

CHAPTER 11

Third Prolegomenon: Practical Anthropology

Man is the measure of all things.
Protagoras

§ 1. Freedom and Mechanism

As we move from the theoretical to the practical Standpoint our treatment of the phenomenon of mind moves from the exposition of representation, perception, judgment, and so forth to the exposition of what we can justly call the kinematical principles that constitute the laws of the phenomena of spontaneity and reasoning. In making this exposition we will go slowly at first because in science today we have a tradition of thinking born of science's mechanistic age and matured in metaphysical attitudes upon which the aftermath of positivism still lies like a heavy hand. Even some of the terminology of science has evolved since the time of Kant so that some words we take in one sense today mean something subtly but crucially different in the language of the Critical Philosophy. Furthermore, we are entering the territory of intelligible causes and objects, some of which, if considered in the wrong context, summon to mind analogies of long-discredited and discarded speculations that have checkered science's past. For this reason we will do well to examine what science requires in its methods and expects from its theories. And we must carefully see to it that science and philosophy do not work at cross-purposes here.

In Chapter 10 we introduced the idea of practical causality, which is involved with causes we characterize as non-physical. Such causes are of merely intelligible character and, as such, do not come under the condition of the transcendental schemata of subjective time (the schemata that bring homogeneity to the otherwise heterogeneous characters of intuitions and concepts). First among these is the idea of the causality of freedom. In introducing the causality of freedom we merely showed that this idea does not contradict our transcendental ontology provided we limit its character by requiring that in *appearance* its effects conform with physical (or, in Kant's words, 'natural') causality, which is judged under the category of causality and dependency. This idea entered our discussion with an "if" standing before it. We must now deal with that "if" in order to determine whether this idea is merely transcendent (and hence a product of dialectic reasoning) or whether this idea can have a transcendental validity in our theory. In short, we must determine whether this idea can only be purely speculative (and therefore have no use or place in a science of mental physics) or if it is an idea necessary for the possibility of human experience.

Now, the starting point for our introduction of the causality of freedom was thoroughly *practical*. Experience provides us with appearances of *actions* that seem to be spontaneous and seem to us to be actualized “at will” rather than solely through the direct agency of some *external* stimulus. What is at issue here is not the *Dasein* of some cause of our own spontaneous activities, because the *Dasein* of this cause is thoroughly established objectively in Nature from the theoretical Standpoint under the category of causality and dependency. What *is* at issue here is the Nature of this cause, in terms of its *Existenz*, and whether we must limit our explanation of it strictly to an automaton theory (e.g. reflex action) or whether something else is also required in the explanation. Since our objective ground for the *Dasein* of this cause lies with the appearance of human actions and behaviors, it is with these that we must begin.

Kant called **anthropology** the “science of the rules of man’s actual behavior¹” [KANT11a: 42 (27: 244)]. He also called it “a science of the subjective laws of free choice” [KANT11a: 42 (27: 245)]. From this second description, we see that we will have to face the thorny question of whether or not we can speak with objective validity of the idea of “free choice” and come to a position on the age-old controversy of freedom *vs.* determinism. The first description, on the other hand, summons to mind the science of psychology. Kant’s anthropology differs from psychology in that Kant intended for anthropology to be a science proper, and that means it is to include an unbroken connection running from empirical fact all the way back to rational principles of metaphysics proper. Psychology as we know it today, on the other hand, grew up in the shadow of positivism and lacks a *system* of underlying metaphysics agreed to by all its practitioners. Because Kantian anthropology² takes for its topic the actual behavior of human beings, it is entirely a practical doctrine and, as such, our idea of the causality of freedom comes under it.

And here is to be noted first that I will for the present attend to the idea of freedom in the practical sense and set to the side, as having been disposed of above, the transcendental meaning, which cannot be empirically presupposed as a ground of explanation of appearances but rather is itself a problem for reason. A choice is, of course, merely brutish (*arbitrium brutum*³) which cannot be determined other than through sensuous stimuli, i.e. *pathological*⁴. But the one which can be determined independent of sensuous stimuli, hence through moving causes⁵ which are represented only by reason, is called *free choice* (*arbitrium liberum*), and all that coheres with this, be it ground or consequence, is called *practical*. Practical freedom can be demonstrated through experience. For

¹ *Verhalten*. This word can also be translated at "conduct" or "deportment," depending on the context.

² So viewed, Kantian anthropology differs from that science we call anthropology today. In this treatise, our context is always the Critical Philosophy and I shall abbreviate "Kantian anthropology" to simply "anthropology" hereafter without any intent to imply or speak to or of "modern anthropology."

³ "Brutish choice."

⁴ Kant used the word "pathological" in a peculiar way. In his terminology, this word never implies disease or other biological abnormality (as it does in medicine). Rather, he uses "pathological" as an adjective meaning anything that has to do with motives or actions arising from bodily stimuli or feelings.

⁵ *Bewegursachen*: literally, "causes of motion." The context roughly implies "motives."

not merely what stimulates, i.e. affects the senses immediately, determines human choice, but we have an ability to overcome the impressions on our sensuous appetitive power by representations of that which in a remote way is useful or detrimental; but these considerations of that which in regard to our whole state is worthy of demand, i.e. good and useful, has its roots in reason [KANT1a: 675 (B: 829-830)].

Kant seems to have regarded the practical objective validity of practical freedom as more or less self-evident in the light of experience. Because our behaviors are capable of being determined by planning, rather than solely by what affects our senses immediately from the external environment or by our tempers and passions, this perceived capability sufficiently demonstrates, in Kant's view, the objective validity of the idea of a practical causality of freedom. Put in other words, practical causality of freedom is seen in the *effect* of those behaviors of ours which are determined by reasoning and from the reasonable consideration of factors not actually present at the moment, but which might 'reasonably' follow from one *possible* action yet perhaps not from another. Suppose, for example, that I do not like you and that you have just made some remark to which I take offense to the point of violent rage. I "feel" very much like assaulting you; but when I restrain myself from doing so – let's say I turn my back on you and walk away – my *actual* behavior is something other than "what I feel like doing." Kant tells us that *this* would be an example in *actual* experience where my behavior was determined non-pathologically. It would not matter that perhaps the reason I walked away was because I did not want to be arrested for assaulting you. A *future* event is not something *actual* in the here-and-now capable of affecting my senses or even calming my feelings. Let's turn it around the other way: It occurs to me that if I assault you I might be arrested and put in jail; then I think, "the consequences be damned," and I assault you anyway. In this case, Kant would say, I *choose* to satisfy my feelings and I act to do so. This is still a demonstration through actual behavior of practical causality because *I knew I could choose otherwise*.

All the examples Kant presents us in *Critique of Practical Reason* and its prolegomenon, *Foundations of the Metaphysics of Morals*, are of this sort. They are examples that illustrate behaviors from which we infer a goal-seeking Reason capable of overcoming immediate sensual or emotional factors in determining the actual behavior. The demonstration in experience consists of taking an action in full consciousness that we could do otherwise.

There has been no shortage of critics who do not accept that Kant's examples have the self-evidence Kant appears to have held them to have. These critics – and I have been one of them – argue that Kant's examples illustrate the phenomenon of what *appears* to be goal-directed behavior, but that these examples do not *necessarily* rule out other possible explanations. After all, they say, appearance by itself hardly constitutes proof, especially if the question is a scientific one. We will look at one example that illustrates this and which can be used to "make a case" for the automaton theory of behavior.

§ 1.1 The Amoeba

Amoebae are one-celled, primarily aquatic organisms belonging to the class of organisms known as protozoa (literally, “first animals”). The amoeba is one of the most studied organisms in biology because of its relative simplicity. They are able to “swim” by forming temporary extensions of their bodies called pseudopodia (“false feet”). At first glance, amoeboid locomotion may appear to the observer to be chaotic and random, but closer inspection shows that this is not the case. Amoebae will creep toward food sources and away from irritants. They perform well coordinated turning movements and reversals of their movements in response to stimuli. In the presence of strong light or an electric current an amoeba will instantly cease its locomotion, contract, and round itself into a little defensive-looking ball.

No one thinks an amoeba possesses a mind and, being a one-celled organism, it has no brain. We even use the amoeba as a metaphor for insulting people, e.g., “he has the brains of an amoeba.” Without the attribution of a mind there is no question of an amoeba having concepts or thoughts of any sort and, in particular, we do not attribute to the amoeba the idea of any intelligible causal behavior. Yet, going strictly from observation of amoeboid behavior, these busy little creatures behave in sufficiently complex ways as to produce the impression of what can seem to us to be purposive behavior. Writing in 1904, the noted biologist H. S. Jennings stated: “The writer is thoroughly convinced, after a long study of the behavior of this organism, that if *Amoeba* were a large animal so as to come within the everyday experience of human beings, its behavior would at once call forth the attribution to it of states of pleasure and pain, of hunger, desire and the like on precisely the same basis as we attribute these things to a dog.”⁶

Jennings is not alone in commenting on this impression we get that amoeboid behavior is such as to seem to us as if the amoeba were in possession of some sort of innate wisdom. Other biologists who have made similar comments include Kepner and Whitlock (1921), Penard (1947), and Thomas (1957). However, this is not to say that Jennings or any other biologist claims an amoeba truly possesses any sort of mental structure or faculty. There is, instead, virtually complete agreement among biologists that there is an integrated mechanistic explanation for amoeboid behavior. We may not completely understand this mechanism in every molecular detail, but we *do* know a great deal about it.

Let us bear in mind that amoebae live in a watery environment (including in some cases the human intestinal tract where they cause what used to be called amebic dysentery). Such environments do not typically consist of pure water. Rather, this water is actually a “soup” seasoned with a great variety of ionic compounds. In the water where living organisms exist, this

⁶ H. S. Jennings, *The Behavior of Lower Organisms*, 1904.

soup contains molecules known as AMP⁷, which is a byproduct of the biochemical degradation of another molecule known as ATP⁸. ATP is a remarkable organic compound that has been called the “battery of life” because it is involved in the fundamental processes of biological metabolism in all forms of life on earth. Where there is life, there is ATP and its byproduct molecule, AMP.

The amoeba is made up, in part, of tiny microfilaments and a gel-like membrane built from a protein known as actin. These proteins chemically interact with AMP in a manner that causes the proteins to move and change shape. The experimental evidence tells us that, as a result, the amoeboid cell responds to AMP in such a way that its mechanical locomotion is attracted toward concentrations of AMP in the water. This appears to be a solid fact, although all the biochemical details of this are not entirely understood as of yet.⁹ The evidence indicates that the amoeba can ‘identify’ chemicals¹⁰ at some distance from their source, although, again, the details of the precise mechanism are not well enough understood. Because the chemicals to which the amoeba is attracted are given off by other living cells (which will be the amoeba’s “prey”), the locomotion of the amoeba toward its food source appears to have a more or less obvious mechanistic explanation.

Amoebae are also “sensitive” to – that is, undergo biochemical reactions to – many other kinds of stimuli. Some are light sensitive. Some respond to droplets of certain kinds of salt solutions in particular ranges of strengths. The ionic content and pH level of the water affects different varieties of amoebae in different ways. They respond to temperature, contact pressure, ultrasonic sound waves, and even electric fields and radio waves. Furthermore, various combinations of stimuli reinforce the response of the amoeba to any one of these. For example, sequentially applied stimuli reinforce one another if the second is applied before the amoeba has recovered from the effects of the first.

The cell structure of the amoeba contains proteins that are very similar to the contractile proteins found in our own skeletal muscles. The biochemistry and biophysics involving these proteins is very complex and not completely understood in all its details, but one thing is clear: the intricate and complex locomotion behavior of the amoeba, which can seem so goal-directed to an observer, admits of a purely *physical* explanation in which we can find nothing whatsoever that would push us to attribute any kind of ‘mental life’ whatsoever to an amoeba. This is not

⁷ AMP: adenosine monophosphate.

⁸ ATP: adenosine triphosphate.

⁹ Eugene C. Bovee and Theodore L. John, "Locomotion and Behavior," in *The Biology of Amoeba*, Kwang W. Jeon (ed.), N. Y.: Academic Press, 1973.

¹⁰ Do not take "identify" too literally. The phrase, in a proper technical discussion, devolves to specific biochemical reactions taking place which, in turn, stimulate changes in the protein structure responsible for cell movement. Note also that it is not the "source" that the amoeba "identifies"; it is only the chemicals that originated from this source.

even a question of Kant's *arbitrium brutum*. We do not say an amoeba makes "brutish choices"; we say *it does not choose at all*. The view of science is that 100% of an amoeba's behavior is determined mechanically and solely by physical laws.

§ 1.2 People

Now let us look at our own species. By one estimate, the human brain alone is composed of on the order of one hundred billion neuron cells; our bodies as a whole have, of course, a vastly greater number of cells than that. As living organisms we are so much more complex than an amoeba that one's mind simply fails to grasp the enormity of the difference. But, as we have just seen, the humble amoeba is capable, on a purely mechanistic basis, of behaviors complex enough to cause well-trained scientists to remark about the seemliness of their behavior to being "goal-directed" even though the scientific evidence says it is nothing of the sort.

If the amoeba truly is nothing more than a biological machine, despite the "goal-directed quality" of its behavior, why should we think it is otherwise the case than that we are too? Most scientists in the life sciences of biology, zoology, etc., when speaking *as* scientists, take the view that we *are*, in the final scientific analysis, nothing other than biological machines.

The **mechanistic view** of life, the view taken by physiologists, holds that all phenomena, no matter how complex, can ultimately be described in terms of physical and chemical laws. In contrast, **vitalism** is the view that some "vital force" beyond physics and chemistry is required to explain life. The mechanistic view has predominated the twentieth century because virtually all information gathered from observation and experiment has agreed with it.

Physiologists should not be misunderstood when they sometimes say that "the whole is greater than the sum of its parts." This statement in no way implies a vital force but rather recognizes that *integration* of an enormous number of individual physical and chemical events occurring at all levels of organization is required for biological systems to function [VAND: 2].

From this physiological viewpoint the introduction, even as an hypothesis, of a non-physical cause, such as the causality of freedom, is utter nonsense.

A common denominator of physiological processes is their contribution to survival. Unfortunately, it is easy to misunderstand the relationship. Consider, for example, the statement, "During exercise a person sweats because the body *needs* to get rid of the excess heat generated." This type of statement is an example of **teleology**, the explanation of events in terms of a purpose, but it is not an explanation at all in the scientific sense of the word. It is somewhat like saying, "The furnace is on because the house needs to be heated." Clearly, the furnace is not on because it senses in some mystical manner the house's "needs," but because the temperature has fallen below the thermostat's set point and the electric current in the connecting wires has turned on the heater [VAND: 2].

This mechanistic paradigm recognizes the existence of biological life, but denies existence to mental life. While some psychologists, Piaget for instance, use the phrase "mental life" in their scientific discussions, this term is extremely rare among biologists. And where there is no mental life, there can be no "goal-directed behavior" because "there is nothing there" to direct it. Science

cannot prove a negative (that is, cannot prove something that truly does not exist is factually nonexistent), but there is no empirical evidence that mental life exists in an amoeba; and if there is none such in an amoeba, why should we think there truly is “mental life” in a human being? What possible *scientific* meaning could the phrase “mental life” even carry?

“But,” those of us who are not trained in the life sciences might protest, “what about *consciousness*?” There is one outstanding difference between our scientific knowledge of the amoeba and what we regard as our ‘common sense’ knowledge of ourselves, and that difference is: to each of us our own consciousness – and hence “mental life” – seems to be a fact beyond any possible dispute. How, then, can the life sciences hold that this mental life “isn’t truly there” in seeming defiance of all common sense?

Let us note carefully that I said the life *sciences* hold this view, not that life *scientists* do. To the physiologist, the hypothesis of the nonexistence of “mental life” is a paradigm – an agreed upon “way of doing business” in the life sciences. It does not matter what the individual physiologist “truly thinks in his heart” about whether or not there “truly is” such a thing as “mental life”; what matters is that physiology *as a science* cannot *do* anything useful with this idea. The idea is not fecund for physiology. To this we should also take note that it was not all that long ago when the life sciences *did* embrace, as part of the paradigm, the idea of something that bears a kind of similarity, by analogy, to the idea of mental life. This something was the “vital force” (sometimes called “spirit” or even “spirits” in those cases where more than one “vital force” was distinguished). This paradigm was called **vitalism**. In the very long history of vitalism in the life sciences, the idea of vital force not only failed to produce anything useful to the science but it did, in fact, produce some things that were prejudicial and even harmful to the science.

Life scientists remember this, and they are rightfully wary of any repetition of the episode. Vitalism can trace its genealogy to Aristotle, but before Aristotle it would seem that “medicine” (as *all* the life sciences collectively were then known) began on strictly empirical grounds that perhaps even Hume might have been comfortable with.

Whoever, having undertaken to speak or write on Medicine, have first laid down for themselves some hypothesis to their argument . . . are all clearly mistaken in much that they say; and this is the more reprehensible as relating to an art which all men avail themselves of on the most important occasions and practitioners in which they hold in especial honor . . . Wherefore I have not thought that it stood in need of an empty hypothesis, like those subjects which are occult and dubious in attempting to handle that in which it is necessary to use some hypothesis[.] ¹¹

Such is the view the ancients put forth as being held by the father of medicine, Hippocrates.

As we saw in Chapter 10, there is no logical contradiction in thinking practical causes, but

¹¹ "On Ancient Medicine," *The Hippocratic Writings*, c. 400 B.C.

absence of contradiction is far from constituting proof of existence. When an hypothesis like the causality of freedom is thrown up against the mechanism paradigm, especially in view of all that has been learned of biology and human physiology in the twentieth century, the idea of practical causality is going to need more to go on than Kant's homely examples by which he seems to have thought practical freedom could be demonstrated through experience. Indeed, unless the idea of practical causes can be both fecund and useful in explaining human behavior, it can carry no weight as a *scientific* object no matter how "self evident" the practical causality of our spontaneity may seem to us as individuals. James' dictum touches upon an important principle in the doctrine of methods in science: There is no such thing as a difference that does not make a difference somewhere else. If science is to distinguish a difference between physical and practical causality, that difference must lead to something we could not obtain without drawing the distinction, and that something must both be rationally sound and in empirical agreement with scientific fact.

§ 1.3 The Topical Question

On evidential grounds and from an historical perspective, neuroscience in general, and physiology in particular, has not recognized any compelling need to admit "teleological causes" into its system. Indeed, it has every reason to distrust such considerations as a threat to bring back vitalism and even more radical superstitious elements that threaten science itself. Nothing Kant used to illustrate practical causality, either in *Critique of Practical Reason* or in his anthropology works, changes this. Indeed, that confederation of biophysics, biochemistry, and psychology known as the "psychophysical method" regards the "goal-directed quality of behavior" not as evidence but as a most interesting epiphenomenon to be explained. Many people, in fact, do not regard Kant's second Critique as a proper work of science philosophy (much less science) at all, and it does in fact contain topics and discussion that seem to lie wholly outside the boundaries of science.

In my opinion, the reason for this is that the second Critique contains an admixture of both Kant's pure philosophy and what I call his *applied* metaphysic of morals. I have no doubt that Kant saw the topic of "morals" as a topic capable of being made into a science, and that it was his wish to accomplish this. Indeed, it may have seemed in the late eighteenth century that there was no sphere of human knowledge that could not be made a science. But science as we know it today can hardly be blamed if it recoiled in disgust from what many have taken Kant to be saying in *Critique of Practical Reason*. Santayana did not merely recoil from Kant's practical philosophy; he ignited:

Kant, like Berkeley, had a private mysticism in reserve to raise upon the ruins of science and common sense. Knowledge was to be removed to make way for faith. This task is ambiguous, and

the equivocation involved in it is perhaps the deepest of those confusions with which German metaphysics has since struggled, and which have made it waiver between the deepest introspection and the dreariest mythology . . .

Side by side with this reinstatement of reason, however, which was not absent from Kant's system in its critical phase and in its application to science, there lurked in his substitution of faith for knowledge another and sinister intention. He wished to blast as insignificant, because "subjective," the whole structure of human intelligence, with all the lessons of experience and all the triumphs of human skill, and to attach absolute validity to certain echoes of his rigoristic religious education. These notions were surely just as subjective, and far more local and transitory, than the common machinery of thought . . . The "categorical imperative" was a shadow of the ten commandments; the postulates of practical reason were the minimal tenets of the most abstract Protestantism. These fossils, found unaccountably embedded in the old man's mind, he regarded as evidences of an inward but supernatural revelation.¹²

That Santayana should have so completely misunderstood Kant's theory is, I think, a testament to the lingering aftereffects of his relatively brief and admixed treatment of practical philosophy made in the second Critique.¹³ My own reaction the first time I read the Abbott translation [KANT4a] was milder in intensity but similar in kind to Santayana's reaction.

