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# Jean Piaget's Concepts Of The Nature Of The Learner

John F. Emling, S.M.

## *Introductory Note*

One of the greatest European authorities of our century for shedding light on the mystery of man and his nature is Dr. Jean Piaget. This is evidenced in America today by an ever increasing number of psychologists, philosophers and educators who are discovering a more meaningful approach to human understanding and learning in applying his many writings and research projects to current problems:

Today Piaget seems to be *the* child psychologist in the eyes of the American public. His name crops up in countless publications and his ideas are discussed in many different circles – psychological, educational, philosophical, psychiatric. In spite of his popularity, however, he remains a difficult author, especially for an English-speaking reader.<sup>1</sup>

The truly amazing phenomenon is not so much the wonderful achievements of Piaget, but rather how long it has taken for his achievements to have their impact here in the United States. Piaget has been around a long time (born 1896 in Neuchâtel, Switzerland). He has been writing ever since the age of ten when he published his first “scientific” paper (a one-page note on a partly albino sparrow which he observed in the park). He has held many influential positions during our century, foreshadowed already at the age of ten when he became part-time laboratory assistant at the local Swiss museum of natural history. Incidentally, during this time as laboratory assistant the youthful Piaget published no fewer than twenty-five papers on mollusks, of which twenty were already in print before he had reached his majority! In his autobiography, Piaget himself refers to the humorous but very complimentary incident of being offered the position of curator of the mollusk collection in the Geneva museum while still studying in the secondary school! For over the past forty years this noted Swiss psychologist and his associates in Geneva have been clinically investigating and publishing about the development of cognitive processes in children from birth through adolescence. During the forties he was appointed head of the Swiss delegation to UNESCO. At present he is both director of the International Bureau of Education and of the Institut J. J. Rousseau, in addition to being professor of child psychology and history of scientific thought at the University of Geneva, a position he has held since 1929.<sup>2</sup>

Certainly, such notable accomplishments over the last sixty and more years of his life make it almost impossible to compare Piaget to any other scholar unless it be to John Dewey who was still writing and publishing at the age of ninety. Still it is only during this

past decade that Piaget's writings have created a great upsurge of interest among Americans, many of whom are now succeeding in translating his findings on how the mind works into sound educational practices. At present there is more and more evidence of his influence in educational literature; these are references to his conclusions and interpretations relative to human behavior and to the truly human aspects of the complete person as a learner. Up to now many of these insights have been truncated, only partially understood and very poorly applied even by so-called experts in the field.

The main reasons for the slow impact of Dr. Piaget and his works on American education seem to center on the problem of translation of his writings. So many of his original ideas were expressed in words coined from the French language that, practically speaking, most American scholars could find no meaningful equivalents for the psychological and epistemological phenomena in English. Hence, the key words necessary to get the full significance of the translations could not be adequately expressed. Others took so long to translate that his works were not being published in this country until many years after they had been written or had grown stale.

The two most common pitfalls for most translators of Piaget's works, however, are the tendency to oversimplify and, at the same time, to adopt the difficult Piagetian terminology without adequate explanations.<sup>3</sup> Hence, it is only in the last few years as more Piagetian translations are gradually being published in our country that such questions are finally being asked by an ever-increasing number. Who is Jean Piaget? Is he an empirical scientist or a psychologizing philosopher, or what?<sup>4</sup>

Mr. David Elkind, the Director of Graduate Training in Developmental Psychology and Professor of Psychology at the University of Rochester, has presented his answers to these questions. He characterizes Dr. Piaget as an experimental philosopher seeking to answer epistemological questions through the developmental study of the child:

Although Jean Piaget could legitimately lay claim to being a psychologist, logician, biologist and philosopher, he is perhaps best understood as a genetic epistemologist . . . . The problems are to discover the psychological structures that underlie the formation of concepts fundamental to science.<sup>5</sup>

There is no question, of course, that Piaget's works have many important implications for psychology and education. But this is not the same as saying that the works themselves are essentially psychological and pedagogical; Piaget's contribution is so great *because* of (rather than in spite of) his being neither psychologist nor educator.<sup>6</sup> How healthy this is and how vast a potential it can have on the spirit of inquiry are just beginning to become evident. It is like a new source or spring of fruitfulness to all whose professional vocation and interests revolve around the activities of the person and the human mind.

