

EDUCATIONAL TEXT

GENETIC EPISTEMOLOGY, FROM JEAN PIAGET'S OWN WORDS AND WORKS

*Ricardo Pereira Tassinari*¹

Abstract: The principal intention and meaning of Jean Piaget's work is difficult to grasp, particularly due to its great length and depth, and some widely spread general misconceptions about it. In order to help clarify it, and furnish data for the discussions about it, this article aims to expose and clarify, in general lines, Piaget's main project: Genetic Epistemology. The intention here is to point out its motive and constitution, from Piaget's own published works and words. In the end, the data analysis shows that the main intention and meaning of Piaget's work was to build a new chapter in Epistemology, Theory of Knowledge and Philosophy of Science, founding and establishing Genetic Epistemology: a new inter-, trans- and multidisciplinary area, directly bound to the scientific methods and contents, and their geneses, especially related to Genetic and Cognitive Psychologies and History of Science. As the outcome, this area furnished various studies of scientific notions and concepts, including their geneses, many analyses of the methods of various sciences, and studies on the System of Sciences, as well as more detailed studies of the elements necessary for the acquisition of knowledge, with concepts so close to the experience that they are immediately applicable.

Keywords: Jean Piaget. Genetic Epistemology. Theory of Knowledge. Philosophy of Science.

Introduction: Broader interests and questions...

Jean Piaget is usually associated with psychology or education. This is natural because his work is widely used in these areas, which are closer to ordinary life, and even plays a central role in them. However, in fact, Piaget's main interests and questions are scientific-philosophical and are broader and more basic than those in psychology or education.

Although he has several publications in psychology, as well as some in education, Piaget's main interests and questions concern philosophical areas referred to in French as *épistémologie* and *théorie de la connaissance*, the first term originating from the Greek: science or study (*-logie*) of knowledge (*épistémè*). Particularly, answering those questions was the main motivation in Piaget's life, culminating in his main project: "Genetic Epistemology, or the theory of scientific knowledge [l'*épistémologie* génétique, ou

¹ Associate Professor (Livre-Docente) of Logic, Theory of Knowledge and Philosophy of Science in the Department of Philosophy at São Paulo State University (UNESP). E-mail: ricardotassinari@gmail.com. ORCID: <https://orcid.org/0000-0003-1026-730X>. Homepage: www.marilia.unesp.br/ricardotassinari.

théorie de la connaissance scientifique] based on the analysis of the very development of this knowledge” (Piaget, 1950, p. 13).

According to the *Technical and Critical Vocabulary of Philosophy* of the French Society of Philosophy, edited by André Lalande (1997, p. 293), the meaning of the French term *épistémologie* constitutes “[...] essentially the critical study of the principles, hypotheses and results of the various sciences, intended to determine their logical (not psychological) origin, their value and their objective importance.” Thus, the meaning of *épistémologie* is close to that of *Philosophy of Sciences*. While, according to Lalande (1997, p. 1129), *théorie de la connaissance* constitutes the “Study of the relationship between the [knower] subject and the [known] object in the act of knowing.” In English, the terms *Epistemology* and *Theory of Knowledge* (that directly seem to correspond to *épistémologie* and *théorie de la connaissance*) are practically synonymous and have the meaning of the French term *théorie de la connaissance*, as pointed out by Lalande (1997, p. 293).

Therefore, from the aforementioned meanings, Piaget’s interests concerned Epistemology, Theory of Knowledge and Philosophy of Science which can be treated as aspects of a single broader area, as done by him.

Some of the main questions of this area are: How do we know if our opinions or beliefs, or even our sciences, correspond to reality? Is it possible to know? If so, what are the necessary (and sufficient) conditions to achieve knowledge or even science (instead of having mere opinions or beliefs)?

Such philosophical questions go back to the beginnings of Western Philosophy and had different answers provided by different philosophers throughout the History of Philosophy. Piaget belongs to this series of great thinkers and aims to answer this type of question. However, he wants to do it in a very specific way: believing that contemporary scientific methods are the best way to get from opinions or beliefs to knowledge, Piaget founded and developed the discipline referred to as *Genetic Epistemology*.

In this context, Genetic Epistemology aims to answer those questions in a very specific way: (1) being supported by experimental scientific methods (especially psychological ones) and (2) studying the constitution or genesis of scientific knowledge (mainly Physics and Mathematics) both in individuals (*ontogenesis*) and in history (*phylogenesis*). As Piaget points out:

Genetic epistemology attempts to explain knowledge, and in particular scientific knowledge, on the basis of its history, its sociogenesis [or *phylogenesis*], and especially the psychological origins [*ontogenesis*] of the notions and operations upon which it is based (Piaget, 1970a, p. 1).