It is not our goal in this treatise to analyze Kant's applied metaphysic of morals. It is part of our topic to treat the practical Standpoint of the Critical Philosophy, because it is in the critique of this Standpoint where the question of the "if" raised in Chapter 10 must be dealt with. Kant drew an important distinction between speculative and practical Reason in terms of Critical Standpoints as follows:

The theoretical employment of reason occupied itself with objects of the faculty of knowledge only, and a critique of the same in view to this use properly concerns only the pure faculty of knowledge, since this aroused suspicion, which was afterwards likewise confirmed, that it [reason] might easily lose itself beyond its boundaries among unattainable objects or even among conflicting ideas. With the practical use of reason it is quite different. In this reason is concerned with grounds of determination of the will, which is a capacity either to beget objects according to representations or just to determine itself to the production of the same . . . i.e. its causality. For here at least reason attains to the determination of will and thus far always has objective reality when it is only a question of volition. Here then is the first question: whether pure reason of itself alone suffices for the determination of will, or whether it only can be a ground of determination regarded as empirically conditioned. Now there comes in here an idea of causality justified by the critique of pure reason, although not capable of empirical presentation, namely that of *freedom*; and if we can presently find our way to grounds to prove that this property does in fact belong to human will . . . so thereby not only do we show that pure reason can be practical, but that it alone, and not the empirically-limited [reason], is unconditionally practical [KANT4: 12 (5: 15)].

¹² George Santayana, *The Life of Reason*, vol. I: *Reason in Common Sense* (unabridged edition), N. Y.: Dover Publications, 1980, pp. 94-97.

¹³ It has been noted by many Kant scholars that Kant had not planned at first to even write the second Critique. In a letter to J.G. Herder in May of 1768, Kant indicated that he was working on a "metaphysics of ethics" [KANT20a: 94-95 (10: 74)]. In a letter to Professor Johann Bering in April, 1786, Kant indicated that he was working on a "system of practical philosophy" that he thought would be ready in another two years [KANT20a: 249-250 (10: 441)]. *Critique of Practical Reason* was published in 1788. It is the shortest of the three Critiques and often lacks the hair-splitting attention to detail one finds in *Critique of Pure Reason*.

Kant tells us here that the question hanging over the idea of practical causality can only be addressed with objective validity from the practical Standpoint. But, by way of this introduction to the *Critique of Practical Reason*, he raises up another idea – the idea of human will – that is just as troublesome as the idea of the causality of freedom. How we regard the reality of these objects (in other words, the limitations we place on the objectively valid *use* of these ideas) will make all the difference between freedom and will as dialectic speculations or freedom and will as objectively valid and scientifically useful ideas. In short, what we take as the *meanings* of these ideas will determine whether they have any place in science and what that place is to be. We have come to the field of struggle where Descartes clashed with Hobbes and Bacon, where the materialists confront the philosophers, and where the mechanists battled the vitalists. But we must engage these issues for here is found the topical question for practical anthropology.

§ 2. What Science Requires of Its Intelligible Ideas

Every science requires its intelligible ideas because the objects of these ideas – although they are *noumena* – bring unity to the manifold of divers phenomena that the science takes in as belonging to its topic. But what, specifically, does a science require of its intelligible ideas? What properties or attributes or characteristics must such ideas contain if they are to be of use in the science, and how is science to use them properly? We never have *immediate* experience with the objects of such ideas; they would not carry the adjective *intelligible* if we did. How, then, can objects born of intellect pertain to experience in sensible Nature?

In the scientific method intelligible ideas are never first posited from mere caprice or “for no reason.” When first conceived, these ideas have a *practical* use: they bring a diverse aggregate of other concepts and cognitions into *connection* in a common ground or condition. *How* they bring this connection is as important as the connection itself. Oftentimes the ground for thinking such an idea is founded on a connection of Relation (substance and accident, causality and dependency, or community). These ideas are always the product of synthesis since, as intelligible constructs, they cannot be given in experience. But synthesis can produce wild fantasies as well as useful objects, and so science develops *methodology* for taming our inclination for dialectical speculation and subjects its ideas to an exacting *discipline* of reasoning. A proper application of scientific method follows a maxim that the idea must not bring unity to one set of ideas and phenomena while, at the same time, bringing contradiction to others. Because the first making of a generalizing idea begins with an inference of judgment, the idea is born of either induction or analogy and is, to this extent, a *guess*. Richard Feynman described the “art of guessing new laws” in the following way:

What we need is imagination, but imagination in a terrible strait-jacket. We have to find a new view of the world that has to agree with everything that is known, but disagrees in its predictions somewhere¹, otherwise it is not interesting. And in that disagreement it must agree with nature. If you can find any other view of the world which agrees over the entire range where things have already been observed, but disagrees somewhere else, you have made a great discovery [FEYN2: 171].

This 'Feynman's rule' expresses a character that must be found in the making of a new hypothesis of a scientific law, but his rule is descriptive of only one organizing principle that science uses as a maxim for exploring its new ideas. It is in a sense a maxim for weighing only relative values in comparing different possible ideas, and it is quite useful as a time-saving maxim because many possible ideas can be quickly discarded if they violate Feynman's 'agreement clause' or if they fail to be fecund in the prediction of new, experimentally testable effects.

But Feynman's rule is not the only maxim in the doctrine of scientific method. It has a kind of negative character inasmuch as it serves mainly for the *rejection* of possible ideas. Scientific method also follows four 'positive' principles which were laid down by Isaac Newton as the "rules of reasoning in philosophy"^{2,3} :

Rule I: We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances.

Rule II: Therefore to the same natural effects we must, as far as possible, assign the same causes.

Rule III: The qualities of bodies, which admit neither intensification nor remission of degrees, and which are found to belong to all bodies within the reach of our experiments, are to be esteemed the universal qualities of all bodies whatsoever.

Rule IV: In experimental philosophy we are to look upon propositions inferred by general induction from phenomena as accurately or very nearly true, notwithstanding any contrary hypothesis that may be imagined, till such time as other phenomena occur, by which they may either be made more accurate, or liable to exception.

Rule II binds all physical sciences, including the life sciences, to operate under a paradigm that discourages (although does not totally forbid) the proliferation of new causes – forces, energies, or what have you – in explaining natural effects insofar as these effects also have the possibility of explanation under causes that have been found to work in other cases. Ultimately these causes come down to ideas established by physics when we are dealing with objects of sensible Nature.

Everything is made of atoms. That is the key hypothesis. The most important hypothesis in all of biology, for example, is that *everything that animals do, atoms do*. In other words, *there is nothing*

¹ That is, it must disagree with what is predicted by current theory for some as of yet untested case, and when that case is put to the test via experiment, it must be the new idea that agrees with the outcome.

² In Newton's day all sciences were called "natural philosophy."

³ Isaac Newton, *Mathematical Principles of Natural Philosophy*, Book III, 1687.

that living things do that cannot be understood from the point of view that they are made of atoms acting according to the laws of physics. This was not known from the beginning: it took some experimenting and theorizing to suggest this hypothesis, but now it is accepted, and it is the most useful theory for producing new ideas in the field of biology [FEYN3: Chap. 1: 8-9].

Neuroscience is not being stubborn in its refusal to incorporate hypotheses of practical causes and teleological causation into its principles. Scientific theory is not a public golf course where any imaginable idea can come and play. In science proper new ideas and theories must earn their membership by merit, never by popularity, and the membership committee has high standards.⁴ Nor is membership necessarily conferred upon ideas or principles forever. Vitalism, as it came to be called in the 19th century, can claim roots that go back to Aristotle and to Galen (c. 130-200 A.D.). Bergson and Whitehead both took what can be called 'vitalist' philosophical positions. Vitalism gave up its place in science very slowly, and no one prosecuted its expulsion more forcefully than Claude Bernard.

We have just said that knowledge of physiology is indispensable to physicians; we must therefore cultivate the physiological sciences if we wish to further the development of experimental medicine. This is all the more necessary, because it is the only way to provide a foundation for scientific medicine, and unfortunately we are still far from the time when we shall see the scientific spirit generally prevailing among physicians. Now the absence of the scientific habit of mind is a serious hindrance, because it favors belief in occult forces, rejects determinism in vital phenomena, and leads to the notion that the phenomena of living beings are governed by mysterious vital forces which are continually invoked. When an obscure or inexplicable phenomenon presents itself, instead of saying, "I do not know," as every scientific man should do, physicians are in the habit of saying, "This is life," apparently without the least idea that they are explaining darkness by still greater darkness. We must therefore get used to the idea that science implies merely determining the conditions of phenomena; and we must always seek to exclude life entirely from our explanations of physiological phenomena as a whole. Life is nothing but a word that means ignorance, and when we characterize a phenomenon as vital, it amounts to saying that we do not know its immediate cause or its conditions.⁵

It may seem strange indeed that the life sciences must exclude the idea of 'life' from playing any role in their theories, but this was the price of progress for these sciences. We may not use that which we seek to explain as an explanation for itself.

Still, we should not let Bernard, or anyone else, leave us with the impression that the vitalists were not men of science as science was practiced in their day. The idea of a 'vital force' or of 'spirits', or whatever else it was called at a particular moment in history, could never have held on for nearly twenty-three centuries if it did not in some way make sense to the scientists of those

⁴ The principal reason I am critical of the Big Bang theory is that its theorists have been, in my opinion, far too quick to embrace new causes or invent new *noumena* such as "dark matter" and "dark energy" whenever new facts contradict expectations based on the Big Bang model. The Big Bang is an hypothesis, not a fact. I think there is an irony somewhere that a science where gravitation plays such a fundamental role should apparently be so neglectful of Newton's four rules of reasoning.

⁵ Claude Bernard, *An Introduction to the Study of Experimental Medicine*, Pt. 3, Chap. IV, sec. ii, 1865.

ages.⁶ William Harvey (1578-1657) was a physician, anatomist, and lecturer and Fellow at the Royal College of Physicians. He is most remembered for his discovery of the circulatory system, which transports blood throughout the body. Dr. Harvey was an extremely well-respected scientist. And he was a vitalist:

Nor is the blood to be styled the primogenial and principal portion of the body because the pulse has its commencement in and through it, but also because animal heat originates in it, and the vital spirit is associated with it, and it constitutes the vital principle itself (*ipsa anima*) . . .

The life, therefore, resides in the blood . . . because in it life and the soul first show themselves and last become extinct. For I have frequently found, from the dissection of living animals . . . that the heart of the animal that was dying, that was dead, and had ceased to breath, still continued to pulsate for a time, and retained its vitality.⁷

Harvey studied the development of chicken eggs, dissected and studied the anatomy of various animals, and, of course, carried out his medical practice (including among his patients Francis Bacon, King James I, and King Charles I of England). Unfortunately, as Bernard would no doubt point out, his theory of the ‘vital spirit’ of or in the blood actually contributed nothing predictive or useful to medical practice.

Let us look at a more successful intelligible object of science, namely, the idea of inertial mass. Modern physics employs the idea of one intelligible object, ‘mass’, in its theories, but in Newton’s original formulation there were two. In Newton’s *Principia* we have:

Definition I: The quantity of matter is the measure of the same, arising from its density and bulk conjointly . . . It is this quantity that I mean hereafter everywhere under the name of body or mass. And the same is known by the weight of each body, for it is proportional to the weight, as I have found by experiments on pendulums, very accurately made, which shall be shown hereafter.

Definition III: The *vis insita*, or innate force of matter, is a power of resisting, by which every body, as much as in it lies, continues in its present state, whether it be of rest or of moving uniformly forward in a straight line.

This force is always proportional to the body whose force it is, and differs nothing from the inactivity of the mass but in our manner of conceiving it. A body, from the inert nature of matter, is not without difficulty put out of its state of rest or of motion. Upon which account, this *vis insita* may, by a most significant name, be called inertia (*vis inertiae*) or force of inactivity. But a body only exerts this force when another force, impressed upon it, endeavors to change its condition[.]

‘Mass’ in Definition I is what later became known as the ‘gravitational mass’. Its experiential feature is that it is “proportional to the weight” of the body. ‘Inertia’ in Definition III gives rise to what we today call the ‘inertial mass’ (or, more often, just “the mass”).

⁶ Some lingering effects of vitalist thinking in medicine can still be seen today in the traditional names given to some medicines, e.g. "spirit of ammonia."

⁷ William Harvey, *On Animal Generation*, Ex. 51.

Newton very carefully kept these two ideas distinct from one another because the means of determining these “quantities” experimentally are different. The “quantity of matter,” tied as it is to weight, can be measured using a balance or a spring scale in conjunction with a pre-defined standard of mass units (e.g. a cylinder of platinum alloy such as is kept in Paris). Inertia, on the other hand, can be measured using a spring scale to pull the body in a horizontal plane on a very smooth (negligible friction) table top. Such a measurement, in accordance with Newton’s laws, is independent of the weight of the body because the force of gravity, acting in the vertical direction, is counterbalanced by the force of the table pushing back against the body.

The basis for the idea of inertial mass lies with another of Newton’s definitions and his famous second law:

Definition II: The quantity of motion is the measure of the same, arising from the velocity and the quantity of matter conjointly.

Law II: The change of motion is proportional to the motive force impressed; and is made in the direction of the right line in which that force is impressed.

The “quantity of motion” is what we today call the “translational momentum” of the body. Note that Newton did not define this as the multiplicative *product* of velocity and “quantity of matter”; he merely said it *arises* from these two things. If we write this as an equation, using p for momentum, m_g for gravitational mass, and v for velocity, we have

$$p = k \cdot m_g \cdot v$$

where k is a proportionality constant. Referring back to Definition III, $k \cdot m_g$ would equal (be defined as) the inertial mass, m_i .

If we now apply a known amount of force, F , and measure the change in the “quantity of motion”, Δp , in time Δt then, since k is merely some constant and classical physics presumed that the “quantity of matter” would not be changed by this operation, the change in inertia would be entirely due to the change in velocity (acceleration), a , of the body. From Law II, we have

$$\frac{\Delta p}{\Delta t} = F = m_i \frac{\Delta v}{\Delta t} = m_i \cdot a \quad \text{or} \quad m_i = F/a.$$

Experimentally, the ratio of force to acceleration is a direct measure of the inertial mass and, from Law II, we see that we cannot simply *assume* that the proportionality constant k is equal to 1.

Now from Newton’s day forward it was known that if k was not equal to 1 it was, at least, very, very close to 1. In 1909 the Hungarian nobleman and physicist Baron Roland von Eötvös

made very precise measurements comparing to value of m_g with m_i and found them to be identical within the limits of the accuracy of his measurement method. Later measurements by R. H. Dicke demonstrated that these two masses are equal in amount to better than one part in 10 billion. Yet classical physics, quite rightly, regarded this equivalence as *accidental*. The “quantity of matter” and “inertia” were two quite different ideas describing two quite different intelligible objects determined from experience in two quite inequivalent ways. It was not until the relativity theory was developed that physics united these two masses into a single object. As Einstein put it:

Is this identity of the two kinds of masses purely accidental, or does it have a deeper significance? The answer, from the point of view of classical physics, is: the identity of the two masses is accidental and no deeper significance should be attached to it. The answer of modern physics is just the opposite: the identity of the two masses is fundamental and forms a new and essential clue leading to a more profound understanding. This was, in fact, one of the most important clues from which the so-called general theory of relativity was developed.⁸

One of the consequences of the relativity theory was that physics had to stop thinking of “mass” in terms of it being in some way the “quantity (amount) of matter” in a “body.” Today, at least for now, the role of “mass” in physical theory is merely “formal” – that is, mathematical – even though mass is quite rightly regarded as a mark of “physical” (i.e. sensible) objects. This merely intelligible nature of “mass” bothers the brightest young students of physics and engineering because we can give them no answer they find ontologically satisfying to the question, “What *is* mass?” These students want to have some kind of material picture of what “mass” is, but we have none such that is as of yet fit to give them.

As this is being written, physics is engaged in an experimental program to test an interesting hypothesis directed at this question of “What is mass?” This hypothesis involves the idea of an as of yet undemonstrated “particle” called the Higgs boson. I confess that I am not expertly acquainted with the mathematical details of this hypothesis, but the idea runs something like this: Physics would like to “unite” the four “fundamental forces of nature” (gravity, the electromagnetic force, the strong force, and the weak force). The hypothesis that attempts to do this is called “the standard model.” In order for the standard model to be mathematically consistent, physics is forced to posit a new kind of omnipresent “field” known as the Higgs field. If the Higgs field “actually exists” (is demonstrable) in Nature, one of its consequences is that particles acquire their characteristic mass by interacting with the Higgs field. Under the current paradigm of elementary particle physics, the interaction of the Higgs field with all particles must be “mediated” by a “particle,” namely the Higgs boson.

Now, the “physical reality” of mass is easily demonstrable in experimental physics. We have a measurable physical effect (inertia) and the *Dasein* of mass is inferred directly from this effect.

⁸ A. Einstein and L. Infeld, *The Evolution of Physics*, N. Y.: Simon and Schuster, 1942.

The *Existenz* of mass, however, is unknown to us. If physics can demonstrate the *Dasein* of the Higgs boson (that is, find an experiment where some physical effect is demonstrated that agrees with the theory of the Higgs field and disagrees with any other attempt to explain the effect without the Higgs field), then “mass” becomes merely a convenient word for describing a combination of higher concepts of other intelligible objects (including the Higgs boson). Mass loses its standing as a thing-in-itself in subordination to these other intelligible objects.⁹ The fact that the theory of the Higgs field will not be regarded as confirmed until and unless such an effect is found, from which we can with objective validity infer the *Dasein* of the Higgs field and its boson, illustrates the scientific method for dealing with intelligible objects at its best.

The point here is this: “mass”, as the *noumenal* object of an idea, serves physics in merely a *formal* (mathematical) capacity, as the idea of an intelligible object that unifies theory. The theoretical objective validity of this idea is chained and locked to the context of the *sensible* phenomena it helps to explain. Classical physics was correct in its methodology in keeping m_g and m_i quite separate because these *noumena* addressed different experiences and did so within Newton’s four rules of reasoning. Both ideas kept their places for more than two extremely productive centuries until the pressure of new evidence and new phenomena called Rule IV into play and forced the unification of these two ideas in a single higher object – “mass” as we understand it today.

§ 3. The Context of Practical Causality

If the idea of practical causality is to have objective validity and serve a useful purpose in science, we must have a thorough understanding of and appreciation for what we take as the real meaning of this idea. Does it, for example, have *any* context within the doctrine of neuroscience? Does it have a context in psychology? If so, what *is* this context? These are questions we must explore.

⁹ For the most part physics has not done a very good job in describing the Higgs field theory to non-physicists or even to physics students. The public explanations offered frequently leave certain aspects of it, as they are described to young students and to non-physicists, bothersome. One of these is that the Higgs boson itself is to “have mass” and, in fact, have quite a lot of it compared to, say, an electron. It is to be a “heavy” particle. This is bothersome because it leaves one with the impression that all other “mass” is to be somehow explained in terms of the “mass” of a Higgs boson, and one therefore is quite right to wonder if physics is trying to, as Bernard put it, “explain darkness by a still greater darkness.” The second thing that one finds troublesome is that the theory seems to require that the Higgs field be omnipresent. This seems to be uncomfortably close the old idea of the luminiferous aether that Einstein did away with. The first objection turns out to be due merely to an inaccurate description of the idea. The “mass” of the Higgs boson comes out of the same proposed mechanisms from which comes the “mass” of every other “particle.” The second objection runs a bit deeper. For a good non-mathematical description of Higgs field theory, see the article by Gordon Kane, “The mysteries of mass,” *Scientific American*, vol. 293, no. 1, July, 2005, pp. 40-48. Physicists expect to be able to test the Higgs theory within the next few years. I find it worth noting that if the Higgs theory is contradicted by experiment, this contradiction will also contradict some crucial and fundamental requirements in the Big Bang model. If Higgs theory fails, Big Bang fails.

Neuroscience takes for its topic the central nervous system. Within this topic, the brain is one of its direct objects of study. To carry out its work, the discipline brings in what Kandel calls the five experimental traditions: anatomy, embryology, physiology, pharmacology, and psychology [KAND: 6]. This confederation of specialties is employed because, beyond the immediate topic stated above, neuroscience sees itself as serving a higher purpose, namely

The goal of neural science is to understand the mind, how we perceive, move, think, and remember [KAND: xxxix].

This description makes it sound as if neuroscience is an all-encompassing discipline – a science of mental physics already in being. I would not be surprised if many or most or even all of its practitioners see it in this way. However, let us note the little word “how” in this description. If we look more closely we soon find out that neuroscience sets further limits for itself in its topic:

Perhaps the last frontier of science - its ultimate challenge - is to understand the biological basis of consciousness and the mental processes by which we perceive, act, learn, and remember. Are these processes localized to specific regions of the brain, or do they represent a collective and emergent property of the whole brain? If various mental processes can be localized to different brain regions, what rules relate the anatomy and physiology of a region to its specific function in perception, thought, or movement? Can these rules be better understood by examining the region as a whole or by studying its individual nerve cells? How do genes contribute to behavior, and how is gene expression in nerve cells regulated by the developmental and learning processes? Can experience alter the way the brain processes and perceives subsequent events? [KAND: 3].

In this job description of neuroscience, there are two points to which we should give special attention. The first is that neuroscience is concerned with the *biological basis* of the various aspects (consciousness, perception, etc.) of the phenomenon of mind. But these mental objects are supersensible and are never observable directly in the physical appearance of the sensible objects of neuroscience (e.g. neurons or brain activity). Instead their *Dasein* is inferred from observable behaviors that we say exhibit in appearance their “presence.” The ground for this, of course, is the self-consciousness we all have of our feelings, motivations, and, in general, from our own “innate sense” of our own *Dasein* (the *I* of transcendental apperception). This latter is a scientific problem and a puzzle for neuroscience, the paradigm of which requires the science to put nothing in a theory that is *objectively* grounded in this transcendental *I*. However, *subjectively* neuroscientists can not help keeping this *noumenon* of the *I* in mind, even if it has been regarded as too much like vitalism to gain admission to the doctrine of the science. They are, after all, human beings and cannot make themselves oblivious of this subjective factor.

