

#### 4. 7 Alpha, beta, and gamma sciences

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##### 4. 7. 1 Humanities

Bibl. st.: G. Legrand, *Vocabulaire Bordas de la philosophie*, Paris, 1986, 306s. (*Sciences humaines*). Since about 1950, the term "human sciences" has emerged. Legrand explains.

**1. Ethical - political science.** For Greek thinkers, the stakes when they formed theory were man and his society. Human sciences were given the name "moral and social sciences" in that context so that conscientious behavior and state-civil behavior were discussed. The "virtuous" ("aretè") man was the goal.

**2. Humanities.** Historically, Legrand sees it as follows.

**2.1.** David Hume (1711/1776), apex of English Enlightenment, proposed the idea of an empirical science with "man" as its object. He can count as *the forerunner of today's human sciences*.

**2.2.** D. Diderot (1713/1784; encyclopedist), J. de La Mettrie (1709/1751) materialist who aroused annoyance with his *l'Homme - machine* (1748), G. Buffon (1707/1788; biologist), de Sade (1740/1814; sexist materialism in e.g. *La philosophie dans le boudoir* (1795)), J.-J. Rousseau (1712/1778); political thinker and educator, author of *Emile* (1762), design a view of man, in Hume's wake that is rather reductive (condescending) and this in often contradictory ways.

2.3. J. Kant (1724/1804; top figure of German Aufklärung (Enlightenment)) sees in "man" the pedestal of all sciences. G. Fr. Hegel (1770/1831); top figure of German idealism) absorbs "man" into the all-encompassing "spirit.

2.4. A. Comte (1798/1857; father of French positivism) reduces "man" to social facts.

**Criticism.** See here how Legrand sees the result in the mid-eighties.

1. The object. The human sciences of the time are far too much reduced to "an accumulation of facts and statistics without serious interpretation." It is as if "man" is reduced to those "facts and statistics." Only the science of history and psychoanalysis have man as an object.

2. Methods. A unitary method the human sciences of the time do not exhibit "The ethnologist does not interrogate primitive man on a divan (Note: like the psychoanalyst). The sociologist, with exceptions neglects the historical past of the groups he studies."

Legrand - evidently - goes against the then "authority" attached to the name "humanities" - which asserted itself in society - and underlines the deficiency regarding definition of object and method.

**Note:** Two omissions Legrand's review shows.

1. He makes no mention of the "spiritual scientific method" (3.3.4) since W. Dilthey's *Einleitung in die Geisteswissenschaften* (1883). Dilthey sought to understand man's soul life, "verstehen," through his signs expressing his experience.

2. Legrand does not seem to be aware of the cognitive sciences already emerging at that time (for which we refer to neuroscience, cognitive psychology, artificial intelligence theory, linguistics and philosophy of mind). See, e.g., O. Houdé et al, *Vocabulaire de sciences cognitives* (Neuroscience, psychologie, intelligence artificielle, linguistique et philosophie), PUF, 1998.

**Note:** We refer to J-Fr. Dortier, *Les sciences humaines (Panorama des connaissances)*, Auxerre, 1998, which deals successively with anthropology, linguistics, psychology, psychopathology, cognitive sciences, social psychology, sociology, economics, antecedents, history, history, geography, philosophy.

A substance that may remain subject in terms of objects and methods to Legrand's criticism!

#### 4. 7. 2 Science and culture

Bibl. st.: P. Cortois, *Snow and the "two cultures" discussion* (Thirty years later), in: *The Owl of Minerva* (Ghent) 11(1994): 2, 121/132. P.C. Snow, a physicist, delivered lectures in Cambridge in 1959 entitled "*The Two Cultures and the Scientific Revolution.*" After publication in *Encounter*, a revised edition entitled *The Two Cultures and a Second Look* followed in 1964.

**Two cultures.** Within the Western world are two cultures grown apart.

1. The alpha - sciences, in English "Humanities," with the prototype being the literary.
2. The beta - sciences, in English "Sciences," with the prototype being the physicist.