As Piaget (1971a, p.4-5) reported, he decided to devote his life to Philosophy from the beginning of his intellectual journey. More precisely, Piaget’s interest in Philosophy began in the summer of 1911, when he was 15 years old. On the shores of Lake Annecy, Switzerland, his godfather, a man of letters concerned about his godson’s excessive specialization in Biology (who at the time had already published his first article on malacology), explained to him the book *Creative Evolution*, by the French philosopher Henri Bergson (1859-1941). This contact with Philosophy generated a tremendous fascination within Piaget (1971a, p. 5), who related: “On returning to school my decision was made: I would de-vote my life to philosophy [...]”. Genetic Epistemology is, thus, the result of such early broad interest and decision.

The new discipline: Genetic Epistemology

In his founding book of the area, *Introduction to Genetic Epistemology*, Piaget defines the central question of the new discipline:

How does the scientific thought involved in the considered cases (and taken with a determined delimitation) proceed from a state of lesser knowledge to a state of knowledge considered superior? (Piaget, 1950, p. 12).

Or, even more briefly and broadly: “How does knowledge increase?”

Genetic Epistemology considers that knowledge is a process and always in development. In this sense, it is important to study this continuous constitution of knowledge. As Piaget highlights:

In fact, if all knowledge is always in a state of development and consists in proceeding from one state to a more complete and efficient one, evidently it is a question of knowing this development and analyzing it with the greatest possible accuracy (Piaget, 1971b, p. 6).

The main bases of Genetic Epistemology are: (1) the History of Science, which provides material to historico-critical analysis; and (2) Genetic Psychology, which provides material to psychogenetical analysis. Or, as Piaget sets forth:

Since the problem is that of the process law, and since the final stages (that is, really final) are as important in this respect as the first known, the section of development considered can offer at least partial solutions, but only if it assures a collaboration of the historico-critical analysis and the psychogenetical analysis (Piaget, 1971b, p. 6-7).

In this sense, Genetic Epistemology, on the one hand, uses the historical-critical method to analyze the notions of a science and their historical geneses. On the other hand, it uses the results obtained in Genetic Psychology to understand the geneses of these notions in individuals, from birth to adulthood, as well as forms and reasons for the construction of these notions. Although Piaget published very few books specifically on the History of Science and Philosophy, the historical-critical analysis permeates his works, especially when he compares the notions of the studied subjects with those of the History of Science and Philosophy.

Therefore, the term *genetic*, as used in *Genetic Epistemology* and *Genetic Psychology*, is related to the idea of the genesis of structures, and has no (explicit) connection with biological *genes* (as the use of such a term might lead one to think). This notion of genesis relates to the human sciences movement called *Structuralism*, of which Piaget (1970b) himself is one of the representatives. According to Piaget (1967, p. 147 and p. 149): “Genesis emanates from a structure and culminates in a structure” and “Every structure has a genesis.”

In this sense, Piagetian reflections on both aspects, psychological and epistemological, subsidized by a structuralist-genetic perspective, will then retrace the form of the constitution of Knowledge, and will also clarify the necessary (and sufficient) conditions for it.

Genetic Psychology

Concerning psychogenetical analysis, from the aforementioned beginning of Piaget’s intellectual life, deep-seated in his studies in Biology, he defined a posture that would characterize his work: always submitting to experimental scientific tests, questions about knowledge which depends on facts. As Piaget writes:

The first aim of genetic epistemology is, therefore, if one can say so, to take psychology seriously and to furnish verifications to any question which each epistemology necessarily raises, yet replacing the generally satisfying speculative or implicit psychology with controllable analyses (on the scientific mode, therefore, of what is known as a control) (Piaget, 1971b, p. 7).

In this sense, in order to build an epistemology that does not deviate from the facts, it is important to carry out an experimental study of the geneses of the notions related to knowledge (such as, for example, classification, seriation, number, space, time, causality, chance, etc.). Genetic Psychology, of which Jean Piaget is one of, if not the, greatest contributors, seeks to carry out such studies. Particularly, it explains why many of Piaget’s books have the term *enfant (child)* in their titles.

Piaget’s decision to always submit fact-dependent questions about knowledge to scientific experimental tests led him to (strongly) contribute to Genetic Psychology before founding Genetic Epistemology, as an early part of it. It may be said that one of Piaget’s greatest contributions to Epistemology, Theory of Knowledge and Philosophy of Science was to make an epistemology, theory of knowledge and philosophy of science in which its concepts are so close to the experience that they are immediately applicable, building models and verifying them, to answer the questions present in these areas.

