construction of new "transformation rules" which, then, allow the "representation" of permanence, but the discovery of one property of the objective realm, i.e., stability, based on the infant's interaction with various objects.

By working within the framework of a priori idealism, the neo-Kantian theories of Preyer and Piaget could not account for the origin of the so-called basic "forms" of thought. This is a

consequence of the premise which holds that the operation of the mind is independent from material reality, an assumption which is part and parcel of the idealist priority of mind over matter. But as Engels argued in the quote below, not only is a materialist approach to mental development able to account for the origin of basic thought processes, but in positive comparison to the idealist accounts, all materialist developmental theories are amenable to testing against actual fact:

> The proof of the pudding is in the eating. From the moment we turn to our own use these objects, according to the qualities we perceive in them, we put to an infallible test the correctness or otherwise of our sense perceptions ...if we find that the object does agree with our idea of it, and does anser the purpose we intended it for, then that is positive proof that our perceptions of it and of its qualities, so far, agree with reality outside ourselves. (1898; cited in Selsam, H. & Martel, H., 1963, p. 142)

Once it has been accepted that the activity of both biological and cognitive processes are a reflection of the environment's objective properties, all assumptions positing the existence of a priori "forms" of thought--perhaps inherited from one's ancestors--seem to be not only redundant, but also unscientific in their dogmatic presentation.

-7-

G. Stanley Hall:
Rousseauism and Psychological Recapitulation.

Throughout his life, evolutionary theory provoked in G. Stanley Hall (1844-1924) a struggle between his own romantic idealism and his contrasting respect for the achievements of science. Thus, it is not surprising to find both elements in his particular evolutionary view of psychological development. Most historians have suggested that his ambition to construct a "scientific psychology," as Hall put it, along evolutionary lines originated from Hall's avant-garde support for Darwin's ideas during his undergraduate years at Williams seminary (e.g. Watson, 1968, p. 168). However, it is more likely that this suggestion is based on Hall's own autobiography, Life and Confessions of a Psychologist (1923). In her biography on Hall, Ross (1972) noted that while evolution was a matter of popular discussion during the years he attended William's, his views on evolution at that time were made clear in an essay which he wrote on Kant's nebular hypothesis of the origin of the solar system, and in which he also considered some of the "heresies" suggested in Darwin's theory of evolution (Ross, 1972, p. 18). Hall's reactionary attitude toward other scientific advances made at that time might be accounted for by the biographical fact that Hall's first

interest was not in science, but in philosophy.

Even in his early youth, Hall was deeply intrigued by the problematic dualism handed down to the nineteenth-century from Kant's idealistic philosophy. This is the same dualism which was disputed in previous discussion for its assertion of an incommensurable division between the material world and human experience. The sheer number of references to Kant on the part of many nineteenth and twentieth-century psychologists indicates the significance of this dualism. Their concern is understandable as Kant's dualism threatened the validity of all scientific results with its implication that no matter how thorough any scientific investigation of a given object or event may be, the true reality of things would still supposedly lie beyond the limits of understanding; since the a priori logical categories given to human understanding would automatically transform what is perceived, no human subject is expected to have knowledge of the objective world as it actually exists. In this way, it may be appreciated that this difficult problem was not just the fancy of philosophers, many scientists of the nineteenth-century were exercised by the dilemma presented by Kant's philosophy. Indeed, it has been argued that the beginnings of scientific psychology might well be understood as a reaction to Kantian idealism (e.g., Heibreder, 1933, pp. 49-51).

Nowhere was the poignancy of Kant's dualism felt more

strongly than in nineteenth-century Germany, especially during the 1870's. It was also during this time that Hall had assumed graduate studies in that country. Like Preyer before him, Hall greatly admired his physiology instructor, Hermann von Helmholtz. It was under Helmholtz that Hall cemented his growing resolve toward a quasi-materialistic solution to Kant's dilemma. On his discovery of this approach to the problem, Hall wrote:

> Since ancient Greece,...(cognitive) categories or innate ideas, as Trendelenberg and Laas well show, have been the goal or the basis or both of most philosophic systems, but from Aristotle's ten to Kant's twelve, they have been underived...till Spencer suggested that even all of those that were valid, although a priori and innate in the individual, were acquired by the race. (1904, v. 1, p. 41)

From this statement alone, it may be anticipated that the direction of Hall's approach to mental development would be similar to Preyer's attempt to entrench Kant's a priori categories within an explanation which blends the biological "principle" of recapitulation theory with psychology.

In fact, Hall was to extend the use of the recapitulation idea far beyond Preyer's speculations regarding the contribution of ancestral "sense-impressions." Enthused by the prospect of a fully "scientific" psychology, which reduced all its terms to the biological level, Hall believed that he could now solve the

philosophical dilemma which had troubled him since his days at William's. In 1879, he wrote that all philosophical questions ultimately

> rest upon psychology, and that psychology is essentially a branch of physiology. The latter is by general consent and practice here already far too wide a branch for a single specialist to profess. So it seems to me that the philosopher must take the brain nerves and muscles as his peculiar province and adopt without reserve the scientific method. (cited in Ross, 1972, p. 83)

Upon his return to the United States, Hall intended to publish his vision of a scientific psychology based on his own new-found "evolutionary" approach, but this project was never completed. Ross (1972) suggested that it was Hall's own deeply-rooted advocacy of free will and romanticism which prevented him from giving his full support to this portrait of "man as machine" (ibid., p. 167).

Ancestral Impetus.

The inadequecy of the mechanical model in psychology is its inability to explain what initially moved the machine into action. In other words, if human behavior can be explained as following machine-like patterns, then it remains to solve how

these patterns are brought into play. To answer this question, Hall returned to his work on the patterns of cognitive behavior in children.

One of Hall's earliest successes over the course of his long career had been his pioneering use of a psychological questionnaire used in order to empirically define the nature of children's thought. In his first study, Hall obtained data from 134 questionnaires answered on a total of 200 returns from local Bostonian kindergartens--66 were excluded for various subjective reasons (1907, p. 13). The stated purpose of the questionnaire was to distinguish between those "concepts which children brought to school from those acquired there" (ibid., p. 2).

The results of this study, presented in "The Contents of Children's Minds" (1907), represents one of the first attempts to style education on the basis of information supplied by psychological testing. The study was successful in that it confirmed the principles of the Herbartian school, i.e., that there exists a tendency for children to first learn those concepts most frequently encountered in the immediate environment. Thus, Hall's study suggested greater educational gains could be made by attempts to establish associations between new knowledge and that which is already familiar to the child.

On the negative side, Hall's study also featured the same unfortunate features of experimenter bias in psychological

testing which later characterized the American intelligence testing movement during the first quarter of this century. For example, in his discussion of the survey's results, Hall made racist comparisons between the scores of American as opposed to Irish children. As well, Hall's questions were explicitly "loaded" in favour of a biased interpretation of what comprises intelligence in that most of the questions would be accessible only to those who were brought up in a countryside setting. Hall, whose works rarely avoided at least one nostalgic reference to his own childhood years in rural Massachusetts, wrote that "the high rate of ignorance" indicated in his test results suggest

> that city life is unnatural, and that those who grow up without knowing the country are defrauded of that without which childhood can never be complete or normal....A few days in the country at the age of five or six has raised the level of many a city child's intelligence more than a term or two of school training without could do. (ibid., p. 25)

These conclusions may be appreciated as more dangerous than humorous upon learning that Hall further recommended that his questionnaire could be employed as a predictor of future academic standing and that, as such, it may prove to be a useful device for selecting out the "deficient" first grade pupils from their classmates (ibid., p. 46).

The study also strongly suggested to Hall that "the child's soul is no tabula rasa", but rather, that the child has come into the world with a "soul" filled with the experiences of his ancestors (ibid., p. 41). In a clear statement of the traditional psychological recapitulation concept, which generally sought to reduce almost all psychological phenomena to inherited ancestral experience, Hall claimed that mental development follows the "evolutionary dictum that the child's mental development should repeat that of the race" (ibid., p. 25). In this way, Hall assumed that he had discovered what it is that initially moved the human machine into action.

Hall's Major Account of Psychological Recapitulation.

In his two-volume work, Adolescence (1904), Hall explained that, according to "general psychonomic law," the course of an individual's mental development is "influenced in our deeper, more temperamental dispositions by the life-habits and codes of conduct of we know not what unnumbered hosts of ancestors, which like a cloud of witnesses are present throughout our lives, and that our souls are echo-chambers in which their whispers reverberate" (Hall, 1904, v. 2, p. 61).

Thus, twenty years after his initial study on child psychology, Hall no longer looked upon this field as a subject of

peripheral interest:

> The genetic psychologist,...will find it necessary, almost in exact proportion as his work becomes fundamental, to gather his data empirically from the comparative study of lower forms of life and of children and from the collation of the varied inner and outer experiences of many minds besides his own. Thus the psychologist of the future, if his science is to have a future, must turn to the past, by which alone it can be judged, and if he would be prophetic and helpful must move more freely with a far larger command of data up and down the phyletic scale. (ibid., v. 2, p.62)

The proper course of all psychological investigation was to be the study of the child, since "the boy is the father of the man in a new sense in that his qualities are indefinitely older and existed well compacted untold ages before the more distinctly human attributes were developed" (ibid., v. 1, p. x). Mental development was assumed to be the unfolding of "hereditary impulses" which steer maturity toward a finished adult state. Thus, while both the mental and physiological aspects of human nature may still be explained in terms of physical and chemical processes, with the introduction of an "evolutionary" element into this scheme, Hall had discovered a way to inject movement into the man as machine model. Hall pointed to the instincts ("instinct-feelings") as the set of basic motivations which guide

the experience of all organic life, of which man is a part:

> Assuming thus that the feeling-instincts of whatever name are the psychophores or bearers of mental heredity in us, some of which persist below the threshold of consciousness throughout our lives, while others are made over as instincts or are transformed to habits into directions of the will more or less persistent, we thus cross-section old methods and can approach this study with a mental horizon vastly widened and with an historic sense less atrophied. (ibid., v. 2, p. 61)

Biological Reductionism in Hall's Account.

As with all other psychologists who had adopted the so-called "biogenetic law" of evolution, Hall's supporting line of argument negates the levels of organisation separating the human species from all other species. Thus, Hall wrote that

> the best and only key to truly explain mind in man is mind in the animals he has sprung from and in his own infancy, which so faintly recapitulates them; for about every property of the human mind is found in animal mind, as those of higher animals are found in the powers of the lower (ibid., v. 2, pp. 65-6).

This is obviously an essential component in the general argument; since what applies to the biological world must also be

shown to apply to psychological phenomena in order to explain both areas in terms of the same principles of recapitulation theory. According to Hall, it would seem that all psychological phenomena could be accounted for by attending to the phyletic influences which guide the psychological development of the individual. Hall's entire account of adolescence depended upon the notion that there exists a biological predisposition to recapitulate certain psychological states assumed to be passed on from all members of the human phylogeny, including those states of consciousness thought to characterize the animals and early man. This notion was considered to supply, not only an explanation of human psychic development, but also, a prescription on how to better direct the adolescent mind toward a healthy frame of mind:

> Our present quest is to detect some characteristic changes at that age of life when a certain group of powers emerges from the past; when heredity is bestowing its latest and therefore highest gifts; when the mind is most exquisitely sensitized to the aspects of nature...repeating most rapidly the later neopsychic stages of phyletic experiences, and laying on this foundation the corner-stones of a new and unique adult personality. (ibid., v. 2, p. 70)

Specific Claims Presented within Hall's Account.

Hall claimed that "our souls are phyletic...far more than they are individual" (ibid., v. 2, p. 65). By assuming that the onus of mental development lies with the adolescent's biological inheritance of phylogenetic influences, Hall justified his references to the affective and intellectual capacities peculiar to the human species as insignificant, e.g.: "Consciousness and personality are far later, modal, attributive, and specific determinations--irrelevant to a psychologia prima" (ibid., v. 2, p. 64). He regarded those aspects of human nature which distinctively characterize man's socio-cultural behavior, e.g., "religious sentiments," "love," and "art" as essentially "elaborated and differentiated forms of instinct, the products of later phylogenetic periods" (ibid., v. 2, pp. 75).

Hall believed that twentieth-century man was really not far removed from the very earliest periods of human civilization. In general, he expected that after an individual had recapitulated the first early stages of humankind during adolescence, there was not much progress beyond this stage (ibid., v. 2, p. 303). This was literally the case for those individuals who belong to presently existing "primitive" societies. Hall's regard for the non-industrial populations of the world may be surmised from the following quote: "Most savages in most respects are children, or, because of sexual maturity, more properly, adolescents of

adult size" (ibid., v. 2, p. 649). This thinking follows from the biological version of recapitulation theory, according to which, the more advanced descendents are expected to resemble the adult stages of their ancestors. Technically, the so-called "primitives" living today of course could not be the ancestors of those presently existing adolescents considered to be of more advanced stock. However, in a psychological sense, those children will resemble today's adult "primitives" given that this latter population was assumed to be fixed at a lower stage of biological development.

Hall's Views on Other Races and Cultures.

Where Down suggested that non-Caucasion races represent various degrees of arrest in biological development, Hall argued while some populations were naturally progressive, others were becoming ever more regressive. Hall's method for distinguishing the "ascendent" from "descendent" stocks relied upon either his own views or the casual opinion of world travellers, e.g.: "Ploetz thinks that the Frenchmen and Yankees are sinking, and most West Aryans, European Jews, English, Dutch, and Scandinavians are rising races (ibid., v. 2, p. 720).

The extent of Hall's own naivete in regard to other races and cultures considered to be primitive may be further assessed

on the basis of his analysis of criminal behavior as linked to an arrest in the individual's recapitulation cycle. He argued for a three-pronged parallel between children, criminals and "savages," e.g.: "Criminals are much like overgrown children--egoistic, foppish, impulsive, gluttonous, blind to the rights of others, and our passions tend to bring us to childish stages" (ibid., v. 1, p. 338).

Hall agreed with the Lombroso school of "criminal anthropometry" which argued that a correlation exists between an innately criminal personality and various "atavistic" or "degenerate" physical features such as those found in one of Hall's many lists of criminal attributes, e.g.: "...a tendency to shorter stature, lighter weight, diminished strength in the muscles of the hand, greater sensitiveness to pain, small, broad heads, broad faces, deformed palates and skulls, defects of sight and hearing, dulness of touch, and inferiority in attention, memory, and association (ibid., v. 1, p. 338). Throughout his text, Hall associated these same features with the physical and psychological make-up of what he considered to be the typical "savage."

Hall's recapitulationist analysis shares one other similarity with Down's views: both argued that the psyche of the most advanced human population represents a culmination of all other "lower" stages of human evolution. On this point, Hall

claimed:

> The mind is now in what the biologists call its generalized form. It is as if man were polyphyletic in his origin and now the different ethnic stocks were successively harked back to...we can often detect the voices of our forebears of very different races in the soul. Never is it so true that nothing human is alien from each individual, as in this fever of ephebeitis, which has so many peculiar features in the American temperment. (ibid., v. 2, p. 89)

American Racism at the Turn of the Century.

As with Down, it would be difficult to accuse Hall of racism, given the popular state of racial attitudes during his time. Indeed, it was during the turn of this century, that the temperment of many Americans was affected by a vigorous campaign of expansionism involving the military conquest of various countries in both the Pacific and Caribbean regions (Tuchman, 1966, pp. 133-195). Beginning with the military takeover of the Hawaiian government in 1893, continuing through to the expulsion of Spanish presence in the Phillipines and Cuba, the U.S. waged war abroad for two tumultuous decades.

During this time, many Americans were persuaded by the

jingoism of the day which declared that the new imperialistic American foreign policy reflected a maturing of an admirable national character. For example, Albert Beveridege, an ambitious lawyer with a gift for histrionic oratory, proclaimed that the Americans "are a conquering race... we must obey our blood and occupy new markets and, if necessary, new lands" (Beveridge, 1898; cited in Tuchman, 1966, p. 177). Fifty years earlier, various accounts of pseudo-scientific racism argued that the reports of mass epidemics which fatally affected a number of populations in conquered territories demonstrated a natural superiority in the physical constitution of the caucasion race. It was likely that such accounts led Beveridge to suggest further that God supported American expansionism: "In the Almighty's plan...debased civilizations and decaying races" were destined to disappear "before the higher civilization of the nobler and more virile types of man" (ibid., p. 177).