Snow labels the alpha - world as "traditionalism" and the beta - world as "belief in progress. He laments that at universities both "live together separately." He even wants to see the "irrationalism" of the alphas and the "professional idiocy" of the betas overcome in a kind of fusion of the two. The concept of "culture" should not be limited to philology (history and linguistics and literature), art and cultural philosophy but should be broadened to natural sciences, engineering, economics, politics and national defense. Alpha and beta one culture!

**Note:** This dichotomy dates as far back as Joh. Adelung, *Versuch einer Geschichte der Cultur des menschlichen Geschlechtes*, Leipzig, 1782, in which steller refers to "Cultur" as peculiar to the privileged classes. E. Kolb, *Culturgeschichte der Menschheit*, Pforzheim, 1843, and G. Klemm, *Allgemeine Cultur-Wissenschaft*, Leipzig, 1855-2, harbor a concept of 'Cultur' that includes material prosperity.

**Three cultures.** When one considers W. Lepenies, *Ist es wirklich so? (Der Möglichkeitssinn in den Sozialwissenschaften)*, in: *Neue Züfcher Zeitung* 24.02.1996, 69 / 70, one discovers what follows.

1. Economics, in the established sense, is a rock-hard science: as a natural science, it does not take into account human beings and their cultural context, and the only language it speaks is mathematical language (tables, statistics, graphs, mathematical theorizing), accessible only to insiders.

2. Since 1989, there has been a crisis of economics: rising unemployment (with the "excluded") in the Western world and the transition from the command to the market economy in the former communist countries compel mathematical economists to "calculate" with non-

economic elements, although - in 1996 - they have not yet succeeded in incorporating such data into economic theory.

Lepenies notes a shift. The opinions of "competent rebels" (Ashok Desai) who express self-criticism within economic science but also the needs for economic analysis within non-economic sciences (geography, biology, psychology, sociology, history, aesthetics) lead to an updating of established economic science.

Lepenies argues with A. O. Hirschmann, *Morality and the Social Sciences (A Durable Tension)*, "We can again speak of 'human sciences' as of 'moral sciences' ". For 'cognitively' established facts ("*Ist es wirklich so?*") are situated within a moral - social commitment ("Es könnte wahrscheinlich auch anders sein"). In other words: the morally and socially concerned thinker takes into account that "man" can intervene in what within established science - is only a natural scientific event. A work like that of Amartya Sen (Harvard), namely *Poverty and Famines* (1981) depicts famines in a more than natural scientific and mathematical language. At the same time, both the proposer as an involved personality and his temperament can be addressed more clearly in human sciences that have integrated the moral-social dimension.

**Three cultures.** Lepenies therefore talks about three types of scientific culture: Humanities, Sciences, Social sciences to put it in English! Gamma - sciences. Immediately the third term comes to mind,- besides alpha and beta sciences. Linguistics, psychology and sociology, economics reveal a gamma -type.

#### **4. 7. 3 Humanities/natural sciences**

Bibl. st.: Christine Mironesco, *La place des sciences sociales dans la recherche (La dette de Darwin à Malthus)*, in: *Le Temps* (Geneva) 29.10.02, 13. Writer is a professor of political science at the Université de Genève. She starts from the fact that the human sciences as "soft" sciences are becoming subordinate to the natural sciences as "hard" sciences and argues for more interdisciplinarity. She refers to the Autobiography of Ch. Darwin (1809/1882; *The Origin of Species by Means of Natural Selection* (1859)) in which he, the naturalist, states plainly and clearly what he owes to Th. Rob. Malthus (1766/ 1834) and his economic theory of the population principle (1798).

**Back from the Galapagos Islands.** Darwin has an impressive collection of facts, backed by his observations. But he did not have a theory to go with it. Namely, he struggled with the question of how "selection" - a term from breeding techniques - could work in the hypothesis of no breeder.