But the fact remains that it is not consciousness *qua* consciousness, nor perception *qua* perception, nor cognition *qua* cognition, etc. that neuroscience studies and seeks to understand. These mental objects are not biological objects and neuroscience seeks to understand the biological basis of those behaviors we commonly say exhibit the “existence” of these mental

objects. Because the objective validity of these mental objects does not arise from the appearance of biological effects, neuroscience has not only a justification for keeping the ideas of these things out of its fundamental theories, but indeed has a *duty* to keep these things out. And, as a member in good standing of science's "membership committee" that judges the merits of scientific hypotheses and theories and rules on the granting or withholding of membership in science for the same, neuroscience is no more than doing its duty when it challenges an hypothesis such as practical causality to clearly and unequivocally *demonstrate* its merit to be called a scientific idea.

Neuroscience does seek the connection of these ideas to physical biology, even if that connection can only be, for neuroscience, a *functional* relationship. This is where the science of psychology gains a seat at the table.

Psychology is the scientific study of the behavior of organisms. Psychology is learning what makes people tick. Psychology is finding out how the mind works. Psychology is a way of thinking about how living creatures cope with their environment and with each other. Psychology is the intersection of philosophy, biology, sociology, physiology, and anthropology. Psychology is what distinguishes men from machines. Psychology is a kind of knowledge and approach that can be used to improve the quality of human life. Psychology is all of these - and perhaps more [RUCH: 2].

I agree with the first sentence of this description. I also agree that the next three sentences express what ought to be goals of psychology. From that point on, I think the description goes beyond the practice and becomes poetry except in the loosest sense.¹

Psychologists are concerned with the study of behavior in living organisms, both *external* behavior - behavior which has a direct effect on the environment - and *internal* behavior, which may or may not influence external behavior. This internal behavior can be of two general classes: *physiological* and *experiential*. Physiological behavior refers to biochemical and electrical activities within the body and is often directly measurable. Experiential processes are things like thoughts and feelings - a broad class of internal behaviors presumably activated by, and having consequences in, the functioning of the nervous system, but involving units too complex and inaccessible to be measured directly [RUCH: 3].

This brings us to the second point. The biological theories we use to describe the brain and its elements do not include in their models such ideas as consciousness, perception, thought, etc. The only links between neurobiology and these psychological objects are: 1) correlation of brain activity with objects of behavior (in the sense described above); and 2) the principle of emergent properties. But, as we noted earlier in this treatise, the principle of emergent properties has objective validity only when it is restricted to Relations of community, never when it is extended to Relations of causality and dependency. In order to have a Relation of community the objects

¹ For instance, if psychology is the intersection of philosophy, etc., I find it odd that a college curriculum in psychology can be accredited in the United States without having any requirement that the students take even a single course in philosophy.

being so-related must be *substances* (in the Kantian, not the materialism, sense of that term). The Relation of substance and accident is probably easy enough for us to visualize when it comes to biological objects (neurons, ganglia, the cerebellum, etc.). But what about behavioral objects? How does psychology (in its role within neuroscience) view the Relation of substance and accident with regard to these objects?

There is probably no one answer to this question that satisfies everyone, but there is a general attitude we can describe that I think is not particularly unfair to psychology as this science is practiced. Psychology tends to view its behavior objects as **normative structures**:

The third major problem which arises in comparative studies is that of the nature of the structures arrived at, i.e. whether they constitute simple 'models' in the service of theoreticians or whether they should be considered as inherent to the realities under study, in other words as structures of the subject or subjects themselves. This question is fundamental, because in the eyes of authors critical of structuralism the latter is merely a language or computing instrument which refers to the observer's logic but not to the subject. This problem is often raised even in psychology, where experimentation is relatively easy and where one can in certain cases be fairly sure that structure reaches down to the underlying explanatory principle of phenomena, in a sense which recalls what philosophers called the 'essence', but with the addition of an undeniable deductive power . . . It goes without saying that in most situations the models used in the human sciences are placed, still more than physical or even biological models, halfway between the 'model' and the 'structure', in other words between the theoretical design partially related to the observer's decisions and the actual organization of the behaviors to be explained . . .

The third problem we have raised . . . often finds a possible solution in the following form: when following the formation of a structure one observes on its completion some modifications in the subject's behavior which are difficult to explain otherwise than by that completion itself, in other words by the 'closure' of the structure. These are fundamental facts which are translated in the consciousness of the subject by feelings of obligation or of 'normative necessity' and in his behavior by obedience to 'rules'. Let us recall that according to the habitual, if not general, terminology of experts in the study of 'normative facts' a rule is recognized by the fact that it imposes an obligation but can be either violated or respected, contrary to a causal 'law' or determination which suffers no exceptions unless it be by reason of contingency variations due to a mixture of causes . . .

Thus the study of rules or normative facts constitutes an important sector of the study of structures, the more so as it provides a link between structuralism and the actual behavior of subjects. Moreover, such rules are observed in all the fields covered by human science [PIAG28: 25-27].

The idea of a normative structure is quite a slippery idea (and thus has the unfortunate character that it can be used by a theorist to avoid actually being pinned down to a clear and well articulated position on a question). Viewed as a Relation of substance and accident, a normative structure seems most often used as a term to designate an aggregate of behavioral and psychophysical appearances as these are regarded as 'part of the same thing' without attempting to pin down what that thing is otherwise than by a "functional definition." Used in this way, it is not too inaccurate to regard the defining of such a normative structure as an attempt to identify an

Existenz for which there is to be inferred no underlying *Dasein*. This seems to be what Piaget was getting at with his comment that normative structures often tend to be “placed” halfway between the theoretical model and the “organization of the behaviors to be explained.” It is perhaps a bit too harsh but not entirely unjustified to say that, used in this way, a normative structure is an idea of an object that we try to regard as both ‘thing’ and ‘non-thing’ at the same time. To the extent that this characterization fits the usage, the idea of a normative structure tries to be the idea of an Object but suffers from the lack of a clear ontological distinction between object and Object. Pragmatically in relationship to a science, **a normative structure is a system of norms with rules of transformation that provide a canonical method or convention for evaluating observations in a proper theory.**

The physical scientist tends to be unconcerned about these fine points of what he often regards as either “not a real issue” or an issue already settled *ipso facto* by the development of the scientific method. For the psychologist, on the other hand, the question of normative structures is a “real issue” and the point of no small amount of interdisciplinary debate. In the twentieth century one of the outgrowths of logical positivism was a school of thought known as “semantics” that tries to deal with such things as normative structures. It does so by attempting to provide what is called a “truth definition” that involves “giving a full description of the systematic effect terms and structure of different kinds have on the truth-conditions of sentences containing them.”²

The question how a certain concept is to be defined is correctly formulated only if a list is given of the terms by means of which the required definition is to be constructed. If the definition is to fulfill its proper task, the sense of the terms in this list must admit of no doubt. The question thus naturally arises: What terms are we to use in constructing the definition of truth? In the course of these investigations I shall not neglect to clarify this question. In this construction I shall not make use of any semantical concept if I am not able previously to reduce it to other concepts.³

Among the fundamental semantical concepts are those of the “name” and the “sentence.” As we might expect from its origins in logical positivism and its close kinship with mathematical logic of the Russell tradition, the semantic schema of a “true sentence” follows the form

$$x \text{ is a true sentence if and only if } p$$

where the symbol x denotes a “name” and p denotes a “sentence.”

Another category of names of sentences for which we can construct analogous explanations is provided by the so-called *structural-descriptive names*. We shall apply this term to names which describe the words which compose the expression denoted by the name, as well as the signs of

² From *The Oxford Dictionary of Philosophy's* description of “semantics.”

³ Alfred Tarski, *Logic, Semantics, Meta-Mathematics*, J. H. Woodger (tr.), 2nd ed., Indianapolis, IN: Hackett Publishing Co., 1983, pp. 152-153.

which each single word is composed and the order in which these signs and words follow one another.⁴

It would take us too far afield to plunge deeply into the ideas and doctrines of semantics. The very brief exposure given above is enough to provide a glimpse of the formal (and formidable) logico-mathematical flavor of semantics theory. What is clear from even this brief exposure is that a semantics-based view of psychological normative structures will quickly pull in ideas of semiotics, a discussion of the nature of “signs and symbols” and not a small amount of mathematical logic and so-called metamathematics. These ideas have participated in a debate over the meaning of signs and symbols that goes back to ancient times. (The interested reader can consult [ADLE v. II, pp. 730-752] as a reference for these elements of this great debate).

What is relevant in all of this for our own discussion is that, in contrast to the objects of physical science, those of psychology – with its topical connection to human behavior and, consequently, to the supersensible objects of the phenomenon of mind – are very hard to pin down. This is especially so in the absence of a systematic applied metaphysic for this most incorporeal field of scientific inquiry. To try under these circumstances to place a normative structure halfway between empirically derived theoretical constructs (models) and the thinking Subject – who is, after all, the target of the inquiry – is not unlike building a bridge when one is standing on one bank of the river (the physical science side) while the other side is hidden in a deep fog so that we are not even sure of the river’s breadth. I suggest to you that a science *proper* of the phenomenon of mind must take under its topic a theory of consciousness *qua* consciousness, perception *qua* perception, and so on. In other words, we should not regard these objects as primitives defined only functionally without any reference to Organized Being. How can one expect to understand the “function” if we do not have a firm grasp of the ideas that give this function context and meaning in relationship to the human Subject as an Organized Being? This is why I offer the suggestion that a science of mental physics is needed and that it is not achieved by present day neuroscience, and still less by empirical psychology. Practical anthropology, in Kant’s meaning of the term, is not contained by either (or both put together) of these latter two sciences; rather, *it* should contain both within itself.

§ 3.1 Practical Anthropology and the Individual

A third description Kant provided of anthropology was that anthropology is “a doctrine of the knowledge of man couched systematically” [AK7: 119]. In other words, Kant’s science of anthropology takes for its topic ‘man’ (human beings) in the totality of his physiological, behavioral, psychological, social, and developmental character. As a *practical* science,

⁴ *ibid.*, pp. 156-157.

anthropology can be viewed either physiologically or pragmatically.

The physiological knowledge of man goes toward the investigation of what nature makes of man, the pragmatical to what he, as a freely acting being, makes or can make or should make of himself [AK7: 119].

Kant appears to not have been a vitalist. In the introduction to *Anthropologie in pragmatischer Hinsicht, abgefaßt*⁵ he remarks that physiology (as it was in his day) was purely prejudicial and specious reasoning. His point seems to have been that all the talk of vital forces or ‘spirits’ were but products of transcendent speculation. To put it another way, Kant seems to have been of the opinion that no science of physiology worthy of the name yet existed in the late eighteenth century. Accordingly, he limited his own discussion of anthropology to the realm of the ‘pragmatical.’ From the description given above, we see that the ‘pragmatic’ viewpoint of practical anthropology is a viewpoint concerned with those actions for which one regards the Subject as the causal agent of the action, and thus concerns a doctrine for addressing what in appearance is seen as goal-seeking behavior insofar as we regard the Subject as having the ability to determine his own actions. It is important to note here that when Kant uses the phrase “freely acting being” above, he is not stating a baseless presupposition that freedom is an *empirical property* of the Subject. Such a claim would have to be grounded in an idea of a phenomenon and no such phenomenal determining ground is given in actual appearance. Rather, a “freely acting being” is an intelligible idea and one for which we have yet to establish a context and meaning in this treatise. (That establishment is, of course, one of the objectives at which our treatment of the practical Standpoint aims).

Kant’s vision of a science of anthropology seems clear enough. It is to unite what we can learn from biology and her many offspring with what we can learn from psychology, all tied to and grounded in the principles of the Critical Philosophy. The principal differences between Kant’s anthropology and the stated goal of neuroscience are: 1) modern empirical psychology, growing up as it did in the shadow of positivism, lacks a systematic applied metaphysic and so, in Kantian terminology, is “science improper”; 2) Kant’s anthropology is to go beyond the individual and concern itself not just with ‘man’ but with ‘mankind’ as a whole, a wider scope that takes in what we can call the social idea.⁶ We will not consider Kant’s broader agenda for anthropology in this treatise, but we are going to examine practical anthropology as it relates to the phenomenon of mind in the individual – a limitation in scope that marks the difference

⁵ Usually translated as "Anthropology from a pragmatic point of view."

⁶ Kant clearly took a very broad view, going well beyond knowledge of the individual to the social, political, and moral principles of human relationships. The breadth of this goal is, I think, one of the reasons Kant so thoroughly admixed his moral philosophy and his presentation of pure practical metaphysics.

between Kant's anthropology and what we are in this treatise calling mental physics.

Now to succeed in this endeavor our rational underpinnings, i.e. metaphysics, must be broad enough to take in both the physiological and the pragmatological aspects of man's "nature." Our topic is the human being as an Organized Being, and this points us straight-away to a most fundamental question that underlies every consideration in this topic: How are we to regard the idea of "the individual"? Put another way, what do we mean when we say someone or something is "an individual"? This probably seems at first glance like a trite question, but it is not. Since the first page of this treatise, we have been examining the phenomenon of mind in the context of the mind *of the individual* and have treated the idea of "the individual" as if it were a self-evident term. At one level, namely common experience, it is. But if we stop to think for a moment, we recall that the *idea* of the individual has taken shape in several different ways in the history of philosophy. At one end of the spectrum we encounter thinkers such as Spinoza and Bergson, for whom the individual sinks into and, to use an Eastern phrase, "becomes one with the universe" as a whole. (Hegel often strikes one in this way also). With Spinoza and with Bergson, the individual is seen as a mere epiphenomenon. According to Spinoza each of us is but a particular aspect of God (and 'God' for Spinoza is synonymous with 'nature'). According to Bergson, we are each transient accidents within the all-encompassing "flux of pure duration":

Who can say where individuality begins and ends, whether the living being is one or many, whether it is the cells which associate themselves into the organism or the organism which dissociates itself into cells? In vain we force the living into this or that one of our molds. All the molds crack. They are too narrow, above all too rigid, for what we have to put in them [BERG2: x].

The universe *endures*. The more we study the nature of time, the more we shall comprehend that duration means invention, the creation of forms, the continual elaboration of the absolutely new. The systems marked off by science *endure* only because they are bound up inseparably with the rest of the universe . . .

There is no reason, therefore, why a duration, and so a form of existence like our own, should not be attributed to the systems that science isolates, provided such systems are reintegrated into the Whole. But they must be so reintegrated. The same is even more obviously true with the objects cut out by our perception . . . Suppress this action . . . and the individuality of the body is re-absorbed in the universal interaction which, without doubt, is reality itself [BERG2: 11].

At the other end of the spectrum we find that intellectual plaything known as the solipsist view, in which "the universe" is viewed as an epiphenomenon under *me*.⁷ Solipsism is the contradictory opposite of the first view; perhaps the only people in the world who seem to "really believe" this extreme position are new-born infants, all of whom behave in a manner consistent with this extreme and radical ego-centrism.

⁷ I cannot say "us" or "you" if I am a solipsist.

Yet a third extreme is found if we go along with Hume to his logical conclusion. This extreme is to be skeptical of being able to speak truthfully to whether the idea of the individual is valid or not. We previously looked at Hume's view back in Chapter 1 (see also [HUME1: 251-253]). To this we can add:

The whole of this doctrine leads us to a conclusion, which is of great importance in the present affair, *viz.* that all the nice and subtle questions concerning personal identity can never possibly be decided, and are to be regarded rather as grammatical than as philosophical difficulties. Identity depends on the relations of ideas; and these relations produce identity, by means of that easy transition they occasion. But as relations and the easiness of transitions may diminish by insensible degrees, we have no just standard by which we can decide any dispute concerning the time when they acquire or lose a title to the name of identity [HUME1: 262].

The Great Skeptic was an empiricist following in the British tradition, and by adopting this position he closed himself off from the option of regarding the consciousness of his own *Dasein* as a primitive ground¹ as thoroughly as Descartes had closed himself off from granting the reality of his own feelings and corporeal *Existenz*. Hume's conclusion, i.e. that this was a "grammatical" question rather than a philosophical one, I think might be very popular with proponents of semantics. As for Bergson, what we have with regard to individualism is *Existenz* without *Dasein*, whereas for solipsism we have *Dasein* without *Existenz*.

The differences among these and all other views of individuality turn on the way in which we take what it means for something to be real. The idea of the individual is tied to one's system of ontology, and for the Critical Philosophy ontology derives from epistemology. Let us look at the idea of the individual from the epistemological viewpoint.

§ 3.2 Self-Consciousness and Individuality

The reality and objective validity of the individual is taken for granted in neuroscience, and all theories of mind and mind-brain relationships in science begin from this presupposition. As we have just seen, however, reasonable and intelligent scholars have challenged this fundamental premise. While many of us may think the positions taken by a Spinoza or a Bergson or a Hume may be absurdly contrary to common sense, the fact remains that if we do not fully understand the ground of objective validity for individuality our foundation upon which we build our theories is a very shaky one.

The objective reality of individuality traces its ground back to the original apperception, which is nothing other than knowledge of the *Dasein* of the transcendental *I* (without the cognition of the *Existenz* of the Self). We establish this on the rational side from the Critical

¹ Hume seems to have made little or no distinction between "existence" as *Dasein* and "existence" as *Existenz*.

Philosophy. From the empirical side, we find support for this principle exhibited in the behavior of infants. The objective validity of all one's knowledge, subjective as well as objective, owes its first ground to this original apperception. We have said this before, many times, in this treatise, but this point is a fundamental one and is worth repeating. Knowledge of an object first requires cognition of an object, and cognition is a representation with consciousness in which we have combination of concepts (via the process of determining judgment) and exhibition in empirical intuition (where there is subjective connection in consciousness).

Before the knowledge of any other object as individual is possible, the thinking Subject must first recognize itself as an object among objects. As all our concepts begin from intuition, the Subject must first obtain an intuition of *itself* as a to-be-determined *Sache*-thing. This provides the reference point for the division of Nature into a Self and a not-Self, which lays the basis for the development of the cognition of the *Existenz* of Nature in these terms.

The first act of the capacity of representation (*facultas repraesentativa*) is the representation of oneself (*apperceptio*) through which the subject makes itself into an Object (*apprehensio simplex*), and its representation is intuition (*intuitus*), not yet concept (*conceptus*) [KANT10: 178 (22: 43)].

The first act of knowledge is the verb: I am - the self-consciousness where I, subject, am Object to myself [KANT10: 179 (22: 413)].

We are not born with *objective* Self-consciousness for this requires experience. As Piaget has noted, the behaviors of new-born infants all point to a state of mind Piaget described as "narcissism without a Narcissus." A long apprenticeship is required before the child gains through experience the cognitive structures that permit him to recognize himself as an object among objects and delimit a boundary that divides his world into a Self and a not-Self.

This apprenticeship is marked by a long process of decentration during which the child thinks of the world quite differently than he will when he comes to adulthood. Piaget reports that during the first months of life the infant does not differentiate between his own acts and the things that he acts upon. For example, the baby does not separate in his mind the rattle from the act of shaking the rattle; there is complete syncretism where action and object-in-the-action are totally assimilated in the child's scheme. There is no separation of ends from means. It is not until the fifth stage of sensorimotor intelligence that the child's behaviors provide clear evidence he has finally differentiated his ends from his means – his actions from the objects acted upon – and thus demonstrates he has conclusively drawn the all-important distinction between Self and not-Self. Before this occurs radical egocentrism and radical realism go hand-in-hand in the child's conception of his world.

In the first three chapters we tried to show that the distinction between thought and the external world is not innate in the child but is only gradually evolved and built up by a slow process. One

result of this is of primary importance to the study of causality, namely that the child is a realist in its thoughts and that its progress consists of ridding itself of this initial realism . . . Reality is impregnated with self and thought is conceived as belonging to the category of physical matter. From this point of view of causality, all the universe is felt to be in communion with and obedient to the self. There is participation and magic. The desires and commands of the self are felt to be absolute, since the subject's own point of view is regarded as the only one possible. There is integral egocentricity through lack of consciousness of self . . .

There are thus two forms of egocentricity, the first logical and the second ontological. Just as the child makes his own truth, so he makes his own reality [PIAG24: 166-167].

These empirical findings are fully in accord with the theory presented here in the earlier chapters. That the child neither quickly nor accurately draws the whole boundary between himself and his environment (the world of the not-Self) bespeaks only of the ambiguity of appearances in a Nature where no copy-of-reality mechanism impresses knowledge in the mind, contrary to what Aristotle, Locke, and the empiricists maintained. Cognitions of *Existenz* are built up slowly as the child's experience grows. But the child nonetheless eventually succeeds in making this division so far as the distinction between an external environment, its own sensible appearance (body), and its mental phenomenon (mind) are concerned. That the cognitive structure of this representation of *Existenz* is subject to an on-going process of elaboration speaks only to the human capacity to continue to learn and to speculate.² But this development of cognitions of *Existenz* as an individual begins with the cognition of the Self.