For this reason, Piaget came to found Genetic Epistemology very late in his life. The book *Introduction to Genetic Epistemology*, which founded Genetic Epistemology, was only published in 1950, when Piaget was 54 years old, 38 years after the beginning of his career. However, in its Preface, Piaget (1950, p. 5) points out: “[...] if we have guarded against too-quick generalizations, regarding the constitution of this Genetic Epistemology whose outlines we are trying to establish today, we have never lost sight of such a goal.”

Although Genetic Psychology is at the base of Genetic Epistemology, one should not confuse them with each other. As Piaget points out:

Genetic psychology is a science whose methods are more and more related to those of biology. Epistemology, on the other hand, is generally considered part of philosophy, necessarily answerable to the other philosophical branches and thus including a metaphysical attitude (Piaget, 1971b, p. 26).

Thus, Genetic Epistemology constitutes a broad area, a part of Philosophy, which deals with various issues related to Knowledge, broader than Genetic Psychology, aimed at building psychological models of the human capacity to know.

Genetic Epistemology Contributions

In this way, from the analysis of Piaget’s books (as in the *Bibliography of first editions of Jean Piaget’s books* at the end of this paper), a general view on the contributions of Genetic Epistemology to Epistemology, Theory of Knowledge and Philosophy of Science is possible. First of all, various studies of scientific notions and concepts and their geneses (such as space, time, causality, chance, speed, force, atomism, physical and mathematical quantities, geometry, etc.) can be mentioned, as well as analyses of the methods of various natural and human sciences (such as structuralism and dialectics) and studies on the System of Sciences. In addition to them, we have more detailed studies of the elements necessary for the acquisition of knowledge (such as, for example, studies related to perception, representation, identity, classification, seriation, mental operation, logical necessity and possibility, formation of notions of conservation, generalization, contradiction, meaning, comprehension, learning and memory).

Genetic Epistemology also provides contributions to other fields of Philosophy, in particular, contemporary Ethics and discussions about the nature of human beings, with, for example, studies on the formation of structures necessary for morality or symbolism.

Inter-, trans- and multidisciplinary of Genetic Epistemology

Last, but not least, a central and principal characteristic of Genetic Epistemology is that of its inter-, trans- and multidisciplinary. Particularly, Piaget (1972a) was the first to define and use the term “transdisciplinarity”. For Piaget (1971a, p. 28), said characteristic made “possible a scientific epistemology”, such as he has “always dreamed of”:

I had therefore dreamed of a “genetic epistemology”, which would delimit the problems of knowledge in dealing with the question “how does knowledge grow?” which concerns both its formation and historical development. But the criterion of the

success of a scientific discipline is intellectual cooperation [...] (Piaget, 1971a, p. 28-29).

Particularly, searching for such “intellectual cooperation”, in 1955, 5 years after publishing the founding book *Introduction to Genetic Epistemology*, Piaget created the *Centre international d'épistémologie génétique* (CIEG), with the support of The Rockefeller Foundation. As Ratcliff and Tau (2018, p. 1215) wrote, the CIEG “functioned at the University of Geneva between 1955 and 1986. This Center led by Jean Piaget had the collaboration of hundreds of researchers from around the world and from different disciplines.” Particularly, a series of 33 books, called “*Études d'épistémologie génétique* [*Studies of Genetic Epistemology*]”, generally abbreviated as EEG, results from the CIEG work. As Piaget wrote in the EEG 1:

The objective of this Center in Geneva is to ensure the possibility of teamwork among specialists from different horizons, in order to address, for a given time, the study of the issues delimited by scientific epistemology, from the perspective of development. More specifically, the Center strives to organize, year after year, the collaborative work of psychologists and representatives of some other particular science, for the study of some epistemological problem related to this second discipline, choosing preferably the problems that can be addressed from genetic way (Piaget, 1957, p. 1-2, *apud* Ratcliff and Tau, 2018, p. 1218).

As Piaget highlights:

It is therefore clear that any study in genetic epistemology, whether it concerns the development of some sector of knowledge in the child (number, speed, physical causality, etc.) or of some transformation in one of the corresponding branches of scientific thought, presupposes the collaboration of specialists in the epistemology of the science studied, of psychologists, historians of science, logicians, mathematicians, cyberneticians, linguists, etc. The method of teamwork has been the one followed by our Centre international d'épistémologie génétique at Geneva. This book is therefore in many respects a collective one (Piaget, 1972b, p. 16).

For an overview on the EEGs, a list of all of them can be found at the end of this paper.