Dr. Piaget considered the growing spirit of inquiry about himself and his works so important that already in 1965 at Paris he published his own partial answers in a book, entitled *Uses and Abuses of Philosophy*,<sup>7</sup> whose impact on French intellectuals far surpassed all expectations. Indeed, the volume has been so much more popular than any

other of his previous works that a second edition was necessary within a very short time. Actually, the book turned out to be an indictment of philosophy as it is practiced today in Piaget's environment without completely solving the mystery of his viewpoint so the inquiry continues. Whatever the results of inquiry, it would appear that Piaget is presaging a "Second Spring" for a more meaningful and wholesome approach to the nature of the learner by establishing a sound basis for combining in a practical way the psychology of essence with that of the psychology of process. This happy marriage is so necessary today that hopefully a new synthesis between the science and the philosophy of man is being achieved by Piaget. Its effects are producing a very beneficial and wholesome process of human learning. One such concrete and practical example of this is Hans G. Furth's recent book entitled *Piaget and Knowledge*. Here are Piaget's own reactions to this excellent study:

In a word, the work of Furth insists throughout on the biological and epistemological dimension of the questions that are being asked, over and above their narrow psychological aspects. In this task Furth appears to us to have been remarkably successful. In fact, the reader will find detailed discussions on operative knowing, on assimilation and accommodation, on symbols or figurative representations, particularly on the relation between development through equilibration and through learning. Thanks to his comprehensive perspective, the author has unquestionably clarified all these important topics.<sup>8</sup>

\* \* \*

In any study of the works of Jean Piaget the "key" word or idea, of his method which actually is the unifying approach to all his writings must be distinguished and accepted.

Like any new discipline, genetic epistemology presupposes its own unique problems, method and theory. The problems are to discover the psychological structures that underlie the formation of concepts fundamental to science. Piaget's method is the semiclinical interview – a form of nondirective inquiry centered about a verbal or practical issue.<sup>9</sup>

For me, one of the closest key concepts expressed in English by many psychologists and philosophers regarding Piaget's work seems to be the word "developmental." It is only after a careful study and appreciation of Piagetian works that one realizes how inadequate the word really is. However, it is sufficient for a start because by the time you have understood the full significance of "developmental" in relationship to his method, you no longer need it as the key idea. You are able then to understand his system in such a way that any such key word would only mar the whole.

Developmental seems also to have been the dominant characteristic of his earliest publications during his so-called "prepsychology" period. This seems likewise to be true of his method in formulating his approaches to what he considers to be the very important views of man's nature – totalities, equilibrium, unification, etc., but especially

of the organization of human intelligence at its different levels of knowledge.

Finally, Piaget's theory, in the most general sense, is that of subject-object equilibration, the view that mental growth is governed by a continual process aimed at balancing the intrusions of the social and physical environment with the organism's need to conserve its structural systems.<sup>10</sup>

Practically all of Piaget's writings from the 1920's on reflect this so-called "developmental" aspect — an approach which seems to have been a direct influence of the doctoral studies which he completed in 1918 at the University of Neuchâtel.<sup>11</sup> This aspect has continued to grow and to be so perfected over the last fifty years that Jean Piaget today is gradually being termed a "developmentalist" interested particularly in the human organism's adaptation to the environment via intelligence. He has pioneered successfully in studies of children from the first years of life through adolescence. An interesting feature about this is that much of his early information was obtained, in collaboration with his wife, by direct study of his own three children from their earliest years.

In the strictest psychological sense of the word, then, Jean Piaget is a leading figure in the field of *developmental* psychology, "a brilliant observer and a leader around whom followers, themselves gifted, have gathered."<sup>12</sup> His emergence as a leader in genetic epistemology, however, is due in no small degree to his developmental and dynamic approaches to intelligence in the nature of man. In addition to his other studies, Piaget has been working on theories of intellectual and perceptual development for more than the last forty years. The technique he employs "is to get inside the child's mind and see the world through the child's eyes,"<sup>13</sup> a projectional approach, almost unique in itself. As a result of this interesting technique, Piaget has traced stage by stage, the development of human intelligence, placing emphasis on the normal structural development of thinking.