These statements do not represent the pious voice of a single racist. During this turning point in American history, many politicians were elected on the promise of fulfilling the new mandate from the American people to expand outward. This popular attitude toward expansionism could was epitomized in a statement made by Republican Senator Shelby Cullom: "It is time some one woke up and realized the necessity of annexing some property—we want all this northern hemisphere" (1896; cited in

Tuchman, 1966, p. 156). In the 1890's, many Americans felt that the invasion of small islands in the Caribbean and the Pacific was a matter of duty to God and country.

Contrary to this popular movement, a vocal minority of Americans, including G. Stanley Hall and William James, were troubled by the contradiction between the democratic ideals set out in the Declaration of Independence and the new international developments. In a letter to the New York Evening Post, in 1898, Hall spoke against American intervention in Cuba and thereafter advocated a paternalistic attitude toward the people of countires now occupied by the U.S. on the grounds that "primitive peoples have the same right to linger in the paradise of childhood" (Hall, 1904, v. 2, p. 649). Thus, in his own time, Hall would have been considered as somewhat liberal in his political and racial views.

This is not to imply that that Hall's ignorance about other races and cultures was any less than the average American. On the contrary, Hall's speculations concerning "the typical behavior" of "savages," as he referred to past and present non-industrial populations, are imbued with the wildest imaginations. Indeed, the lack of empirical support for Hall's judgment of primitive culture stands as a serious criticism facing his account as a whole, since the validity of the theory of psychological recapitulation rests upon how well the behavior of

the modern child or adolescent may be explained by refering to the behavior of his ancestors.

Vestiges of Ancestral Experience in Contemporary Adolescence.

According to Hall, if "reason is the apparatus of restraint," then to be guided by instinct is "tap the freshness and resources of earlier years (ibid., v. 2, p. 402). However, Hall's application of instinctual behavior represents perhaps the most questionable aspect of his entire account. For example, as an explanation of petty theft behavior in adolescence, Hall simply pointed to "a deep instinct that things belong to those who most need or can best use them, and the finer conceptions of the sacredness of personal property come as a later stage of evolution" (ibid., v. 2, 364). Hall claimed further that an earlier common law of ownership, i.e., ownership according to "personal whim" was promoted by the open availability of natural resources during man's supposedly plentiful primeval epoch:

> Poaching was impossible, for there were no preserves.... Food, clothing, and shelter are theirs by the right of their dependent state, and it is a long, hard curriculum to understand the meum, tuum, suum, of civilized life. Slaves newly emancipated have found this a hard lesson to learn, as the census of the causes of imprisonment of the

colored race in the South shows. (ibid., v. I, p. 364)

The more "advanced" types of thievery, such as, "fraud and stealth," were, according to Hall's recapitulation scheme, expected to appear in later adolescence. These phyletically more recent forms of crime were explained as an "atavism" which harkens back to the "old days when things belonged to those who were shrewdest to get them" (ibid., p. 364). It may be noted that the lack of anthropological support for these and other similarly speculative claims is typical throughout Hall's account. More disturbing, though, is the derogatory portrayal of the social and psychological make up of primitive man, not to mention contemporary Negroes. Logic alone would suggest that if all primitive societies habitually indulged in unconscionable plunder, then the likelihood of the human species being to able to survive prehistoric times would have been minimal.

Hall's analysis of the development of the Western adolescent in relation to so-called "savages," veered even further from his own aims of developing a truly "scientific psychology" wherever he indulged in "arm-chair" descriptions of prehistoric society. Although Hall's assessment of the psychology of the prehistoric man was, for the most part, similar to Rousseau's vision of the "noble savage," it also contained elements of Hobbes' portrait of primitive life as "mean, short, nasty and brutish." In short, Hall's vision of prehistoric life provided him with an unlimited

wealth of various phylogenetic "impulses," or "instincts," by which he could explain virtually any behavior exhibited by the modern adolescent. Among the various types of instincts described were: a "courage instinct" (ibid., v. 2, p.366); an instinct for "self-exhibition"; a "fighting instinct" (ibid., v. 2, p. 367); "the instinct to explore all the possibilities of life in feeling and expression" (ibid., v. 1, p. 317); pyromania was explained as the emergence of "the strong instinct to gaze into the fire" (ibid., v. 1, p. 367); and, finally, Hall also claimed that the "wish to explore night out-of-doors, to rove about perhaps with adventurous or romantic thoughts, and on moonlit nights particularly...suggests an atavistic recrudescence of what may have been in primitive man the need of watchfulness" (ibid., v. 1, p. 264). Apart from attributing an idyllic glow to instinctual behavior, Hall's habit of creating an instinct for almost every psychological event resulted in removing a great deal of credibility from his account of psychological recapitulation.

Clearly the most prominent feature of Hall's vision of prehistoric life was its romanticism. It is likely that Hall's nostalgic feelings for his own rural upbringing led him to advocate a more liberal attitude toward the American adolescent. He frequently argued for the notion that efforts should be made to allow the child to play out his "instincts" lest they later

resurface in a more unwieldy form of expression, an idea which he claimed he gained from Aristotle's "principle of catharsis" (Hall, 1904, v. 1, p. vii). Through this combination of ideas, Hall arrived at the conclusion that the imposition of education, tempered manners and all the trappings of modern civilization combined to produce a detrimental effect upon the natural course of mental development in the child. This line of thought preceded Freud's far more comprehensive treatment of the same principle, which will be discussed in a later section.

However, with the exception of accounting for criminal behavior on the basis of this theory, Hall did not consistently refer to the contribution of repressed "impulses" and their distorted manifestations in adult behavior. Nevertheless, there are some remarkable similarities between Hall's ideas and Freud's. It is suggested that such similarities can only be explained after observing that their accounts shared the same theoretical grounds, i.e., both accounts adhered to the concept of psychological recapitulation. It could be said that the basic difference between the two psychologists is that where Freud followed Hobbes' view of the natural "brutish" tendencies in man, Hall's view leaned closer to Rousseau's beatific naturalism. For example, Hall wrote:

> The child revels in savagery, and if its tribal, predatory, hunting, fishing, fighting, roving, idle, playing

> proclivities could be indulged in the country and under conditions that now, alas! seem hopelessly ideal, they could conceivably be so organized and directed as to be far more truly humanistic and liberal than all that the best modern school can provide. Rudimentary organs of the soul now suppressed, perverted, or delayed, to crop out in menacing forms later, would be developed in their season so that we should be immune to them in maturer years... These nativistic and more or less feral instincts can and should be fed and formed. (ibid., v. 1, pp. x-xi)

Conclusion.

Much attention has been focused upon Hall's romantic image of the life of our prehistoric ancestors, as it was this ideal which formed a pivotal point in his "genetic psychology." Hall's Rousseauistic vision of primitive life was essential to his conclusion that education and general upbringing practices should be modified in respect to the effects of inherted phylogenetic influences; "...youth needs repose, leisure, art, legends, romance, idealization, and in a word humanism, if it is to enter the kingdom of man well equipped for man's highest work in the world" (ibid., v. 1, p. xvii). But upon closer analysis of Hall's work, especially in comparison to other accounts of

psychological recapitulation, it becomes clear that his account of primitive life was more fanciful than factual.

Throughout Hall's writings, there is a sense that he was dissatisfied with the world as he saw it; that his major work, Adolescence, was not so much an objective account of the adolescent psychology, but a call to recognize the contribution of emotions toward the constituition of a well-balanced psyche. In each account of the difficulties observed to frequently occur during adolescence Hall almost invariably returned to his thesis that such difficulties were the result of the psychological collision between the instinctual urge to indulge in the freedoms of man's idyllic prehistoric life and the "suppressions" and "repressals" which civilization demands of the modern child. Hall's solution was, therefore, to work within the guidelines provided by a clear understanding of hereditary factors: "We have to deal with the archeology of mind" (ibid., v. 2, p. 61).

However, Hall's own attempt at this sort of "archeology" was far from systematic. In following the premise of recapitulation theory, one would expect a type of stage theory describing the contribution of each epoch in human history to each psychological stage of development in the ontogeny of the modern individual. Instead, the entire past was treated in accordance with a very naive anthropological understanding; for Hall, history was virtually divided into two epochs, pre- and post-civilization.

Similarly, Hall provided only a few vague explanations as to how the phylogenetically older hereditary impulses in childhood differed from those contributing to adolescence. For example, Hall attributed the onset of self-identity in adolescence as an echo of the moment in primitive history when "in some remote, perhaps pigmoid, stage of human evolution, when in a warm climate the young of our species once shifted for themselves independently of further parental aid" (ibid., v. 1, p. ix-x). The highly speculative character of such explanation was found to be typical of Hall's thoughts on man's ancestral past. For the most part, Hall viewed primitive history as one vast period during which an innumerable amount of instincts were formed. The accounts given intended to explain the origin of these many instincts, as well as the specific character of the instincts, were found to be highly questionable.

Yet, despite these serious flaws in Hall's account of psychological recapitulation, his work was widely received by a public that was, by 1904, well familiar with the idea of recapitulation. And, despite its awesome length (1337 pp.) Hall's Adolescence sold a record twenty-five thousand copies in the United States within its first year of publication. Later, an abridged volume, omitting several of the original book's chapters on sex, was used as a school text-book (Ross, 1972, p. 336). These facts give some indication as to the pervasive

influence of Hall's ideas on psychological recapitulation in American education and psychology throughout the twentieth-century.

-8-

James Mark Baldwin: Society and the Individual Compared to Phylogeny and Ontogeny.

During Hall's time there was only one other center in North America, apart from Clark University, seriously committed to developmental research. That was the department of psychology at the University of Toronto under the direction of Princeton graduate, James Mark Baldwin (1861-1934) (Sewny, 1945, p. 2). While at Princeton, during the years 1881 to 1884, Baldwin had already begun work on his own account of mental development--an account which also relied upon the biological principles of recapitulation theory.

Again, this coincidence of ideas should not appear surprising; for by the time Baldwin had finally published his first account of psychological recapitulation in 1894, in a work entitled, Mental Development in the Child and the Race (1906; 3rd ed.), other attempts to extend the principles of evolution to human behavior had already been been brought forward by various writers. Preyer's work, The Mind of the Child, first published in 1882, has already been discussed. In addition, the very popular works of some of the most eminent biologists of the day may also be recognized for their efforts to extend evolutionary principles to explain human behavior. These include: Charles

Darwin's The Expression of the Emotions in Man and Animals, first published in 1872 (1973). Then, there was Haeckel's pseudo-evolutionary ideas in his Generelle Morphologie, published in 1866, and, more significantly in terms of an extension to human development, The Evolution of Man (1876). All the major works by Herbert Spencer, British philosopher and founder of Social Darwinism, should also be included in this category, e.g., "The Comparative Psychology of Man" (1878; cited in Robinson, 1977, pp. 7-20). And, finally, there was also the extensive work on this subject presented by the biologist George John Romanes, who had published ideas very similar to Spencer's in his books, Mental Evolution in Animals (1885) and Mental Evolution in Man (1888).

It is very likely that each of these writers, especially Spencer, influenced the construction of Baldwin's "evolutionary" view of the process of mental development. However, of all the authors listed above, only Haeckel and Baldwin focused upon an extension of recapitulation theory in order to explain psychological phenomena; the others mentioned were more or less faithful to the Darwinian model of evolution. Though Haeckel and Baldwin both claimed that their ideas were based on evolutionary principles, their understanding of evolution was actually quite removed from what Darwin had originally proposed. Baldwin's incorporation of recapitulation theory within his outlook on

developmental psychology is the subject of this chapter.

Novel Features of Baldwin's Account of Psychological Recapitulation.

Like Hall, Baldwin also studied under Wundt (Sewny, 1945, p. 15). It was from Wundt's work in so-called "folk psychology" that Baldwin became convinced that a study of the social relations between the individual and society was not outside the range of scientific investigation. However, unlike Hall, Baldwin did not pursue a treatment of mental development which reduced the matter to strictly biological terms. For instance, Baldwin vehemently criticized any account which proposed that society was merely the consequence of an instinct for gregarious behavior. He argued that such explanations posit nothing more than an "analogy" between human and animal behavior, "and by thus levelling the higher down to the lower, we are failing to recognize the essential process by which, and by which alone, all through the whole organic evolution, higher functional forms are reached by development from lower" (1906, p. 19).

Baldwin further argued that the human species represents a unique position in the "phylogenetic series" since man is the only species which has been endowed with a nervous system capable of extending beyond mere instinctual behavior. It was on the

basis of this reasoning that Baldwin did not follow a strict adherence to the recapitulation theme, according to which

> we should find the child first passing through a stage of very varied and admirable instinctive adjustments,--corresponding to the instinctive equipment of the brutes,--and then later losing these instincts when it learns to act voluntarily. (...) We find instead that he passes directly from the suggestive, sensori-motor, stage, which is much lower and earlier in the phylogenetic series than the extreme instinctive stage, directly to the volitional stage. (ibid., p. 24)

Baldwin's term, "volitional stage," referred to the child's innate tendency to concentrate attention upon elements in his environment during the process of learning. Thus it was assumed that the child would rely upon phylogeny only to provide the necessary biological equipment required for the capacity to learn. In this respect, while Baldwin's account is similar to Hall's in that both theorists relied upon the principles of recapitulation theory, the former's arguments represent a definite advance over the deterministic concept of human behavior. Baldwin also recognized the important contributions made by the more immediate social aspect of human behavior. This distinction may be more explicitly drawn by noting that, in contrast to Hall, Baldwin also included more recent historical

advances in the intellectual package inherited by the child:

> He is born with a more 'broken up' or mobile nervous organization, because his immediate ancestors have had full consciousness and volition, whose function is to secure new adaptations by choice, memory, etc., in opposition to the old reflex adaptations of animal instinct. The long period of his infancy has come with this mobility and relative helplessness, to give him time to acquire these higher conscious adaptations. (ibid., p. 282)

Baldwin further deviated from the other accounts discussed so far in suggesting that the means by which the child acquires these "higher conscious adaptations" are essentially social in nature. Specifically, he claimed that the child assimilates the complex behavioral patterns exhibited by individuals in his immediate environment through imitation: "The child is par excellence the animal that learns; and if imitation is the way to learn, he has 'chosen the better part' in being more imitative than the rest" (ibid., p. 282).

The Role of Imitation in Mental Development.

In his explanation as to how the child attains "the fruits of his social heritage," Baldwin repeatedly turned to imitation. In his view, imitation implied far more than just the automatic

copying of various behaviors:

> By imitation he gets the 'feel' of things that others do, and so learns to value the safe and sane; by imitation, he tries on the varied ways of doing things, and so learns his own capacities and limitations; by imitation he actually acquires the stored up riches of the social movements of history; by imitation he learns to use the tools of culture, speech, writing, manual skill, so that through the independent use of these tools he may become a more competent and fruitful individual; finally, it is by imitation in the way of varied and effortful trial that he succeeds in being original and inventive. (1911, p. 21)

Baldwin's recognition of the qualitative difference between human and animal behavior appears promising until this point where he has broadly claimed that imitative behavior alone accounts for this difference. By comparison, this amounts to the same problem encountered with Hall's use of instinctual behavior, except that for Baldwin, it is the capacity to imitate which supposedly provides the sole means for the transmission of knowledge from one generation to the next. The unlimited capacity which Baldwin attributed to imitation is captured in his slogan: "The social process is imitation" (1897, p. 28).

Further examination of this critical point only confirms this first impression of Baldwin's use of imitation, and it soon

becomes apparent that he had only marginally widened the scope of instinctual behavior. Instead of a biological impulse to "play out" certain behavioral patterns, as proposed in previous accounts, Baldwin has substituted an "innate tendency" to record whatever behavior is in the organism's immediate environment. Baldwin wrote: "The child is therefore actuated by all the impetus of race history to imitate, to use his own motor apparatus upon every hint which he gets of a movement, and this tendency takes, of course, no account of exceptions" (1906, p. 285).

The Grafting of Phylogeny upon Ontogeny.

Baldwin assumed that through the imitation of habits and traditional patterns of behavior the child could come to incorporate all the wealth of his culture's social evolution. Since the course of ontogeny is expected to describe the learning of the most simple habits in the early years, with the assimilation of increasingly more advanced habits to follow, it struck Baldwin that "the relations of individual development to race (cultural) development are so intimate--in fact, the two are identical--that no topic in the one can be treated with great clearness without assuming results in the other" (ibid., p. viii). Recapitulation theory appeared to offer the means by

which this relationship could be explained. Baldwin wrote:

> The infant is an embryo person, a social unit in the process of forming; and he is, in these early stages, plainly recapitulating the items in the social history of the race...The embryology of society is open to study in the nursery. (ibid., p. 148)

Despite his exaggeration of the significance of imitation, Baldwin brought into focus the need to further explore the relations between the individual and society. In some places, his approach to the relations between the individual and society reflect a truly dialectical understanding of this particular unity, e.g.: "The individual is a product of his social life, and society is an organization of such individuals" (ibid., p. 118).