Finally, it is important to note that, besides such work in the CIEG, Piaget continued to produce his own books (as can be seen here in the *Bibliography of first editions of Jean Piaget's books*) with co-workers, particularly attesting the inter-, trans- and multidisciplinary of his work. An excellent example of it is (Piaget *et al.*, 1967):

Logique et connaissance scientifique [Logic and scientific knowledge]. This 1,345-page encyclopedic book contains the parts: nature and methods of epistemology, logic, epistemology of mathematics, epistemology of physics, epistemology of biology, epistemology of human sciences, classification of sciences and principal contemporary epistemological currents. It was produced with co-writers: Léo Apostel, Louis de Broglie, Olivier Costa de Beauregard, Jean T. Desanti, Dominique Dubarle, Lucien Goldmann, Gilles-Gaston Granger, Pierre Greco, Jean-Blaise Grize, Jean Ladrière, Jean Leray, André Lichnerowicz, Benoît Mandelbrot, Benjamin Matalon, François Meyer, Czeslaw Nowinski, Seymour Papert and Jean Ullmo.

Conclusion: New chapter in Epistemology, Theory of Knowledge and Philosophy of Science

In the end, the main intention and meaning of Jean Piaget’s work was to build a new chapter in Epistemology, Theory of Knowledge and Philosophy of Science, founding and establishing Genetic Epistemology, as described in general terms here: a new inter-, trans- and multidisciplinary area, directly bound to the scientific methods and contents, and their geneses, especially related to Genetic and Cognitive Psychologies and History of Science. As the outcome, this area furnished various studies of scientific notions and concepts, including their geneses, many analyses of the methods of various natural and human sciences, and studies on the System of Sciences, as well as more detailed studies of the elements necessary for the acquisition of knowledge. It constitutes an epistemology, theory of knowledge and philosophy of science that has its concepts so close to the experience that they are immediately applicable, building models and verifying them, to answer questions present in these areas.

Of course, an *oeuvre* of this type, and its outcomes, are extremely useful in many areas, mainly in Education as well as in Psychology (particularly, Child Psychology and Cognitive Psychology), which explains the strong association of Jean Piaget’s name with these areas.

Bibliography of first editions of Jean Piaget’s books

The references are preceded by the English translations of book titles. When available, titles of already translated books were used, which is indicated by an asterisk

after the item numbering. Piaget’s books in the series *Études d'épistémologie génétique* are listed separately at the end. For a complete list of all editions, see the Jean Piaget Foundation website (data source here): www.fondationjeanpiaget.ch.

- [1] **The Mission of the Idea: La mission de l'idée.** Lausanne: La Concorde, 1915.
- [2] **Research: Recherche.** Lausanne: La Concorde, 1918.
- [3]* (With collab.) **The Language and Thought in Children: Le Langage et la pensée chez l'enfant.** Neuchâtel, Paris: Delachaux et Niestlé, 1923.
- [4]* **Judgment and Reasoning in Children: Le jugement et le raisonnement chez l'enfant.** Neuchâtel, Paris: Delachaux et Niestlé, 1924.
- [5]* **The Children’s Representation of the World: La représentation du monde chez l'enfant.** Paris: F. Alcan, 1926.
- [6]* **The Child’s Conception of Physical Causality: La causalité physique chez l'enfant.** Paris: F. Alcan, 1927.
- [7]* **The Moral Judgement of the Child: Le Jugement moral chez l'enfant.** Paris: F. Alcan, 1932.
- [8]* **The Origins of Intelligence in Children: La Naissance de l'intelligence chez l'enfant.** Neuchâtel; Paris: Delachaux et Niestlé, 1936.
- [9]* **The Construction of Reality in the Child: La construction du réel chez l'enfant.** Neuchâtel; Paris: Delachaux et Niestlé, 1937
- [10]* (With B. Inhelder) **The Child’s Construction of Quantities – Conservation and Atomism: Le développement des quantités chez l'enfant – Conservation et atomisme.** Neuchâtel; Paris: Delachaux et Niestlé, 1941
- [11]* (With A. Szeminska) **The Child’s Conception of Number: La genèse du nombre chez l'enfant.** Neuchâtel, Paris: Delachaux et Niestlé, 1941.
- [12] **Classes, Relations and Numbers – An Essay on the Groupings of Logistics and on the Reversibility of Thought: Classes, relations et nombres – Essai sur les groupements de la logistique et sur la réversibilité de la pensée.** Paris: J. Vrin, 1942.
- [13]* [The Formation of the Symbol in the Child –] **Play, Dreams and Imitation in Childhood: La formation du symbole chez l'enfant – Imitation, jeu et rêve, image et représentation.** Neuchâtel; Paris: Delachaux et Niestlé, 1945.
- [14]* (With collab.) **The Development of the Concept of Time in Children: Le développement de la notion de temps chez l'enfant.** Paris: Presses Universitaires de France, 1946.