Here we must remind ourselves that the representations of new phenomenal concepts originate as an inference of judgment. This is key to a very fundamental point regarding the cognition of anything as *individual*. The transcendental unity of apperception is absolute and is the ground of the objective validity of individuality for the Self (*apprehensio simplex*). Because no other object in the child's environment occupies the unique position filled by this apperception, all other ideas of any individual object are inferred from the individuality of the Self *by analogy*. When we think these individual objects as real, *the context of their reality as objects* is given by our context of one's own Self as a real Object. And this context does not include *problematical* speculations that may occur to us – e.g. theories like those of Bergson, Hume, etc. – that result from educated introspection in our adult lives. The objective validity of the idea of individuality for *any* object is grounded in that which is objectively valid for the Self (either theoretically or practically). On the other hand, not everything that is objectively valid for the Self need be objectively valid for other things (e.g. the idea of the mind of an amoeba).

The fact that the elaboration of the *Existenz* of the Self is apparently an on-going process does raise some issues. While it is clear that novelty in this elaboration comes at a slower pace in

² That biological maturation is a factor in setting the pace of this development is also to be expected as a direct consequence of the necessary community of *soma* and *nous* that we discussed earlier in this treatise.

adulthood than in childhood (i.e. our 'sense of Self' in a manner of speaking "solidifies"), does it ever altogether cease? Psychological evidence appears to suggest that it does not. For example, my cognition of my Self certainly includes as part of the Self my own body. Yet there are certain limitations placed on this idea. If I break a fingernail or get a haircut, I certainly "lose" pieces of my body in the process, but my own idea of my Self goes on unperturbed by this loss. These examples are so common-place that they occasion no great self-reflection. Suppose, though, that I lose a finger as a result of an accident. I cannot speak from personal experience here, but if the examples of people I know who have suffered such accidents are applied hypothetically to my own case, I am convinced my own idea of my Self would similarly remain unaltered. "I" will endure even if I lose a finger. Does this mean that I ought to "draw the boundary line" between my Self and the not-Self somewhere inside my physical body? Or does it mean that the cognition of Self is, so to speak, a 'plastic' representation of myself as an object? The first question is transcendent; the second is transcendental.

Recognizing that cognition of *Existenz*, as a process, is on-going, this raises the question of whether we need some norm from which to consider different possible viewpoints of "reality." (This ties in with the object-issue of normative structures in psychology that we touched upon in the previous section). One such norm we have previously invoked is expressed in the statement "nothing is real *to me* unless I have a concept of the object connected by determining judgment to other concepts that give it a context and meaning." Here the norm, as a standard, is "me." The issue with this is perhaps obvious: A science for which the "scientific community" consists only of a single person is not recognized by others as a science, and the lone member of its "community" is usually called a "crackpot." But if the idea of "an individual" is so intimately tied to the recognition of the Self, is there any way to depersonalize this objective idea using some other impersonal norm?

If we examine the intellectual development of the individual or of the whole of humanity, we shall find that the human spirit goes through a number of stages, each different from the other, but such that during each, the mind believes itself to be apprehending an external reality that is independent of the thinking subject. The content of this reality varies according to the stages: for the young child it is alive and permeated with finality, intentions, etc., whereas for the scientist, reality is characterized by its physical determinism. But the ontological function, so to speak, remains identical: each in his own way thinks that he has found the outer world in himself.

This being so, two points of view are possible in the study of intellectual evolution.

The first of these is to choose a system of reference and agree to call "external reality" reality such as it is conceived to be during one of the stages of mental evolution. Thus it would be agreed upon to regard as the external world reality as it is postulated by contemporary science, or contemporary common-sense. From this point of view, the relations of child thought to the external world would, in fact, be its relations to the universe of our existing scientific thought taken as the norm. In each explanation given by a child it would be possible to determine the part played by the activity of the subject and the part played by the pressure of objects, the latter being, by definition, objects as we now conceive them to be. And this would be Psychology, for the statements which this method led

to would not claim to have any decisive bearing upon the Critical Problem³ in general.

Or else, the attempt to regard any system of reference as absolute can be abandoned. Contemporary common-sense or even contemporary science may be regarded as stages among other stages, and the question as to the true nature of external reality left open. And this would be Theory of Knowledge: this would be to place oneself above all the types of mentality that characterize the various stages of human development, and to seek to define the relations of the mind to reality without any preconceived notions as to what is mind and what is reality [PIAG8: 237-238].

Do you see what the issue is here? If we allow contemporary scientific views, let alone contemporary “common-sense” views, to stand as the norm, this norm will shift with every change in the underlying scientific paradigm. Science can accept this, but science hasn’t much of any other choice but to do so; those who cannot do so cannot function as scientists in a scientific community. Fortunately for scientists, sweeping changes in paradigm do not happen very often, and when they do they constitute what Kuhn called “scientific revolutions.” We have ample evidence to support the viewpoint of regarding even contemporary science as a “stage among other stages” in the “mental evolution of the whole of humanity,” but basing a norm on this viewpoint presupposes that we have a “Theory of Knowledge” upon which to base it. Contemporary science has none such that merits the title of scientific doctrine. In the Critical Philosophy, what Piaget called the “Theory of Knowledge” is what we call the theoretical Standpoint, but even with all that has gone before in this treatise it is likely very obvious to you that what we have presented so far cannot be the full picture. We have not touched upon such subjective factors as *motives* or *values* or *needs* or the other denizens of what neuroscience calls “the motivational system.” You might already suspect, and the chapters that follow will confirm, that a complete system of Critical epistemology cannot leave these factors out.

In his own work, Piaget adopted the first method for his psychological research but did not forget the second. His formulation of the latter is what he called genetic epistemology. There is, however, a third choice, and that is to attempt to base our norm on a *synthesis* of the two views stated above. In such a synthesis, the ‘physical determinism’ of science and the principles of epistemology provide conditions and limitations within the overall viewpoint, but this overall viewpoint is neither the one nor the other. The “norm of contemporary science” and the “norm of epistemology” are coordinate in the third view and neither is subordinated to the other. In the Critical Philosophy the synthesis of these two views is called *the practical Standpoint*. We seek for the norm it provides, and from this norm we can evaluate the objective validity of ‘individuality’ and, likewise, establish how we are to regard the idea of ‘practical causality’ and understand its proper role and use in a theory of the phenomenon of mind.

§ 3.3 The Mental Evolution of Reality Considered Psychologically

Following Aristotle’s dictum, let us proceed with caution and look first at psychology.

³ The “Critical Problem” refers to Kant and the issues he raised in the Critical Philosophy.

Because it is precisely our “common-sense view” of the phenomenon of mind (which is, for all of us, “that which is clearer to us”) that contemporary neuroscience contests with automatism, let us lean first toward ideas of the phenomenon of mind that can be established scientifically by psychological studies and experiments. When psychological theory works in partnership with biological theory, as it does in Piaget’s system, we find ourselves operating neither wholly “within” nor wholly “without” the thinking Subject as an Organized Being. We are, in other words, operating at the boundary between the Subject and its environment, and science finds this boundary to be far less crisp than we usually think it is.

More exactly, the problems we are about to study are biological problems. Reality, such as our science imagines and postulates, is what the biologists call Environment. The child's intelligence and activity, on the other hand, are the fruit of organic life (interest, movement, imitation, assimilation). The problem of the relation between thought and things, once it has been narrowed down in this way, become the problem of the relation of an organism to its environment. Is the organism entirely molded by its environment in so far as intelligence is concerned? If so, then we have, in terms of cognition, what may be called the empirical solution of the problem. Or does the organism assimilate the actions to its environment in accordance with a structure that is independent of these actions and that resists the pressure of all modifications coming from outside? If so, then we have in terms of cognition what may be called the a priori solution. Or is it rather not the case that there is interaction between the two - organism assimilating the environment to itself, but the environment reacting upon the structure of the organism? Such is the solution which, in the domain of cognition, would imply a capacity for transformation in the categories of thought and an increasingly delicate adaptation of thought to things or of things to thought [PIAG8: 239].

As we have already seen from Chapter 9, Piaget concluded that the third solution is the correct solution from the viewpoint of empirical psychology. The structures of equilibration we discussed earlier are deduced on the basis of the normative convention he describes above, which is placed “between” the Subject and the appearance of the Subject’s observable behaviors. If one finds Piaget’s observables, functions, etc. presented in Chapter 9 to still be somewhat vague, we can at least understand that this is a consequence of the placement of his normative structure. The description provided through this normative structure can be applied to the organism as a whole, but its viewpoint cannot reach so far as *nous* without breaking contact with *soma*. Piaget does not take the step that many neural scientists take, namely to sever the link between what we here call *nous* and *soma*, and we can now understand from his earlier comments why he leaves the organism whole. Piaget recognized the “normative issue” very clearly and can thus speak *scientifically* of both “mental life” and “biological life” as logical divisions in the phenomenon of the human organism. In this he is almost a Critical Philosopher.

To better appreciate the fuzziness we find at the “organism-environment boundary” we need to review some of the psychological evidence that led Piaget to his theory. We will begin with the psychology of the child’s conception of “reality.”

How does the idea of reality constitute itself in the child's mind? Any direct analysis of its origin is beyond our power; the earliest stages precede language or are contemporaneous with the first spoken words, and any effort to reach the child's consciousness during these stages is fruitless if one claims to go beyond mere hypothesis. But if we can content ourselves with conjecture, then it is best to try and extricate the laws according to which the idea of reality develops between the ages of 3 and 11, and to extrapolate the guiding lines thus obtained so as to reconstruct the earliest stages. Moreover, we find that we can learn enough from the laws of evolution between 3 and 11 years, and that there is no need to attach any special importance to the original stage [PIAG8: 241].

The last sentence above must not be misunderstood. Piaget is not saying we need not *look at* childish behavior prior to the age of 3 years; he is saying that *when* we look at this behavior, we find nothing that defies explanation in terms of the theory gathered from studies of the older children. The most fundamental of these we have already discussed: equilibration through assimilation and accommodation. But after the development of language in the child we gain a window into what the child is thinking that we do not have available during the development of sensorimotor intelligence. How does childish reality evolve from 3 to 11 years?

Three complementary processes seem to be at work in directing the evolution of reality as it is conceived by the child between the ages of 3 and 11. Child thought moves simultaneously: 1° *from realism to objectivity*, 2° *from realism to reciprocity*, and 3° *from realism to relativity*. By *objectivity* we mean the mental attitude of persons who are able to distinguish what comes from themselves and what forms part of external reality as it can be observed by everybody. We say there is *reciprocity* when the same value is attributed to the point of view of other people as to one's own, and when the correspondence can be found between these two points of view. We say that there is *relativity* when no object and no quality or character is posited in the subject's mind with the claim to being an independent substance or attribute.

Let us examine these processes more closely. In order to be objective, one must have become conscious of one's "I". Objective knowledge can only be conceived in relation to subjective, and a mind that was ignorant of itself would inevitably tend to put into things its own pre-notions and prejudices, whether in the domain of reasoning, of immediate judgment, or even of perception. An objective intelligence in no way escapes from this law, but, being conscious of its own "I", it will be on its guard, it will be able to hold back and criticize, in short, it will be able to say what, roughly, is fact and what is interpretation.

So that in stating that the child proceeds from realism to objectivity, all we are saying is that originally the child puts the whole content of consciousness on the same plane and draws no distinction between the "I" and the external world. Above all, we mean that the constitution of the idea of reality presupposes a progressive splitting-up of this protoplasmic consciousness into two complementary universes - the objective universe and the subjective [PIAG8: 241-242].

Piaget goes on to remark that, "The feeling of subjectivity and inwardness felt by an adult is, to a great extent, connected with the conviction of being the owner of a thought that is distinct from the things thought about, distinct from the physical world in general, and more internal and intimate than the body itself. This conviction only comes late in the child's development . . . All these facts show that the localization of the objects of thought is not inborn. It is through a progressive differentiation that the internal world comes into being and is contrasted with the external . . . The initial realism is not due simply to ignorance of the internal world, it is due to

confusion and the absence of objectivity.”

There is no clean break between childish realism and adult objectivity. “Evolution” is indeed the right word to use to describe this process. Piaget describes five “adherences” that maintain tendrils of connection between the subjective and the objective.

This phenomenon is very general. During the early stages the world and the self are one; neither term is distinguished from the other. But when they become distinct, these two terms begin by remaining very close to each other: the world is still conscious and full of intentions, the self is still material, so to speak, and only slightly interiorized. At each step in the process of dissociation these two terms evolve in the sense of the greatest divergence, but they are never in the child (nor in the adult for that matter) entirely separate. From our present point of view, therefore, there is never complete objectivity: at every stage there remain in the conception of nature what we might call “adherences”, fragments of internal experience which still cling to the external world.

We have distinguished at least five varieties of adherences defined in this way. They are, to begin with, during a very early stage, feelings of participation accompanied sometimes by magical beliefs; the sun and the moon follow us, and if we walk, it is enough to make them move along . . . In short, the world is filled with tendencies and intentions which are in participation with our own. This is what we have called dynamic participation . . .

A second form of adherence, closely allied to the preceding, is that constituted by animism, which makes the child endow things with consciousness and life.⁴

A third form is artificialism . . . The child begins by thinking of things in terms of his own “I”: the things around him take notice of man and are made for man; everything about them is willed and intentional, everything is organized for the good of men. If we ask the child, or if the child asks himself how things began, he has recourse to man to explain them . . .

A fourth form is finalism: the starting-point and then the residuum of both animism and of artificialism, the deep and stubborn finalism of the child shows with what difficulty external reality frees itself from schemes due to internal and psychical experience.

A fifth form of adherence is constituted by the notion of force: things make efforts, and their powers imply an internal and substantial energy analogous to our own muscular force [PIAG8: 244-245].

In time, these adherences are weakened and compromised as the child progresses from realism to objectivity. The most childish conceptual adherences are, in fact, largely done away with in the evolution of mental development. But we never shed these adherences entirely; we merely make the connections much more sophisticated.

Along with the child’s progress from realism to objectivity we also find childish thinking moving from a completely uncritical presupposition that his own cognitions of reality are the only ones possible, and hence are the same for everyone, to the discovery that this is not so.

The second characteristic process in the evolution of the idea of reality is the passage *from realism to reciprocity*. This formula means that the child, after having regarded his own point of view as absolute, comes to discover the possibility of other points of view and to conceive reality as constituted, no longer by what is immediately given, but by what is common to all points of view

⁴ In a sense, scientific automatism is the polar opposite of childish animism. We usually do not phrase it as I am about to, but as the child views everything as being alive, automatism at its roots views everything as being not-alive in the Critical sense of the idea of “life.” We will discuss this in Chapter 12.

taken together.

One of the first aspects of this process is the passage from realism of perception to interpretation properly so called. All younger children take their immediate perceptions as true, and then proceed to interpret them according to their egocentric pre-relations, instead of making allowance for their own perspective. The most striking example we have found is that of the clouds and the heavenly bodies, of which children believe that they follow us. The sun and moon are small globes traveling a little way above the level of the roofs of houses and following us about on our walks. Even the child of 6 - 8 years does not hesitate to take this perception as the expression of truth, and, curiously enough, he never thinks of asking himself whether these heavenly bodies do not also follow other people. When we ask the captious question as to which of two people walking in opposite directions the sun would prefer to follow, the child is taken aback and shows how new the question is to him. Children of 9 - 10 years, on the other hand, have discovered that the sun follows everybody. From this they conclude that the truth lies in the reciprocity of the points of view: that the sun is very high up, that it follows no one, and that each sees it as just above him [PIAG8: 247-248].

This viewpoint is applied to more mundane objects as well. Among Piaget's examples are the child's conception of such things as weight. A pebble is light, a boat is heavy. But, as the child moves towards reciprocity, he will say the pebble is light for him but heavy for the water (because it sinks), whereas the boat is heavy for him but light for the water (because it floats). Closely tied to this process of thinking is the evolution in childish thought from realism to relativity.

These last examples bring us to the third process which marks the evolution of the child's idea of reality: thought evolves *from realism to relativity*. This process is closely related to the last, and yet differentiates itself from it on certain points. During the early stage, the child tends to think of everything under the form of absolute substance and quality; after that, bodies and their qualities seem to him more and more dependent upon each other and relative to us. Thus, substances become relations, on the one hand, because of the mutual connection of phenomena has been seen, and on the other, because the relativity of our evaluations has been discovered . . .

The most striking example of this process is undoubtedly the evolution of the conceptions about life and movement. During the early stages, every movement is regarded as singular, as the manifestation, that is, of a substantial and living activity. In other words, there is in every moving object a motor substance: the clouds, the heavenly bodies, water, and machines, etc., move by themselves. Even when the child succeeds in conceiving an external motor, which already takes away from the substantiality of movement, the internal motor continues to be regarded as necessary. Thus a leaf is alive, even though it moves with the wind, *i.e.* it retains its spontaneity even though the wind is needed to set it in motion. Similarly, a cloud or one of the heavenly bodies remains master of its movements, even though the wind is necessary to start it on its path. But later on, the movement of every body becomes the function of external movements, which are regarded no longer as necessary collaborators but as sufficient conditions. Thus the movement of clouds comes to be entirely explained by that of the wind. Then these external motors are conceived as themselves dependent upon other external motors, and so on. In this way there comes into being a universe of relations which takes the place of a universe of independent and spontaneous substances [PIAG8: 248-251].

Consider well the final sentence in the quote above. Most of us do not go to the limit and apply this final reduction to ourselves. The paradigm of physical science does, e.g. Feynman's "all things are made of atoms." There are two ways to view this reduction.

§ 3.4 Objectivity and Piagetian Relativity

The first way is found in physical science and its paradigm. We most likely can all agree that adult thinking is superior to childish thinking insofar as objective understanding of Nature is concerned. The passage from childish thinking to adult thinking moves from realism to relativity, as described above, and the “all things are made of atoms” paradigm follows logically as the endpoint of this movement. As far as we know, the movements of the amoeba are determined entirely through physical laws, with no spontaneity and no self-determination involved. And if this is so for the amoeba, why not for us as well?

But when we apply this reduction to ourselves, it is uncomfortable. The second view, that of a critic of the automaton paradigm, asks of the physicist, “How do you know you haven’t gone too far in your reduction?” Feynman’s “all things are made of atoms” is a simplified statement of the atomic hypothesis. In physics the atoms are regarded as the building blocks of everything except themselves, but physics does not leave out the laws by which these atoms interact with each other. These laws include a great many intelligible ideas, e.g. various energy terms and, of course, the probability amplitudes which govern quantum physics. “How do you know,” the critic might ask, “that you are not simply replacing childish animism, participations and magical belief by a different brand of magic?”

To this science can answer that its paradigm *works*; it explains a marvelous variety of phenomena and stands up in the laboratory under rigorous experimental testing. Childish physics, on the other hand, is easily falsified. Even so, we should recognize that, in the final analysis, the reductionism of physical science is a product of mere induction. Experience does not provide us with direct knowledge that “now you have gotten it right.” Science knows this and tacitly admits to it with the word *hypothesis*, which means “a scientific guess based on facts.” Every science admits to dubitability. Science does not equate theories obtained by physical reductionism with *certainty*; it merely holds them to be true with overwhelming likelihood.

It is not unscientific to make a guess, although many people who are not in science think it is. Some years ago I had a conversation with a layman about flying saucers - because I am scientific I know all about flying saucers! I said 'I don't think there are flying saucers'. So my antagonist said, 'Is it impossible that there are flying saucers? Can you prove it is impossible?' 'No,' I said, 'I can't prove it's impossible. It's just very unlikely'. At that he said, 'You are very unscientific. If you can't prove it impossible then how can you say that it's unlikely?' But that is the way that *is* scientific. It is scientific only to say what is more likely and what is less likely, and not to be proving all the time the possible and the impossible. To define what I mean, I might have said to him, 'Listen, I mean that from my knowledge of the world that I see around me, I think that it is much more likely that the reports of flying saucers are the results of the known irrational characteristics of terrestrial intelligence than of the unknown rational efforts of extra-terrestrial intelligence'. It is just more likely, that is all. It is a good guess. And we always try to guess the most likely explanation, keeping in the back of the mind the fact that if it does not work we must discuss the other possibilities [FEYN2: 165-166].

Objectivity in the Piagetian sense (the distinguishing of things independently of subjective factors) lies at the core of all that physical science typically regards as factual knowledge. But in view of what we have discussed in the previous chapters of this treatise, particularly with regard to the distinction between things and objects, we should recognize that this idea of “objectivity” – which at its core involves the idea of individuality (“the” object) – *is not itself objectively valid* unless our idea of it takes into account the transcendental Logic of experience, i.e. is *Critical*. Contemporary science does not take a Critical view of objectivity and without such a critique lacks an epistemological norm for clearly distinguishing the subjective factors going into the objective ideas of its reductionism. How does elaboration of the not-Self develop? Piaget tells us:

Such, then, is the evolution of the notion of reality in the child. Three processes help to make it emerge from its initial realism and to orientate it towards objectivity. In what relation do these three processes stand to one another? The first is of a purely social nature: the child replaces his own individual and egocentric point of view by the point of view of others and the reciprocity existing between them. The second of these three processes is of a purely intellectual order: substantialism of perception is replaced by relativism of intelligence. The third process is both social and intellectual in character: in becoming conscious of his "I", the child clears external reality of all its subjective elements, and thus attains to objectivity; but it is, above all, social life that has forced the child to become conscious of his "ego" . . . All three begin very early, all three are very slow, they remain uncompleted at the close of childhood and survive throughout the intellectual development of the adult. There is therefore every reason to believe that they are interdependent.