Baldwin was, in fact, introduced to dialectical thought during his graduate studies under the idealist philosopher, James McCosh (1811-1894). It was also McCosh who had inspired his student to combine Hegel's account of the dialectical development of consciousness with Darwin's theory of biological evolution (Sewny, 1945, pp. 1-2). It is beyond doubt that a dialectical approach to the problem of development of consciousness has already shown tremendous promise in psychology (e.g., Vygotsky, 1962; Leontiev, 1981). However, this progress does not necessarily suggest that any dialectical approach to mental development is infallible.

As dialectics implies a careful observation of the relations of necessity between objects or events set in contradiction to one another, the true nature of the particular object or event from which such an investigation begins is crucially important. For the objective idealist philosopher G.W.F. Hegel (1770-1831), the material realm, was to be considered as merely a reflection of an underlying essence. Contrary to the Platonic sense of this supposition, Hegel argued that there is not simply one essence corresponding to each category of material phenomena, but rather that all such categories stand in a deductive relation to each other, and that, as a consequence, all categories are ultimately included within the same universal unity, the Absolute Idea. Following this general principle, Hegel's Phenomenology of Mind (1967), described a logical progression from the most fundamental form of thought to the most fully aware state of consciousnesss.

It should be noted that Hegel's account was not intended to describe a chronological order but only a logical sequence of deductions. Hegel was not interested in the material conditions which allow for such development, since he assumed that the course of development was determined by the logical substrate by which matter is conditioned. In recognition of Hegel's priority of the idea over matter, his philosophical system belongs to an idealistic conception of the forces of nature. Thus, Hegel's view contrasts with the now prevailing materialistic or

scientific methodological system, which has repeatedly demonstrated that in order to account for whatever developments take place in nature, it is necessary to return to an examination of the properties of those objects or events in question.

Now, in his attempt to combine the idealistic assumptions established in Hegel's dialectics within his largely biological account of human ontogeny, Baldwin presented an awkward pseudo-scientific account of mental development. For example, although Baldwin gave some attention to the material conditions necessary for biological evolution, he perceived the course of evolution as the unfolding of a predetermined sequence of events, similar to Hegel's unfolding of the Absolute Idea. The notion of one absolute path of development which supposedly reigns over all instances of change comes to the forefront in Baldwin's claim that the pattern of changes described by evolution are also described by the symmetry of ontogeny and phylogeny. This deterministic outlook will appear plausible only if one ignores the element of chance which pervades the biological world. However, by ignoring this aspect of nature, one ignores the influence of random variation in the genetic constitution of the species, an insight which represents a central theme in the modern Darwinian account of evolution. Thus, Baldwin's view of evolution should be considered as more teleological than biological.

On the basis of the symmetry assumed to exist between ontogeny and phylogeny, Baldwin argued that there must also be a symmetry between the evolution of the species and the development of consciousness. Thus, he believed that psychologists "are at liberty to use what we know of the correspondence between nerve process and conscious process" (1906, p. 13). Both processes were assumed to be represented in the development of society, as well as in the development of the individual. Both movements also followed a quasi-Hegelian triadic set of stages: (1) the non-reflective state; (2) the spontaneous and imitative state and (3) the reflective or social state of awareness (Baldwin, 1897, pp. 7-89). In agreement with Hegel, he also argued that only until the child, or society as a whole, had achieved a level of social consciousness proper that an ethical understanding could be finally realized.

Criticism of Baldwin's "Dialectical" Account of Social and Psychological Development.

In a very general sense, the history of social behavior depicted in Baldwin's account appears quite reasonable. For instance, some species do exhibit little more than automatic instinctual behavior. Their reflexive nature is even more pronounced when compared beside those animals capable of rapidly

adapting to new situations. Furthermore, the difference between these levels of consciousness and man could well be described as one of a non-reflective vs. "reflective" state of consciousness.

However, though Baldwin claimed that this progression follows a dialectical process, he did not provide an account of the necessity involved in this series of changes. Why, for example, must have consciousness necessarily transformed itself from a non-reflective to a reflective condition? What were the conditions which would have brought about this qualitative shift? To answer these questions, Baldwin presented only vague references to the biological grounds supposedly responsible for these changes, but such grounds cannot be relied upon to provide a sufficient explanation. The following critical examination of his biologically oriented supporting arguments illustrates this inadequecy.

In the first chapters of Mental Development in the Child and the Race (1906), the book which summarized his thoughts on psychological recapitulation, Baldwin claimed that there exist some crucial distinctions in the neurological aspect of the species. In agreement with a contemporary physiologist, Dr. M. Foster, Baldwin pointed to one particular "simple structural device" that supposedly allows man quick, conscious adaptation and, thus, provides the human species with its decisive edge over the animals. He quoted the following statement from Foster's

comparative analysis:

> When we pass in review a series of brains from the lower to the higher, and see how the pyramidal system is, so to speak, grafted on to the rest of the brain,...from the advantages it offers to the more primitive path from segment to segment along the cerebo-spinal axis, has by natural selection been developed into being in man the chief and most important instrument for carrying out voluntary movements. (Foster, 1856; cited in Baldwin, 1906, p. 22)

The fallacy of this sort of explanation is indicated by the fact that it does not answer the question it initially set out to resolve, i.e., answering the question this way completely ignores the essential questions of how and why such apparatus originally came into being. To say, for example, that the "pyramidal system" allows for the dawning of human consciousness is only a slightly more sophisticated explanation than saying that the brain allows for the existence of consciousness. The question still remains as to why consciousness should form as a consequence of the relations between inorganic matter and organic matter. What is missing from Baldwin's account is a discussion of these relations between the organism and its environment, and a description of how the character of such relations should provide the conditions for the development of consciousness. The simple abstraction of one component from the human nervous system

and to label it the seat of consciousness is tantamount to the archaic practice of phrenology.

Nevertheless, this type of error is to be expected from Baldwin's account as it begins, not from an explanation of the changing relations between evolutionary advancements within the state of organisms and prevailing material conditions, but from a fundamentally idealistic scheme which describes evolution as a series of qualitative leaps from one stage to another. The result was that Baldwin frequently resorted to "emergent evolutionism," the nineteenth-century philosophy which claimed that for any change which may appear over the course of development, such change may not be entirely accounted for in terms of preceding conditions (Goudge, 1967, v. 2, pp. 474-476). The combination of the gases oxygen and hydrogen which creates the new emergent quality of the liquid water is frequently cited as an example of emergentism.

Again, the problem here involves the fallacious abstraction of particular properties inherent in the object, while neglecting their functional relation; an omission which completely distorts any scientific inquiry into the true nature of its change. Without giving proper attention to material constraints, nor the necessity of a certain limitations to the course of development where such constraints prevail, there is nothing to restrict the "arm-chair" evolutionist from presenting some very dubious

assertions. Thus, Baldwin was able to waffle between the three lines of development alluded to earlier, viz., the supposedly symmetrical paths of biological, psychological and social evolution.

A disregard for the relations between the individual and surrounding material conditions is especially evident in Baldwin's application of his position on cultural evolution ("phylogeny or race psychology"). As in previous accounts, Baldwin also found that the concept of psychological recapitulation theory could provide a "scientific" justification for personal prejudices. For example: During the First World war, Baldwin was working in France. He had been elected, in 1910, to succeed William James as Correspondent of the Academy of Moral and Political Sciences of the Institute of France (Sewny, 1945, p. 9). While he and his family were travelling back to France from England, their passenger ship was torpedoed by a German submarine. One of Baldwin's daughters was seriously injured in the incident. From this time forward, Baldwin came to despise the Germans and attributed the war to a psycho-evolutionary arrest in their social development: "Germany being still 'at a tribal stage of political development,' its people lacked the humanist and cosmopolitan outlook so characteristic of the French,..." (ibid., p. 10). In another place, Baldwin declared that the

> leading nations of today, are all progressive and making no comparisons that would serve to arouse disputation, I think it would be safe to say that Anglo-Saxon civilization is characterized by great moral earnestness and the genius for self-government that goes with it; while it lacks a correspondingly high development of artistic sensibility and creativeness. The Latin mind, on the contrary, notably as illustrated by French culture, shows remarkable superiority on the side of sentiment, and all that sentiment creates--literature, fine art, personal taste and refinement. (1911, pp. 159-160)

Two points of criticism may be levelled at Baldwin's non-dialectical anaylsis: (1) that he had over-emphasized the role played by biological inheritance, and (2) that he did not work through the dialectical relation which exists between individual and society in a consistent manner. Although he had the foresight to indicate that "the individual is a product of his social life, and (that) society is an organization of such individuals" (ibid., p. 118), Baldwin frequently contradicted his call for a more social understanding of human development by returning to biological determinism. For example, it was previously noted that Baldwin abhorred the view that human society is a product of an instinct for gregariousness. Instead, he argued for the position that an individual learns, via

imitation, how to behave in accordance with existing social and ethical standards.

How, then, did Baldwin account for criminal behavior? In answering this crucial question, he first reminded the reader of the principle which stated that the capacity to imitate is biologically inherited: "The tendency to imitate has thus become a congenital thing, given by endowment in the motor organism" (1906, p. 285). Since "everything that (man) learns is copied, reproduced, assimilated, from his fellows" (1897, p. 87), then it follows that "the socially unfit person" is a result of some hereditary "variation" which has hampered his ability to learn ethical practices.

> It is (therefore) the duty of each individual to be born a man of the social tendencies which his communal tradition requires of him; if he persist in being born a different sort of man, then, as far as his variation goes, he is liable to be found a criminal before the bar of public conscience and law, and to be suppressed in an asylum or a reformatory, in Siberia or in the potter's field.
>
> (ibid., p. 77)

In sum, even though Baldwin referred to the individual as "a social outcome rather than a social unit" (idid., p. 87), he showed no hesitation in placing the blame for criminal behavior fully upon the shoulders of the criminal. "The criminal is a man

of poor judgment," Baldwin declared. "It may be that he has a bad strain of natural heredity, what the theologians call 'original sin'; he is then an 'habitual criminal' in Ferri's distinction of types" (ibid., p. 86). For Baldwin, the conclusion which naturally follows from these statements is that, if, because of his genetic make-up, the criminal is unable to act otherwise, then society must curb this "sport" in the same way that natural selection eliminates maladaptive organisms within a given animal population: "In the organic world it is the organic causes themselves which work with the environment to secure a race progressively better as individuals; in the social world it is the social whole which applies social criteria for the eradication of what is harmful" (ibid., p. 74).

Baldwin used this same line of reasoning in his defence of eugenics: "What is more important to a race or group than the sort of children produced by it?... Weaklings, diseased persons, mental and moral incapables are not only freely produced, but they are allowed in turn to perpetuate themselves by further reproduction" (1911, p. 167). His solution for such unfortunate individuals was only slightly more humane than his euphemistic suggestion to "select out" criminals. To deal with these "incapables," Baldwin proposed that "the only course that would be actually and permanently effective is some process of sterilization of the persons of undesirable heredity which would

not, however, destroy the sexual function itself" (ibid., p. 169).

Conclusion.

Baldwin's arguments for biological determinism were directly contrary to his more accurate view of man as "a product of his social life". However, as if to follow the deterministic tradition of all other accounts of psychological recapitulation, Baldwin assumed that mental development over the course of ontogeny was genetically predetermined, leaving little or no room for immediate relations of a material or social nature.

The inconsisteny of Baldwin's account implies that one could use his writings to support virtually any psychological position. This is a serious criticism which perhaps warrants another "side by side" comparison of statements. At one point, Baldwin had claimed:

> The truths and norms which are of social derivation and social value are...reflected into the individual. He has no strictly individual standards. (ibid., p. 67)

But, within the same chapter, Baldwin offered the following contradiction:

> It is from the individual that the inventive ideas come... it is only after society has generalized the individual's

> thoughts in a form acceptable to the social body, that these can be embodied in institutions of public value. (ibid., p. 56)

It was suggested that the central difficulties inherent in Baldwin's account were largely due to his idealistic point of departure. In his conclusion of The Individual and Society (1911), Baldwin explicitly stated his support for idealism and its implications for positing a primacy of ideas over the progress measured by man's evolving relations to his material environment: "It has largely been my purpose to show that it is to mental movements and processes that social life owes its existence, and its progress..." (ibid., p. 210).

The other major difficulties encountered in Baldwin's use of recapitulation theory were: (1) logical inconsistency and (2) an exaggeration of the role played the biological conditions of human mental development. It was further suggested that both of these errors are a consequence of all pseudo-evolutionary accounts characterized by their minimal regard to the material relations involved in man's biological and socio-historical development.

Sigmund Freud: The Recapitulation of Neurotic Behavior.

In the history of biology, recapitulation theory achieved its most popular moment when Haeckel published The Riddle of the Universe (1902). Haeckel had delayed publishing this book until the turn of the century with the idea that it should be viewed as a harbinger to a new era in intellectual thought. However, his hopes for recapitulation theory as a biological law did not last through the 1920's, recapitulation as a psychological law would survive much longer time.

This history is ironic considering that Haeckel had frequently claimed that recapitulation theory should eventually serve to subsume other fields of social inquiry within its biological framework. It may be noted that in maintaining this view, Haeckel had only extended recapitulation theory one step further than the proposals suggested by the accounts of psychological recapitulation examined so far. These accounts had explained the basic elements of human consciousness as a reflection of earlier periods in human phylogeny; Haeckel merely argued that the regression backwards in time should go even further to animal behavior, the stage before the onset of a stricty human history. With the same disdain toward psychology characteristic of like-minded contemporary "sociobiologists,"

such as E.O. Wilson (1975), Haeckel wrote, "that most of psychological literature of the day is so much waste paper (1902, p. 19).

Sigmund Freud (1856-1939) believed that psychoanalysis was grounded upon a sound biological principle, viz., recapitulation theory. It is unlikely that he ever thought of his books as "so much waste paper". However, it will be shown that without recapitulation theory, Freud would probably not have been able to formulate his work on the dynamic relation between individualistic instinctual drives and collectivistic social restrictions. It was precisely this relation which represented a central theme in Freud's psychoanalytic theory, as is evident from his comments on neurosis, as can be seen from the following quote:

> All these (neurotic) experiences had involved the emergence of a wishful impulse which was in sharp contrast to the subject's other wishes and which proved incompatible with the ethical and aesthetic standards of his personality. There had been a short conflict, and the end of this internal struggle was that the idea which had appeared before consciousness as the vehicle of this irreconcilable wish fell a victim to repression, was pushed out of consciousness with all its attached memories...Thus the incompatibility of the wish in question with the patient's

> ego was the motive for the repression; the subject's ethical and other standards were the repressing forces. (1910, p.24)

The point at which recapitulation theory enters this discussion is not exactly clear on the basis of this quote alone. This quote was intended to present the general thrust of psychoanalysis. In order to recognize its connection to recapitulation theory, one must consider how Freud explained the "emergence of a wishful impulse" assumed to oppose the individual's "ethical and aesthetic standards":

> The psychic impulses of primitive man possessed a higher degree of ambivalence (conflict) than is found at present among civilized human beings. (...) Neurotics who are compelled to reproduce this conflict,... may be said to have brought with them an atavistic remnant in the form an archaic constitution the compensation of which in the interest of cultural demands entails the most prodigious psychic efforts on their part. (1918, p. 88)

In short, Freud has assumed the presence of a biological predisposition to recapitulate ancestral experience. The conflict situation which precipitates the onset of neurotic behavior arises from the primeval "impulses" appearing in ontogeny thwarted by the modern standards of civilized, social behavior. As to the extent of neurosis in the twentieth-century, Freud said: "We humans, with the high standards of our

civilization and under the pressure of internal repressions, find reality unsatisfying quite generally" (1910, p. 50). The intimate relations between psychoanalysis and recapitulation theory will become much clearer over the course of the following discussion.