- [15]* **Child's Conception of Movement and Speed: Les notions de mouvement et de vitesse chez l'enfant.** Paris: Presses Universitaires de France, 1946.
- [16]* **The Psychology of Intelligence: La Psychologie de l'intelligence.** Paris: A. Colin, 1947.
- [17]* (With B. Inhelder and A. Szeminska) **The Child's Conception of Geometry: La géométrie spontanée de l'enfant.** Paris: Presses Universitaires de France, 1948.
- [18]* (With B. Inhelder) **The Child's Conception of Space: La Représentation de l'espace chez l'enfant.** Paris: Presses Universitaires de France, 1948.
- [19] **Treatise on Logic – Essay on Operational Logics: Traité de logique – Essai de logique opératoire.** Paris: A. Colin, 1949.
- [20] **Introduction to Genetic Epistemology – (I) Mathematical Thought: Introduction à l'épistémologie génétique – (I) La pensée mathématique.** Paris: Presses Universitaires de France, 1950.
- [21] **Introduction to Genetic Epistemology – (II) Physical Thought: Introduction à l'épistémologie génétique – (II) La pensée physique.** Paris: Presses Universitaires de France, 1950.
- [22] **Introduction to Genetic Epistemology – (III) Biological Thought, Psychological Thought, Sociological Thought: Introduction à l'épistémologie génétique – (III) La pensée biologique, La pensée psychologique, La pensée sociologique.** Paris: Presses Universitaires de France, 1950
- [23]* (With B. Inhelder) **The Origin of the Idea of Chance in Children: La genèse de l'idée de hasard chez l'enfant.** Paris: Presses Universitaires de France, 1951.
- [24] **Essay on the Transformations of Logical Operations – The 256 Ternary Operations of the Bivalent Logic of Propositions: Essai sur les transformations des opérations logiques – Les 256 opérations ternaires de la logique bivalente des propositions.** Paris: Presses Universitaires de France, 1952.
- [25]* **Logic and Psychology.** Originally published in English, this book is based on three lectures given at the University of Manchester in 1952. Translated by W. Mays and F. Whitehead, with an introduction by W. Mays. Manchester: Manchester University Press, 1953.
- [26]* (With B. Inhelder) **The Growth of Logical Thinking from Childhood to Adolescence – An Essay on the Construction of Formal Operational Structures: De la logique de l'enfant à la logique de l'adolescent – Essai sur la construction des structures opératoires formelles.** Paris: Presses Universitaires de France, 1955

- [27]* (With B. Inhelder) **The Early Growth of Logic in the Child** – Classification and Seriation: **La genèse des structures logiques élémentaires** – Classifications et sériations. Neuchâtel: Delachaux et Niestlé, 1959.
- [28]* **The Mechanisms of Perception** [– Probabilistic Models, Genetic Analysis, Relations with Intelligence]: **Les mécanismes perceptifs** – Modèles probabilistes, analyse génétique, relations avec l'intelligence. Paris: Presses Universitaires de France, 1961.
- [29]* (With Paul Fraisse and Maurice Reuchlin) History and Method: Histoire et méthode. *In: Experimental Psychology Its Scope and Method: Traité de psychologie expérimentale*, vol. I. Paris: Presses Universitaires de France, 1963.
- [30]* (With P. Oléron, B. Inhelder and P. Gréco) The Intelligence: L'intelligence. *In: Experimental Psychology Its Scope and Method: Traité de psychologie expérimentale*, vol. VII. Paris: Presses Universitaires de France, 1963.
- [31]* **Six Psychology Studies: Six études de psychologie**. Genève: Ed. Gonthier, 1964.
- [32]* **Sociological Studies: Études sociologiques**. Genève: Droz, 1965.
- [33]* **Insights [Wisdom] and Illusions of Philosophy: Sagesse et illusions de la philosophie**. Paris: Presses Universitaires de France, 1965.
- [34]* (With B. Inhelder, M. Bovet *et al.*) **Mental Imagery in the Child** – A Study of the Development of Imaginal Representation: **L'image mentale chez l'enfant** – Étude sur le développement des représentations imagées. Paris: Presses Universitaires de France, 1966.
- [35]* (With B. Inhelder) **The Psychology of the Child: La psychologie de l'enfant**. Paris: Presses Universitaires de France, 1966.
- [36]* **Biology and Knowledge** – An Essay on the Relations Between Organic Regulations and Cognitive Processes: **Biologie et connaissance** – Essai sur les relations entre les régulations organiques et les processus cognitifs. Paris: Gallimard, 1967.
- [37] (*et al.*) **Logic and Scientific Knowledge: Logique et connaissance scientifique**. Paris: Gallimard (La Pléiade), 1967.
- [38]* (With B. Inhelder, H. Sinclair-De Zwart *et al.*) **Memory and Intelligence: Mémoire et intelligence**. Paris: Presses Universitaires de France, 1968.
- [39]* **Structuralism: Le structuralisme**. Paris: Presses Universitaires de France, 1968.
- [40]* **Science of Education and the Psychology of the Child: Psychologie et pédagogie**. Paris: Denoël, 1969.