But at the same time, it would seem that reason, while it presupposes a social environment in which to develop, at one point transcends it. Once it has liberated the appearance of the logical norms of the child, the social environment enables him to become "permeable" to experience. And when this faculty has been acquired, the collaboration of logical reason and experience itself suffices to account for the intellectual development that takes place.

With this last remark we are led to analyze the evolution of the idea of reality from the point of view of the influence of the environment on intelligence. Here we are at once confronted by a paradoxical fact: compared with ourselves, the child is both closer to immediate observation and further removed from reality. For, on the one hand, he is often content to adopt in his mind the crude forms of actuality as they are presented in observation . . . Logical coherence is entirely sacrificed in such cases to fidelity to fact. The causality which results from phenomenalism of this kind is not unlike that which is to be found in primitive races and has been wittily compared by M. Brunshvicg to causality as it was understood by Hume . . . We shall give this the name of *phenomenistic causality*. It is the starting point of a large number of childish notions . . .

But, in another sense, the child is far farther away from reality in his thought than we are. Reality, for him, is still overgrown with subjective adherences: it is alive and artificial . . . the world is filled with forces . . .

The counterpart of this paradoxical dualism of phenomenalism and egocentricity is the following: as it develops, the idea of reality tends to become both desubstantialized and desubjectified. Reality, as the child conceives it, is desubjectified with the years, in the sense that the adherences of animism, of artificialism, and of dynamism are progressively eliminated. But at the same time, reality becomes desubstantialized, in the sense that a universe of relations gradually takes the place of the universe of absolute substances which were presumed by primitive perception . . .

In short, from the point of view of the action of the physical environment upon the child, we are faced with a continual paradox: the child is both nearer to and farther from the world of objects than we are, and in evolving an adult mentality he both advances towards reality and recedes from it [PIAG8: 251-254].

These are the conclusions drawn by Piaget and his coworkers from the behavioral facts of their examination of the mental development of children. We can note here that even Piaget takes for granted non-Critical presuppositions of “external reality” and “objectivity.” But, we might ask, do not trained scientists follow some more learned pathway in formulating objectivity? Certainly they do compared to non-scientists with regard to the methodological discipline with which they study the phenomena of nature. But, perhaps surprisingly, with regard to objectivity the methods employed by the trained scientist are very same as the processes used by the child.

Now three criteria seem to us to contribute to the definition of the object¹ peculiar to science: in the first place, every objective phenomenon permits anticipation, in contrast to other phenomena whose advent, fortuitous and contrary to all anticipations, permits the hypothesis of a subjective origin. But . . . a second condition must be added to the first: a phenomenon is more objective the more it lends itself, not only to anticipation, but also to distinct experiments whose results are in accordance with it. But that is still not enough . . . [Only] that phenomenon constitutes a real object which is connected in an intelligible way with the totality of a spatio-temporal and causal system . . .

These three methods are found to be the very same which the little child uses in his efforts to form an objective world. At first the object is only the extension of accommodation movements (anticipation). Then it is the point of intersection, that is, of reciprocal assimilation of multiple schemes (concordance of the experiments). Finally, the object is fully constructed in correlation with causality to the extent that this coordination of schemes results in the formation of an intelligible spatio-temporal world endowed with permanence (comprehension tied to a deductive system of the totality) [PIAG2: 87-88].

The little child Piaget is talking about in this quotation is the child at age 2 and less – that is, the child who is still in the sensorimotor intelligence stage of development. Putting this in the terminology of this treatise, the *maxims of reasoning* that all of us use in objectifying Nature are, at their roots, developed far back in early childhood and permeate every aspect of how we as adults (even scientists) come to regard “objectivity.”

The point here is that, no matter how “objective” our conceptualization of things may seem to us as adults, under all our paradigms for thinking about Nature lies a subjective element tied to inferences of judgment which, at the core, rely not only on our maxims of deductive reasoning that we learn in adulthood (particularly in science education) but, inextricably, on inferences of analogy that are referred to the cognition of the Self. At the root of any idea we form of a thing stands an idea of individuality. Lacking any “wax tablet impression” of a copy-of-reality, the archetype of any ‘real individual’ is the Object we call the Self. Although the child does move from uncritical and egocentric realism to Piagetian relativity (insofar as the attributions he makes to things can eliminate *concepts* that he comes to *know* as subjective in his thinking process), the very characteristic that *marks* individuality itself arises by inference of analogy with the Self.

Evidence of this inference of analogy at work can be seen most easily in childish conceptions of the world. Let us look at a couple of examples of childish animism.

¹ Recall that Piaget uses “object” as a synonym for what we call a “thing” in this treatise.

REYB (8;7): "Can water feel anything? - *No.* - Why not? - *Because water isn't all one* (is liquid). - If it's put on the stove, does it feel the heat? - *Yes.* - Why? - *Because the water is cold and the fire is hot.* - Does wood feel anything? - *No.* - Does it feel it or not when it burns? - *Yes, because it can't stop it (!)* - Then it feels or not? - *It feels*" [PIAG24: 177].

VEL (8½): "Is the sun alive? - *Yes.* - Why? - *It gives light.* - Is a candle alive? - *No.* - Why not? - *(Yes) because it gives light. It is alive when it is giving light, but it isn't alive when it is not giving light.* - Is a bicycle alive? - *No, when it doesn't go it isn't alive. When it goes it is alive.* - Is a mountain alive? - *No.* - Why not? - *Because it doesn't do anything (!)* - Is a tree alive? - *No; when it has fruit it's alive. When it hasn't any it isn't alive.*" "Is a watch alive? - *Yes.* - Why? - *Because it goes.* - Is a bench alive? - *No, it's only for sitting on.* - Is an oven alive? - *Yes, it cooks the dinner and the tea and the supper.* - Is a gun alive? - *Yes, it shoots.* - Is the play-bell alive? - *Yes, it rings.*" Vel even goes so far as to say that poison is alive "*because it can kill us*" [PIAG24: 196].

The children in these two examples are still in what Piaget calls the first stage of animism in their conception of the world. The work of analogy is, I think, probably quite apparent to you in these instances. The children do, of course, come to more and better refinement in their concepts of the *Existenz* of the things they described above. Yet we can see that individuality precedes objectivity in their conception of these things. With regard to the child's conception of the idea of "consciousness" (e.g. REYB), Piaget comments:

For children of the first stage, everything that is in any way active is conscious, even if it is stationary. In the second stage consciousness is only attributed to things that can move . . . During the third stage an essential distinction is made between movement that is due to the object itself and movement that is introduced by an outside agent. Bodies that can move of their own accord, like the sun, the wind, etc. are henceforth alone to be held conscious, while objects that receive their movement from without, like bicycles, etc., are devoid of consciousness. Finally, in the fourth stage, consciousness is restricted to the animal world [PIAG24: 173].

As for the child's conception of "life":

During the first stage everything is regarded as living which has an activity or function or use of any sort. During the second stage, life is defined by movement, all movement being regarded as in a certain degree spontaneous. During the third stage, the child distinguishes spontaneous movement from movement imposed by an outside agent, and life is identified with the former². Finally, in the fourth stage, life is restricted either to animals or to animals and plants [PIAG24: 194-195].

Now that we better understand the evolution of our object concepts and the origins of our maxims for reasoning about objectivity, we are ready to return to the question of how we are to regard *real* individuality and *real* objectivity. (Recall that we entered into the discussion just concluded in order to be able to place the idea of practical causality in context). In Chapter 6 we saw that a disjunctive judgment on an object *X* into members *Y* and *Z* is a real division if the

² i.e. with the spontaneous.

Modality of the judgment is that of actuality, i.e. that the rule of Modality applied to this judgment is the category of *Dasein & Nichtsein*. The division is merely logical if its Modality is judged under the category of possibility & impossibility. Symbolically, we have

$$\begin{aligned} \text{Real division} & \Leftrightarrow X \xrightarrow{\text{actuality}} \{Y, Z\}; \\ \text{Logical division} & \Leftrightarrow X \xrightarrow{\text{possibility}} \{Y, Z\}. \end{aligned}$$

When the question before us is the objectivity vs. relativity of intelligible ideas such as practical causality, the objective validity of such an idea hinges on whether we regard the object of the idea as something that is ‘real’ or merely ‘logical’ in the description of Nature. In other words, because the object is something made ‘individual’ by the limitations and conditions that delimit its concept in Reality, the nature of its objectivity hinges on whether the object is specified in Nature as a real division or merely a logical division. Science education rarely discusses this “real vs. logical” question and, indeed, usually succeeds in leaving the students with the impression that everything science talks about belongs to the former rather than the latter division.

With this in mind, let us take another look at the *idea* (not the notion) of ‘causality.’ From the theoretical Standpoint, when an event in actual experience is judged under the category of causality and dependency the connection made by determining judgment is a connection between two concepts whose objects have been conceptualized under the Relation of substance and accident. The transcendental schema for this connection is the schema of Relation under the *modus* of succession in the pure intuition of subjective time. The two substances involved in this judgment are called, respectively, the cause and the effect.

Now, the actuality of the experience – i.e. the Modality of *Dasein & Nichtsein* – attaches to the *effect* in the determination of its *Existenz*. That we think the *Dasein* of the cause in this judgment is objectively valid, but *the judgment does not determine the Existenz of the cause*. Put another way, the *Dasein* of the cause is judged to be contained in the concept of the cause, but the representation of what *contained in* this concept is to represent the *Existenz* of “the” cause (we might call this “the causal factor”) is *left undetermined* by this judgment. In order to determine the *Existenz* of the cause we must make a disjunctive judgment on the object in which the *Dasein* of the cause is vested, and this is an entirely different judgment of Relation, and one not made concurrently with the judgment of causality and dependency.

The objective determining ground of the *Dasein* of the cause lies with the effect. Is this cause “physical” or “practical”? No objective ground for the judgment of this disjunction is presented in the initial judgment of causality and dependency. If, then, we make this disjunctive

judgment, the Modality of the judgment is not *Dasein & Nichtsein* but, rather, possibility & impossibility – a merely *logical* division in judgment. This division *is* objectively valid; that is not the issue. What is the issue, from the viewpoint of practical anthropology, is how the *Existenz* of “the” cause is to be represented. When we represent this *Existenz* in the context of *sensible objects of experience*, as we do in neuroscience, the representation of “the” cause *must* be homogeneous with the representations of these sensible objects and this means nothing less than that “the” cause must conform with the conditions of sensible experience, i.e. the transcendental schema of subjective time, *and is therefore objectively valid only as a physical cause*.

But we may equally well judge the *Existenz* of “the” cause in the context of intelligible objects – objects which themselves are not objects of any possible sensuous experience. The objects of the ideas of concepts, intuitions, and even processes such as judgments are merely intelligible, not sensuous, objects. In order for science to presume to speak to mental phenomena at all, these objects *must* be admitted as objectively valid (real in some way), and when we speak of the *Existenz* of “the” cause in the context of these objects, its representation must likewise be homogeneous with the representation of these intelligible objects. Now, no merely intelligible object as such is a sensible object and so homogeneity of the representation of “the” cause *must* be represented as standing outside the conditions of sensuous experience, and the representation of such an object *is therefore objectively valid only as a practical cause*.

The *Dasein* of any intelligible object is established with objective validity only through a determinant judgment of causality and dependency. The same is true of the *Dasein* of physical causes. Although physical causality and practical causality are opposites of each other – the one sensible, the other intelligible – both are recognized through a logical disjunction of the representation of one and the same higher concept, namely, that of “the” cause. Thus we can see that an objectively valid concept of a cause is the representation of an Object since only an Object can be a unity of opposites. This is the ‘safety net’ we spoke of in Chapter 10. The unity of the Object is a *necessary* unity under the principle of apperception and from this comes the *necessity* (in judgments made on representations of this Object) that the causality thought as physical causality and the causality thought as practical causality *must* conform with each other *in the effect*.

All this follows *if* we make the disjunctive judgment that logically divides the idea of “the” cause into ideas of physical and intelligible causes. Now we must ask: *is this judgment itself necessary?* Where it is not, no necessity can attach to the thinking of practical causality. In such a case, the idea of practical causality carries only the Modality of contingency and, as it is wholly an object of intelligible Nature, it is speculative.

If neuroscience or psychology or Kantian anthropology were only concerned with, say, amoebae, we would be able to find no objectively valid ground for a judgment of necessity in

making a disjunctive judgment of causality into physical and intelligible members. We can have no possible experience of “the mind of an amoeba.” We cannot say with objective validity that an amoeba *has no mind*, for this is an assertoric judgment on an object that is not an object of any possible experience, and so it is as transcendent as would be the assertion that an amoeba has a mind. *But we have no need to posit an amebic mind to explain the appearance of an amoeba* so far as we know. The “mind of an amoeba” remains a transcendent (lacking in objective validity) idea.

But neuroscience, psychology, and Kantian anthropology are not about amoebae when all is said and done. They are about *us*. We cannot objectively seek to explain “the biological basis of consciousness and the mental processes by which we perceive, act, learn, and remember” if we do not have objectively valid representations of these *intelligible* objects whose *Dasein* is grounded in our sensible behaviors. These ideas are ideas that *mark the individual Object we each call “my Self,”* the cognition of which, for each of us as individuals, is nothing other than the representation of the *Existenz* of the only *noumenon* in Nature for which one’s holding-to-be-real is absolute and which is the ultimate ground of our objective representation of every other *thing* as individual thing. Our mental objects of our ideas of the Self, considered as individual objects, are judged as notions of substances (in the Kantian sense of our transcendental ontology). For the ideas of these objects *to have context with each other and meaning* requires their connection in the manifold of concepts, and this connection is not and cannot be sufficient only through Relations of substance and accident alone. (This was the error of vitalism). The unity of apperception in the *nexus* of concepts for these representations of mental objects requires also connections of causality and dependency and of community.

But connections of causality and dependency with or among intelligible objects can be of no kind other than connections of *practical* causality. When the objects of study are people, the disjunction of ‘cause’ into ‘physical’ and ‘practical’ cause *is necessitated* by the acroam of the unity of apperception. Our theory is therefore going to have to deal with Kant’s practical causality which, because it must stand independent of the conditions of sensibility, we call the causality of freedom. In evaluating the objective validity of concepts connected through the idea of practical causality, we have already seen one formal condition for gauging the validity of these concepts, namely Margenau’s ‘safety net’ principle. We can likewise quickly set down a *negative* principle for evaluating these ideas, namely that concepts of practical causality must never be concepts of *sensible* objects, for such concepts belong only to physical causality. Souls, spirits, vital forces – the entire claptrap of vitalism, spiritualism, or mysticism – can have no place in our theory because, at root, all such ideas end up being viewed as moving powers seen as interacting with “corporeal” matter as if *nous* were tugging *soma* along by a rope.

To establish other principles for objectively valid representation of practical causality we cannot look for guidance from the theoretical Standpoint. The causality of freedom, as an object, is supersensible. To make a theory for it is to represent it in objectively valid relationships but the only such relationships there can be for practical causality are those which refer back to *actions* of the Organized Being (from which the sensible effects are obtained that ground its *Dasein*). We have come to that synthesis of physical determinism and epistemology we call the practical Standpoint for here is where the context of practical causality must be explored.

§ 4. Practical *Existenz*

The making of a theory of intelligible objects faces difficulties that must be all too evident to us by now. Considered as things, intelligible objects are *noumena*. Any effort on our part to describe them as things in themselves is transcendent from the start because all our knowledge of objects *as* object must call upon the categories of understanding, and these categories have objectively valid application only for sensible experience. How, then, can we hope to come to an objectively valid understanding of the *Existenz* of objects of a merely intelligible Nature?

As we have seen earlier, our only means of obtaining objectively valid representations of the *Existenz* of such objects requires a synthesis of the appearances of sensible experiential behaviors on the one hand with transcendental ontology on the other. We called this the synthesis of the norm of physical science with the norm of epistemology, and the product of this synthesis is a practical Standpoint. Whereas the *Existenz* of objects of sensuous appearance is a physical *Existenz*, that of intelligible objects has to be called practical *Existenz*.

One thing we have in our favor is that our topic at hand need not try to address all possible intelligible objects. Our current topic is the theory of practical anthropology and, as such, it is limited in scope to only those intelligible objects that are objects of the phenomenon of mind. It is true that such a theory must be capable of explaining the possibility of all other intelligible objects (such as mass in physics, probability in mathematics, utility in economics, etc.), but we need not deal with these particular objects here. It is perhaps worthwhile to remind ourselves at this point of the four common themes of mind which, although the words are vague enough to lead to the historical diversity of opinions on the topic, are nonetheless objects that all mind theories (even behaviorism and functionalism) agree are targets of explanation for mind-theory. These are: thought (or thinking), knowledge (or knowing), self-knowledge (consciousness), and purpose (or intention). These intelligible objects belong to the base set of topics of the theory. We may also anticipate that we will find other such objects in the course of our investigation that we must include as well.

To carry out our work, we will have to give weight to both the empirical findings of

psychology as well as the rational principles of our metaphysics proper. It is therefore important for us to appreciate and apprehend at the outset that it will often not be easy to carry out the synthesis we require to develop the theory from the practical Standpoint because there is an issue with the language by which the ideas of psychology and those of metaphysics are expressed. What I mean by this is that researchers such as Piaget often use the same words Kant uses in the Critical Philosophy, but use these words to mean something different from Kant's meaning. This is a consequence of the different *contexts* in which Nature is viewed by these different doctrines. We can see the context of the Critical Philosophy at work in the first ten chapters of this treatise. Let us look at the context of empirical psychology.

This question of context comes down to one of the psychologist's normative convention. Since it is the Piagetian doctrine from which we will draw most of our detailed understanding of fact, we shall ask Piaget himself to describe the convention that runs throughout his theory:

If we agree to take as our system of reference nature as science describes her, then we shall call matter, or content of the child's knowledge, all that experience and observation impose upon the child. And we shall name form of the child's knowledge everything that the child adds to this matter, that is, the pre-relations and pre-notions which we, as adults, have shed. The choice of system of reference is, we repeat, a convention, but we are making use of this convention quite consciously, and shall not allow it to lead us into epistemological realism of any kind [PIAG8: 282].

Piaget uses terms such as *representation, perception, object, causality*, and many more besides in ways that often differ in meaning from our own use of these terms in the Critical Philosophy. Because we are faced with doing a synthesis, we are faced also with a translation problem when it comes to assimilating his descriptions and conclusions into the language of Kant. It is only by keeping Piaget's convention clearly in mind that we will be able to perform this translation.

Now, as we have previously discussed, the objective validity of ideas of objects *qua* thing is tied to the idea of individuality. This, in turn, is tied to the representation of the *Existenz* of the Self. We have not yet discussed the *Existenz* of the Self from the viewpoint of the Critical Philosophy, but we can foresee right now that, whatever the Critical meaning of Self is to be, it is not going to be the same as Piaget's idea of the self. This is entirely due to Piaget's normative convention, which places the definitive norm in the hands of contemporary science and thereby places the Piagetian self from a perspective that is *in violation of the Copernican hypothesis* of the Critical Philosophy. Reconciliation of the homonymous uses of the word "self" in the two theories will be among the first of our tasks.

In Piaget's theory the idea of the self is closely tied to the idea of Piagetian causality. Earlier we saw Margenau's comment that scientists by and large do not speak of "causality" as technical experts using a technical term. Piaget is in one way an exception to that rule because he took the idea of causality not as a presumption but, rather, as a phenomenon of mind that was to be

studied, dissected, and placed on a firmer psychological foundation. To put it another way, he asked: What is our conception of causality and how do we come by it? Given his choice of normative convention described above, we might well wonder how he proposed to answer the causality question. After all, in the viewpoint of physical science one either naively employs the “first *A* then *B*” or “if *A* then *B*” definition or, if one follows Margenau, one must first obtain a mathematical description in the appropriate differential equation form.

The second option is not open to Piaget; neither zoology (in which he was trained) nor psychology is so highly developed as to have cast their doctrines in a mathematical form. But Piaget is not thereby trapped into a commitment to the first option. As he stated above, he will “not allow it to lead us into epistemological realism of any kind.” The epistemological implications of causality are philosophical, and causality studies appear in his work almost from the very beginning. His mature position on the question of causality is very practical – in our sense of that word in this treatise – and, because the issue of causality is of fundamental importance, we will look at it in considerable detail.

§ 4.1 Piagetian Causality

Let us begin by making an observation that is essential to our synthesis of the practical Standpoint. When Piaget discusses causality, he is explaining the *idea* of causality, not the Kantian category of causality and dependency. The two are not at all the same. The object of the Piagetian idea of causality is, in our terminology, an intelligible object and an *Unsache*-thing. We will see this shortly. On the other hand, the category of causality and dependency is a *notion* and a rule for the construction of rules. The nearest Piagetian analogy is the idea of the regulation of a structure. We must not and shall not attempt to equate the Piagetian idea to the Critical notion.

But if Piaget uses neither science’s “default” view of causality nor Margenau’s convention, what convention does he adopt? Just as the starting point of the Critical Philosophy is the Copernican hypothesis, so also the starting point of Piaget’s genetic epistemology is an hypothesis we will call the *genetic hypothesis*: **A certain continuity exists between intelligence and the purely biological processes of morphogenesis and adaptation to the environment** [PIAG1: 1]. Now this hypothesis is almost a statement of our principle of Organized Being. One can say that the principal difference between Piaget and Kant in this regard is that, rather than adopting the Copernican hypothesis, Piaget instead attached this hypothesis to his normative convention of science with the result that he must proceed from here in the role of the *external* observer. He will meld empiricism and rationalism from “outside” the thinking Subject (a non-Copernican Perspective).