According to Piaget, the development of logical thinking can be categorized into a series of stages, the order of which is constant. Within each stage a period of formation and a period of attainment occur, within certain limits, at specifiable chronological ages.<sup>14</sup>

As a result of his detailed and lengthy research, Dr. Piaget has outlined carefully the major stages of child development. However, he cautions against an over literal identification of stage and age. He insists that his findings give only a rough estimate at best of the mean ages at which various stages are achieved.

... the series of stages form an ordinal but not an interval scale. Thus Piaget readily admits that all manner of variables may affect the chronological age at which a given stage of functioning is dominant in a given child: intelligence, previous experience, the culture in which the child lives, etc. For this reason, he cautions against an over literal identification of *stage* and *age*.<sup>15</sup>

## Emling: Jean Piaget's Concepts of the Nature of the Learner

The first of these stages is termed the sensory-motor stage. This stage lasts from birth to about two years of age. The sensory-motor stage is marked by the absence of formal intellection and intellectual behavior. Rather, in this stage the child becomes aware of and learns about his muscles and senses.

... the small child can only perform motor actions, without thought activity, but such actions display some of the features of intelligence, as we normally understand it....<sup>16</sup>

It is here in the motor actions Piaget insists that intelligence begins. Moreover, there is a step by step growth in the performance of simple habits and the control of manual activities such as vision and hearing. Finally, the infant reaches the stage where language begins for him and "the internalization of actions into thoughts becomes possible."<sup>17</sup>

... with the advent of the capacity to represent actions rather than simply to perform them, the sensory-motor period draws to a close and the child is ready for an analogous but even more extended and torturous apprenticeship in the use of symbols.<sup>18</sup>

The actual transition from one stage to the next occurs when the more mature structure gradually integrates with and wins over the previous stage. So the shift from motor activity to symbolic response marks the transition from the sensory-motor stage to the stage, called by Piaget, "the preoperational."

The preoperational stage is marked by many characteristics, one of which is egocentrism. In the early years of this development "the child is not able to take the viewpoint of another person."<sup>19</sup> Moreover, the child has a tendency to focus his attention on only the more striking aspects of reality. Human characteristics and powers are given to inanimate objects as a result of the child's inability to separate or categorize reality. Also, the child considers himself the cause of every event. Yet, even

if the child renounces considering his actions as the cause of every event, he nevertheless, is unable to represent to himself the actions of bodies except by a schemata drawn from his own activity.<sup>20</sup>

In this stage the child has a reason for everything and every question has an answer. Every answer makes sense to the child regardless of the logic used.

This is the period of greatest language growth and through the use of words and other symbols the child can represent the outside world and his own inner world of feeling. It is a period when magical explanations make sense, when 'God pushes the sun around' and stars must go to bed when he does. The child begins to gain a sense of symmetry, depends on trial and error adjustments, and manages things by a kind of intuitive regulation.<sup>21</sup>

The youngster in his preoperational stage is unable to cope with such problems as are related to causality, measurement, and time. However, he is gradually comprehending

specifics and, hence, is entering the stage Piaget terms the period of concrete operations.

It is important not to disregard the fact that each stage is characterized as containing an initial period of preparation and a final period of achievement in a means-end and an end-means relationship. The preparation period as the means goes through a process of formation and organization characterized by fluctuations and instability. It is only in the final phase of achievement that stable equilibrium actually exists as a stage in its own right and which Piaget refers to as *structures d'ensemble*, a kind of totality that ends as an integrated whole.<sup>22</sup>

As further epistemological experimenting continued, Dr. Piaget became more interested in the middle-childhood ages of approximately seven to twelve years. He made his great descriptive contributions on this level which he termed the concrete operational stage.