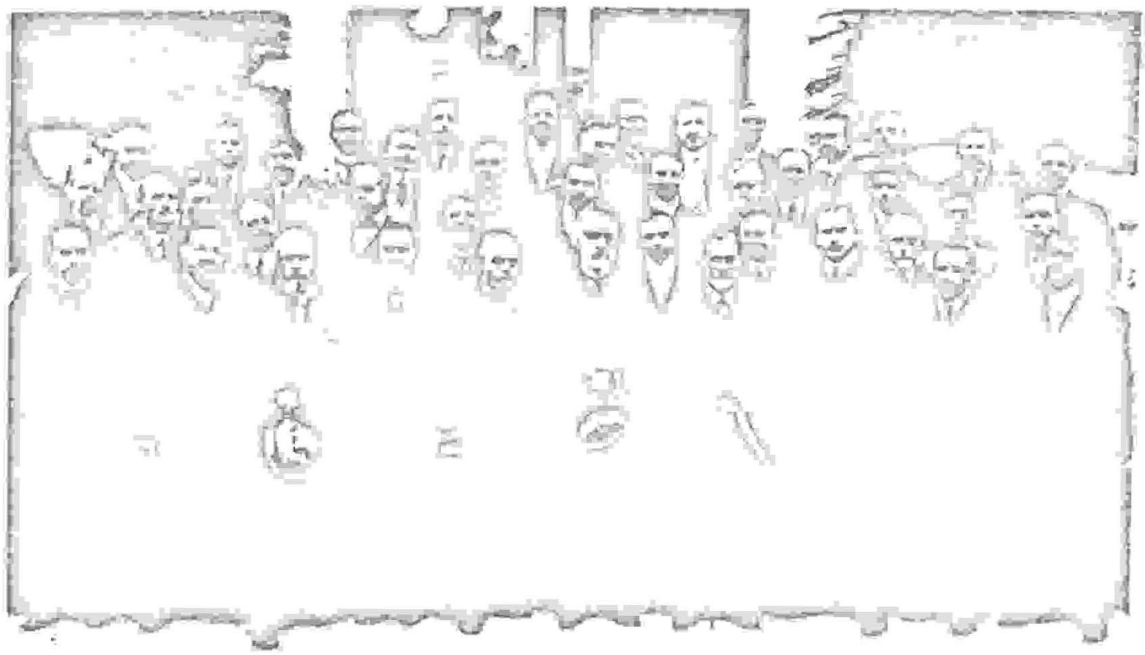
The Clark Conference of 1909.

The quote immediately above is an excerpt from Freud's address at Clark University, given in 1909. That year could well mark the most popular moment for recapitulation theory in the field of psychology. On his own initiative, G. Stanley Hall had invited Freud to speak at Clark's second decennial conference (Ross, 1972, p. 386). Ross also noted that "Hall was quite conscious of the fact, in inviting Freud, that interest in his work was increasing, particularly among the influential group of psychotherapists" (ibid., p. 387). The psychotherapists referred to here are those who followed the psychoanalytic model in Europe and America, particularly in Boston and New York. With their incorporation of the relatively new "theory of evolution" (actually recapitulation theory) within their outlook, this group represented the leading edge in psychology at that time. It was the new "band-wagon," with the result that much of the theoretical literature of this period appeared to be very

similar. The similarity between some of Hall's thoughts on instinctual "impulses" and Freud's was indicated in the previous chapter, but one more example of this fascinating coincidence of ideas is presented here in order to impress upon the reader that the notion of psychological recapitulation was truly pervasive during the first years of psychology. Hall wrote:

> Psychoses and neuroses abound in early adolescent years more than at any other period of life. This causes great emotional strain, which some have described as a kind of repressed insanity that is nevertheless normal at this period. To keep down morbid impulses is often a very difficult matter in this age of stress. There is an intense antagonism between egoistic and racial motives. One writer (W.S. Christopher, 1902) would almost have us believe that the relative reduction of the individual involves a latentizing of energy which builds up the great organs involved in reproduction... (1904, v. 2, p. 266)

Similar comparisons made be shown to exist between Freud's ideas and those belonging to other contemporary writers, all of which, again, points to the conclusion that recapitulation theory was definitely "in the air." Indeed, of each of the psychologists who appear in the photographic record of the 1909 conference on the following page, many had already touched upon the recapitulation theme in their work before Freud's visit.



This famous record of the Clark Conference of 1909 was probably taken on Friday, September 10, and does not include everyone who attended. Photo courtesy of Robert G. Hall

1. Franz Boas
2. E. B. Titchener
3. William James
4. William Stern
5. Leo Burgerstein
6. G. S. Hall
7. Sigmund Freud
8. C. G. Jung
9. Adolf Meyer
10. H. S. Jennings
11. C. E. Seashore
12. Joseph Jastrow
13. J. M. Cattell
14. E. B. Buchner
15. E. Katzenellenbogen
16. Ernest Jones
17. A. A. Brill
18. W. H. Burnham
19. A. F. Chamberlain
20. Albert Schinz
21. J. A. Magni
22. B. T. Baldwin
23. F. L. Wells
24. G. M. Forbes
25. E. A. Kirkpatrick
26. Sandor Ferenczi
27. E. C. Sanford
28. J. P. Porter
29. Sakyo Kanda
30. Kikuoi Kakise
31. G. E. Dawson
32. S. P. Haves
33. E. B. Holt
34. C. S. Berry
35. G. M. Whipple
36. Frank Drew
37. J. W. A. Young
38. L. N. Wilson
39. K. J. Karlson
40. H. H. Goddard
41. H. I. Klopp
42. S. C. Fuller

(Photograph and key from Ross, 1972, p. 389).

In addition to providing a meeting of great minds, the Clark Conference of 1909 was also significant in that it was upon this occasion that Freud first enunciated his thoughts on the Oedipus complex. As fantastic as this set of psychological symptoms may first appear, the Oedipus complex was the cornerstone of Freud's psychoanalytic model. In his conclusion of Totem and Taboo (1918), Freud claimed "that the beginnings of religion, ethics, society, and art meet in the OEdipus complex. This is in entire accord with the findings of psychoanalysis, namely, that the nucleus of all neuroses as far as our present knowledge of them goes is the OEdipus complex" (p. 202).

The primary object of Totem and Taboo was to introduce the nature of the Oedipus complex and to give the notion empirical support in the form of psychogical and anthropological data. The value of this specific work among the voluminous amount of literature that Freud published may be summarized from Ludwig Eidelberg's comment that "applied psychchoanalysis began with Freud's study of anthropological data from the psychoanalytic point of view in Totem and Taboo" (1965, p. 348).

Recapitulation Theory and the Oedipus Complex.

Upon reading Totem and Taboo, it is clearly evident that Freud had, in fact, adopted the recapitulation idea to support his notion that there is a relation between the experience of our

ancestors and contemporary instances of neurosis. This much is evident right from the following passage which appears on the first page of the book:

> In a certain sense he (primitive man) is still our contemporary; there are people whom we still consider more closely related to primitive man than to ourselves, in whom we therefore recognize the direct descendants and representatives of earlier man. We can thus judge the so-called savage and semi-savage races; their psychic life assumes a peculiar interest for us, for we can recognize in their psychic life a well-preserved, early stage of our own development. (Freud, 1918, p. 3)

In contrast to the "armchair anthropology" which flawed the psychological accounts previously examined, Freud supported his estimation of ancestral behavior by providing frequent reference to the most current anthropological research. However, a closer examination of Totem and Taboo soon reveals that Freud had invariably interpreted all social behavior on the part of primitive man as only thinly veiled attempts to keep more hedonistic and self-centered desires under restraint. Thus, Freud depicted primitive man as somewhat schizophrenic or, more precisely, as neurotic insofar as primitive man was thought to be in perpetual conflict between his own selfish desires and the aims of his society. Indeed, this assessment of primitive life

could be gathered from the full title of the book: Totem and Taboo: Resemblances between the Psychic Lives of Savages and Neurotics (1918). In sum, his entire account attempts to demonstrate a three-fold parallel between the behavior of young children involved in the recapitulation of the experience of his adult ancestors, the behavior of neurotics who had partially regressed to childhood, and the behavior of "savages,"--also represented by currently existing non-industrial societies--all of whom were assumed to be barely coping with their primal instincts. Thus, in speaking of the relation between neurotics and children, Freud claimed:

> Not only do they remember painful experiences of the remote past, but they still cling to them emotionally; they cannot get free of the past and for its sake they neglect what is real and immediate. This fixation of mental life to pathogenic traumas is one of the most significant and practically important characteristics of neurosis. (1910, p. 17)

What was the nature of these "pathogenic traumas" which intrude upon the mental development of the child, and create such painful experiences which so often adversely affect adult behavior? Freud discovered the answer to this question in descriptions of the fantastic, dream-like imagery his patients reported to him in "talking sessions." He characterized their

free mental associations as containing "pathogenic wishful impulses" of an "erotic instinctual" nature which contrast with the "high standards of our civilization" (ibid., p. 40; p. 51). In order to resolve this conflict, Freud advised his patients to "reach back" to their childhood experiences since only these would be able to "explain the susceptibility to later traumas and it is only by uncovering these almost invariably forgotten memory-traces and by making them conscious that we acquire the power to get rid of the symptoms" (ibid., p. 41).

Freud observed that these disturbing childhood memories were typically sexual in character. He further noted that such events usually involved the awakening of the patient's sexual desire for either one of the parents, e.g., that as a boy, the patient secretly wished to engage in sexual relations with his mother and, thereby, take the place of his father. While this would create positive relations for one parent, the child was expected to be overcome by violently hostile feelings which the child would project as emanating from the other parent. Thus, Freud wrote:

> The complex which is thus formed is doomed to early repression; but it continues to exercise a great and lasting influence from the unconscious... Together with its extensions, it constitutes the-nuclear-complex of every neurosis, and we may expect to find it no less actively at

> work in other regions of mental life. The myth of King Oedipus, who killed his father and took his mother to wife, reveals, with little modification, the infantile wish which is later opposed and repudiated by the barrier-against incest. (ibid., p. 47)

When Freud further explored the nature of this universal "barrier" to sexual activity, or what he later referred to as the "incest taboo," he discovered that its origins derive from a set of behaviors common to man's ancestors. The term "taboo" was taken from a Polynesian word which connotes a thing or action as being both "sacred" and "dangerous" or "forbidden" (Freud, 1918, p. 26). The term "totem" usually refers to an animal, sometimes, a plant or element of nature. According to Freud, the totem is recognized by the tribe as its primal ancestor: "The members of a totem are therefore under a sacred obligation not to kill (destroy) their totem, to abstain from eating its meat or from any other enjoyment of it" (ibid., p. 26). This "sacred obligation" to the clan's totem was assumed to have been originally formed upon the universal belief that the taboo had at one time actually been violated.

This violation had occurred in the following manner: Based on Charles Darwin's speculations concerning the social structure of the first human groups, Freud argued that the more recent appearance of the totem animal is a substitute for the "primal

father," the leader and embodiment of all the social customs which governed the conduct of the first human societies. The primal father's authoritative position entitled him to exclusive possession of all the fertile women in the clan. The women, and the lesser males, obeyed the clan's leader and respected him as their totem. However, this relative stability within the group was eventually broken by the sexual frustrations shared by the subservient male members forced to seek sexual relations with females outside of the clan. The hedonistic desires of these males finally erupted in the face of the established social order. The younger males killed and ate the primal father and took his women (their mothers) to be their own wives (ibid., pp. 182-4).

In the midst of the chaos which resulted from this "fall from grace" (and Freud did not resist the temptation to draw analogies between these events and similar scenarios depicted in various religious texts), the males resolved their overwhelming sense of guilt by exhibiting what Freud referred to then as "subsequent obedience," later referred to as "reaction formation."

> They undid their deed by declaring that the killing of the father substitute, the totem, was not allowed, and renounced the fruits of their deed by denying themselves the liberated women. Thus they created two fundamental taboos of totemism

> out of the sense of guilt of the son, and for this very reason these had to correspond with the two repressed wishes of the Oedipus complex. Whoever disobeyed became guilty of the only two crimes which troubled primitive society. (ibid., p. 185)

Freud was convinced that "the removal of the primal father by the band of brothers must have left ineradicable traces in the history of mankind" (ibid., p. 200). Like Carl Jung, who was to later expand upon his mentor's central ideas, Freud believed that his assumption that descendent generations "re-lived" or, recapitulated, the violent emotions of this primeval event was supported by "signs of reminescence" in current "beliefs, language and philosophy" (ibid., p. 101). Although he thought that these "signs" were most readily observable in the customs and expressions of presently existing "primitive" cultures, they were also assumed to be evident in the behavior of everyday life, "in the form of mistakes in talking, reading, writing, forgetting, dreams and wit...(these) psychic formations are therefore nothing but manifestations of the struggle with reality, the constant effort to adjust one's primitive feelings to the demands of civilization" (Brill; cited in Freud, 1918, pp. xiii-xiv).

Criticism.

According to Freud, the validity of his far-reaching hypothesis was demonstrated by the sheer ubiquity of the conflicts which often appear between the individual and the social environment. The common occurrence of various confrontations between self-serving hedonism and collectively oriented ethical standards, or the typical tensions of familial relations, were all considered to stand as proof of Freud's speculations. But the problem with this sort of proof is that Freud had not demonstrated the necessity of accepting his explanation over any other; that such tensions between the individual and society, between members of a family do exist does not necessarily imply that Freud's explanation of those tensions is the only true and correct one. Moreover, by not making allowances for the multitude of other factors which could be involved in such situations, Freud's account begins to appear too vague and abstract.

Indeed, it was during the 1920's and '30's, that psychoanalysis lost much of its appeal due to the widespread practice of generalizing the Oedipus complex to essentially any situation where one dominant element suppressed a particularly rebellious subservient party, whether this relation pertained to politics, literature, history or any other number of like

situations. Despite the objections of the psychoanalysts at that time, the ease with which lay persons could find signs of an Oedipus complex at work was a direct consequence of Freud's own infamous talent for "explaining" a wide range of behaviors on the basis of a remarkably few principles.

In terms of his use of recapitulation theory, Freud's account may be questioned on two points: First, in accordance with what may be considered the general principles of psychological recapitulation, Freud claimed that the development of the individual is expected to pass through various psychological stages which once characterized the typical conscious state of modern man's ancestors. This is a very difficult claim to prove with any appreciable amount of certainty, as it relies solely upon the relatively scant amount of anthropological information left to the modern world concerning man's ancestral past. Although Freud presented an admirable effort to check his speculations against the most reliable data of his time, it is soon apparent to any reader that his account of primitive life was influenced by his own prejudices and the popular biases of the nineteenth-century. This criticism does not require much elaboration. The initial premise that there are direct similarities between "the lives of savages and neurotics," immediately connotes a summary view of primitive lifestyles reminescent of the assertions already

examined in Down's account of congenital idiocy.

As with Down, the primary purpose of highlighting Freud's cultural prejudices is not to dismiss his account simply on the grounds that it is negatively biased against non-European cultural and social practices; but rather to indicate a crucial flaw related to the recapitulationist basis of his theory. To explicate: an inaccurate account of phylogeny, i.e., in this case, the level of mental development of our ancestors, should be expected to equally distort the psychological view of presently existing ontogenies--and this distortion was found to be an outstanding feature of Freud's analysis.

In researching the early history of the human species, Freud's perception was explicitly influenced by his own over-riding hypothesis that ultimately it is nothing more than frustrated sexual desire which is primarily responsible for past and present social behavior. This subtle intrusion of Freud's ideas before the facts is most evident in the assertions he set down in his initial statements concerning the psyche of contemporary "primitives": "We must say that these savages are even more sensitive to incest than we, perhaps because they are more subject to temptations than we are, and hence require more extensive protection against it" (1918, p. 14). Despite the fact that this is a key assumption underlying Freud's view of the central role played by sexual drives, there is virtually no

support for this claim other than the repeated reference to his own sexualist interpretation of social customs and instituitions. There are many occasions in Freud's text where it the presence of circular argument is readily apparent.

Freud's Hobbesian View of Human Nature.

Before proceeding with criticism specifically aimed at certain logical difficulties in Freud's account of recapitulation, there is one other prominent feature of Freud's personal prejudice against primitive man, a bias which appears almost as frequently as his emphasis upon sexual motivations. This was Freud's adherence to a Hobbesian view of the primitive psyche. It is significant to note how this particular view affected his conception of the social contract between the individual and society, both past and present. The pessimistic character of Freud's outlook on natural man may be best illustrated by drawing attention to the following quote:

> ...primitive man seems egotistical. Only if retribution fails to overtake the taboo violator spontaneously does a collective feeling awaken among savages that they are all threatened through the sacrilege, and they hasten to inflict the omitted punishment themselves. (...) Not infrequently the punishment gives the executors themselves an opportunity

> to commit the same sacrilegious act by justifying it as an expiation. This is really one of the fundamentals of the human code of punishment which rightly presumes the same forbidden impulses in the criminal and in the members of society who avenge his offence. Psychoanalysis here confirms what the pious were wont to say, that we are all miserable sinners. (ibid., p. 94)

An element of selfish brutality inundates Freud's entire account of the primitive beginnings of man's moral and ethical standards. This observation is especially significant in light of Freud's support for the concept of psychological recapitulation, i.e., the pessimism which characterized the primitive mind would, therefore, also be thought of as appearing again in the many forms of modern behavior which suggest neurotic behavior.