- [41]* **Genetic Epistemology: L'épistémologie génétique.** Paris: Presses Universitaires de France, 1970.
- [42] **Genetic Epistemology.** Series of lectures delivered by J. Piaget at Columbia University. Translated by Eleanor Duckworth. New York; London: Columbia Univ. Press., 1970.
- [43]* **Psychology and Epistemology – For a Theory of Knowledge: Psychologie et épistémologie – Pour une théorie de la connaissance.** Paris: Gonthier-Denoël, 1970.
- [44]* **To Understand is to Invent – The Future of Education: Où va l'éducation.** Paris: Denoël Gonthier, 1972.
- [45] **Epistemology of Human Sciences: Épistémologie des sciences de l'homme.** Paris: Gallimard, 1972.
- [46] **Essay on Operational Logic: Essai de logique opératoire.** This book is the 2nd edition of **Traité de logique: essai de logique opératoire**, revised by Jean-Blaise Grize, with a J. Piaget's 2nd edition introduction. Paris: Dunod, 1972.
- [47]* **The Child and Reality – Problems of Genetic Psychology: Problèmes de psychologie génétique – L'enfant et la réalité.** Paris: Denoël Gonthier, 1972.
- [48]* **Adaptation and Intelligence – Organic Selection and Phenocopy: Adaptation vitale et psychologie de l'intelligence – Sélection organique et phénocopie.** Paris: Hermann, 1974.
- [49]* (With collab.) **The Grasp of Consciousness – Action and Concept in the Young Child: La prise de conscience.** Paris: Presses Universitaires de France, 1974.
- [50]* (With collab.) **Success and Understand: Réussir et comprendre.** Paris: Presses Universitaires de France, 1974.
- [51]* **Behavior and Evolution [Behavior, Motor of Evolution]: Le comportement, moteur de l'évolution.** Paris: Gallimard, 1976.
- [52] (Edited by B. Inhelder, R. Garcia, J. Vonèche) **Tribute to Jean Piaget – Genetic Epistemology and Equilibration: Hommage à Jean Piaget – Épistémologie génétique et équilibration.** Paris et Neuchâtel: Delachaux et Niestlé, 1976.
- [53] (With J. C. Binguier) **Free Conversations with Jean Piaget: Conversations libres avec Jean Piaget.** Paris: R. Laffont, 1977.
- [54] **My Ideas: Mes idées.** Paris: Médiations (Denoël-Gonthier), 1977 (This book is a translation, by E. Duckworth, of *Jean Piaget, The Man and His Ideas*, New York: E.P. Dutton, 1973, from an interview by R. I. Evans).

[55] 1980 (With collab.) **The Elementary Forms of Dialectics: Les formes élémentaires de la dialectique.** Paris: Gallimard, 1980.

[56]* **Possibility and Necessity** – Vol. 1, [The Evolution of] The Role of Possibility in [Child's] Cognitive Development: **Le possible et le nécessaire** – Vol. 1, L'évolution du possible chez l'enfant. Paris: Presses Universitaires de France, 1981.

[57]* **Possibility and Necessity** – Vol. 2, [The Evolution of] The Role of Necessity in [Child's] Cognitive Development: **Le possible et le nécessaire** – Vol. 2, L'évolution du nécessaire chez l'enfant. Paris et Neuchâtel: Delachaux et Niestlé, 1983.

[58]* (With R. Garcia) **Psychogenesis and the History of Science: Psychogenèse et histoire des sciences.** Paris: Flammarion, 1983.

[59]* (With R. Garcia *et al.*) **Toward a Logic of Meanings: Vers une logique des significations.** Genève: Murionde, 1987.

[60]* (With G. Henriques, E. Ascher and coll.) **Morphisms and Categories** – Comparing and Transforming: **Morphismes et catégories** – comparer et transformer. Neuchâtel: Delachaux et Niestlé, 1990.