**The discovery.** Darwin reads Malthus' work concerning population. Malthus emphasizes the imbalance between the increase in population and the increase in the necessities of life. He also emphasizes the fact that said balance is sometimes restored "naturally" o.g. famines, epidemics and wars. Darwin was familiar with the "struggle for life" but what struck him as a light was the adventure of a population being depleted, and of the survivors. So the problem was human science because it applied to the relationship between a group and its members.

**The survivors.** Darwin thought like this: those who survive undoubtedly exhibit new characteristics that allow them to survive and that will gradually change the lifestyle of the whole group. In Darwin's terms: the favorable changes tend to become established and the unfavorable changes tend to be destroyed. The result in that case would be new species! "At last! I had them, my theory!". So he writes.

**Marx and Engels.** The most famous critics of Darwin's thesis were K. Marx (1818/1883; *Das Kapital* (1867)) and Fr. Engels (1820/1895), dialectical - materialists. Great was their admiration for all that was scientific progress (they founded "scientific socialism") and for Darwin. But with fierce energy they contested the connection between the economist Malthus and the biologist Darwin. The hostility of Marx and Engels toward Malthus is a notorious fact. Notwithstanding Darwin himself very explicitly confessed his dependence on Malthus, Marx and Engels and a few others performed acrobatics in their wake to make the opposite true. "As if Darwin's confession had been only a misstep in the search for the pure and hard truth." Christine Mironesco, who specializes in the relations between science, technology and politics, is concerned about the subordination that the human sciences are trying to impose on them and also about the difficulties encountered by interdisciplinarity (meaning: dialogue between "disciplines," i.e. scientific specialties) when it comes to contacts between the human and natural sciences. Or rather: between human scientists and natural scientists!

#### **4. 7. 4 Materialism (ideology/method)**

Ludwig Büchner (1824/1899) publishes his *Kraft und Stoff* in 1855 which achieved enormous success: it was republished twenty-one times before 1900! Büchner's aim: to eradicate from human knowledge all traces of that which goes beyond or exceeds the "substance ("matter") (all that is immaterial). Only that which is visible, weighable, measurable, imaginable exists. Spirit is only a part of the 'force' which itself is only an expression of matter.

**Method or ideology.** Fr. Lange (1828/1875; neo-Cantian) said that *Kraft und Stoff* offers to extremely nearsighted eyes glasses that are unfortunately too colored." He himself wrote *Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart* (1866-1; 1873/1875-2). "Lange readily recognizes materialism as a method of scientific investigation, yet denies it the right to become a philosophical world-view. As a philosophical world view it has long since been refuted by physiology and especially by the philosophy of I. Kant (1724/1804)." (J.Fischl, *Materialismus und Positivismus der Gegenwart*, Graz, 1953,40).

**'Ideology'.** A. Destutt de Tracy (1754/1836); *Eléments d' Idéologie* (1801) introduces the term with two meanings: (a) science concerning the means of knowledge; (b) science concerning the "ideas" in the proper sense that are one of the means of knowledge. Practically, this amounts to seeing the origin of ideas in sensory experience.

Today "ideology" means mainly two things: (a) the totality of a group's ideas; (b) the totality of a group's ideas (the whole of society, for example) insofar as it draws attention away from the true problems, i.e., the economic-social problems (the Marxist interpretation). When Lange rejects materialism as a "philosophical worldview," this amounts to a rejection of materialism as an ideology.

**One material object/many formal objects.** All that is (material object), is amenable to a plurality of views (perspectives, viewpoints). Lange distinguishes two.

1. The methodical - materialist pays attention in all that is, to all that is material, yet in the inclusive sense: he does not exclude the non-material. Here materialism limits itself to method. It only methodically neglects the non-material.

2. The ideological - materialist pays attention in all that is, to all that is material, in the exclusive sense: he excludes the incorporeal. Thus materialism becomes an "ontology," a theory of all that really is and can be.