The far-reaching extent of Freud's pessimistic view of social relations was indicated in his account of the beginnings of modern consciousness. According to Freud, it was a sense of imposed moral duty which formed the original basis of conscience. Freud argued that "the understanding of taboo also throws light upon the nature and origin of conscience" (ibid., p. 89). Freud supported this claim by stating that comparative linguistic analysis has shown the term "conscience" to be "hardly to be distinguished from consciousness" (ibid., p. 89). The abstract

character of this line of argument was continued in his summary statements on the development of consciousness:

> Conscience is the inner perception of objections to definite wish impulses that exist in us; but the emphasis is put upon the fact that this rejection does not have to depend on anything else, that it is sure of itself... Confirmation seems superfluous here; whoever has a conscience must feel in himself the justification of the condemnation and the reproach for the accomplished action. But this same character is evinced by the attitude of savages towards taboo. Taboo is a command of conscience, the violation of which causes a terrible sense of guilt which is as self-evident as its origin is unknown. (ibid., p. 90)

Thus, Freud had arrived at the following historical sequence depicting the evolution of the modern psyche: Consciousness is assumed to be based on moral conscience which is, in turn, based on a primitive understanding of various taboos. Finally, the taboo itself is regulated, not by any moral understanding of the anti-social consequences of one's action, but rather, is enforced by a "terrible sense of guilt" which overwhelms the wrong-doer. By Freud's own admission, the origin of the sense of guilt is unknown (ibid., p. 88; p. 202).

In light of the crucial role which Freud attributed to the

moral conscience and guilt, the inadequecy of this developmental account is surprising. The reader cannot but conclude that Freud was convinced that his own subjective assessment of the role of conscience was sufficient. Many other instances of dogmatic assertion were found in Freud's text where he had simply posited the existence of sexual or selfish motives behind the everyday behavior of both primitive and modern man.

The Fallacious Use of Correlational Evidence.

Freud treated correlations as if they categorically demonstrated the results of a latent causal connection. For example, when he first found resemblances between the neurotic behavior of modern adults and their memories of childhood, he forged a causal link between these two different age spans on the principle that "the child is the father to the man" (1910, p. 49). Later, when Freud extended his analysis of the development of the individual psyche to the development of culture and society, he claimed that the modern neurotic "reproduced" the same "psychic conflicts" which affected the primitive mind. The modern adults who displayed neurotic tendencies were therefore said to have "brought with them an atavistic remnant in the form of an archaic constitution" (1918, p. 88). From a scientific standpoint, it would be expected that this claim would be

followed by an explanation which detailed precisely how such a psychological "constitution" could have become manifest in the mind of the modern individual. In other words, one would want to know what precisely caused this transmission of mental states which are chronologically separated by thousands, if not millions, of years.

Instead of providing an adequate causal explanation, Freud proceeded to prove his hypothesis by pointing to correlations between the customs of contemporary "savages," European neurotics and normal children. Some similarities in behavior probably do exist. But no matter how many correlations Freud brought in to support his recapitulation hypothesis, such correlations simply do not provide adequate proof for the claim that there must exist a necessary causal connection between these different mental states. Other explanations for the correlations Freud provided may demonstrate greater or equally sufficient explanatory power. Moreover, other contradictory correlations from the same sets compared by Freud may be quite easily introduced, thereby disputing his original claim on the same grounds. Most damaging would be other explanations which could completely account for a causal connection between the mental states described by Freud, but do not refer to his hypothesis of psychological recapitulation. The possibility that such explanations exist is made all the more likely by the fact that the "biogenetic law,"

upon which his theory relies was proven to be empirically false.

Apart from the occasional allusion to recapitulation theory, Freud never provided any details as to the empirical nature of the mechanism which supposedly brought about the recapitulation of "atavistic remnants" in the psyche of the modern individual. He excused this serious omission in the following terms:

> Social psychology is in general little concerned with the manner in which the required continuity in the psychic life of succeeding generations is established. A part of the task seems to be performed by the inheritance of psychic dispositions which, however, need certain incentives in the individual life in order to become effective. This may be the meaning of the poet's words: Strive to possess yourself of what you have inherited from your ancestors. (ibid., p. 204)

Metaphorical Argument.

Freud asserted that the Oedipus complex is due to "ineradicable traces" supposedly imprinted on the human psyche ever since the violent death of the primal father. However, since he failed to detail the nature of such "traces," one suspects that this term might be meant in a metaphorical sense only. But, as his entire account of the Oedipus complex comes to

its conclusion and the objective nature of these crucial phylogenetic "traces" still remains to be described, one begins to question how much of Freud's theory is nothing more than poetic metaphor.

Contrary to the quote above, it is suggested that contemporary social psychologists would be more than just a "little concerned" over the empirical aspect of his hypothesis. It has already been argued that it was precisely Freud's lack of attention to empirical details which invited the over-generalization of the psychoanalytic model. By keeping the level of discussion upon a generally abstract plane, and by considering only "resemblances" between certain behaviors as sufficient proof of a causal connection, it would appear that Freud was able to "explain" a wide variety of social behavior by simply referring to one metaphor after another. It is suspected that the abstract nature of the Freud's psychoanalytic model is primarily responsible for the survival of psychoanalysis today in the face of the dismissal of recapitulation theory as a sound biological principle during the 1920's.

Summary and Conclusion.

At the time that Freud had formulated his ideas on psychological recapitulation, many other psychologists were

entertaining the same concept in their own work. Although Freud supported the notion with a great deal of anthropological evidence, it was found that the use of such evidence often appeared forced to comply with Freud's own sexualist and pessimistic assessment of the nature of man. The Oedipus complex, which represents the cornerstone of the psychoanalytic model, captures the character of Freud's generally Hobbesian view of man as an essentially self-serving creature distinguishable from the animals only by a sense of foreboding guilt.

Although the development of this sense of guilt was never adequately accounted for in his text, Freud argued that it nevertheless played a crucial role in the evolution of social behavior; as if guilt just somehow suddenly appeared. The importance of guilt in the psychoanalytic model was especially evident in his account of an actual moment in history when supposedly a primal clan performed an extremely violent and anarchic series of actions which were assumed to have left "ineradicable traces" of emotional pain in the minds of subsequent generations. Freud argued that evidence of the recapitulation of this ancestral experience, encapsulated in the Greek legend of Oedipus Rex, could be found in the repressed thoughts of children, the social customs of contemporary non-industrial societies, and in neurotic behavior.

Apart from the intrusion of Freud's own personal views on

the natural condition of the human species, the arguments and examples he provided to support this claim were also found to be fallacious for essentially two reasons: First, a major part of Freud's supporting arguments involved correlations between the behavior of four populations: primitive man, contemporary "savages," children and neurotics. Since the basis of Freud's claim rested upon the premise that there exists a causal connection along biological lines, between these four different sets, one would have expected some details as to the empirical nature of the mechanism which produced these relations. However, no such details were provided. Instead, Freud presented only a large number of vague similarities in behavior across these different populations.

Despite the inappropriateness of demonstrating a causal relation among these four groups by pointing to a selected number of broad psychological correlations, these arguments represented the most persuasive feature of Freud's account. The attraction of these arguments were made even more persuasive by the liberal use of metaphor, so that the reader is often presented with a convincing comparison between one metaphor and another, e.g. a "primal father," and the father of a modern nuclear family. By far, the most frequently encountered error in Freud's account was its dependence upon abstract comparasons to distantly similar situations.

After noting the presence of correlational arguments and frequent metaphors, one is likely to re-read Totem and Taboo to discover that the entire account takes on the appearance of a "castle in the air." The abstract nature of Freud's account of psychological recapitulation could well account for its continued support, despite the loss of its empirical premise--the biological "principle" of recapitulation.

-10-

Carl Jung: The Recapitulation of Antiquity.

Between the years 1906 and 1913, Freud had enjoyed a invigorating intellectual relationship with his colleague and pupil, Carl Jung (1875-1961). Though Jung had absorbed many of Freud's ideas, it is clear that it was especially his ideas on psychological recapitulation which were to assume a central role within Jung's own theoretical position. Jung, himself, stated that Freud's greatest contribution to psychology was his recognition of the fact that "every civilized human being, whatever his conscious development, is still an archaic man at the deeper levels of his psyche" (1933, p. 126). On the question of the Oedipus complex, Jung concurred with Freud, albeit with some qualifications, stating that Freud's insight stands to remind psychologists that it would be impossible to uncover the true nature of the psyche based on merely an analysis of "the hectic, ephemeral life of the present" (1959, p. 8). Jung's support for Freud's so-called "psycho-historical" approach is evident from the following quote:

> While still struggling with the confusing impressions of the infinite variablity of the individual psyche, we suddenly catch a glimpse of the simplicity and grandeur of the Oedipus tragedy, that perennial highlight of the Greek

theater. (ibid., pp. 8-9)

From this, and other quotes provided within the following text, it is evident that Jung, even more than Freud, turned to recapitulation theory as a means for avoiding the often baffling minutiae of everyday experience and getting to what he considered to be the "real" essence of behavior. It will also be shown that Jung's desire to "get behind" the immediate experience of the individual moved him to adopt a sceptical position toward mental development.

The Foundations of Consciousness.

First of all, it would be appropriate to define Jung's efforts to look beyond everyday behavior, as more closely aligned with a certain variety of idealism, than as following in the foot-steps of Freud's psychoanalytic model. According to Jung's own account, his divergence from Freud, and the psychoanalytic school in general, was largely over the issue of Freud's attempt to explain all patterns of human behavior solely in terms of the conflicts which arise as a result of an individual's personal desires inevitably thwarted by social restraints. Jung was convinced that certain behavioral patterns must be derived from another source of primal energy, the soul or "spirit."

> He (Freud) points no way that leads beyond the inexorable cycle of biological events... There is nothing that can free us from this bond except that opposite urge of life, the spirit. It is not the children of the flesh, but the "children of God" who know freedom. (1933, p. 122)

Thus, Jung had separated himself from the psychoanalytic school by arguing that in order to obtain a "glimpse" of the true motivations underlying all behavior, the psychotherapist cannot simply conduct an analysis of a single individual's particular history. Instead, Jung believed that what is required is an analysis of the "archetypal" conditions which have been shown to influence the troubled individual's behavior. The proper role of the psychotherapist is, therefore, to recognize the effects of the "collective unconscious" as manifest in the individual's conscious behavior, the collective unconscious being the psychic store of inherited ancestral experience which constitutes the content of the archetypes. On this point, Jung wrote:

> By penetrating into the blocked subterranean passages of our own psyches we grasp the living meaning of classical civilization, and at the same time we establish a firm foothold outside our own culture from which alone it is possible to gain an objective understanding of its foundations. (ibid., p. 9)

Jung's reference here to an "objective understanding" of the

psyche implied two things: (1) an understanding of the absolutely true and eternal state of things in a somewhat Platonic sense, i.e., as separate from any influence of cultural relativism; and (2) an indication of the supposedly objective biological grounds underlying Jung's position. Where Freud's stand on recapitulation theory was not wholly explicit, Jung's reliance upon this biological "principle" appeared repeatedly throughout Jung's writings. This is understandable in light of Jung's principle thesis, that there exists

> ...a parallel between the mythological thinking of ancient man and the similar thinking found in children, primitives, and in dreams. This idea is not at all strange; we know it quite well from comparative anatomy and from evolution, which show that the structure and function of the human body are the result of a series of embryonic mutations corresponding to similar mutations in our racial history. The supposition that there may also be in psychology a correspondence between ontogenesis and phylogenesis therefore seems justified. If this is so, it would mean that infantile thinking, and dream thinking are simply a recapitulation of earlier evolutionary stages. (1959, pp. 26-27)

Similar to each of the accounts previously examined, Jung, too, provided nothing more than an empty analogical argument to

demonstrate the "necessity" of psychological recapitulation. Behind the critical "therefore" in the statement above is merely the dogmatic assertion that as in biology, so in psychology.

Turning again to the quote immediately above: What significance did Jung attribute to day-dreaming, or what he referred to as "infantile" or or "dream thinking"? The question is significant considering that, in contrast to what might be normally expected, Jung argued that this type of thinking is of greater importance to psychology than knowledge of the individual's ordinary conscious relations with presently existing material and social phenomena. This unusual priority may be explained in the following manner. Jung claimed that "dream thinking," (a term which is synonymous with a host of other Jungian terms such as "archaic-," "fantasy-," or "non-directed thinking") consists of "primordial images" or "archetypes."

On the basis of his observations of his patient's dreams and schizophrenic behavior, Jung arrived at the conclusion that human consciousness is predetermined by inheritable modes of thought "which are older than historical man; which have been ingrained in him from earliest times, and, eternally living, outlasting all generations, still make up the groundwork of the human psyche" (1933, p. 113). Thus, apart from being the oldest form of thought, dream thinking is significant in that it represents the fundamental cognitive structure of human consciousness.

It is noted that these statements imply that a greater priority should be given to the past over the present, i.e., that an inherited body of knowledge, a collective unconscious, should be considered as more significant in the course of mental development than what the individual may gain from his immediate material and social environment. It is also noted that this claim follows the tradition of a priori determinism observed in each account of psychological recapitulation discussed so far. Specifically, Jung's theoretical approach most closely approximates Preyer's account in this respect. Thus, in Jung one encounters the same presuppositions contained with the classical dualism which describes an incommensurable division between the "object-in-itself" and the comprehension of the object as affected by certain a priori "forms of intuition," to apply Kant's own terminology. The similarity between Jung's position and Kant's idealist philosophy may be ascertained from the following quote:

> In this "deeper" stratum (the collective unconscious) we also find the a priori, inborn forms of "intuition," namely the archetypes of perception and apprehension, which are the necessary a priori determinants of all psychic processes. Just as his instincts compel man to a specifically human mode of existence, so the archetypes force his ways of perception and apprehension into specifically human

> patterns. The instincts and the archetypes together form the 'collective unconscious'. (1971, p. 52)

In making the claim concerning "the archetypes of perception and apprehension" as the "necessary a priori determinants of all psychic processes," Jung has followed the strong sense of Kant's thesis, i.e., that without the a priori "forms of intuition," meaningful experience would be impossible. Kant summarized his position this way: "Thoughts without content are void; intuitions without conceptions, blind" (1905, p. 91).

In the introductory remarks to this chapter, an allusion was made to the effect that Jung's psychology is in part comparable to Plato's philosophy concerning the eternal state of the "idea," a parallel was drawn between this concept and Jung's concept of the "archetype" in that both terms were assumed to refer to the "essential" or "true" meaning of an object under study. Now, present discussion has focused upon Jung's implicit association with Kant's philosophy. Does this imply a contradiction? No; since all three thinkers may be accounted for in terms of the same category of philosophy to which each belongs, viz., idealism, these comparisons do not imply a contradiction. Idealism is a philosophical position which is described in more detail below.

Jung's Idealism.

Although idealism has been traditionally presented in a wide variety of philosophical systems since its classical formulation in Plato's philosophy, one common feature which marks all such systems is the claim that the actual nature of material realm is not the primary determinant of man's knowledge about the world. Instead, idealism advocates that the subject will approach and understand the nature of the material world on the basis of a set of universal principles given to the subject's cognition a priori, i.e., before any actual personal experience of the world. As these principles are said to precede empirical experience, and serve to "shape" raw sensory experience into a manner that is compatible with the way man's understanding is innately predisposed, idealism holds that the mind, or the understanding, presents a greater influence over how the subject comes to understand the objects and events before him, than the experience of the actual material state of such objects and events. Indeed, for the idealist, it is nonsensical to discuss the actual state of the material realm, since all human knowledge of the world is based on experience, and experience is necessarily structured by certain a priori cognitive forms.

Accordingly, idealism maintains that a "true" or objective understanding of man's place in nature requires, first of all, a careful examination of those a priori forms within cognition

which guide man's sensory experience of the world. This much explains the designation, "idealism," in that, since it is claimed that the cognitive factors which direct the subject's approach to an object must necessarily precede any meaningful comprehension of that object, the onus for man's comprehension of the world lies with those mental "principles" or "ideas" said to provide the ability to experience the external world.