The older child seems to have at his command a coherent and integrated cognitive system with which he organizes and manipulates the world around him. It is this same system which makes the elementary-school-age child different from his preschool-age counterpart, for now, he gives the decided impression of possessing a solid cognitive bedrock, something flexible and plastic and yet consistent and enduring, with which he can structure the present in terms of the past without undue strain and dislocation, that is, without the ever-present tendency to tumble into the perplexity and contradiction which mark the preschooler. Now the child can move things around, make them fit properly.<sup>23</sup>

Piaget also found that the child during this time could learn how to arrange things into orders, either by height, color, size, or amount. Moreover, he was likewise able to follow and to retrace his steps in solving problems.

Now the child becomes capable of reasoning about concrete objects. Some of the major logical rules he uses have to do with the ordering of objects in a series of 'greater than' and 'less than' . . . .<sup>24</sup>

In the previous stage of concrete operations, the child can only organize, classify, and separate what is real. However, it is when the child enters into the period of so-called formal operations that he is able to "consider general laws, and his thoughts concern what is hypothetically possible as well as what is real."<sup>25</sup> In this stage the adolescent begins to reason deductively and his dependence on handling the concrete is lessened by his ability to think abstractly. Now he is able to speculate about the future and can solve problems in a more adult manner.<sup>26</sup>

In four major stages Dr. Piaget has traced the development of intelligence from the performance of simple motor actions to the emergence of what he terms "the formal operations of intelligence." His four stages are important in studying the nature of the learner for at least two reasons: First, it is necessary to realize *what* a child is capable of knowing and *how* he can know in order to present things in a manner capable of being understood by the child. Secondly, it is necessary for any teacher to know what children

## Emling: Jean Piaget's Concepts of the Nature of the Learner

are capable of doing as individuals at each stage of growth and development as individuals, so that he will not demand more than each is able to do or to judge any child by standards beyond his reach. Hence, to be effective the activities of learning and teaching themselves must be based upon the "Piagetian stages" of intellectual development of the learner.

Evidently Dr. Piaget's idea of intelligence constitutes an organizing activity whose functioning extends that of the biological organization of the child, but at the same time surpasses it due to the elaboration of new structures. He maintains that all such activity involves a striving for equilibrium through mental organization. For example as an individual acts upon his environment, certain elements from the experience are stored in mental structures. It is here, Piaget insists, that construction of these mental structures begins already at birth. Then when any new elements from fresh experiences are incorporated into them, his states of consciousness become more vivid. Accordingly:

Intelligence is said to originate within a biological substrate, a substrate beyond which it soon extends. At its core are the invariant attributes of organization and adaptation, the latter including the two interacting functions, assimilation and accommodation. Through the continued operation of these last, structural units called *schemas* are born, develop, and eventually form interlocking systems or networks . . . Changes in the assimilation-accommodation relationship occur both within and between stages of development.<sup>27</sup>

It is in accordance with these principles that Piaget has constructed his four major stages, not as specific behaviors, but as explanatory of child growth and development as follows:<sup>28</sup>

1. Sensory – motor stage (from birth to about two years).
2. Preoperational or representational stage – (from about 18 months to 7 years).
3. Concrete Operations – (from about 7 years to 12 years).

These groupings are intellectual schemas which possess particular characteristics such as closure, associativity, reversibility, and identity.

4. Formal operations – (from about 11 years to 15 years).

By these the adolescent acquires the adult capacity for abstract thought no longer exclusively preoccupied with trying to stabilize and organize just what comes directly to the senses. He has a new orientation, the potentiality of imagining all that might be there – both the very obvious and the very subtle – and thereby exercises a much better assurance of discovering all that is there.

In all of these major stages, however, new elements upset equilibrium. Hence, the old structures are altered only according to the conditions of reality being experienced at the time equilibrium is restored. When reduced to the barest essentials, these mental activities can be expressed in this simplified manner:



ASSIMILATION process by which information is taken into mental structures. Also the functioning of the system of which organization is the structural aspect.

BEGINNING  
EQUILIBRIUM

RESULTING  
EQUILIBRIUM

ACCOMMODATION is the modification of the thought patterns to adapt to reality.