Behold what Lange saw and expressed very clearly in the XIX century, albeit as a Kantian.

Even if the ideological - materialist is confronted with something that is not interpretable within his axiom ("All that is, is material"), he tries to make the non - material fit into it and explain it exclusively material. The exclusive materialist can be typified axiomatically as follows: There are certainly material facts and immediately material presuppositions. Expressed logically in ABC terms: "If (A) given and (B) only material interpretations, then (C) the given and well the whole given is intelligible.

An example. Human consciousness does not fit very well into exclusive materialism, but there is a means of including it: one does not interpret consciousness on the basis of similarity models but on the basis of coherence models, because in man the body and mind go together as a unity. It is not so difficult to interpret materially what appears as conscious because with the conscious phenomena material phenomena go hand in hand so that what goes hand in hand with it is interpretable as coinciding with it. One pretends that coherence is sameness, yes, total identity!

Also the immaterial soul, all that is sacred in the strictly religious sense (God e.g.) are analogously expressed by the exclusive - materialist in purely material terms, i.e. reduced to the purely material. This reduction or reduction leads to labeling that exclusive materialism as a reductionism.

For the spiritualist, consciousness is "the light that our mind throws on all that is." "Light" is a metaphorical model: one who is not aware of something gropes regarding that something in darkness, i.e., the opposite of light. - He who receives a blow to the head and falls into swoon, i.e. absence of consciousness, shows that the head - the brain or brain as part of the whole body - is connected with consciousness. The spiritualist fully recognizes these connections and thus denotes consciousness in terms of brain: "Consciousness, if not hindered by brain damage or any failure of the brain (and even the whole body: those who drink too much alcohol undergo a change of consciousness), illuminates the data of our experience." In other words: the brain, indeed the whole body, is a metonymic or cohesive model of conscious life. The materialist routinely shuns consciousness as light and, as its model, reduces everything to the metonymic or coherence model: consciousness is the brain but with a certain cerebral appearance, which the spiritualist calls "consciousness."

Ontology, after all that is given, asks the twofold question, "How real is it? How is it real?" (existence and essence question). Exclusive materialism turns that question into : "How material is something? How is it material?". 'Being' and 'being material' are identified. This is the basic axiom, which, however, is neither inducible from a preposition (deductive) nor inducible from a number - a finite number - of samples from overall reality (inductive). It remains an - logically speaking - unproven axiom.

#### **4. 7. 5 Operational definition**

Bibl. st.: A. Crisinel, *La météo dispose d'une nouvelle formule pour mesurer la sensation de froid*, in: *Le Temps* (Geneva) 22.11.01, 41. North American researchers have replaced a previous operational definition with an improved one. 'Operational' means "brought about by physical measurement model."

**1.** Stimulus - response scheme. The weather is cold and windless (stimulus). Our body protects us a little from the prevailing temperature by warming a thin layer of air in immediate contact with our skin (answer).

**2.1.** It is cold but the wind expels the protective layer of a moment ago. Our skin comes into direct contact with the cold moving air. Our body responds by supplying energy to the skin but this energy is immediately swept away by the wind. The skin temperature immediately drops.

**2.2.** It is cold but a cold wind at some point generates loss of moisture which also involves loss of skin heat. Such a cutting wind can cause hypothermia (chilling) unless we shield ourselves or are not exposed to such cold for too long. In worse cases, frostbite occurs.

**Measurement method.** To arrive at an operational definition, we did the following.

**1.** Method of Siple and Passel. It occurred in Antarctica in the 1940s+).

They filled a plastic cylinder with water, let it freeze under noted wind and temperature conditions, and made a list of measurements. One criticism, however, was that a receptacle is too far away from our human skin.

**2.** New method. Canadian and American researchers developed a method in June 2001 that directly measures the physiological response to cold. Twelve volunteers step on a rolling carpet in a laboratory for four and a half hours at 4.8 kilometers per hour on their winter clothes. A bellows generates winds of 8, 18 and 29 kilometers per hour. The temperature ranged from -10° C to +10° C. Every 15 seconds, the subjects received a little water in the face (to simulate humidity).