Plato labelled these cognitive factors the "ideas," defined as the metaphysical substrate providing the true absolute and categorical meaning for all material phenomena. There is an approximate equivalence between Plato's concept of the "Ideas" and Kant's concept of the "categories," which Kant defined as "forms of thought, which contain only the logical faculty of uniting a priori in consciousness the manifold given in intuition" (1905, p. 245). And, finally, there is an equivalence between these terms and Jung's concept of "archetypes," which he defined as "typical modes of apprehension, and wherever we meet with uniform and regularly recurring modes of apprehension we are dealing with an archetype, no matter whether its mythological character is recognized or not" (1971, p. 57). Thus, Jung's concept of "archetypes" having the property of directing human experience in an a priori manner may be approached as an idea which follows a tradition in the history of idealism.

Jung, however, believed that his concept was derived from

biology and not philosophy. Jung's educational background was not philosophical in nature. He claimed that he had approached psychology from a primarily medical standpoint. Such an approach was certainly congruent with the popular aims of psychology at that time. Thus, for Jung, all psychological phenomena, including scientific discovery, political movements and philosophical advances, were to be understood in view of the inheritance of the "collective unconscious" with its store of "archetypes"; all human activity is biologically predisposed to follow a limited set of archaic motivations: "Just as the body has its evolutionary stages, so too does the psyche" (1959, p. 33).

This reductionistic position led Jung to propose a number of statements which indicate gross over-simplification. For example, Jung claimed that the complex history of idealistic thought in philosophy represents merely "that same psychological process at work which disguises the instincts under the cloak of rational motivations and transforms the archetypes into rational concepts" (1971, p. 56). As to philosophical discourse in general, there is Jung's statement that "the most abstract system of philosophy is, in its method and purpose, nothing more than an extremely ingenious combination of natural sounds" (1933, p.16). This latter claim is based on Jung's return to the concept of the archetypes, the inheritable modes of thought "which have been

ingrained since the earliest time" and "still make up the groundwork of the human psyche" (1933, p. 113). In sum, Jung has argued that history has not progressed far beyond what it was since the dawn of self-critical thought, and he supported this dubious claim by attempting to negate the significance of recent history in the following manner:

> What was once strong enough to mold the spiritual life of a highly developed people will not have vanished without a trace from the human soul in the course of a few generations. We must remember that a mere eighty generations separate us from the Golden Age of Greek culture. And what are eighty generations? (1959, p. 31)

One last example of how Jung's efforts to reduce all conscious activity to a limited number of archetypes led him to over-simplify human behavior is provided below in order to fully illustrate the absurd priority he attributed to the archetypes. In accounting for the rise of fascism in Germany of the 1930's, Jung completely ignored the significance of such events as, the 1919 Treaty of Versailles, the peace treaty which, as is well-known, threw post-war Germany into a hopeless economic state and provoked a nationalistic fever bent on revenge. Jung also neglected the dynamic economics of the Nazi's military-industrial complex, and the boiling tensions between competing capital interests in Europe at that time. Instead, his analysis of the

situation in Germany during the 1930's focused solely upon certain aesthetic "representations" of the archetypes which Jung believed must be behind the Nazi's political upheaval:

> There is no lunacy people under the domination of an archetype will not fall prey to. If thirty years ago anyone had dared to predict that our psychological development was tending towards a revival of the medieval persecutions of the Jews, that Europe would again tremble before the Roman fasces and the tramp of legions, that people would once more give the Roman salute, as two thousand years ago, and that instead of the Christian Cross an archaic swastika would lure onward millions of warriors ready for death—why, that man would have been hooted at as a mystical fool...The man of the past who lived in a world of archaic "representations collectives" has risen again into very visible and painfully real life...(1971, p. 66).

Clearly, Jung did not follow closely the original biological principle of recapitulation describing the development of the individual as passing through a sequence of stages which resemble the evolution of the species to which the individual belongs. Although the basis of his position lies with the statement, "Just as the body has its evolutionary stages, so too does the psyche" (1959, p. 33), Jung's examples of recapitulation imply that the course of ontogeny could regress far back in history even during

the adult stage. Indeed, in his analysis of Nazi Germany, the "psychological development" of millions of adults were able to simultaneously recapitulate medieval social tendencies of one-thousand years ago and other various customs which prevailed two-thousand years ago. In light of his inconsistent use of the recapitulation process, there appears to be a similarity between Jung's perception of phylogeny and Hall's. Both used history in a non-historical sense; essentially separating history into two parts, the contemporary (industrial) period against the rest of history.

Sceptical Implications of Jung's Idealism.

The central difficulties facing Jung's account rest with the same subjectivist conclusions which follow the Platonic and Kantian idealist philosophies. These include: (1) an abstract division between sensory perception and understanding and, (2) the larger issue of the subject-object dualism which stands as a necessary consequence of that abstract division.

In Jung's account, evidence for the first problem is apparent from the following quote:

> Consciousness seems to stream into us from outside in the form of sense-perceptions... Sense perceptions tell us that something is. But they do not tell us what it is. This is

> told us not by the process of perception but by the process of apperception, and this has a highly complex structure. (1971, p. 25)

The "highly complex structure" referred to here is the "collective unconscious" which, indeed, would be complex since Jung claimed that it contains the psychological characteristics common to all species in man's pre-human, biological history plus the experiences of those past generations belonging to the age of antiquity. In his own account of man's phylogeny, Jung repeated Haeckel's error of suggesting that the phylum of vertebrates evolved from the invertebrates during the course of evolution in his claim that man's collective unconscious "still preserves elements that connect it with the invertebrates and ultimately with the protozoa" (ibid., p. 38).

According to Jung, it is man's phylogenetic inheritance, i.e., the collective unconscious and the archetypes it contains, which must aid the developing "psychic organism" in its assimilation of the sensory input pouring into consciousness. Thus, he claimed that the collective unconscious forms "the true basis of the individual psyche" (ibid., p. 38). In sum, Jung had sided with the view that sensory perception itself is a passive activity, and that it remains for the collective unconscious, "as the ancestral heritage of possibilities of representation" to organize raw sensory data.

Two questions may be asked at this point: First, is it necessary to lay the responsibility for the organization of the organism's perceptual field upon an archaic "form of thought"? It would seem redundant to return to speculations concerning the ancient history of a species in order to account for phenomena that could be explained sufficiently in terms which relate to the present condition of the species. Biologists ordinarily expect an animal to organize its activity, including its basic perceptual activity, according to the constraints presented by its immediate environment and its own needs as dictated by its psychological and biological constituition. For example, consider the large ground-dwelling ape: It would mean the demise of this species if a significant number of such apes were to ignore their specific needs and, begin to organize their perceptual field in a manner reflecting their ancestral state as a tiny, tree-dwelling lemur. The unlikelihood of such atavistic behavior occurring in the face of the merciless forces of natural selection should, at the least, call into question the possibility of psychological recapitulation in the animal realm. It is concluded that the differences among species implies differences in their needs and, correspondingly, differences in their relations to the environment.

This emphasis on the biological needs of an organism introduces the second question to be put to Jung's claim, i.e.,

would it be possible for an organism to perceive the objective world in any way which did not relate to its own particular needs? Again, obviously not; reasoning that the perceptual field of any organism could not be formed by any other means other than that which is determined by the physiological structure of its senses. Thus, it is not expected that any given organism will first passively register raw data and, then, organize its sensations according to certain abstract a priori psychological predispositions. Rather the correct view holds that perception itself is dependent upon the organism's particular biological constitution, and that, therefore, the act of knowing is intrinsically involved in the act of perception itself. The alternative, which Jung and other idealists have traditionally maintained, is to suggest that perception is one thing, and knowing is another. It has been argued here that this claim is false on empirical grounds, i.e., given that many species continue to exist, surviving the limiting conditions set by natural selection, it must be assumed that their existence is in part due to the endowment of sensory organs which are capable of efficiently corresponding to their material environment; that if this capacity did not form the basis of their psyche, it is unlikely that the species would have been able to survive. That species do exist is a fact which must be agreed upon unless one is willing to accept the absurdities of absolute scepticism.

The purpose of not attending to the situation presented by the human consciousness up to this point has been to highlight the problematic biological implications that can be drawn from Jung's idealistic division between "sense-perceptions" and apperception with the implication that the mind functions as an open receptacle for sensory stimuli. The following discussion will focus specifically upon Jung's sceptical position concerning how man comes to perceive and know the world, and the following quote will serve as a point of departure for this discussion:

> We speak of 'knowing' something when we succeed in linking a new perception to an already established context in such a way that we hold in consciousness not only the new perception but this context as well. 'Knowing' is based, therefore, upon a conscious connection between psychic contents. (1933, p. 98)

The quotation marks around the word "knowing" in the quote above signify that Jung did not consider that term in accordance with its common usage, i.e., as a conscious understanding of objects and events gained through experience. Jung's sceptical position toward knowledge actually follows from his idealistic premise, that the primary determinant of knowledge is within the mind, and not with external stimuli. Specifically, Jung advocated that the primary determinants of knowledge are the archetypes which structure one's experience of the world and,

again, not with the objective properties of objects and events in the material realm. Accordingly, 'knowing' could not involve a relation of correspondence between subject and object, but only the re-arrangement of subjective relations between archetypes. Thus, knowledge could be described as merely variations on ancient themes. In support of this sceptical point of view, Jung wrote:

> Conscious mind is an ephemeral phenomenon that accomplishes all provisional adaptations and orientations... The unconscious, on the other hand, is the source of the instinctual forces of the psyche and of the forms or categories that regulate them, namely the archetypes. All the most powerful ideas in history go back to archetypes. This is particularly true of religious ideas, but the central concepts of science, philosophy, and ethics are no exception to this rule. In their present form they are variants of archetypal ideas, created by consciously applying and adapting these ideas to reality. (1971, p. 46)

In this respect, Jung's particular type of idealism had led him toward the conclusion which inevitably arises from all idealist systems: that knowledge is essentially conditioned by certain a priori determinants: that cognitive elements which supposedly cannot be derived from man's relation to the material environment are responsible primarily for the formation of

cognitively meaningful experience. For Jung, this meant that knowledge was essentially conditioned by man's phylogenetic inheritance, i.e., the archetypes, which contain the psychological experiences of man's human and pre-human ancestors. Thus, Jung wrote that "the psyche is not a thing of today..." (1959, p. 5). Although this conclusion is automatically implied by the concept of psychological recapitulation itself, from each of the psychologists studied in earlier chapters, only Jung had fully enunciated this concept's support for this idealistic position. In studying Jung, the reader gains the most explicit understanding of the epistemological direction of the psychological recapitulation concept. While the other similar accounts previously examined provided "hints" of support for a sceptical epistemology, Jung laid bare this conclusion in his writings.

Jung's Historical Relativism.

Historical relativism is a branch of the larger philosophical category of sceptical thought. Like scepticism, the tradition of relativism advocates that there is no objective basis for truth. This claim is justified by the argument that a complete and final understanding of any particular object or event has never, and will never, be achieved. In particular,

historical relativism supports this view that knowledge will always be limited, and, therefore, somewhat false, on the grounds that knowledge is always conditioned by what is 'known' at any given point in history. Empirical support for historical relativism is typically taken from the history of science which is argued to be filled with examples of where knowledge, once thought to be state-of-the-art, was later improved upon or sometimes shown to be largely erroneous.

In order to conclusively demonstrate the falsity of the admittedly persuasive argument, it would be necessary to discuss the most fundamental principles of materialism which are: first, that material reality does exist and, second, that subjective consciousness has access to material reality. As a thorough demonstration of these points would move discussion too far away from present criticism concerning the implications of Jung's particular position, it is suggested that readers interested in a more complete refutation of relativism refer to one or all the following sources: Cunningham (1973); Newton-Smith (1982); or Tolman (in press).

For the sake of present argument, however, historical relativism may countered by the following common sense line of reasoning: While it may be true that human knowledge has never obtained the "absolute truth" concerning any particular object or

event, this does not necessarily imply that humans are incapable of forming objective knowledge based on their experience of the world. In other words, knowledge need not be absolute in order to be classified as objectively valid. For example, although not everything is known about molecular activity, few would be willing to claim that, therefore, all that is known at the present time concerning molecular activity is false or completely void of any objective value. Other examples from any scientific field of investigation, past or present, would also provide sufficient support for this counter-claim; for if it was the case that all historical knowledge is only relatively true, i.e., true only at the time it is generally believed, then the self-evident progress that has been made in man's dealings with the objective realm could not adequately explained. Clearly, over the course of his interactions within the material world, humankind has been able to discover at least some, if not many, lasting truths about the reality of those objects and events which surround our everyday life. If this much is accepted, then the limitations of historical relativism should also be apparent.

Returning to Jung's efforts to explain man's dealings with the material world as conditioned by ancient archetypes, there now appears to be to be something profoundly abstract and speculative in this claim. For example, when Jung wrote, "Even when I deal with empirical data, I am necessarily speaking about

myself" (1933, p. 118), this would appear to strongly suggest that Jung denied that humans have an undistorted access to the objective realm; that instead, an individual should be thought of as thinking and living mainly inside the mind. This extremely sceptical conclusion follows from his premise that the collective unconscious, which contains the archetypes is "the source of all our conscious thought" (ibid., p. 113).

Jung, in fact, explicitly dismissed the evidence of progress in science by again returning to the concept that all human activity is structured by the ancestral experience which motivates each modern individual. Thus, he referred repeatedly to the sceptical notion that knowledge will always be historically limited, e.g.: "All the same, every science is function of the psyche and all knowledge is rooted in it" (1959, p. 39). If this be the case, then how did Jung explain scientific activity itself? Proceeding from his assumption that all "progress" is merely variations on archetypal themes, Jung wrote that "an equivalent of our science already existed in scholasticism. This took its subjects from fantasies of the past, but it gave the mind a dialectical training in directed thinking" (1959, p. 23).

In order to make a convincing case for this point of view, that all conscious activity "is rooted in the psyche," Jung frequently resorted to a scepticism marked by a boldly deliberate

neglect of material conditions which affect social and scientific progress: "Can experience with the objective world save us from subjective prejudgements? Is not every experience, even in the best of circumstances, to a large extent subjective interpretation?" (1933, pp. 115-116).

After these statements, it is evident that in order to give significance to the idea of psychological recapitulation, i.e., to show that a phylogenetic inheritance of ancestral experience actually plays an important role in everyday modern behavior, it would first be necessary to deny the significance of the relation between the individual's immediate consciousness and the objects or events in his environment. Thus, it was necessary for Jung to frequently regard science as a subjectively motivated activity, considering that science represents the possibilities which follow from the premise that an objective relation does between the individual and his material environment.

Jung suspected the validity of scientific progress, since this evolution would represent only insignificant deviations around a central archetype; the grounds for science would, therefore, rest upon subjective justifications. Thus, Jung referred to causality as merely a subjective assertion: "It is a rational presupposition of ours that everything has a natural and perceptible cause. Causality, so understood, is one of our most sacred dogmas" (1933, p. 130).

According to Jung, this rational belief in "so-called natural causes" (ibid., p. 127) was not always at the forefront of man's thinking about the world: "We must also remember that the interest of the man of antiquity was turned in quite another direction: he reverenced the divine cosmos, a quality which is entirely lacking in our technological age" (1959, p. 20). The dualism between "sense-perception" and "apperception," and between object and subject is not unrelated to the dualism Jung had attempted to establish between the thinking common to our ancestors and modern thinking. "The center of gravity of our interest has switched "over to the materialistic side," Jung explains, "whereas the ancients prefered a mode of thought nearer to the fantastic type" (1959, p. 24).

In essence, what has been proposed here is a split between materialism and idealism, with much greater weight being given to the "idea"; or the "psychologically true," as opposed to what is objectively true in the state of the material world. Thus, it is not surprising to find Jung's account of "ancient modes of thought" portrayed in such a positive light. Speaking as if he himself belonged to the age of antiquity, Jung wrote, "We move in a world of fantasies which, untroubled by the outward course of things, well up from an inner source to produce an ever-changing succession of plastic or phantasmal forms" (1959, p. 24).

There is nothing in Jung's writings which would counter the

criticism that he believed that ancient man literally lived in a dream-world, a heaven in which "phantasmal forms" prevail. Jung wrote: "The conclusion that the myth-makers thought in much the same way as we still think in dreams is almost self-evident" (ibid., p. 28). The suspicion that Jung's own religious orthodoxy has been injected into his account of psychological recapitulation was confirmed where comparisons were made between his vision of man's early history as a dreamy "garden of eden" and the subsequent "fall" of modern man who has "renounced the halo of sanctity which history bestows":

> A great horde of worthless people in fact give themselves a deceptive air of modernity by skipping the various stages of development.... Suddenly they appear by the side of the truly modern man--uprooted wraiths, bloodsucking ghosts whose emptiness casts discredit upon him in his unenviable loneliness. (...) To be "unhistorical" is the Promethean sin, and in this sense the modern man is sinful. (1971, p. 458).