Études d'épistémologie génétique (EEG)

The *Études d'épistémologie génétique (Studies of Genetic Epistemology)* (EEG) are books resulting from the activities of the *Centre international d'épistémologie génétique*. The (seven) EEGs that do not have Jean Piaget as (co)author are not preceded by numbering. All volumes were published by *Presses Universitaires de France* (PUF).

[61] EEG 1: (With W. E. Beth and W. Mays) **Genetic Epistemology and Psychological Research: Épistémologie génétique et recherche psychologique.** Paris: PUF, 1957.

[62] EEG 2: (With L. Apostel and B. Mandelbrot) **Logic and Equilibrium: Logique et équilibre.** Paris: PUF, 1957.

EEG 3: (By L. Apostel, B. Mandelbrot and A. Morf, with introduction by J. Piaget) **Logic, Language and Information Theory: Logique, langage et théorie de l'information.** Paris: PUF, 1957.

[63] EEG 4: (With L. Apostel, W. Mays and A. Morf) **Analytical and Synthetic Interrelationships in the Subject's Behavior: Les liaisons analytiques et synthétiques dans les comportements du sujet.** Paris: PUF, 1957.

- [64] EEG 5: (With A. Jonckheere and B. Mandelbrot) **The Reading of Experience: La lecture de l'expérience.** Paris: PUF, 1958.
- [65] EEG 6: (With J. S. Bruner, F. Bresson and A. Morf) **Logic and Perception: Logique et perception.** Paris: PUF, 1958.
- [66] EEG 7: (With P. Gréco) **Learning and Knowledge: Apprentissage et connaissance.** Paris: PUF, 1959.
- EEG 8: (By Leo Apostel, A. R. Jonckheere and B. Matalon) **Logic, Learning and Probability: Logique, apprentissage et probabilité.** Paris: PUF, 1959.
- EEG 9: (By A. Morf, J. Smedslund, Vinh Bang and J. F. Wohlwill, with a foreword by J. Piaget) **The Learning of Logical Structures: L'apprentissage des structures logiques.** Paris: PUF, 1959.
- [67] EEG 10: (With M. Goustard, P. Gréco and B. Matalon) **The Logic of Learning: La logique des apprentissages.** Paris: PUF, 1959.
- [68] EEG 11: (With P. Gréco, J.-B. Grize and S. Papert) **Number Construction Problems: Problèmes de la construction du nombre.** Paris: PUF, 1960.
- [69] EEG 12: (With D. E. Berlyne) **Behavioral Theory and Operations: Théorie du comportement et opérations.** Paris: PUF, 1960.
- EEG 13: (By P. Gréco and A. Morf) **Elementary Numerical Structures: Structures numériques élémentaires.** Paris: PUF, 1962.
- [70]* EEG 14: (With W. Beth) **Mathematical Epistemology and Psychology [– Essay on the Relations between Formal Logic and Real Thought]: Epistémologie mathématique et psychologie – Essai sur les relations entre la logique formelle et la pensée réelle.** Paris: PUF, 1961.
- [71] EEG 15: (With L. Apostel, J.-B. Grize, S. Papert) **The Filiation of Structures: La filiation des structures.** Paris: PUF, 1963.
- [72] EEG 16: (With E.W. Beth, J.-B. Grize, R. Martin *et al.*) **Implication, Formalisation and Natural Logic: Implication, formalisation et logique naturelle.** Paris: PUF, 1962.
- [73] EEG 17: (With P. Gréco, B. Inhelder and B. Matalon) **The Formation of Recursive Reasoning: La formation des raisonnements récurrentiels.** Paris: PUF, 1963.
- [74] EEG 18: (With T. V. Bang, P. Gréco, J. B. Grize *et al.*) **The Epistemology of Space: L'épistémologie de l'espace.** Paris: PUF, 1964.
- EEG 19: (By Vinh Bang and Eric Lunzer) **Spatial Conservations: Conservations spatiales.** Paris: PUF, 1965