**Equipment.** Measuring instruments were placed on the forehead, cheeks, chin, nose and on the inside of one cheek. They were given a rectal probe inserted. This was to measure the sensations of, cold. Note: It is of course these "sticking to the body" yes, physical measuring instruments inserted into the body that allow a physical - operational definition. This method is reflected in weather reports in North America. Thus: if it is e.g. is -13° C and there is a north wind of 40 kilometers per hour, then the "subjective" sensation is that of -25° C, where freezing of body parts may occur.



**Note:** An "operational" definition speaks of subjective read-throughs in terms of physics and numbers. From "It is cold / very cold / extremely cold" one thus arrives at measured degrees of "cold.

#### **4. 7. 6 W.K. Heisenberg's uncertainty axiom**

Bibl.st.: J. Montenot, dir., *Encyclopédie de la philosophie, Librairie Générale Française*, 2002, 706 / 707 (Heisenberg). We reproduce this little chapter first simply because it so blatantly states the theorem of W.K. Heisenberg (1901/1976), the physicist.

Leading the way is quantum physics with, among other things, its "particles" (take electrons, for example) which also exhibit a wave nature. Well, Heisenberg states as an axiom first: "The simultaneous measurement of the location and velocity (or quantity of motion) of a physical particle is impracticable." Corollary: predicting in an absolutely exact manner the location of a particle is impracticable. Further inference: only statistical positioning is feasible. That involves predicting the occurrence of an event (e.g., the location of a particle at a moment in time) and predicting the percent of probability of that occurrence.

**Foundation.** Such statistical statements of quantum physics do not involve the possibility of a deterministic order of nature (Note: a natural order whose events are exactly predictable) which, although we cannot uncover by the methods of physics, would nevertheless exist independently (Note: in itself, independently of us).

**Further foundation.** Heisenberg's basic axiom is "only what is 1. measurable and 2. experimentally testable exists objectively. From which he concludes: the principled impossibility of simultaneously determining place and motion quantity (velocity) of a particle entails the principled impossibility that those two 'quantities' (place and velocity) exist simultaneously in objective reality. Note: In other words: what concerning those two aspects of quanta (particles) is not both measurable and experimentally testable, simply does not exist. Because - to say it again clearly: 'determine' is "to determine only measurably and experimentally (in the manner of physics)." It is not the general concept of 'determining' but one type of it!

**The classical axiom of causation.** The Encyclopedia continues. Such beliefs - namely, that only what is observable in a measurable and experimentally testable manner exists - entail that, if one thinks them in unison with the uncertainty axiom expressed above, one rejects the

classical causality axiom. One formulation of this axiom reads: "Of a given physical system (e.g., a particle), predicting the future state (Note : place, time, event) in an exact manner is always practicable."

**Note:** 'Executable', at least within the theoretical possibilities of meanwhile advancing physics. According to Heisenberg the causality axiom thus expressed must be rejected because it is never practicable (as he defines 'practicable'), precisely because of the uncertainty relation (place or speed), to know in an exact manner the present state of a physical system. Anyone who cannot know the present state cannot - even within a deterministic system - know a future state on the basis of its knowledge either.

One note: Heisenberg only posits the measurable and experimentally testable reason and thus does not address the reason without more. Well, that reason without more offers other possibilities than the measurable and experimentally testable reason. Both - place and speed of e.g. a particle - each have their 'reason' and both have their relationship as well. So ultimately the relationship between the two quantities is not so 'uncertain'. But then one must be willing to accept the radical limitation of physics as far as it only puts forward the measurable and experimentally testable (coupled or not).