Based on his view that "existence is as we see and understand it" (ibid., p. 493), Jung assumed that the correct course toward solving the various pscyhological problems which beset modern man would simply involve a change in his perspective and his recognition of the ancient forces behind his conscious behavior: "The trouble with us (modern man) seems to be far more psychological. Our blight is ideologies--they are the long-expected Anti-christ," and on the same page, Jung went on to point to ideologies such as National Socialism and communism as examples of the Anti-christ (ibid., p. 495). Therefore, in order for modern man to literally gain redemption, what is first required is a recognition of man's dependence "upon the unconscious psyche or the 'grace of God'--names make no difference," and, thereby, gain an understanding of the "myths we live by" (ibid., 496). Thus Jung wrote: "It is only possible to live the fullest life when we are in harmony with these (archetypal) symbols; wisdom is a return to them" (1933, p. 113).

However, the process of returning to the psychic states of our ancestors must be appreciated as completely unrealistic. It calls for nothing less that a complete disregard of the material conditions which influence the thinking of any human era. Nevertheless, such disregard is, indeed, an assumption which may be easily drawn from the concept of psychological recapitulation,

by which it is to be understood that the slide down the ladder of human history simply requires that the individual roll his eyes inward to "the deeper levels of his psyche" (1933, p. 113): "Through fantasy thinking, directed thinking is brought into contact with the oldest layers of the human mind" (ibid., p. 33).

It may well be asked, what sort of scenario would be the consequence of Jung's recommendation to modern man to regress to earlier historical modes of thought? In reading Jung, it soon becomes clear that he preferred any pre-scientific era as infinitely more desirable than present-day society, e.g.:

> The activity of the early classical mind was in the highest degree artistic: the goal of its interest does not seem to have been how to understand the real world as objectively and accurately as possible, but how to adapt it aesthetically to subjective fantasies and expectations. There was very little room among the ancients for that coldness and disillusionment which Giordano Bruno's vision of infinite worlds and Kepler's discoveries brought to mankind. (ibid., p. 24)

Jung dismissed the impossibility of a mass regression to an earlier era by indicating that just such a regression had occurred over the course of human history during the Middle Ages, an era to which Jung reserved his most nostalgic prose:

> How totally different did the world appear to medieval

> man! For him the earth was eternally fixed and at rest in the centre of the universe, circled by a sun that solicitously bestowed its warmth. Men were all children of God under the loving care of the Most High, who prepared them for eternal blessedness; and all knew exactly what they should do and how they should conduct themselves in order to rise from a corruptible world to an incorruptible and joyous existence. Such a life no longer seems real to us, even in our dreams. Science has long ago torn this lovely veil to shreds. (1971, p. 464)

Conclusion.

Jung's attitude toward modern science--indeed, toward any endeavour intended to achieve objective knowledge--was based on the idealistic assumption that: "All the same, every science is function of the psyche and all knowledge is rooted in it" (1959, p. 39). It would be accurate to suggest that this and other similar claims imply absolute scepticism or solipsism. This much said, it would be unfair to suggest further that he had deliberately intended to use the concept of psychological recapitulation as a means toward promoting solipsistic ends.

It was argued that at the explicit level of Jung's writing, the position he tried to put forward belonged to the

philosophical category of idealism; in that he argued that knowledge is determined primarily by the subject in the subject-object relation. According to Jung, what determines the subject's approach to the material realm are universal and necessary "forms of intuition," which Jung referred to as archetypes derived from a collective unconscious.

However, it was found that as Jung's archetypes were not so general as to allow for the introduction of new knowledge, specifically, scientific knowledge. In this respect, Jung attributed a very restrictive role to consciousness. Indeed, he argued that the archetypes so controlled conscious behavior as to make its activity appear severely limited by their range and that range, though never specified in any detail, was assumed to be set by the typical activities of man's ancestors. Thus, Jung's position was more correctly classified as a special type of historical relativism where it was assumed that all knowledge is conditioned by certain ancient modes of thought. By further investigating Jung's assessment of these ancient modes of thought, it was found that he had injected his idiosyncratic notions into how ancient man was supposed to have once thought and behaved. This criticism was supported by the sheer number of references to his own religious sentiments in association with the nature of ancient modes of thought.

Throughout this section on Jung, it has been necessary to

provide somewhat lengthy and frequent quotes from his various works in order to justify many of the very serious criticisms which have been levelled against his particular use of the concept of psychological recapitulation. Jung's own thoughts on what he considered to be the typical mentality of individual's living in earlier periods in human history revealed an idyllic view of the social and economic circumstances which affect the human condition.

The extent of Jung's distortion of the phylogenetic (historical) record in this regard was very surprising, in light of the generally high regard which he holds as one of this century's most scholarly and innovative thinkers. But any first-year classics student could question Jung's aesthetic vision of antiquity by simply asking whether or not the the typical slave oarsman whipped by a lackey upon a Phoenician pirate vessel would be best characterized as moving "in a world of fantasies... untroubled by the outward course of things"? More significantly, it might have been indicated to Jung that some men of the medieval era, of whom he claimed "knew how they should conduct themselves in order to rise from a corruptible world to an incorruptible and joyous existence" had burned Giordano Bruno at the stake. The clergy at that time justified their action by declaring that Bruno's speculation concerning the likelihood of other life-supporting planets in the universe was inspired by the

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General Summary.

The assumption that Haeckel's biogenetic law is a reliable scientific fact presented a major problem for the notion of psychological recapitulation. Where an entire theory depended upon a literal extension of recapitulation theory to support its major principles, the legitimacy of the theory as a whole remains questionable. Thus, the review of the rise and fall of recapitulation theory in biology was of primary importance, since its failure as an actual biological fct stands as the most challenging empirical criticism facing its use in psychology.

It may well be argued that the course of a child's intellectual development repeats the social and historical development of the human species, but this progress cannot possibly be the inevitable result of a biological predisposition to recapitulate ancestral experience. There is simply no evidence to support this latter claim. It has not been conclusively demonstrated that any species actually undergoes recapitulation. Yet, recapitulation theory, as a biological law, was often referred to by the psychologists examined here to distinguish their position as a purely "scientific hypothesis" as opposed to mere philosophical speculation. This distinction was especially important for most psychologists working near the turn

of the century, when psoyhology was striving for recognition as a legitimate branch of science.

Unfortunately, this line of thinking prompted the introduction of biological determinism. From Down's diagnosis of congenital idiocy as a result of a degeneracy to a "lower" race to Jung's more recent attempt to explain all social and psychological phenomena as the outward manifestations of inheritable "archetypes," there was a tendency to support the idea of psychological recapitulation by declaring it to be simply a consequence of a well-known biological "fact."

By generalizing the principles of recapitulation theory to account for psychological development, the large questions which have faced psychologists since the beginning appeared to be soluble at last. Thus, Preyer (1894) used recapitulation to explain the complex problem of how an infant achieves the fundamental ability to perceive objects in a spatial and temporal order by suggesting that the infant inherits certain cognitive guidelines from his predecessors. The fundamental "sense-impressions" of ancestral experience supposedly served to provide an a priori structure to the sensory content of the infant's own experience.

However, Preyer's assertion concerning the existence of supposedly a priori cognitive guidelines was found to be a continuation of an subjectivist trend in psychological thought.

This trend began with the empiricist approach to the problem of perception first formulated by John Locke (1959) and it has been continued in twentieth-century psychological literature, most notably by the cognitive emphasis in Piaget's popular works. Their position was found to be incorrect on the grounds that it depicted the subject as passively registering sensations flowing in a one-way direction from the object perceived. Accordingly, all that would remain for the subject is the entirely internal task of mentally re-arranging all incoming information in a cognitively meaningful manner. For Preyer, this was accomplished by an innate predisposition passed on from one's ancestors and, supposedly, it was the inheritance of their experience which provided a structure to the infant's cognitive development. Due to the initial assumption that the subject deals not with the "object-in-itself" but only with the sensations of the object as represented in the mind, the conclusion followed that perception must be primarily determined by a set of a priori cognitive principles.

This assumption that the infant represents a passive contemplative subject was found to be another common feature among each of the accounts examined. For example, Hall considered practically almost every adolescent behavior to be motivated by the recapitulation of experiences thought to have once dominated the lives of our primitive ancestors. Both he and

Freud felt that the "child is the father of the man," and that, in order to understand the child, one must return to the primitive motives behind the child's behavior. Jung, as well, continued this relegation of the individual's immediate experience to a secondary place behind the pervasive influence of ancestral experience. He repeatedly emphasized that what was important was to get beyond the "ephermal" and fluctuating world of day to day appearances in order to gain an understanding of certain essential psychological "forms." These he referred to as the "archetypes," which have supposedly moved humans to think and behave according to particular patterns since ancient times.

In sum, what is implied by these related views is that the subject is "cut off" from the material environment; that the constitution of the individual's psyche does not reflect the world as he has experienced it. It is assumed that the individual's experience is not shaped by external events, but rather by internal cognitive predispostions. And, again, these internal tendencies are assumed to be activated not by external events, but by an innate, biological tendency to recapitulate ancestral experience.

There were varied opinions as to the precise nature of the mechanism responsible for the process of psychological recapitulation. Down believed that a degeneration to another race "lower" on the phyletic scale could be a side effect of

tuberculosis in either one of the parents (1866, p. 262). Preyer claimed that ancestral experiences had been physically etched in the brain itself:

> The brain comes into the world provided with a great number of impressions upon it...Each ancestor has added his own to those previously existing...deep impressions will, like wounds, leave behind scars...and very frequently used paths of connection between different portions of the brain and spinal marrow and the organs of sense are easier to travel even at birth. (1909, v. 2, p. 211)

Baldwin's explanation was similar to Preyer's phrenological account where he indicated that it must be the "pyramidal system" of the human brain which allowed the child the capacity to absorb all the phylogenetic influences within his environment (1906, pp. 21-23). Hall's description of whatever it was that induced psychological recapitulation did not proceed any further than vague references to "psychophores," "archeopsychisms" or "soul stuff...pervaded with reverberations from an immeasurable past" (1904, v. 2, pp.64-65). Freud's account remained largely at a very general level referring only to "ineradicable traces" and "the inheritance of psychic dispositions" (1918, p. 204). And, finally, Jung referred to his own similar terms in such a way as to present a very persuasive, but completely abstract, map of the mind complete with a "collective unconscious" and its

"archetypes."

In the final analysis, there was typically little or no effort to adequately describe the physical nature of the entities assumed to carry ancestral influences, nor was there any effort to explain in empirical terms how these entities might be passed on from generation to generation. Instead, the proponents of the psychological recapitulation concept rested their case upon the empty analogical argument: as in biology, so in psychology. But it is very unlikely that any such entity would ever be found anyway, owing to the theoretical difficulties facing this prospect. These difficulties are the subject of the following discusssion.

Theoretical Problems.

In each of the accounts discussed, it was assumed that there exists a fundamental distinction between the psyche of the human species in earlier periods and the psyche of contemporary man. Thus one could supposedly distinguish the vestiges of primitive consciousness intruding upon a modern individual's otherwise normal behavior. No doubt progress has occurred over the course of human history, and, certainly, this development has been intimately tied with changes in man's relations with the material world. But could the dramatic changes which have occurred in

human history over the last 2000 years be linked with a corresponding evolutionary change in the physiological structure of the human brain? Clearly this is an unreasonble proposition; for the progress that has been made over this comparatively brief span in the history of our species cannot be accounted for by the slow and gradual pace of natural evolution.

A comparison of ancient and modern modes of thought assumes already that there is a common standard by which such a comparison might be accomplished. For example, Freud (1918) wrote:

> We would say that among primitive people thinking is still highly sexualized and that this accounts for the belief in the omnipotence of thought, the unshaken confidence in the capacity to dominate the world and the inaccessibility to the obvious facts which could enlighten man as to his real place in the world. (p. 116)

This statement suggests that, by comparison, modern man is less given to believe that thought is omnipotent, less confident about his capacity to dominate the world and more accessible to obvious facts. The conclusion which follows is that there has been a shift in the subjective state of man's consciousness. This analysis, typical of all traditional accounts of psychological recapitulation, assumes that it is the nature of the psyche that determines which approach to the world would be best.

Would it be correct to suppose that it is the subject's psyche which is primarily responsible for recognizing, as Freud put it, his "real place in the world"? Essentially the same question could be presented in other terms in order to draw out its relevance to other accounts of psychological recapitulation. For instance, it could just as easily be asked of Preyer's account: Is the subject's perception of the world dependent upon innate cognitive structures which are singularly responsible for the ability to order sensations of the world into meaningful spatial and temporal sequences? It will be argued presently that these questions stem from a fundamental misunderstanding of the nature of knowing.

At the core of this misunderstanding is the absence of any recognition of the relations which exist between any living, breathing organism and the surrounding environment. This relation is the subject of Lenin's proposition

> that sensations are connected with definite processes in the organism. Are not these not these 'processes' connected with an exchange of matter between the 'organism' and the external world? Could this exchange of matter take place if the sensations of the particular organism did not give it an objectively correct idea of it? (1927, p. 37)

These statements imply that to posit the human subject as primarily responsible for his understanding of the world is to

put the "cart before the horse," since it was the nature of the objective world which was responsible for initially shaping the development of man's senses. In other words, since the nature of man's sensory equipment has evolved in such a way as to provide the human species with an adaptive sensititivity to the material environment, it would be erroneous to suggest further that man's perception of the material environment would not operate in a manner which corresponds to the actual nature of the objective world.

But the notion that sensations are meaningless unless mentally re-arranged has assumed precisely this dichtomy between perception and the objects perceived. From a materialist perspective, it could be answered that sensations themselves would not exist if they were not produced by mechanisms formed as a result of an adaptive relation between the organism and its environment. And the similar notion that the subject's psychic experience of the world is dependent primarily upon the fundamental features of inherited ancestral experience must also be seen as a negation of the subject's immediate relations with the material world. In sum, the subject's real place in nature can only be revealed by his sensory experience of nature; anyone who has experienced an unexpected encounter with a heavy object is well aware that nature has a way of quickly making obvious facts accessible. It cannot be reasonably argued that primitive

man was incapable of such fundamental sensitivity.

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An Alternative Approach: Socio-Historical Recapitulation.

It would be incorrect to interpret materialist epistemology as implying that all one needs to do in order to fully understand the external world would be to simply open one's eyes. Such an interpretation harkens back to an idealist understanding of the relation between subject and object. The proposition that the subject stands in a passive contemplative relation to the world must be substituted for one that recognizes the practical and active nature of knowing. One cannot expect a child to comprehend the property of weight until he or she begins to interact with objects of various weights, i.e., begins to actually pick up and move objects and, on the basis of the sensations such movements incur, form an understanding of heaviness or lightness. Thus, Leontiev (1981) wrote:

> Knowledge of a thing is only possible in its relation to other things, in reciprocal action with them, in motion. Only in motion, in interaction, does a thing reveal its properties. But knowledge of properties is also knowledge of the things themselves. We cannot say anything about bodies apart from their motion, their interaction, their relation with other bodies. (p. 33)

Now that the subject's activity has been argued to be

essential to knowing, does this mean that one may regard random activity on the part of the child as a sufficient condition to learning? Obviously not; what must indicated at this point is that a child's activity is never conducted without some purpose in view. In observing a child's activity, it soon becomes evident that they are actively working to understand their environment. Due to the tremendously complex state of man's present environment, that learning process by far exceeds that normally found in other species.

The proposition that the survival of the human species has been dependent primarily upon the far-reaching capacity of the human intellect is a point that does not call for much elaboration; those who live in urban centers, need only to look out their windows in order to verify the truth of this claim. In contemplating the modern urban center, one is virtually forced to recognize the qualitative difference which exist between the way the human species has responded to the challenges of the environment as opposed to any approach taken up by the other species.