From this vantage point, he is able to establish as a system of reference a normative position that he described in the following way:

Now if we regard the living organism as forming the link between the physical world, of which it is a part, and the behavior or even the thought of the subject, of which it is the origin, then it seems plausible to hold that those concepts which are the most resistant are also the most deeply rooted from the psycho- and even perhaps bio-genetic point of view [PIAG27: 76].

Piaget made this remark in the context of discussing problems of epistemology in physics. The “resistant concepts” to which he refers are ideas that tend to survive scientific revolutions (in Kuhn’s terminology) with little or no alteration while other ideas are being drastically altered or even swept away. “Causality” is one such idea, and Piaget’s point is that to understand such an idea is to understand how we come by it in terms of “the living organism.” What is important in the above remark is the place Piaget assigns to the “living organism.” It stands at the junction of “the physical world” on the one side and a “mental world” on the other, and can therefore be viewed as the common ground where the union of empirical science and epistemology is possible. To understand our most fundamental ideas, therefore, is nothing else than to explain their origins in the organism.

Getting back to Piagetian causality, no good purpose would be served by holding you, the reader, in suspense. At some risk of putting the cart before the horse, Piaget’s mature position is:

Causality consists in an organization of the universe caused by the totality of relations established by action and then by representation between objects as well as between object and subject. Hence causality presupposes at all levels an interaction between the self and things . . . Such an elaboration presupposes an invariant functioning . . . but a structuring which is progressive and not at all *a priori* . . .

It is obvious that the progress of such a structuring stems from that of intelligence, and that causality must definitively be conceived as intelligence itself to the extent that the latter is applied to temporal relations and organizes a lasting universe [PIAG2: 315].

In looking at the first sentence of this quote, it initially appears as if Piaget is handing us a circular definition by talking about “what causality is caused by.” However, we will not let a careless phrase carry us away. Piaget holds that the organism (human being) constructs in his or her mind an interlocking structure of schemes by which the organism both represents Piagetian “objects” and represents “relations” of coordinated actions between them. One of these constructed objects is the self. The *meaning* of ‘causality’ is defined by the activity of structuring an entire *system* of schemes, observables, and coordinations carried out in the process of equilibration. To put it another way, causality is the name of the *action* of cognitive structuring. In our terminology, Piagetian causality in general is an *Unsache*-thing – a “happening.” Wolfe Mays of the University of Manchester summed it up this way:

In a number of specific studies Piaget has examined in some detail the development of the physical concepts of time, speed, conservation, chance, and causality, all of which are regarded as

constructions from behavioral activities. Starting as he does from the facts of observable child behavior rather than adult introspections, he differs from the empiricist thinkers like Locke in his emphasis on the part played by overt activities in building up the conceptual machinery of thought. Such thinkers, Piaget claims, have taken thought as prior to action and have used introspective analysis to explain how we arrive at abstract concepts and thereby overlooked that the process of conceptual abstraction is a highly developed form of activity which only occurs at a relatively late age, and which furthermore implies a complex learning process.

In his discussion of causation, Piaget aims to show that causality first arises from sequences of events in which the activity of the child is always an element . . . In order that an event *A* should be considered the cause of an event *B*, it is necessary that *A* be an action of the child itself; as when he pushes, pulls, or otherwise handles objects in his environment. Only at a later stage does causality become dissociated from the child's activities and take on a physical character [PIAG27: 2-3].

This is probably as close as it is possible to come, without adopting the Copernican Perspective, to the Critical Philosophy's theory of causality as Object we discussed earlier. Because we cannot actually observe equilibrium *per se*¹, Piaget's causality-as-construction is a thoroughly *practical* idea. Its specific manifestations in behavioral appearance (when someone attempts to communicate by example what he means by "causality" or when we infer how he views it from his explanation that something happened "because of" something else) is a context in physical cause-and-effect open to experiential observation.

There are issues and problems with this view of causality, but since our purpose is not to debate Piaget but rather to establish the objective basis of the practical Standpoint, we will pass over these issues. But because Piaget's theory – whether we call it functional, constructivist, or structuralist – is so different from the most common usages of the word "causality", we need to examine in a little more detail how he came to this view. If it is sufficient to judge from the chronological record of his work, Piaget came to his "genetic" definition carefully, methodically, and over a very long number of years.

Piaget's study of causality appears in some of his earliest work. In his 1928 book, *Judgment and Reasoning in the Child*, Piaget examined how young children's explanations employed the idea of causality in their use of the word "because." Here Piaget distinguished two forms of use. In one, "because" expressed the relationship between cause and effect; in the other, "because" expressed a relationship of a reason (e.g. a "why") to a consequent.

The causal 'because' is the mark of a relation of cause and effect between two phenomena or two events. In the sentence we gave to the child, "The man fell off his bicycle because . . .," the 'because' calls for a causal relation, since it is a question of connecting an event (a fall) with another event (e.g. "someone got in his way"), and not of connecting one idea with another.

The logical 'because,' on the other hand, denotes a relation, not of cause and effect, but of 'implication,' of reason and consequent; what the 'because' connects here is no longer two observed facts, but two ideas or two judgments. For instance, "Half of 9 is not 4, because 4 and 4 make 8." Or, "That animal is not dead, because it is still moving." [PIAG11: 6].

¹ What we observe is the process of equilibration in action. *Absence* of the action implies equilibrium.

Piaget also distinguished a third use of "because" that we will later find very interesting:

In addition to this, it is necessary to distinguish a third type of relation, which may be considered as intermediate between the last two, and which we shall call the *relation of motive for action* or the *psychological relation*. The 'because' which denotes this relation establishes a relation of cause and effect, not between any two facts, but between an action and an intention, between two psychological actions. For instance: "I slapped Paul's face, because . . . he was laughing at me." The relation here is empirical in a sense, since it is a question of two facts and of a causal explanation. In another sense, however, it is logical, since it introduces a reason, an intelligent motive as a cause. We have here as much a justification as an explanation.

We have distinguished this third type because children have a tendency to replace logical by psychological relations. We gave an example of this just now. "Half of 9 is not 4, because he can't count" [PIAG11: 7-8].

The point of this early study was not centered on 'causality' as such. Rather, what was being examined was the child's process of logic and reasoning. We have discussed this at length earlier in this treatise with the ideas of syncretism and juxtaposition in childish reasoning. Two years later, in his 1930 *The Child's Conception of Physical Causality*, childish causality was in the spotlight.

The evolution of the idea of causality in the child follows very much the same lines as those we have just been observing in connection with the notion of reality. But it is important at this point to recall the facts in all their complexity. If we decide to do away with arbitrary simplifications, we shall find no less than 17 types of causal relation in child thought . . .

The first type is that of psychological causality, which is both causal and final; let us call it the *motivation* type . . . This type is, no doubt, the most primitive, but it is also the one that survives the longest . . . Elsewhere we have designated as *pre-causality* this tendency to take a psychological motive as the true cause of everything: there are two Salève mountains, because there must be one for grown-ups and one for children, and so on.

The second type is that of pure *finalism* . . . It is much the same when we say, in accordance with ordinary common-sense, that ducks have webbed feet so as to swim better . . .

A third type is constituted by *phenomenistic causality*: two facts given together in perception, and such that no relation subsists between them except that of contiguity in time and space, are regarded as being connected by a relation of causality . . . A child will say . . . that the moon remains suspended in the sky because it is yellow and bright, and so on. Anything may produce anything.

A fourth type of relation is *participation*. This type is more frequent than would at first appear to be the case, but it disappears after the age 5-6. Its principle is the following: two things between which there subsist relations either of resemblance or of general affinity, are conceived as having something in common which enables them to act upon one another at a distance, or more precisely, to [regard] one as a source of emanations, the other as the emanation of the first . . .

Closely akin to participation is *magical causality* (a fifth type), magic being in many respects simply participation: the subject regards his gestures, his thoughts, or the objects he handles, as charged with efficacy, thanks to the very participations which he establishes between those gestures, etc., and the things around him . . .

A sixth type, closely related to the preceding ones, is *moral causality*. The child explains the existence of a given movement or of a given feature by its necessity, but this necessity is purely moral: the clouds "must" advance in order to make night when men go to bed in order to sleep; boats "have to" float, otherwise they would be of no use, etc.

The seventh type of relation is *artificialist causality* . . . [The] event or object to be explained is

then conceived as the object of human creative activity . . .

An eighth type is *animistic causality*, or what might be called causality by realization of form. The existence of a character or form is explained by an internal biological tendency that is both alive and conscious . . .

A ninth type, which is simply left over from the preceding, is constituted by *dynamic causality* . . . Thus, primitively, force is confused with life itself, but dynamism outlives animism, just as finality outlives pre-causality . . .

A tenth type of relation is explanation by *reaction of the surrounding medium*. It is, properly speaking, the child's first genuinely physical explanation . . . But the reaction of the surrounding medium implies, and for the first time, the need for defining the "how" of phenomenon, *i.e.* the need for continuity and contact . . .

An eleventh type of causality is constituted by *mechanical causality* properly so-called, *i.e.* explanation by contact and transference of movement: the wind pushes the clouds, the pedals make the bicycle go, etc. This form of causality appears between the years of 7 and 8. It is always the result of eliminating dynamism . . .

A twelfth type of relation may be called *causality by generation* . . . We saw that in the matter of the heavenly bodies, of the clouds, etc., as soon as the child has given up the idea that they were made by men, he tries to think of them as being born out of each other. This is the type of relation which we shall call generation . . .

From this type of explanation to the thirteenth, namely, to explanation by *substantial identification*, there is but a step. We shall say there is identification when bodies that are born from each other cease to be endowed with the power of growth as it exists in living beings. It is not always easy to draw the line, but it is useful to note the difference. For instance, great progress has been made when the sun is no longer believed to have been born of a cloud, but is regarded as a collection of clouds that have "rolled themselves into a ball." . . . It will be remembered how frequent were these explanations by identification between the years of 8 and 10.

. . . The fourteenth is characterized by the schemes of *condensation* and *rarefaction*. For it is not enough for the child to say that the sun has been made by clouds that have rolled themselves up into a ball . . . The qualitative differences have to be explained, which separate bodies of similar origin. The child then makes the following perfectly natural hypothesis. That the qualities of the sun result from the fact that the clouds have been "well packed." That the hardness of the stone comes from the fact that the earth is "close." Thus the matter that makes up bodies is more or less condensed or rarefied . . .

The fifteenth type of explanation is, in a sense, simply an extension of the last: it is that of *atomistic composition*. From the moment that bodies are regarded as the result of the condensation or rarefaction of original substances, it follows inevitably that sooner or later they will be conceived of as made up of particles tightly or loosely packed together . . .

The sixteenth type of explanation is *spatial explanation*. Thus the explanation of the cone-shaped shadow appeals, in the later stages, to principles of perspective . . . This is a rather advanced form of explanation and consequently only occasionally to be found in children.

Finally, the seventeenth type of explanation, the most subtle, but towards which most of the others tend, is *explanation by logical deduction* . . . This is explanation by the principle of sufficient reason. All mechanical explanations, spatial, atomistic, etc., appeal sooner or later to the principle of deduction, and this type of explanation is therefore one of increasing frequency after the age of 10-11. [PIAG8: 258-266].

This is indeed quite a catalog, is it not? Looking over this list, it is not difficult to imagine we can see the origins of the ancient pagan gods or the belief in witchcraft. Piaget found that these 17 varieties of causal explanation developed in three distinguishable periods. In the first period, the youngest children, childish explanations tend to rely upon explanations of types 1-6. The second stage sees the rise of types 7-9, accompanied by a diminishing of the "magical" causal types 3 and 4. These explanations gradually give way to explanations of type 10-17 in the

third period and physical (that is, “scientific-like”) causality does not make its appearance until around the ages from 7 to 8 years. Piaget typically referred to causality types in the first two stages (*i.e.* types 1-9) as pre-causality “in the widest sense.”

From his research, Piaget concluded there were three processes at work that characterized the evolution of the child’s conception of causality. He described these as: 1) the desubjectification of causality; 2) the formation of series in objective time; and 3) the progressive reversibility of the systems of cause and effect. With regard to the first process, causality for very young children is, as Piaget put it, “teeming with subjective elements.” Earlier, when we spoke to the question of Piagetian objectivity and the idea of individuality, the role of inference by analogy to the Self in understanding ‘external’ objects was discussed. It is not too difficult to see the fruits of this analogy in the first period of childish causality. By the “process of desubjectification,” Piaget means that the evolution of causality undergoes a progressive separation of the Self from the rest of the universe and increasing objectification in causal explanations.

As for the formation of explanations based upon a series in objective time, Piaget notes:

The second process is peculiar to causality: it is the constitution of temporal series. What strikes one most about the child’s more primitive forms of causality is the immediate and almost extra-temporal character of the relation . . . Joined to this relative immediacy is a remarkable absence of interest as to “how” phenomena occur. Thus, according to the very youngest children, the pedals make the wheels go around without being in any way attached to them, simply by influence . . . Immediacy of relations and the absence of intermediaries, such are the two outstanding characteristics of causality round about the ages of 4-5. But such features are completely absent from children of 11-12 in subjects of which they know nothing. Thus it is more or less impossible for a child of 10 to understand how a motor-car works [PIAG8: 268].

Before causality in the usual adult sense of the word becomes possible, childish thought must evolve to the point of positing “intermediaries” between the final effect and the initial cause. This is what the construction of a temporal series in objective time makes possible. Piaget carefully notes that a “feeling” of “before and after” is not absent from childish thought even in the most primitive causal explanation types; but objective time is simply not a factor to which the child pays attention in the first stage of causality.

Finally, the third process involves the evolution of the idea of *reversible series*. Reversibility in this sense can be illustrated as follows. A child tells us a stone is composed of little particles of dirt; the younger child, having said this, does not also understand that if this is so, then the stone can be de-composed into dirt. The older child, on the other hand, is able to draw this inference. With the evolution of reversibility, the series in time is not abolished; *it is made to be able to run in both directions.*² The primitive forms of causality are all irreversible.

² Currently in physics we see some discussion regarding objective time arising from the reversibility of time in physics equations. Piaget’s “causality catalogue” can be discerned in the presuppositions used by the physicists in this discussion.

§ 4.2 Causality and Assimilation

Piaget's early work (*viz. The Language and Thought of the Child, Judgment and Reasoning in the Child, The Child's Conception of the World, and The Child's Conception of Physical Causality*) led up to the making of what is perhaps the most important hypothesis in his system, namely the hypothesis of assimilation. In analyzing his findings from the study of childish objectification and causality, Piaget considers views ranging from those of Hume to the those of the interesting French vitalist Maine de Biran (including, of course, Kant as Piaget and the neo-Kantians of the day misunderstood him). Piaget found these views wanting. On the other hand, by employing in his normative structure a reference based on "the organism" Piaget was able to make something out of the mass of his psychological findings.

These biological hypotheses, it will be seen, account for the facts we have observed, and are necessary for that purpose. The whole structure of the child's idea of reality rests on a primitive lack of differentiation between the self and the external world, that is on a fusion of organic experience and external experience. External perceptions are molded into muscular sensations; the contents of organic consciousness is amalgamated to external things. Sometimes we have complete fusion of the element of muscular sensation with the external element, as in the idea of force. Sometimes we have progressive dissociation between the self and external objects, as in the evolution of the notion of cause. Thus the analogy is clear that exists between this confusion of the self with the world on the one hand, and the continuity of the organism with its setting on the other . . .

Every fresh external influence exercised upon the organism or the mind presupposes two complementary processes. On the one hand, the organism adapts itself to the object which exercises this influence: in this way there is formed a sort of motor scheme related to the new object. This is what we shall call, in a very wide sense, *imitation*.¹ On the other hand, this adaptation implies that between the new movements and the old habits there is a certain continuity, *i.e.* that the new movements are partly incorporated into already existing schemes. This incorporation we shall call *assimilation* [PIAG8: 284-285].

Before going any further, there is a terminological issue between Piaget and Kant that we need to settle. Among the metaphysical speculations that Piaget examined we find some using the idea of analogy as an explanation for how we view reality, causality, etc. Piaget rejects this idea. However, I claimed earlier that inference of analogy is a factor in the generation of generalizing concepts and that the Piagetian theory is in accord with this. The contradiction is only apparent rather than actual. This is because in the Critical theory analogy is an inference of judgment and, furthermore, the making of this judgment belongs to the process of *reflective* judgment, not determining judgment. Put another way, the representations that are the matter for inference of analogy are not objective concepts but representations of sensibility. For Piaget, on the other hand, an analogy is a product of *objectified* reasoning. Hence, Piagetian 'analogy' and the Critical inference of analogy are not the same.

With this point clarified in advance, let us look at how Piaget saw the idea of assimilation

¹ What Piaget here calls 'imitation' he will later call 'accommodation.'

that emerged from his early findings:

As to assimilation, insufficient attention has been paid to the important part it plays. Assimilation must not be confused with analogy, with that perpetual tendency to reason by analogy which has been taken as the characteristic of elementary intellectual reactions. For even if analogy is derived from assimilation, the latter is quite a different thing at first. There is analogy when two percepts or concepts of the same order are reduced to one another . . . Thus when we see what we believe to be a tree, what we are actually perceiving is a green patch, an oblong shape, etc., and by immediate fusion we identify this perception with other earlier analogous perceptions and in this way are enabled to recognize a tree. In such a case there is analogy because the terms compared are on the same plane of reality, that is, they both are borrowed from external experience. But assimilation takes place when percepts, formless in themselves, and incapable of being completed by elements drawn from the same plane of reality, are worked into schemes taken from another plane of reality, into schemes, that is to say, which *were there before the experience* of the kind in question, and which are conditioned by the structure of the organism.

In short, the subjective adherences which we observe during the primitive stages of intellectual evolution cannot be due simply to judgments of analogy, because there are not in this case two separate terms, known separately, which are compared and then identified with one another. There is fusion which takes place prior to any knowledge of the terms compared. This fusion is what we have called assimilation, and is something which cannot be understood unless one imagines the existence of schemes already formed by action and into which are merged the elements of knowledge in the process of formation.

We are fully aware of all that remains obscure in this notion of assimilation. But our results up to date do not permit of any further analysis of the subject. In order to grasp the mechanism of assimilation one would have to investigate the zone that lies between organic and intellectual life. It is therefore from an analysis of the first two years of the child's life that we may hope for light on the subject. All we can do for the moment is to postulate the existence of this process of assimilation [PIAG8: 285-287].

As we have previously noted, the hypothesis of the process of assimilation was to prove successful when Piaget finally carried out the aforementioned study of children in the first two years of life. His landmark theory of assimilation and accommodation appeared in the now classic work, *The Origins of Intelligence in Children*. As for causality in the sensorimotor stage of development, Piaget's findings followed two years later (1954²) with the publication of *The Construction of Reality in the Child*. These works confirmed Piaget's earlier hypothesis that the evolution of all the intellectual structures of intelligence are founded upon the structuring of schemes, beginning from innate reflex schemes, in an on-going process he eventually came to call the process of equilibration. Specifically with regard to causality, Piaget concluded:

To be sure . . . the elementary causal relations are all due to the mechanism of circular reaction, first primary, then secondary, and if circular reaction could be reduced to the simple concept of habit, Hume would be right. But circular reaction involves an element of organization or active repetition which transcends habit . . . Assimilation, which is at the point of departure of all schemes, is the source of classifications and the making of relationships which transcend the frames of simple

² Publication year of the first English edition.

habit and which therefore involve a more complex concept of causality [PIAG2: 310].

The significance of this statement should not be underestimated. Piaget found experimentally that there does exist an *a priori* element in the making of all empirical knowledge, namely the sensorimotor schemes. He did not view this apriorism as being the same as that of Kant's theory. As his remarks made in numerous places in his work show, he took Kant's knowledge *a priori* to imply that the categories were "fixed concepts" or "innate ideas" rather than viewing them as rules for the construction of rules (a popular error in how people have come to view Kant's philosophy). In fact, apriorism in both the Kantian and the Piagetian theories is a 'functional' apriorism and not at all the "fixed innate ideas" of the rationalists. This does not mean, however, that Piaget's schemes and Kant's categories are one and the same. They are not. A Piagetian scheme is a structure, and it assimilates its experiential 'aliments' into itself. In terms of mental representation, the "elements within" a structured scheme have some similarity to our idea of a "manifold of concepts." But, again, these two ideas are not identical because a scheme always involves *actions* and, at the root, always stem from the *physical* actions of the organism that are the grounds of meanings for the organism (although the connections that bestow the meanings in highly developed intellectual structures to the elementary sensorimotor schemes have become quite lengthy and remote by the time we reach adulthood). If we refer back to the idea of a hierarchy of increasing equilibrations of structures in Chapter 9, we should have no great difficulty picturing this aspect of Piagetian structuring.