#### ***4. 7. 7 Operational humanities***

##### **Operation(al)ism.**

If a theory presupposes that concepts are definable observably, and preferably measurably, only by means of physical actions repeatable by fellow human beings using instruments, then it is operationalist. Already Ch. Peirce's pragmatic maxim went down such a path but it is P.W. Bridgman (1882/1961; *The Logic of Modern Physics* (1927-1)) who pushed operationalism on physics.

Model. 'Length,' if the physical actions by which it is measured are established and proven to be useful, is operationally definable. So e.g. by means of a measurement model, a physical gauge.

**Black box.** "Black box" is the term used to refer to the unknown. One has no satisfactory similarity model. What does one do? One tries to acquire knowledge through coherence models. What - exactly speaking - is the essence of such terms in physics as "cause" or "force," is a black box as long as one has only coherence models as e.g., "I feel the force of this steam boiler. But find the means to measure and quantify that force by physical means, and you have an

operational definition. Bridgman's intention was to "cleanse" physics of such black boxes and banish the last vestiges of "the subjective" from physical language.

**Limitation.** In the micro - physical field, however, problems arise: particles (an electron e.g.), given their particle - wave nature, escape such method.

**Human science operationalism.** In psychology (Stevens (1935), Tolman (1936)) and in sociology (Lundberg (1953), Zitteberg (1954)), people tried to define operationalism by e.g. defining 'behavior' as "change in time and space of biological organisms insofar as objectively (practically: operationally) observable". Which, among other things, makes behaviorism (Watson - 1913) conceivable. Here the registrable behavior is the only valid object of investigation. Feelings and emotions that can be expressed through introspection (methodical self-observation) and psychoanalysis are ignored in behaviorism. Thus concerning the phenomenon of "thirst. A person, only if he is deprived of drink for a measurable period of time seeking to quench that state, is 'thirsty'!

**Criticism.** Bridgman himself accused operational psychology of falling into "physicalism" (irresponsible extension of physical methods). He suggested that suggestive descriptions of introspection should be integrated into scientific work.

"I'm thirsty." This is a mental, inner experience of a physical condition.

**Similarity model:** "I know by my own introspective experience what it is "to suffer thirst" and so I 'understand' you." But, in strict science, non-operationally tested testimony, even from an entire group of individuals, is not a "scientific fact" that can also be tested by other researchers working independently.

**Coherence model.** The operational definition outlined above takes the mental phenomenon "I am thirsty" by what is associated with it (deprivation of drink, measured duration of it, physical manifestation of thirst). One can clearly see the detour. But, if no operational - scientist had ever gone through the "subjective" (introspective) experience "I'm thirsty," how would such a person even remotely grasp "the black box" that is "I'm thirsty," - let alone want to operationally investigate it?

***The crucial weakness.*** The purely operational method thinks through coherent phenomena (coherence models) to grasp the black box itself as if those coherent things were already resemblance models. As long as coherence is thoroughly different from resemblance, defining along the detour of coherent data will not produce a resemblance model, and the introspectively known - and truly known - "soul," "interiority," "spirit," "consciousness," "mental life" will remain a merely indirectly known reality. In other words: a black box! Human science that seeks similarity models, while open to human science operationalism, will exceed that method.

#### **4. 7. 8 Cognitive sciences**

Bibl. st.: J.-F. Dortier, *Les sciences humaines (Panorama des connaissances)*, Auxerre, 1998, 197/230 (Sciences cognitives : du cerveau à l'esprit). The stages are the following.

**1. 1945/1955.** The brain and automatic machines attract enormous attention.

- J. von Neumann and Al. Turing invent the computer (immediately computer science).
- N. Wiener founded cybernetics as the science concerning self-regulating automata.
- W. Mc Cullough develops neurophysiology.

**Note:** 1946/1953. The Macy - foundation organizes conferences in New York on complexity, systems, cybernetics, theory concerning automata or the workings of the brain etc. ... They bring together a variety of scientists (von Neumann (mathematician), G. Bateson (anthropologist), McCullough (neurophysiologist) and others).