The complex level of communication, cooperation and knowledge that must have been required to realize man's past and present achievements serves to, once again, emphasize what must be taken as the first fact in any assessment of the human psyche; that human behavior is characterized far more by its social,

rather than biological, capacities. Thus, it is to be expected that a child's psychological development will not rely upon hereditary factors so much as it does on what the child gains through an active participation with the surrounding social environment. It has been argued previously that no child could be born with a workable set of developed cognitive "structures" nor could it be possible that the child carries into the world any a priori knowledge of the world. Thus, knowledge about the world, and the manner by which the observer structures knowledge, are said to be acquired. This does not imply that each individual has had to learn the nature of the nature of world anew; from the moment of birth, a child enters a world literally inundated with all the practical knowledge accumulated by previous generations. On the basis of these observations, therefore, it is hypothesized here that the psychological development of the individual involves the assimilation of the knowledge which has been accumulated over the course of human history. In this respect, there is some similarity between the socio-historical approach introduced at this point, and the traditional idealist conception of psychological recapitulation, i.e., insofar as both positions would agree that the mental development of the child is expected to repeat the history of the human species.

However, the similarity between the two positions ends at

this very general, theoretical level. In opposition to the traditional concept, the socio-historical approach demands that the process of mental development be analyzed as an integrated system involving the subject's struggle to find solutions to the problems which arise from the needs created by man's physiologial and social condition. This statement would only be misleading if it was not also indicated that many solutions to those problems have been already achieved over the course of human history.

Clearly, much knowledge about the world would remain at an immediate level of understanding if it were not for the guidance provided the others in the previous generation, e.g., parents, educators, etc. Members of the previous generation prompt children to assume particular modes of action toward objects in their environment. Specifically, they direct the child to follow a mode of action known to be most suitable given the properties of the object. All objects may be appreciated as presenting a manifold of relations. Working within the limits presented by the actual properties of the object, man has learned to use objects in special relations which afford him the benefit of a particular property inherent in the object. For example, a chunk of coal presents a number of properties including its colour, density, and so on, but its property of flamability presents itself as an aspect within a special relation which exists between coal and man. While all objects present to their

user a manifold of relations, over the course of historical development some relations have been found to serve a practical purpose in fulfilling the many needs of humankind. It is the knowledge of these relations which make up almost all of the child's education and training. It is the knowledge of certain "hidden" properties of the objective world, those properties which have been discovered in objects over the course of human history; this knowledge is passed on through various social means, from generation to generation.

The practical aspect of an intellectual recapitulation of human history was not discussed by the traditional approach to this subject. In the past, some sort of psychological recapitulation was assumed to represent the unfolding of an obscure biological predisposition. Thus, the subject was portrayed as the passive recipient of ancestral "sense-impressions" (Preyer) or "instinct-feelings" (Hall) or primeval "unconscious thoughts" (Freud). However, this position ignores the fact that the environment that surrounds the child is primarily social in nature. Humankind no longer merely adapts to the natural environment, as other species do, but uses the environment and manipulates its resources to suit human needs. The human species does not "wait" for evolution to change the biological constitution of the species in order to better adapt to the environment. Instead, through the uniquely human activity

of planned and cooperative labour,--an activity made possible by the condition of an extremely complex level of nervous organization--mankind has created his environment. It is now this social environment which the child assimilates over the course of his or her intellectual development.

These statements do not necessarily imply support for the notion an innate predispostion to recapitulate human history, nor do they definitely suggest any support for a Social Darwinist understanding of "mental development as a process of adaptation to social conditions" (Spencer; cited in Robinson, 1977, p. 20). Both of these positions assume a literal extension of biological principles to human development. Again, these positions miss the fundamental distinction between adaptation and appropriation. Leontiev (1981) defined this distinction in the following manner:

> The process of biological adaptation is one of change of the organism's species characteristics and capabilities and its species behaviour, whereas the process of appropriation or mastering is one that results in the individual's reproduction of historcally formed human capacities and functions. That, it can be said, is the process by which man achieves in ontogenetic development what is achieved in animals through heredity, viz., embodiment of the advances of the species' evolution in the characteristics of the

individual. (1981, p. 296)

From the assumption that human mental operations are essentially social in nature, it follows that the mental development of the individual is produced through the active assimilation of those modes of cognitive activity which constitute humankind's cognitive experience. Thus, over the course of the individual's mental development, it is expected that the child will internalize the cognitive experience of previous generations, i.e., experience which has been partly or wholly externalized in the form of man-made objects, books or other records encapsulating the human activity which produced them. It would now appear that the task of education and training is clear: (1) to prompt children to assume activities which will "draw out" those special relations that human history has shared with material objects, and (2) to reproduce for the child's understanding the experience that is contained in man-made objects. By "unpacking" the historical content from the object to be learned, one is able to guide the child toward a recognition of the logical and practical relations of its existence.

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Conclusion.

The history of recapitulation theory describes a movement away from idealist beginnings toward an increasingly materialist understanding of its central theme, i.e., the repetition of phylogeny in ontogeny. At first, it was used to explain an a priori design thought to underly the appearance of the natural world. This condition, referred to as the scala naturae (scale of being), defined the species within a ranking scheme, according to which the species at the higher end of the scale were thought to represent a culmination of the souls which make up the various lower species. This was the genesis of the recapitulation idea. The Aristotelian concept of recapitulation relied heavily upon a metaphysical proposition of a "Prime Mover" in order to explain how the essence of a species came into being and how this essence was primarily responsible for its material nature.

However, this idea was later recognized to be false in its portrayal of nature as a "well-ordered" and essentially static system. It could not account for the changes which must have occurred given the material evidence of extinct species. As more knowledge of the biological world accumulated, the conclusion that biological forms were capable of transformation became increasingly self-evident. The new formulations which attempted

to explain biological development carried with them the vestiges of classical anthropocentrism and Aristotelian-theological doctrine. But there was, at least, a growing recognition of the material factors involved in the process of evolution. Lamarck's theory of evolution and Haeckel's version of recapitulation theory epitomize this problematic mixture of natural theology and modern biology.

Once again, though, these theories could not account for the mounting material evidence which contradicted their claims. First, the notion that the species were descendent to one another in a single, linear manner was dismissed by the observation that there are four distinct lines of descent. Then, it was argued that on the basis of actual observations, ontogeny does does not appear to recapitulate ancestral stages, but increasingly moves away from them on its course from a general, undifferentiated form toward only its own unique adult form. Next, further empirical studies showed the stages of ontogeny to be simply inconsistent with the phylogenetic record. And, finally, Haeckel's theoretical "patch-work" which attempted to rescue his "biogenetic law" served only to reveal its fundamentally abstract character.

However, before Haeckel's so-called "biogenetic law" was dismissed, it had been adopted by the psychologists of the day. Their understanding of development was also in accord with the

idealist assumptions carried by the biogentic law. Similarly, the phylogenetic progression of consciousness was not associated with the material relations which exist between an organism and its environment. The proponents of psychological recapitulation found that they could cloak a priori mental determinism within the so-called biological fact of recapitulation. Thus, it was asserted that the mental development of the individual was physiologically predisposed to repeat the same course of development that was accomplished during the development of the species. But, the lack of empirical evidence supporting this view and a long list of associated theoretical difficulties has since moved contemporary advocates of psychological recapitulation to argue that it is a principle which is not amenable to empirical testing (e.g., Furth, 1980).

Again, in the search for a more objective solution to the problem of development, psychologists working from a materialist point of departure,--particularly those in the Soviet Union--have called for a re-examination of the relations which exist between the environment and the human psyche. What has been found is that the subject's experience is "in the world" (Vygotsky); that knowledge by its very nature must be gained through the subject's activity with objects in the world. Once this unity of psychic and external activity is recognized, one observes that the intellectual development of the individual psyche involves the

psychological assimilation of the nature of material objects and, of course, man-made objects, e.g., the use of tools, the knowledge inherent in books, art, and so on. This latter type of object, so-called objects of knowledge, are the product of the experience and knowledge of previous generations. Thus, the process of learning may be described as following a form of recapitulation; that over the course of intellectual development, the individual is expected to assimilate stages of socio-historical development achieved by previous generations.

Epilogue.

In closing his discussion on the influence of recapitulation theory upon psychological theory, Gould (1977) wrote:

> I have tried to argue that these (psychological) theories cannot be properly assessed or even understood without recognizing their links to the biogenetic law. Yet these links have rarely been mentioned because so few psychologists and historians have any inkling of Haeckel's doctrine and its impact. (p. 164)

It is hoped that this historical review will help to alleviate the problem which Gould has indicated. As well, it is very much hoped that the alternative materialist approach briefly discussed above will be given further consideration. The notion

of a socio-historical recapitulation at the level of psychological organization may well prove to be the kernal of truth within this ancient idea of human development as a recapitulation of phylogeny.

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Appendix.

John Dewey: A New Emphasis on Process.

The American philosopher, educator and psychologist John Dewey (1859-1952) also maintained a notion of pscyhological recapitulation. However, Dewey's use of recapitulation theory presented a few outstanding advantages over the accounts previously discussed. At the same time, his work in this area deserves to be included within the scope of this historical review, if only for being one of the first to remove the notion of psychological recapitulation from its biological pretences. Indeed, his criticism also led him to assume a re-working of recapitulation theory which has much in common with the socio-historical formulation suggested in chapter twelve, including an emphasis upon a materialist, activity-oriented approach to knowing.

For instance, Dewey strongly objected to the traditional school which presupposed the existence of mental faculties. This objection extended to any account of psychological recapitulation which presented mental development as the unfolding of innate (biological) predispositions. In this regard, Dewey agreed with the pioneering work of Herbart's educational psychology:

> He (Herbart) abolished the notion of ready-made faculties,

> which might be trained by exercise upon any sort of material, and made attention to concrete subject matter, to the content, all-important. Herbart undoubtedly has had a greater influence in bringing to the front questions connected with the material of study than any other educational philosopher. He stated problems of method from the standpoint of their connection with subject matter: method having to do with the manner and sequence of presenting new subject matter to insure its proper interaction with old. (1916, p 71)

Despite this praise, Dewey also made it clear that there was something missing from the Herbart's psychology: "It takes...everything educational into account save its essence,--vital energy seeking opportunity for effective exercise" (ibid., p. 72). Dewey is probably best known today for his views on the role of activity in learning, views which have a great deal in common with contemporary materialist psychology:

> When a pupil learns by doing he is reliving both mentally and physically some experience which has proved important to the human race; he goes through the same mental processes as those who originally did these things. Because he has done them he knows the value of the result, that is, the fact....Where children are fed only on book knowledge, one "fact" is as good as another; they have no standards of

judgment or belief" (1915, pp. 210-211).

In suggesting that the child learns by "reliving both mentally and physically" certain historical patterns of behavior, Dewey approached the central arguments put forward by psychological recapitulation theory. However, he could not embrace the notion in toto. "In the first place," Dewey began, "its biological basis is fallacious" (1916, p. 73). He argued that recapitulation theory is contrary to evolution in the sense that it calls for a closed system. This point is reminescent of early nineteenth-century criticism of recapitulation for its ties to the scala naturae concept. However, Dewey's argument turned upon a logical, rather than biological, point of contention:

> If there were any strict "law" of repetition, evolutionary development would clearly not have taken place. Each new generation would simply have repeated its predecessors' existence. Development, in short, has taken place by the entrance of short-cuts and alterations in the prior scheme of growth. (ibid., p. 73)

The term "short-cuts" here simply referred to new ways of solving old problems, i.e., methods which have enabled the more advanced culture to become more efficient and productive than it had been previously. The developments which have occurred over the course of man's civilized history, therefore, represent the proper content of educational matter:

> The social environment of the young is constituted by the presence and action of the habits of thinking and feeling of civilized men. To ignore the directive influence of this present environment upon the young is simply to abdicate the educational function. (ibid., p. 73)

Dewey's style of argument assumed a truly dialectical stance where he argued against psychological recapitulation on the grounds that it ignores the process by which the products of culture arose. The result of this one-sided emphasis is a separation of the present from the past; for what is lacking is the continuity provided by human activity ("life") which serves as the common ground under all knowledge:

> The study of past products will not help us understand the present, because the present is not due to the products, but to the life of which they were the products. A knowledge of the past and its heritage is of great significance when it enters into the present, but not otherwise. (ibid., p. 75)

In this, and other quotes, Dewey has indicated a general agreement with the the notion of recapitulation in mental development. However, he also claimed that the true value of historical knowledge lies solely within its capacity to widen the meaning of present activities:

> The question of how human beings live, indeed, represents the dominant interest with which the child approaches

> historic material. It is this point of view which brings those who worked in the past close to the beings with whom he is daily associated, and confers upon him the gift of sympathetic penetration. (1900, p. 153)

Dewey made it very clear that such sympathy could only be mediated by an understanding of the natural and social conditions which faced those who lived in the past. The consequence of not "drawing out" the necessity of certain techniques designed to meet particular challenges presented by the environment is the false impression that technical or cultural developments jsut somehow "appear on the scene" or are the result of a "flash of genius" on the part of a "gifted individual." This contention harkens back to Dewey's complaint that the notion of psychological recapitulation has too often ignored the larger issue of the process which set the stage for innovation. Thus, Dewey asked

> when Robinson Crusoe supplies the material for the curriculum of the third- or fourth-grade child, are we not putting the cart before the horse? Why not give the child the reality with its much larger sweep, its intenser forces, its more vivid and lasting value for life,... Again, whatever may be the worth of the study of savage life in general, and of the North American Indians in particular, why should that be approached circuitously through the

> medium of Hiawatha, instead of at first hand? employng indeed the poem to furnish the idealized and culminating touches to a series of conditions and struggles which the child has previously realized in more specific form. (ibid., p. 155)

Insofar as history could provide "the child insight into, and sympathy with, a variety of social activities," Dewey recommended a general three-stage education program. In the first stage, the six-year old would be introduced to various rural and urban occupations; the seven year-old would learn the "evolution of inventions and their effects upon life"; and, the eight year-old would learn about "the great movements of migration, exploration, and discovery" (ibid., p. 157). This period is intended to provide a fundamental historical basis upon which the more recent cultural advances may be understood.

In the second period, the child would be expected to better grasp the meaning of facts of a more particular nature. Knowledge about the world, therefore, may be derived mostly from places and events in the immediate environment (e.g., the child's own city and country). The final third year in this period is directed to defining the relations between the child's own country to other countries.

Once the child has reached an understanding of the differences between various social and political systems in

relation to his own, he is prepared to comprehend the position of other cultures in terms of world-history. The completion of this program is expected to provide a solid foundation for studies of a more specialized nature assumed during college years (ibid., pp. 158-159).

Conclusion.

Dewey's account follows a far more accurate analysis of phylogeny than the other accounts previously discussed. The progression from the concrete relations between man and the natural environment toward the more abstract relations which occur between man and various present-day social institutions describes the actual course of civilization far better than the other accounts previously studied. In giving recognition to the unique set of relations which exist between the environment and the peoples of any historical period, Dewey avoided the traditional error of comparing past cultures as radically different--and inferior--than present Western culture.

Dewey's emphasis upon human activity, the process behind historical development, also led him to formulate a more adequate description of the factors involved in an individual's intellectual development. Like primitive society in the remote past, the child's first concerns are of an immediate and concrete

nature. This is not to suggest that primitive man would have been literally incapable of comprehending the complexities of international social systems, but such knowledge would have been simply irrelevant in light of his actual needs. And the same applies to the education of the modern child. In experimenting with socio-historical recapitulation, Dewey found that children were profoundly disinterested in the material which described the first stages of civilization, the Babylonian and Egyptian eras (ibid., p. 156). He found that, psychologically speaking, the young child is closer to much of prehistoric life "than the complicated and artificial life of Babylon or of Egypt" (ibid., p. 157). The child's interest, therefore, provides a rough indication as to what material would be most suitable for each level of mental development. This is not to argue support for the recent "open education" programs where the course of a child's development is dictated primarily by the child alone. On the contrary, Dewey argued that the educator's task is two-fold: first, to recognize the intellectual needs of the child and, secondly, to guide the child toward the fullest satisfaction of those needs. The grounds for this reasoning rest upon his assumption that the child's "interest ought to be the basis for selection because children are interested in the things they need to learn" (1916 p. 217). For Dewey, the "things" children desire to learn and need to learn are not merely the products of

history, but the methods by which those products came into being.

> The study of history can reveal the main instruments in the discoveries, inventions, new modes of life, etc., which have initiated the great epochs of social advance; and it can present to the child types of the main lines of social progress, and can set before him what have been the chief difficulties and obstructions in the way of progress. (1909, p. 38)

This practical approach is entirely compatible with the notion of socio-historical recapitulation outlined earlier. In this, and other quotes, Dewey has clearly demonstrated the need to emphasize the essential role played by process in the course of historical development, a course which would provide a good deal of guidance to the learning mind.

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The History of Recapitulation Theory in Psychology.

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April, 1984.