- [75] EEG 20: (With J.-B. Grize, K. Henry, M. Meylan-Backs *et al.*) **The Epistemology of Time: L'épistémologie du temps.** Paris: PUF, 1966.
- EEG 21: (By Magali Bovet, Pierre Gréco, Seymour Papert and Gilbert Voyat, with introduction by J. Piaget) **Perception and Notion of Time: Perception et notion du temps.** Paris: PUF, 1967.
- EEG 22: (By G. Cellerier, S. Papert and G. Voyat, with a foreword by J. Piaget) **Cybernetics and Epistemology: Cybernétique et épistémologie.** Paris: PUF, 1968.
- [76]* EEG 23: (With J.-B. Grize, A. Szeminska, Vinh Bang *et al.*) **Epistemology and Psychology of Functions: Épistémologie et psychologie de la fonction.** Paris: PUF, 1968.
- [77] EEG 24: (With H. Sinclair, V. Bang *et al.*) **Epistemology and Psychology of Identity: Épistémologie et psychologie de l'identité.** Paris: PUF, 1968.
- [78] EEG 25: (With Bunge, F. Halbwachs and T. S. Kuhn) **Causality Theories: Les théories de la causalité.** Paris: PUF, 1971.
- [79]* EEG 26: (With R. Garcia) **Understanding Causality: Les explications causales.** Paris: PUF, 1971.
- [80] EEG 27: (With collab.) **The Transmission of Movements: La Transmission des mouvements.** Paris: PUF, 1972.
- [81] EEG 28: (With collab.) **The Direction of Moving Bodies during Shocks and Pushes: La direction des mobiles lors de chocs et de poussées.** Paris: PUF, 1972.
- [82] EEG 29: (With collab.) **Formation of the Notion of Force: La formation de la notion de force.** Paris: PUF, 1973.
- [83] EEG 30: (With collab.) **The Composition of Forces and the Problem of Vectors: La composition des forces et le problème des vecteurs.** Paris: PUF, 1973.
- [84-85]* EEG 31-32: (With collab.) **Experiments in Contradiction: Recherches sur la contradiction.** Paris: PUF, 1974. 2 v.
- [86]* EEG 33: **The Development of Thought – Equilibration of Cognitive Structures [The Central Question of Development]: L'équilibration des structures cognitives – Problème central du développement.** Paris: PUF, 1975.
- [87-88]* EEG 34-35: (With collab.) **Studies in Reflecting Abstraction: Recherches sur l'abstraction réfléchissante.** Paris: PUF, 1977. 2 v.
- [89] EEG 36: (With collab.) **Research on Generalization: Recherches sur la généralisation.** Paris: PUF, 1978.

[90] EEG 37: (With collab.) **Research on Correspondence: Recherches sur les correspondances.** Paris: PUF, 1980.

References

- BETH, W. E., MAYS W., PIAGET, J., **Genetic Epistemology and Psychological Research: Épistémologie génétique et recherche psychologique.** Paris: PUF, 1957. (EEG 1)
- LALANDE, A., **Vocabulaire technique et critique de philosophie.** Text reviewed by the members and correspondents of the Société Française de Philosophie and published with their corrections and observations. Paris: Presses Universitaires de France, 1997. 2v.
- PIAGET, J., **Introduction à l'épistémologie génétique.** Paris: Presses Universitaires de France, 1950. v. 1.
- PIAGET, J., Introduction. Le "Centre international d'épistémologie génétique" et "Études d'épistémologie génétique". In Beth, Mays, Piaget (1957), pp.1-11.
- PIAGET, J., **Six psychological studies.** Translated by Anita Tenzer. New York: Random House, 1967.
- PIAGET, J., **Genetic Epistemology.** Series of lectures delivered by J. Piaget at Columbia University. Translated by Eleanor Duckworth. New York; London: Columbia Univ. Press., 1970a.
- PIAGET, J., **Structuralism.** Translated and edited by Chaminah Maschler. New York: Basic Books, 1970b.
- PIAGET, J., **Insights and Illusions of Philosophy.** Translated by Wolfe Mays. New York and Cleveland: The World Publishing Company, 1971a.
- PIAGET, J., **Psychology and Epistemology: Towards a Theory of Knowledge.** Translated by Arnold Rosin. New York: The Penguin Press, 1971b.
- PIAGET, J. L'épistémologie des relations interdisciplinaires. Text resulting from J. Piaget's lecture at the event *L'interdisciplinarité: problèmes d'enseignement et de recherche dans les universités*, held at the l'Université de Nice, France, from September 7th to 12th, 1970. In: **L'interdisciplinarité: problèmes d'enseignement et de recherche dans les universités.** Paris: OCDE, 1972a, p. 131-144.
- PIAGET, J., **The Principles of Genetic Epistemology.** Translated by Wolfe Mays. London and New York; Routledge & Kegan Paul Ltd, 1972b.
- PIAGET, J. *et al.* **Logique et connaissance scientifique.** Paris: Gallimard (La Pléiade), 1967.
- RATCLIFF, M. J., TAU, R., A networking model. The case of the International Center for Genetic Epistemology. **Estudos e Pesquisas em Psicologia**, vol. 18, n° 4, 2018, pp. 1215-1238.

Received: 15/08/2023

Approved: 18/12/2023