**2. 1956/1979.** Three stretches stand out.

- Summer 1956. At Dartmouth (USA) the first seminar on artificial intelligence (AI). H.A. Simon and A. Newell present their first program of AI. They - with J. McCarthyen and M. Minsky - are the four founders of AI.
- 1957. N. Chomsky works on his first version of his generative grammar.
- G. Miller and J. Bruner, profs at Harvard University, founded the first cognitive psychology. In 1960, they jointly founded the Harvard Center of Cognitive Studies.

**3. 1979 and later.**

- 1979. Foundation of the Society for Cognitive Science that publishes a journal, Cognitive Science.

- Research centers are getting off the ground, - first in the Anglo-Saxon countries, - with delays later in several European countries.

- Numerous research laboratories, teaching centers, journals see the light of day.  
Conclusion. That is a brief outline of the cognitive revolution.

The five basic sciences emerging from the revolution are: Psychology, artificial intelligence, brain science, philosophy of mind and linguistics.

Note: The term "mind" in "philosophy of mind" is understood not in the classical sense but in a materialistic or approaching materialism sense.

#### ***4. 7. 9 Philosophy of mind within cognitivism***

Bibl. st.: P. Wagner, *Introduction*, in: P. Wagner, dir., *Les philosophes et la science*, Gallimard, 2002, 59/62. Steller there briefly takes a stand against cognitivism as a philosophy of mind.

A set of basic concepts and judgments. Knowledge - "cognition" - has been studied spectacularly in recent decades by researchers from a variety of disciplines - artificial intelligence and robotics, neurobiology, anthropology, psychology, philosophy - but without arriving at a single science of cognition. What does emerge is a set of common concepts and judgments underlying the acquisition of scientific knowledge regarding perception, formation of concepts, representation of knowledge forms, memory, decision, consciousness, intelligence, etc. ...

***Naturalism regarding 'mind'***. Note: 'Naturalism' means reducing something - here: mind - to phenomena and explanations ascertainable by natural science. 'Mind' is equated with "system of information processing," pretty much in the sense of a computer (program, data processing, hardware and software). Although not all cognitivists agree on this analogy (mind/computer), they aim at a unified theory concerning human cognitive processes as if they were processes of nature (which occur as much in machines as in animals).

***Science theory***. Science theory then is not an independent subject - separate from the other sciences -, still less a basic philosophy that would ground knowledge, nor a normative (logical and methodological) science. For cognitivists, philosophy is only a unified theory concerning machines, brains and "mind. This theory is the paradigm of the set of cognitive sciences.

*Critique.* If philosophy - so conceived - merges into professional sciences, then the typically philosophical task of defining what is knowledge or scientific knowing is subordinate to the process of the creation of knowledge, especially of that type of knowing which the other cognitive sciences discover. Consequence: Such extreme "naturalization" makes any reflection on knowledge, resp. science, coincide with that knowledge, resp. science itself. That is a type of more or less conscious scientism (Note: science idolization) that bypasses all philosophical criticism concerning knowledge, resp. science. This is not how far naturalists like E. Mach (1838/1916), W. Quine (1908/2000), L. Wittgenstein (1889/1951) go regarding reductionism (Opm.: reduction of mind to data ascertainable by science).

We can paraphrase this with the following syllogisms.

- All cognition within cognitive science is true.

Well, cognitive philosophy of mind is cognition within the cognitive sciences.

So the cognitive mind philosophy is true.

- Cognitive philosophy of mind is cognition within the cognitive sciences.

Well, the cognitive mind philosophy is true.

So all cognition within cognitive science is true.

- The cognitive mind philosophy is true.

Well, all cognition within cognitive science is true.

So cognitive philosophy of mind is cognition within cognitive science,  
although both are valid.

Fundamentally, consistent cognitivists reason in such deductive, generalizing and generalizing syllogisms. As Wagner says, philosophizing with cognitivism basically coincides. that is what the three syllogisms express.