In connection with all operations Piaget believes that the functional invariants — organization and adaptation (assimilation and accommodation) — and the psychological structures are inextricably intertwined . . . assimilation and accommodation, although complementary, nevertheless occur simultaneously. A balance between the two is necessary for adaptation. Moreover, adaptation is not separate from organization. In the process of organizing his activities the individual assimilates novel events into pre-existing structures to meet the demands of the new situation. Furthermore, the functional invariants (organization and adaptation) are closely related to the structures of intelligence.<sup>29</sup>

*Self-activity* is the single most important element in this adaptive process for Piaget. If equilibrium is to be achieved at a higher level, then the child must be mentally active. The elements to be incorporated may be present in an experience or the child may be told of the error in his thinking, but unless his mind is actively engaged in wrestling with data, no accommodation occurs. To Piaget, therefore, knowledge is *not* a copy of reality; to know something is to modify external reality. Knowledge always involves a mental operation which permits one to transfer what one sees in the light of what one already knows. However, these operations are not the same at all ages, but are conditioned and contingent upon many factors.

### *Factors in Development*

Among others, Piaget lists the following four main factors that influence human development from one stage to another:

1. Maturation: which he defines as the ripening of neural structures with age, affecting the transformations in mental structures.

Piaget is not a simple maturationist. He does not believe that the infant's development unfolds solely as a result of some kind of physical maturation . . . it is not the only factor in development . . . he believes that the effects of the environment are quite important, and to this extent Piaget is in agreement with the environmentalists.<sup>30</sup>

2. Experience: in the broadest sense. He maintains that experience is not alone

enough to accelerate logical development, if experience is defined as mere exposure to objects or events. Piaget says there must be a total coordination of actions: actions of joining things together or of ordering things about, etc., to constitute experience.

3. Social Transmission: which he considers as the linguistic or educational transmission, but like the two preceding factors, this too has its role in logical development. However, it is not enough in itself. He insists that linguistic transmission is possible only when logical structures are present in children's thinking.
4. Equilibration: which Piaget calls the critical factor. The previous factors are necessary, but it is the mental activity of the subject himself, when confronted with cognitive conflict and operating to compensate, which actually determines the development of logical structures.

In short, Piaget is neither a maturationist nor an environmentalist, at least not in the dominant behaviorist tradition. His position incorporates elements of both traditions, and, in addition, elaborates upon them in highly original ways. He thinks of himself as an "interactionist," for his theory stresses that intellectual development results from an interplay between internal and external factors.<sup>31</sup>

Understanding the various stages in the development of intelligence and of the major factors involved are considered by Dr. Piaget to be a prerequisite for comprehending human knowledge. Hence, he cautions against viewing incorrectly any major stage of mental development with its specific factors as isolated from its emergence into a new way of relating with and responding to reality. Any partial view, he insists, can only be avoided by referring to what is actually happening in terms of knowing. Thus, it is necessary to examine what he considers as the nature of knowledge and exactly what is occurring within the mental states of the child in terms of knowing as he explains it in this context.

Jean Piaget takes a dynamic stand in expressing the essence and nature of knowledge:

Knowledge is not a copy of reality. To know an object, to know an event, is not simply to look at it and make a mental copy, or image of it. To know is to modify, to transform the object, and to understand the process of this transformation, and as a consequence to understand the way the object is constructed. An operation is thus the essence of knowledge; it is an interiorized action which modifies the object of knowledge.<sup>32</sup>

Here is where he steps into the realm of active and total awareness of the child and puts his stress on the creative aspects of the learner. He argues that the aim of education is to produce people capable of re-creating all that has gone before them. For him, knowledge is living, not static; demanding of response, not satisfied with mere recognition:

Knowledge is the structuring of behavior as interchange between organism and environment. Behavior at every level implies a certain amount of knowledge on the part of the organism concerning the environment.<sup>33</sup>

Thus for Piaget general objective knowledge is identical with intelligence.<sup>34</sup>

Although Dr. Piaget appears primarily concerned with using the study of the child to answer questions about the nature and origin of knowledge, several other equally important practical conclusions have been formulated affecting more directly the nature of the learner. The first is biologically oriented. In Piaget's opinion, mental growth is an extension of biological growth and, as such, is governed by the same laws and principles.<sup>35</sup> The four major stages of mental development, as previously outlined by Piaget, indicated how "mental growth" parallels that of physical growth in the learner. In each stage, therefore, the environment served as a nourishment for the growth of mental structures or abilities whose developmental pattern followed a course which is laid down in the genes. In this relationship, Dr. Piaget has found through controlled experimentations, that children can utilize whatever stimuli is in their environment to foster mental growth, providing it is in keeping with the child's maturity and maturation level.