As for the "mechanism" of causality *that defines this idea practically*:

On the other hand, causal relations can be traced back to reproductive assimilation which itself explains the origins of habit. When, having fortuitously set an interesting phenomenon in motion, the child immediately tries to reproduce his gesture and recapture the desired result, we may say that this effort, which will subsequently engender a habit, constitutes the most elementary form of causal relation. But the formation of this scheme presupposes that from the very beginning the subject establishes a connection between the result perceived (whether this result is located in the external world or remains inherent in his own body is of little importance) and a certain aspect, more or less analyzed, of the activity itself. Hence it is this connection, and not its automatization into habits, which defines causality. Such a connection presupposes, of course, an experimental sanction, and on this point empiricism is right, but it does not result from experimentation alone: it involves also the ability to establish relationships, in which reproductive and generalizing assimilation consists, and, in general, the organization of schemes. The relations thus established are not, of course, rational from the outset, since they are partly phenomenalistic and make personal activity play a role which it does not fill in reality. We must therefore avoid the belief that causality is an identification from the outset or that it constitutes from its inception a category of *ne varietur* structure. But the organization of schemes which constitutes causality is capable of a progressive structuring in the direction of reversibility and geometric connection and thus presages from the beginning the possibility of a later rationalism.

Finally, to the extent that causality appears as reproductive assimilation it is always, during the earliest stages, on the occasion of personal activity that causal connections are established. Never, therefore, does the subject at first elaborate a relation between an external cause and effect [PIAG2: 311].

There are a few points for us to note in this finding. The first of these is a “teleological” presupposition that slips into Piaget’s exposition in the second sentence, namely the idea that the child wants to “recapture a desired result.” As Piaget dryly noted in *The Origins of Intelligence* [PIAG1], the habit of thumb-sucking is not an innate biological reflex. Now, are we to suppose that Piaget merely succumbed to a careless habit of speech in introducing this idea of a “desire” as a “motive” for the child’s action? No. The idea of “desires” appears frequently in his exposition in [PIAG1], and we should not assume that a scientist who is so painstakingly careful otherwise in his analyses would be an habitually careless writer. Indeed, we will later see that “affectivity” is as integral to Piaget’s system as is assimilation. The idea of affectivity goes, in part, to what Piaget called the “regulations of the second order.” We shall not be surprised later on to find affectivity integrated into the theory of structuring and, hence, find this idea to have, like objectification and causality, a *practical basis*.

A second point appears in the presuppositions he mentions. One of these presuppositions is that of the ability of the subject to “establish a connection” between the perceived result and some aspect of his activity that is “more or less analyzed”. What this presupposition goes to is the idea that the causal structuring in the scheme can be employed by the subject in a particular way, namely in establishing that elusive character of knowledge we call *meaning*. This is our first glimmer of what will be an important idea later on: the idea of “meaning” is a *practical* idea. We shall have to expend some not inconsiderable effort later on in explaining the difference between an “idea” in the context of cognitions and a “practical idea,” (because these have very different contexts). The former belongs to the theoretical Standpoint, the latter does not. From the theoretical Standpoint alone, the question, “What does ‘meaning’ mean?” is inherently circular. What we shall find is that to resolve this question we will need to view it, in part, from the practical Standpoint and, in part, from the judicial Standpoint.

The third (and for now the last) point to note is the implication that all of the most primitive practical relationships call upon the “personal activity” of the subject for the structuring of their connections. As mentioned before, the evolution from realism to objectivity necessarily presupposes structuring in terms of something we have called “individuality.” But, as Piaget noted, assimilation (which is unremittingly practical) is the “mechanism” for “classifications.” Thus we should expect that “to classify something” as ‘individual’ will, like causality, take its *practical Realerklärung* from the structuring of a Relation and, at the underlying ‘primitive’ structural ‘level’, we have seen enough to anticipate that this “definitive structure” will be one that contains a connection through the subject’s own activities to the practical *Existenz* of the Self.

§ 5. The Emergence of the Self

The road each of us travels from the undifferentiated experiences of infancy to the development of our cognition of an objective Self is a long one. In the beginning the noumenal *I* of transcendental apperception – which we have characterized as a knowledge of one’s own *Dasein* without any accompanying cognition of one’s own *Existenz* – might best be described as a general and global “sense of aliveness.” Psychological evidence very firmly indicates that the early stages of infant life show no evidence that the infant views anything objectively, and indeed seems to come into this world with no concepts of objects of any sort as far as we can tell. This does not mean, of course, that the infant is *unconscious*. Quite the opposite. But in the early stages of life the consciousness of the infant seems to be almost wholly affective. Noted psychiatrist Stanley Greenspan describes this in the following way:

As an infant takes in sensations, we have to wonder how he experiences his emerging sense of self. What type of consciousness does he have? His world is an array of sights, sounds, textures, tastes, and smells that strike his notice fairly randomly. We may see him gradually begin to turn toward a noise, then try to get together a smile, then cast his gaze in the general direction of a colorful toy. Though he can't quite manage yet to focus on his sensory impressions or complete his motor actions, he nonetheless seems full of an affective aliveness, a sense of the wonders about him. He seems to take pleasure in his involvement with the world without yet being able to interact with it in any purposeful way. He has no active self that engages with others or wills action. Rather, he responds to the features of his environment globally or wholly. If things overwhelm him, he screeches in distress; if they please or soothe him, he beams with delight. He feels lung-wrenching anger, limb-flapping joy. His affects are primary. There is nothing nuanced or complex about his relationship to the world. Indeed, he seems not so much to relate to the world as to belong to it through a sense of oneness with his surroundings, an encompassing excitement or anguish in all he experiences [GREE1: 49].

The *objectification* of the transcendental *I* as an Object is the formation of the general cognition of the experiential object we call the Self. Objective consciousness of the Self adds to the mere consciousness of one’s own *Dasein* the recognition of the appearances of one’s *Existenz*. Merely because a baby does not appear to be prone to introspection – that is, merely because the baby does not appear to spend any time *thinking* about himself – does not mean that this recognition of the Self is not being formulated in his mind. Indeed, if we did not suppose that the cognitive processes were at work previously in the formation of concepts of Self prior to revealing this cognition to us as observers, through behaviors and actions, it would be impossible to understand the phenomenon of Self in any manner consistent with the evidence of psychological research. There does not seem to be any empirical evidence that would indicate there is a “golden moment” in the sensorimotor stage of intelligence when the child appears to make the first recognizable division of his world into a Self and a not-Self. There appears to be no *Eureka!* when the child suddenly and definitively “finds himself.”

What there appears to be instead is a progressive cognitive structuring of what we can call “maxims of thinking” through which the child comes to “sort things out” in terms of an objective disjunction where some concepts come to be placed under a concept of an Object we call the Self and other concepts are placed outside the sphere of the concept of this Object. This recognition of the Self is, of course, a byproduct of experience.

The successive study of concepts of object, space, causality, and time has led us to the same conclusions: the elaboration of the universe by sensorimotor intelligence constitutes the transition from a state in which objects are centered about a self which believes it directs them, although completely unaware of itself as subject, to a state in which the self is placed, at least practically, in a stable world conceived as independent of personal activity. How is this evolution possible? [PIAG2: 350].

“How?” indeed. This question is one of the most fundamental questions we can ask about the phenomenon of mind. Our earlier discussion of Piagetian “pre-causality” illustrates the fact that the recognition of the Self plays a fundamental role in a person’s understanding of everything else inasmuch as maxims for thinking “individuality” are necessary for the thinking of any individual thing. By this term “maxims of thinking” we mean “rules of reasoning in the concrete about objects of experience.” From one Standpoint – the theoretical – we must regard such maxims as empirical cognitions of learned experience if we are to make a theory for explaining the behavior. From another Standpoint – the practical – we must regard them in terms of the idea of a determining factor necessary for the possibility of thinking the Self.

We introduced the idea of a determining factor in Chapter 3 (§3.2), where we described it as one of the functions of Modality in the general 2LAR of representation. In our present context we are concerned specifically with the Organized Being’s representing of its own *Existenz*, and thus with the determining factor in terms of this cognitive act from the practical Standpoint. Just as was the case in the theoretical Standpoint, we have four reflective perspectives from which to view this idea (the logical, transcendental, hypothetical, and empirical), but now we are viewing these perspectives from the practical rather than from the theoretical Standpoint.

§ 5.1 The Logical-Practical Perspective of the Self

When we discussed the ontology of determinant judgments in Chapter 8 we described the logical perspective as the perspective concerned with the relationships of representations insofar as the form of the composition of the representation is considered. In Palmquist’s words:

The logical perspective is the 'merely formal' employment of reason which 'abstracts from all content of knowledge' . . . [It] 'has nothing to do with the origin of knowledge, but considers only representations . . . according to the laws which the understanding employs . . . when it relates them to one another'. [PALM1: 127].

From the theoretical Standpoint Piaget's schemes are ideas of this sort inasmuch as the idea of a scheme "abstracts from all content of knowledge" and is an idea of a formal relationship involving the activity of the Subject.

But in the practical Standpoint we turn our attention from the schemes *per se* to the process (mental acts) in which these schemes are structured in a system. This process is, of course, the process of equilibration through assimilation and accommodation. We looked at this general Piagetian "process of reasoning" in detail in Chapter 9, where we saw that this process could be viewed as a system of regulations. Our focus there was fixed upon speculative Reason, and we used Piaget's theory as a stepping stone in our exposition of the *Realdefinition* of the categories of understanding from the hypothetical and empirical perspectives in the theoretical Standpoint. But Piaget's theory of equilibration, viewed as an exposition of human reasoning from his system of reference (his aforementioned normative convention), is a theory couched in terms of the practical Standpoint. Within this Standpoint it is also a theory that takes an unremittingly *logical* reflective perspective. We will call this logical perspective in the practical Standpoint a **logical-practical perspective**.³

What does this logical-practical theory tell us about the emergence of the Self? Piaget summarized the evolution of the self in the following way:

In its beginnings, assimilation is essentially the utilization of the external environment by the subject to nourish his hereditary or acquired schemes⁴. It goes without saying that schemes such as those of sucking, sight, prehension, etc., constantly need to be accommodated to things, and that the necessities of this accommodation often thwart the assimilatory effort. But this accommodation remains so undifferentiated from the assimilatory processes that it does not give rise to any special active behavior pattern but merely consists in an adjustment of the pattern to the details of the things assimilated . . . In other words, at first the universe consists in mobile and plastic perceptual images centered about personal activity. But it is self-evident that to the extent that this activity is undifferentiated from the things it constantly assimilates to itself it remains unaware of its own subjectivity; the external world therefore begins by being confused with the sensations of a self unaware of itself, before the two factors become detached from one another and are organized correlatively.

On the other hand, in proportion as the schemes are multiplied and differentiated by their reciprocal assimilations as well as their progressive accommodation to the diversities of reality, the accommodation is dissociated from assimilation little by little and at the same time insures a gradual delimitation of the external environment and of the subject . . . In terms of reflective intelligence this would mean that deduction is organized and applied to an experience conceived as external. From this time on, the universe is built up into an aggregate of permanent objects connected by causal relations that are independent of the subject and are placed in objective space and time. Such a universe, instead of depending on personal activity, is on the contrary imposed upon the self to the extent that it comprises the organism as a part in a whole. The self thus becomes aware of itself, at

³ Where we have used the term "logical perspective" by itself, we mean the "logical-theoretical" perspective, i.e., the logical perspective from the theoretical Standpoint.

⁴ In [PIAG2] the translator rendered *schème* as "schema" rather than "scheme." Piaget later remarked that he preferred the translation to be "scheme" and "schemes" rather than "schema" and "schemata."

least in its practical action, and discovers itself as a cause among other causes and as an object subject to the same laws as other objects [PIAG2: 351-352].

Assimilation is a process that is conservative (conservation of schemes) and always attempts to “subordinate the environment to the organism as it is” [PIAG2: 352]. Accommodation, on the other hand, is “the source of changes and bends the organism to the successive constraints of the environment.” These are antagonistic processes in the sense that the need to accommodate sensorimotor schemes to the conditions of the environment tends to thwart the assimilation of external objects (objects of the not-Self) in these schemes, while assimilation always tends to resist new accommodations to things. In terms of our model of Organized Being (Figure 1.8.1 in Chapter 1), the Organized Being’s first “point of contact” for the “universe” and its Self at the beginning of life takes place immediately at the boundary between the organism and the external world. This is what we call the *soma*-environment boundary in Figure 1.8.1.

In other words, the first knowledge of the universe or of himself that the subject can acquire is knowledge relating to the most immediate appearance of things or to the most external and material aspect of his being. From the point of view of consciousness, this primitive relation between the subject and object is a relation of undifferentiation, corresponding to the protoplasmic consciousness of the first weeks of life when no distinction is made between the self and the non-self. From the point of view of behavior this relation constitutes the morphologic-reflex organization, in so far as it is a necessary condition of primitive consciousness. But from this point of undifferentiation A, knowledge proceeds along two complementary roads. By virtue of the very fact that all knowledge is simultaneously accommodation to the object and assimilation to the subject, the progress of intelligence works in the dual direction of externalization and interiorization, and its two poles will be the acquisition of physical experience ($\rightarrow Y$) and the acquisition of consciousness of the intellectual operation itself ($\rightarrow X$) . . . From this point of view the morphologic-reflex organization, that is, the physiological and anatomic aspect of the organism, gradually appears to the mind as external to it, and the intellectual activity which extends it by interiorizing it presents itself as the essential of our existence as living beings [PIAG2: 355-356].

In terms of the interactions discussed in Chapter 9, Piaget’s “point A” corresponds to the undifferentiated *Obs.OS* in the most primitive sensorimotor schemes. The Subject’s mental evolution of a gradual differentiation and coordination of an act of accommodation from the act of assimilation leads to the eventual distinction between *Obs.O* and *Obs.S* in the types I and II interactions and, afterwards, the cognition of coordinations *Coord.O* and *Coord.S*. Put in other words,

Thus it may be seen that intellectual activity begins with the confusion of experience and awareness of the self, by virtue of the chaotic undifferentiation of accommodation and assimilation. In other words, knowledge of the external world begins with an immediate utilization of things, whereas knowledge of the self is stopped by this purely practical and utilitarian contact. Hence there is simply interaction between the most superficial zone of external reality and the wholly corporal periphery of the self. On the contrary, gradually as the differentiation and coordination of assimilation and accommodation occur, experimental and accommodative activity penetrates to the interior of things, while assimilatory activity becomes enriched and organized. Hence there is a

progressive formation of relationships between zones that are increasingly deep and removed from reality⁵ and the increasingly intimate operations of personal activity. Intelligence thus begins neither with knowledge of the self nor of things as such but with knowledge of their interaction, and it is by orienting itself simultaneously toward the two poles of that interaction that intelligence organizes the world by organizing itself [PIAG2: 354-355].

When Piaget speaks of accommodative activity “penetrating to the interior of things” he is referring to the structuring of observables *Obs.O* and, later, coordinations *Coord.O* in the child’s cognizance of his experiences. This is “externalization” in the sense of a “direction $\rightarrow Y$ ” moving “away” from the boundary (“point A”) between the organism and the environment. Similarly *and conjointly* there is a structuring of observables *Obs.S*, and later coordinations *Coord.S*, in which the thinking Subject “interiorizes” (becomes cognizant of) these observables as personal and distinct from those he places in the environment. This is a “movement” in the sense of a “direction $\rightarrow X$ ” into the “interior” of the organism. Symbolically, we can illustrate these two “poles” as [PIAG2: 355, Figure 2], [PIAG25: 335, Figure 6]

$$X \leftarrow A \rightarrow Y.$$

Structures *X* and *Y* in this depiction are to be regarded as concurrent in the child’s consciousness. In other words, in the Organized Being’s consciousness these two structurings do not take place independently of each other but, rather, the act of structuring is reciprocal with *X* and *Y* each determining, and being determined by, the relationship with the other. In terms of the mental act, this is nothing less than a *real division* in which *X* is conceptualized (in Kantian terminology) within the scope of the Self-Object and *Y* is consciously regarded as outside of this scope.

This is nothing less than *practical* self-consciousness in action. We can indeed call this the *practical Quantity* of the cognition of the Self in the *form of the matter* of Piagetian structuring. The “logical nature” of Piaget’s theory is more or less plainly evident in this depiction, as is its “practical nature”; thus the name “logical-practical perspective” is indeed quite appropriate as a description of Piaget’s theory of the grasp of consciousness. Note that this practical Quantity of self-consciousness does not involve any sudden “flash of illumination” in terms of a full-grown concept of the *Existenz* of the Self as an object of appearance. On the contrary, what we see in this mental evolution is a gradual dividing up of the manifold of concepts with some concepts being placed within the sphere of a concept that understands the Self and others under a concept that understands the not-Self. This is, from a logical-practical perspective, the essence of what Förster called Kant’s *Selbstsetzunglehre* or “doctrine of self-positing” [KANT10: xlii].

⁵ see §3.3 for Piaget's use of the word "reality" in this context.

§ 5.2 The Transcendental-Practical Perspective of the Self

Despite the logical clarity Piaget's theory brings to the phenomenon of the emergence of the Self, it is nonetheless clear that the logical-practical perspective does not give us the full story. Given the normative convention adopted by Piaget, this is hardly surprising. It is one thing to deduce the logical functioning of structuring in terms of "observables" and "coordinations"; it is something else altogether to explain how these structures are possible in the first place given the infant's lack of any innate *objective* perceptions around which these observables can "nucleate" in the first place.

To put it another way, the logical-practical perspective provides us with no insight into the *matter of the matter* of these practical structures. It is the thinking Subject who performs the real division described above between Self and not-Self; but what is the ground for this division? What is the determining factor in the Subject's employment of its cognitive powers to the synthetic and *a priori* determination of these object concepts? These questions reach into what is *subjective* in our thinking Nature insofar as acts of mental composition are concerned. To inquire into these grounds is to view the emergence of Self from a **transcendental-practical perspective**.

Now, how are we to make an objectively valid inquiry into these subjective elements? The objective validity of Piaget's logical-practical perspective depends upon the ability to observe the child's actions and deduce from them intelligible objects (structures, interactions, etc.). For the psychologist-observer, Piaget's normative convention makes the distinction between Piagetian observables, *Obs.S* and *Obs.O*, relatively easy. But how are we to gauge the purely subjective on the basis of what we can know from actual appearances (and, hence, with objectively valid use of the categories of understanding in the making of our theory)?

As it happens, psychology can gain insight into these matters from a source that, at first glance, may seem more than a little surprising: the study of autistic children. Piaget, who studied the development of normal children, often made references in passing to the role of affective perceptions in the child's mental development, but most of these references are vague and non-technical. However, the affective perceptions are the gateway to probing the purely subjective because perceptions of this kind are, by definition, perceptions that are *non-objective* and therefore provide in appearance something we can study to probe the *practical Quality* of acts of mental composition. Greenspan describes this behaviorally observable gateway to the matter of cognitive structuring in the following way:

Perhaps the most vivid understanding of the fundamental way emotions influence cognitive growth comes from observing autistic children. These children, who suffer some of the most severe biologically based thinking and language problems imaginable, can teach us a great deal by how they learn to think, relate, and communicate. The children my colleagues and I work with have very serious deficits related to their neurological problems, such as poor ability to process sounds,

comprehend words, and plan sequential movements. Diagnosed between eighteen months and four years of age, these youngsters display a variety of bizarre and disturbing behaviors - wandering aimlessly, compulsively flapping their arms, continually rubbing a spot on the carpet, repeatedly opening and closing a door, painstakingly marshaling small objects into rigidly straight lines - but almost no ability to respond to even the most basic attempts to communicate [GREE1: 13].

In his clinical work Dr. Greenspan is in the business of treating these unfortunate children, and it is through an examination of what works and what does not work in bringing his young patients “out into the world around them” that we find the behavioral effects needed to ground the objective validity of the *Dasein* of the subjective matter of practical Quality.

Working with these children, we found that the basic unit of intelligence is the connection between a feeling or desire and an action or symbol. When a gesture or a bit of language is related in some way to the child's feelings or desires - even something as simple as the wish to go outside or to be given a ball - she can learn to use it appropriately and effectively. Until she makes that connection, however, her behavior and communication remains disturbed; indeed, the difficulty in making such connections constitutes a basic element of the disorder [GREE1: 16].

For those of us who do not spend our lives with autistic children, this finding may seem to be hardly of any significance, or we might question how the psychiatrist can presume to state that a “feeling” or a “desire” is truly an element of Greenspan’s “basic unit of intelligence.” To better appreciate the significance of Greenspan’s findings, let us look in detail at one example he provides:

In another instance we used a child's rather alarming repetitive motion to communicate with her for the first time. This two-year-old girl neither spoke nor made any response to those around her, but would spend hours staring into space, rubbing persistently at a patch of the carpet. We saw in her abnormal repetition, however, not only a symptom of her autism but also a sign of interest and motivation - at least involving that little spot of pile. Perhaps it could serve as an opening wedge for emotional connection and, later, learning.

We had the girl's mother place her hand next to hers, right on the favorite stretch of floor. The girl pushed it away, but her mother gently put it back. Again she pushed, again the hand returned. A cat-and-mouse game ensued, and by the third day of this rudimentary interaction, the little girl was smiling while pushing her mother's hand away. From this tiny beginning grew emotional connection, a relationship, and then thoughts and words. From pushing away an obstructing hand to seeking out that hand and then offering flirtatious grins and giggles, the child progressed to using gestures in a reciprocal nonverbal dialogue. When she began repeatedly flinging herself on her mother, the therapist recognized that this behavior gave her sensory pleasure. He instructed the mother to whinny like a horse each time her daughter lunged at her. Soon she was whinnying too, imitating her mother. Before long, she had started making her own sounds and then her own words. The therapist helped the mother stretch this sensation into a richer, more complex interaction . . . Today, at age seven, this girl has a range of age-appropriate emotions, warm friendships, and a lively imagination. She argues as well as her lawyer father, and scores in the low superior IQ range. We have worked with a large number of such children and observed many of them make similar progress. In our recent study of over two hundred youngsters with autistic spectrum diagnoses undergoing this type of therapy, we found that between 58 percent and 73 percent have become warm, loving, and communicative [GREE1: 17-18].