Piaget's second conclusion is with regard to the normative aspects of children's behavior and development. He believes that an understanding of normal development is a necessary starting point for a fuller understanding of differences between individuals. He insists that a child merely lacks in experience, but that his capacity to learn is no different in kind from that of an adult. Through careful experimentation, he demonstrated conclusively that capacity determines learning and not the reverse.

Thirdly, Jean Piaget concluded that when one chooses to observe human behavior via children, the observer must maintain an attitude of empathy towards those whom he observes. Only then will the observations have the solid ring of truth; for it is through this type of observation, he says, that adequate provisions can be made for the physical development which sets limits as to exactly what can be learned at any particular point in the child's life. He emphasizes, in this regard, the necessity of providing the child with the settings and stimuli which will free the learner to realize his capacities at his own time and place as an individual entity. This, of course, is the antithesis of what earlier educators understood when they advocated the acceleration of mental growth.

Finally, however, Piaget believes that the child can be stimulated in order to satisfy his cognitive needs through repetitive behavior. Good devices to stimulate thought are found in the repetitive behavior of such studies as geometry, space, and numbers.

\* \* \*

These are a few of the more important reflections and experiences from the life and works of Dr. Jean Piaget that are impregnated with meaningful implications about the learner. You may or may not agree with some or with any of them, but that does not matter. Here the constructive criticism of Mr. James Deese of the Johns Hopkins

## Emling: Jean Piaget's Concepts of the Nature of the Learner

University regarding Piaget is apropos:

How does Piaget know that children develop in this way? It is an inference from his many years of observing infants and children. His observations and tests to which he puts children are ingenious (many of his tests derive from the work of his teacher, Alfred Binet), and they do permit Piaget to make many surprising discoveries. Nevertheless, Piaget's work is largely anecdotal, and his tests are not always carefully controlled. Therefore, while most students of child development accept the main outlines of Piaget's work, not all of the details of the inferences he draws from his observations are accepted.<sup>36</sup>

However, what does matter is whether you are aware of him, of his contributions and their potentials for assisting in educating the "whole" person in his nature as the learner.

Piaget cannot be ignored any longer in our modern educational era of changing realities and adaptations. His profound sensitivity to knowledge in the light of its relevance to learning is paramount because learning still is the most important and universal occupation of man. Learning is the great task of childhood and of youth, and the only means of achieving progress at any period of life.<sup>37</sup>

This capacity to learn, which makes man truly a rational and hence a human being, Dr. Piaget considers man's most significant native endowment. In the natural order, it is his reason for being and the primary characteristic of his human nature. It is the foundation of every human act and of all human achievement. It explains the nature of the learner as a learning nature, *as a process* instead of a mere essence.

More and more psychologists today agree that the capacity to learn constitutes the best single measure of man's intelligence. Piaget in a very meaningful and significant pattern has presented us with a better understanding of the nature of the learner in its developmental aspects regarding intelligence.

However, Piaget explicitly restricts the notion of learning to an acquisition of new knowledge that is derived primarily from the environment. This is in opposition to knowledge as mere maturation which is based on physiological processes. He also differentiates knowledge from the acquisition of general knowledge or intelligence by defining it as "the slowly developing sum total of action coordinations available to an organism at a given stage."<sup>38</sup> Hence for Piaget general knowledge is not something that is merely imparted or to be taken from a book; it is actively constructed by the person who in constructing this knowledge lives the process of his development.<sup>39</sup>

It is only in realizing the true power of knowing and how to incorporate it into the stages of mental development in the nature of the learner, therefore, that each student can be given the opportunity to realize his potential of human excellence *at each stage of maturity*. Piaget's theories place the emphasis on the whole nature of the child, how he knows and what knowing means in the full significance of how the nature of the learner is truly a learning nature to be perfected by the learner himself, i.e., lives the process of his development.<sup>40</sup>

Since the two major activities of the school are learning and teaching, both of these

must be directed toward guiding the nature of the learner into meaningful self-activity so as to enable them to gain an appreciation of and control over the values of life. A help in doing this is given by applying what Dr. Piaget asserted in his various stages of developmental psychology. He demonstrated how learning always implies that a real interior change or modification has been produced in the response, reaction, thought, conduct or attitude of the learner. These insights into the learning process regarding the nature of the learner are, therefore, extremely valuable because they establish a solid foundation on which the nature of learning can be grasped in a more meaningful "Piagetian" way:

In the strict sense learning is the acquisition of knowledge due to some particular information provided by the environment. It is inconceivable without a theoretically prior interior structure of equilibration which provides the capacity to learn and the structuring of the learning process; in the wide sense, it includes both factors.<sup>4 1</sup>

University of Dayton

<sup>1</sup> Herbert Ginsburg and Sylvia Opper, *Piaget's Theory of Intellectual Development: an Introduction* (Englewood Cliffs: Prentice-Hall, Inc., 1969) p. 7.

<sup>2</sup> John A. Flavell, *The Developmental Psychology of Jean Piaget* (New Jersey: Van Nostrand, 1963) pp 1, 6. Ginsburg and Opper, *op. cit.*, pp. 1, 12.

<sup>3</sup> Ginsburg and Opper, *op. cit.*, p. 8.

<sup>4</sup> Hans G. Furth, "The Problem of Piaget," *Commonweal* (April 4, 1969) p. 69.

<sup>5</sup> Jean Piaget, *Six Psychological Studies* (New York: Random House, 1969) p. 5.

<sup>6</sup> *Ibid.*, p. 6.

<sup>7</sup> Furth, *op. cit.*, p. 69. Incidentally, this book — *Uses & Abuses of Philosophy*, is only now being translated into English and is a good example of how long it takes before the English-reading scholars can have translations of Piaget's works.

<sup>8</sup> Hans G. Furth, *Piaget and Knowledge*, (New Jersey: Prentice-Hall, 1969) p. 8.

<sup>9</sup> Piaget, *op. cit.*, *Six Psychological Studies*, p. 5.

<sup>10</sup> *Ibid.*

<sup>11</sup> Flavell, *op. cit.*, pp. 2 ff.

<sup>12</sup> Robert Coles, "Piaget as God," *Commonweal* (April 5, 1969), p. 68.

## Emling: Jean Piaget's Concepts of the Nature of the Learner

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- 27 Flavell, *op. cit.*, p. 67.
- 28 Dr. Furth, in his book entitled *Piaget and Knowledge*, pp. 29 32 gives only three major stages by combining the first two.
- 29 Ginsburg and Opper, *op. cit.*, p. 23.
- 30 *Ibid.*, p. 70.
- 31 *Ibid.*
- 32 Jean Piaget, quoted by Frank Jennings, p. 81.
- 33 Furth, *Piaget and Knowledge*, p. 262.
- 34 *Ibid.*
- 35 Piaget, *Six Psychological Studies*, Chapter I.
- 36 James Deese, *General Psychology* (Boston: Allyn and Bacon, Inc., 1967) p. 329.
- 37 William A. Kelly, *Educational Psychology* (Milwaukee: The Bruce Publishing Co., 1965) p. 187.
- 38 Furth, *Piaget and Knowledge*, p. 221.

39 *Ibid.*

40 *Ibid.*

41 *Ibid.*, p. 262.

### Bibliographical Note

The following is a list of outstanding books dealing with Piagetian concepts. When studied in the order given, they will give a progressional insight into Dr. Piaget's developmental views of the nature of the learner; they begin with his early writings on infancy and develop into his later theory of equilibration, expanding on the role of experience as a gradual introduction into the concepts of internal cognitions, and finally culminate in his views on human knowledge and logical thinking. The final reference — *Piaget for Teachers* — serves as a summary and application to the field of education of all preceding references.

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