As is usually the case in psychology and psychiatry, Greenspan does not set down a specific definition for such terms as emotion, feelings, desire, etc. Psychology has always found these

terms notoriously difficult to define, and researchers who have ventured definitions usually do so in the context of what Reber's *Dictionary of Psychology* calls "mini-theories" (of which there are a great many with little agreement between them). This is a deficiency we must try to remedy later in this treatise. For now, however, we can regard Greenspan's affective terminology in the usual dictionary sense of the words (since "emotions" and so on are things with which we are all familiar enough to allow us to follow Greenspan's ideas). As an umbrella term for the context of these words, we can employ Piaget's word "affectivity", which he defined as follows:

AFFECTIVITY The term affectivity includes feelings, properly so-called, as well as the various drives or tendencies including "higher tendencies" such as the will. Some authors, it is true, distinguish between affective factors such as emotions or feelings and conative factors such as drives or will. We will not do so, however, because the difference between the affective and the conative appears to be only a matter of degree. This may be illustrated by considering Pierre Janet's definition of feelings. He based his definition on the economy of behavior¹ and defined feelings as regulations of the force an individual has at his disposal. From the same point of view, the will would only be a regulation of the elementary regulations constituted by feelings [PIAG16: 2].

At this point it should be mentioned that Greenspan is well-acquainted with and on the whole seems generally agreeable to Piaget's theory. However, he correctly points out that Piaget's system does not pay sufficient attention to the role of affectivity. It is this shortcoming that he seeks to correct.

It should be pointed out that Piaget has not developed a full theory of affective life. Consequently, we need not attempt to criticize systematically his model of affectivity. We need only look at those parallels to cognitive development that he has posited to evaluate their compatibility with psychoanalytic thought.

Piaget basically holds that intelligence and affectivity develop parallel to each other. He has stated that affectivity may retard or accelerate cognitive development. We accept this. Piaget, however, believes that affectivity cannot be considered the cause of the progressive structuralization that marks cognitive growth. We would go further than Piaget by stating that affective factors can have an impact both on the structuring and on the functioning of cognition . . .

It is important that Piaget notes a parallel between affective life and cognitive development, but does not offer an integration of the two realms. Such an integration would have to deal with the effects of drives, affectivity, and internalization of human object relations on cognition and vice versa. In other words, to attempt an integration, Piaget would need to postulate something with more explanatory power than parallel features. To use his own language, he would need to postulate "transformational rules" relating affectivity to cognition [GREE2: 92-93].

There are some very broad ramifications to be found in this "integration." Piaget will get his turn to speak later; for now, we will confine our attention to those elements of Greenspan's theory that speak to the emergence of the Self.

¹ Piaget's word should probably have been translated as "conduct" rather than "behavior." Piaget used "conduct" to mean "behavior including consciousness" [PIAG16: 2, fn], which differs from the behaviorist use of the term "behavior." However, if we agree to note this distinction, we may use "behavior" rather than "conduct" without danger of confusion.

Greenspan's fundamental hypothesis is that the formation of all perceptions, and hence all experience, involves a "dual coding" of objective and affective perceptions.² Along with those data of the senses that go into the formation of an intuition, this "coding" also includes an "emotional" factor that serves to establish *meaning and relevance* for the child's cognitions.

Human beings start to couple phenomena and feelings at the very beginning of life. Even infants only days old react to sensations emotionally, preferring the sound or smell of Mother, for example, to all other voices or scents. They suck more vigorously when offered sweet liquids that taste good. Somewhat older babies will joyfully pursue certain favorite people and avoid others . . .

Another aspect of this new understanding of thought and emotion is a recently discovered fact: a given sensation does not necessarily produce the same response in every individual. Inborn differences in sensory makeup can make a sound of a given frequency and loudness - say, a high-pitched voice - strike one person as exciting and invigorating while it impresses another as piercing and shrill, rather like a siren. A light of a certain brightness might seem cheerful to one person but glaring and irritating to another. A gentle caress may soothe one but painfully startle another, like a torch on sunburned skin. Despite long-held assumptions that we all experience sensations like sounds or touch in more or less the same way, significant variations are now known to exist in the manner that individuals process even very simple sensory information. A given sensation can thus produce quite different emotional effects in different individuals - in one case pleasure, for example, but in another anxiety. We each unwittingly compile our own personal, sometimes quite idiosyncratic, catalogues of affective reactions to sensory experience [GREE1: 19].

This "recently discovered fact" is probably old news to a mother who has had more than one child. Nor should these differences between individuals be particularly surprising to the rest of us. Despite the fact that our brains are much more alike than they are different, it remains true that individual differences *do* in fact exist. Our earlier principle of the *psyche* - namely, that there must exist a Relation of community between *soma* and *nous* - tells us that somatic differences must also imply mental differences. (The reverse is also true, but since mental elements are supersensible, we cannot obtain direct experimental evidence for this and must fall back on the rational principle of *psyche* to deduce this). Finally, we should also bear in mind that the infant is born with an immature brain structure, which leads us to make the reasonable guess that these differences in brain structure from one baby to the next are possibly greater at the beginning of life than studies of adult brains might imply. Why, after all, should babies differ recognizably in outward appearance and yet lack a similar difference in immature brain structure?

The known difference in brain structure has consequences when we consider maturation in both physical and mental development.

Recent philosophers such as Daniel Dennett as well as many reasonable people would like to believe that all mental phenomena, including consciousness, must be explained by the physical activity of the brain. As we have seen, however, the brain grows through constant interaction with

² Greenspan does not, of course, use our terminology of objective vs. affective perceptions, intuition, and the other terms in the technical terminology of this treatise. I am, so to speak, "translating" his terminology into that of our own theory. I think this translating is faithful to Greenspan's theory, but we will, as usual, let Greenspan speak for himself in the quotations we cite from his work in order to provide a safeguard against misinterpretations.

affective experience. Impairments in these experiential interactions lead to impairments in consciousness. For example, children who do not have certain types of interactive experiences, such as children in multiproblem or dysfunctional families, even when their brains function normally, may lack the capacity for self-reflection. Similarly, children with physical problems affecting the functioning of the nervous system also evidence impairments in consciousness. Children with autistic patterns rarely display any degree of self-awareness and self-reflection until later in the course of therapy.

Observing infants and children suggests that the growth of consciousness relates to evolving awareness of our own affects or emotions. Affects that arise from physical processes and gradually take on subjective meaning are unique in that they bridge what we view as the objective aspects of the brain and subjective experience. They produce observable, measurable physiological patterns. For example, many different processes of the sympathetic and parasympathetic nervous systems are associated with different states of affect . . .

The evolving cycle of experiencing and categorizing appears to affect the physiology of the brain, rather than just vice versa, in an intimate dance between nature and nurture. It is misleading to attempt to separate the contributions of each because one can be defined only in the context of the other. Consciousness develops from this continuous interaction in which biology organizes experience and experience organizes biology [GREE1: 111-113].

Greenspan's dual coding hypothesis implies that affectivity organizes, or at least plays a role in organizing, cognitions. Greenspan speaks of "affective categorizing" in a manner that calls to mind Kant's aesthetic Idea. In every cognitive discrimination we make,

we depend on these affective categories to function essentially as a sense organ, much as we depend on our eyes to perceive light and our ears to perceive sound . . . Sorting through the emotionally coded categories under which our minds have stored our previous experiences, this affective sense tells us, long before we could figure it out consciously, that the guy approaching from a dimly lit alley is up to no good. Then our minds instantly retrieve other similarly coded information that might be relevant about menacing situations and how we have handled them before [GREE1: 29].

This idea of "affective categorizing" should not, of course, be confused with the categories of understanding we discussed in the previous chapters. Indeed, a full exploration of this idea properly belongs to the judicial rather than the practical Standpoint. Nonetheless, the idea does tie in with practical anthropology in general and with the emergence of the Self in particular. To see how, we need to take a brief look at what Greenspan calls "the deepest structural components supporting all later [mental] development."

§ 5.3 Greenspan's Six Levels of Development

Based on studies of different groups of infants and children, some healthy and some with severe biological or environmental challenges, Greenspan identifies a developmental process containing six "levels" that "prepare the baby to translate the raw data of her senses and inner feelings into images that represent them both to herself and others." These developmental levels, he claims, support all other mental developments and are necessary for normal and healthy mental

capabilities of all kinds, including the development of self-recognition. Even capacities thought to be biologically innate, he writes, “must be grounded in these deeper levels to acquire purpose and function.” The levels themselves “require both nature and nurture to form properly” [GREE1: 43].

These six overlapping levels are [GREE1: 44-94], [CARL: 270-271]:

- 1). “Making sense of sensation” (ages birth to 3 or 4 months);
- 2) “Intimacy and relating” (ages 2 to 7 months);
- 3) “Buds of intentionality” (ages 6 to 10 months);
- 4) “Purpose and interaction” (ages 9 to 18 months);
- 5) “Images, ideas, and symbols” (ages 18 to 36 months);
- 6) “Emotional thinking” (ages 30 to 48 months).

Each level is characterized by the achievement of specific learned capabilities observable in the child’s behavior. Each level also has its own peculiar manifestations in the child’s behavior that can be related to the emergence of the Self.³

Level 1: Making Sense of Sensation

As noted earlier, the baby is born with an immature central nervous system. Recalling our earlier characterization of the infant’s global “sense of aliveness” and the primal “nature” of his affectivity, the principal milestone of this level can be described as “learning to organize sensations and his body’s response” to these sensations. The infant must develop the ability to remain calm, to focus on and organize the data of the senses, and learn how to respond to sensational stimuli. Even the ability to regulate his or her attention is a learned skill that develops at this level.

“Learning to attend” to stimuli is perhaps the most basic theme descriptive of this first level of development. Another basic theme characteristic of this level can be described as “acquiring the ability to regulate one’s own state of mind.” At this level the infant’s reactions seem to be of an immediate sort, i.e. responsive to the “here and now” with apparently little or no ability to maintain behavioral concentration in the face of diverse sensorimotor stimuli.⁴ There is no evidence of any organized cognition of the *Existenz* of the Self and, as Piaget noted, no apparent differentiation of objects of cognition nor of ends and means. The infant’s capabilities at this stage are restricted to what Piaget calls innate reflexes and primary circular reactions.

Greenspan notes that at this level the role of the infant’s primary caregiver – usually the

³ As we are about to see, Greenspan is more willing to make functional interpretations of affective behaviors than was Piaget. His hypotheses add some psychoanalytic factors to Piaget’s basic system.

⁴ The behaviors exhibited are in better agreement with *arbitrium brutum* than *arbitrium liberum*.

mother – is particularly important. Left to himself, the infant tends to be inward focused and must be enticed to, as Greenspan put it, divert “his attention away from himself and direct it to the thrilling world around him” [GREE1: 48].

For the moment his ability to organize sights and sounds is more advanced than his ability to organize the desires and intentions that will eventually help him to define who he is. The self is at this stage an undifferentiated consciousness consisting primarily of that wondrous sense of alert, affective aliveness and reactivity [GREE1: 50].

The “self” described here is consistent with what we should expect as an exhibition by an Organized Being conscious of its own *Dasein* without cognition of its *Existenz* as a Self. Because the infant’s ability to do anything for himself at this stage is extremely limited – basically restricted to what can be accomplished with innate reflexes and primary circular reactions – the baby must depend upon the primary caregiver to supply its early opportunities for experiences. Much has been made of the importance of the “bonding” between parents and child (especially mother and child) for the infant’s subsequent development. Some have even suggested that this particular aspect implies that other human beings occupy a privileged place in infantile cognition, and that this is in some way the most basic aspect of an infant’s “inborn” cognitive and affective capacities. However, there is no support to justify this as being either primal or *a priori*. There is effectively no other practical alternative – not because of some instinctual or inborn mental trait in the infant, but simply because inanimate objects cannot be active agents in supplying the opportunity for experiences. People, on the other hand, can act as such agents.

Typically parents supply their babies with most of their early experiences – everything from nursing to acting as playmates (e.g. baby talk, cuddling, etc.). A baby’s rattle does not rattle itself, nor can one reasonably expect that an infant who is not even consciously aware of his own hands (as objects) will know how to seek to spontaneously entertain himself with one. It is well documented that infants placed in the charge of cold, distant “uncaring caregivers” are subject to severe developmental handicaps (even in the absence of biological problems). The most severe of these is autism.

Not infrequently, the early tasks are not mastered at all. Some children simply fail, either because of inborn defects or inappropriate nurturing, or a combination of both. Variations in a baby’s nervous system, musculature, or sense organs may keep him from developing a given ability . . . A child with a well-endowed nervous system may still fail to achieve mastery because his caretakers don’t provide the nurturing he needs. A drug-addicted mother, for example, may leave her baby alone in a filthy crib in a bare room, without the sights and sounds, the holding and rocking, required to entice his attention away from himself and direct it to the thrilling world around him [GREE1: 47-48].

As Kant said, “all knowledge begins with experience.” However, there must also come into the picture the *ability* to “have” experience and those factors of mental life necessary for the

possibility of experience. Those factors of what we might call “affective know-how” necessary for the possibility of acquiring cognitive experience are the factors we seek to know in both the transcendental-practical perspective and, later in this treatise, the judicial Standpoint.

What are these fundamental transcendental-practical factors? Greenspan’s thesis focuses on the idea of “emotions” but, unfortunately if understandably, this idea is on the whole non-technical and rather vague. As two researchers commented a few years ago, “Everyone knows what an emotion is until asked to give a definition.”⁵ Greenspan, rightly so, limits his discussion of the first level to observable facts and to what we might call the “end goals” of this stage of “making sense out of sensation,” namely the infant’s attainment of “calm attention” and the ability to “regulate his own state of mind.” He seems to imply that these achievements rely on a sense of “basic security” that is “grounded in the ability to decipher sensations and to plan actions.”

This earliest security is the foundation for the next level: establishing relationships. As sensations are exchanged between child and caregiver, the emotion of pleasure or joy often emerges. Out of the experience of joy grows a continuous sense of engagement as the caregiver responds to expressions of curiosity and assertiveness. Mother offers not simply pleasure and excitement but relief from distress as well as a safe haven in which to make bold declarations of anger and rage. The early sense of security and the capacity for relating send the mind on its lifelong journey of growth [GREE1: 44].

True as this description may sound, it is rather more poetic than technical. Greenspan charges Piaget and later researchers of his school with “maintaining the ancient split between emotion and cognition.” It is true that Piaget offered no *complete* systematic theory of affective development and its relationship with cognitive development, but Greenspan’s characterization is a bit unfair when we consider what Piaget could accomplish with his normative convention.

Feelings, without being structures by themselves, are structurally organized by being intellectualized. When someone claims to have demonstrated a fundamental heterogeneity of affective and intellectual life, he ordinarily has made the error of comparing feelings on one level to intellectual operations on a different level. If care is taken to compare cognitive structures and affective systems that are *contemporary* in development, however, it becomes possible to speak of a term-by-term correspondence . . . [PIAG16: 15].

Greenspan’s first level overlaps Piaget’s first and second sensorimotor stages (hereditary organizations and the first acquired schemes). When Piaget says that affectivity cannot create structures, we should bear in mind that, for Piaget, a *structure* is a regulated scheme and, in these early stages, all such schemes are sensorimotor schemes. The acquired schemes arise from innate reflexes – things the child is equipped to do at birth – and “feelings” do not “create” these.

⁵ B. Fehr and J.A. Russell, "Concept of emotion viewed from a prototype perspective," *Journal of Experimental Psychology: General*, vol. 113, pp. 464-486, 1984.

This, however, does not mean that “feelings” are not *organized* (by heredity in Stage I, and by “being intellectualized” in Stage II), nor does it mean that “feelings” and “cognition” do not interact in some fundamental and important way. At the level of “hereditary organization” Piaget names “instinctual drives and all other inborn affective reactions” as the constituents of Stage I. Affectivity in Stage II involves the “first acquired feelings” such as “joys, sorrows, pleasantness, and unpleasantness linked to perceptions as well as differentiated feelings of contentment and disappointment linked to actions” [PIAG16: 14].

What are these “instinctual drives and inborn affective reactions”? This question is one that has bedeviled psychology throughout its history as a science, and Piaget was no more successful in establishing an objective description of them than anyone else has so far been.

Studying the infant's affectivity is much more difficult than studying his cognitive functions, however, for the risk of "adulthood" is much greater in this area. Most of the well-known studies are psychoanalytically oriented and for a long time were limited to the reconstruction of the early stages in the emotional life of the child in terms of adult psychopathology. R. Spitz, K. Wolf, and Th. Gouin-Décarie, however, have adopted experimental procedures to assist in the psychoanalysis of the baby, and the current research of S. Escalona, whose inspiration is both psychoanalytic and Lewinian, is breaking out of the limitations of the Freudian definitions and reaching the level of objective analysis and control [PIAG15: 21-22].

Regarding affectivity, Piaget calls the first two sensorimotor stages a period of “adualism” – which simply means that the infant is not yet Self-conscious in any cognitive sense.

The affects observable in this adualistic period are at first dependent upon general rhythms corresponding to rhythms of the spontaneous global activities of the organism; namely, alternations between states of tension and relaxation, etc. These rhythms are differentiated into a search for agreeable stimuli and a tendency to avoid disagreeable stimuli [PIAG15: 22-23].

Ideally we could hope that Piaget, Greenspan, and other researchers could move from this point of “what is clearer to us” to some deeper level that objectively establishes a more crisp exposition of these ideas. This, however, has not yet been the case, at least not in the sense of any generally accepted theory. If there are “instinctual hereditary drives and inborn affective reactions,” what are they and why hasn't their nature been agreed upon by now? Piaget explains:

Instinct, in fact, designates both a technique and a drive. The *technique* (in German, *Instinkt*) is a *structure* composed of reflexes coordinated into a single system which permits satisfaction of a need. An example would be the coordinated reflexes of sucking and swallowing which satisfy alimentary needs. The *drive* (in French, *tendance*; in German, *Trieb*) is the hereditary need itself and corresponds to the *energetic* element of an instinct. Every instinctive technique presupposes a drive that it will satisfy . . .

In fact, it is difficult to isolate and enumerate instinctive drives for two reasons. The first is that innate does not mean contemporaneous with birth. Certain drives, like the sexual drives, are activated by maturation. It is very difficult, therefore, to decide what comes from biological maturation and what comes from social learning. This fact leads to the second reason that the

distinction is so difficult, i.e. all developmental drives are influenced by the environment . . . In a general way then, let us recognize that every drive is inserted into a context that goes far beyond it and that this context includes both intellectual and acquired elements [PIAG16: 16-17].

What, then, can we conclude at this point from all this? The first and perhaps most important point is that the fundamental unobservability of “what is going on inside the baby’s head” means that our knowledge of actual appearances is restricted to what we can observe the child’s development *apparently leading up to*, both in normal development and in those sad cases where things go wrong such as in autism. The later levels can help us refine our ideas in this regard, but the fundamental fact is that what we can *objectively* infer is teleological in flavor. It follows from this that our intelligible ideas of the transcendental elements of this level, which we must use to give meaning and context to our theory, are going to be of a teleological or “goal-directed” type. Physical science, of course, traditionally hates and rejects such ideas. But here we need to bear in mind that *objectively valid* ideas of non-physical causes must all have their counterpart in physical causality (that is, the category of causality and dependency). To use an analogy, does it matter all that much if a physicist begins with Hamilton’s principle (a “teleological” view) to derive Lagrange’s equations (an empirical causal view)? No. The Relation of community required by *psyche* is a principle telling us that if we can construct a “teleological” model in *nous* for our transcendental-practical perspective, we should likewise be able to find its reciprocal element or elements of *soma*, and that these must have expression in non-teleological terms.

We have seen above the use of such terms as *drives*, *attention* (or “attending”), *needs*, and so on. These terms are common, either explicitly or implicitly, in both Greenspan’s and Piaget’s theories (which, I submit, are much closer to each other than superficial appearance suggests). These ideas are not to be considered, at least for now, as primitives; they describe phenomena or appearances that are “clearer to us” than “clearer by nature.” But, like the x that marks the spot, they give us a place to start digging.

Level 2: Intimacy and Relating

Greenspan’s second level is primarily characterized by the appearance of the first acquired “emotions” and the demonstration of different “degrees of intensity” in the display of these acquired emotions, particularly in those that are indicative of happiness and anger. The second level overlaps Piaget’s second and third sensorimotor stages (*viz.* the stage of primary circular reactions and secondary circular reactions, respectively), and Piaget’s findings agree with Greenspan’s in holding that the first acquired “feelings” develop during this time. In certain other respects, however, Greenspan and Piaget differ somewhat in their interpretations of this period of development, as we are about to see.

What Greenspan calls the “emotional selectivity” of the infant is exhibited by what appears to be a refinement of discrimination in the child’s emotional displays. Some of the distinctions that appear at this level include [GREE1: 52]:

- 1) Protestation rather than eruption;
- 2) anger rather than undirected distress;
- 3) glee rather than generalized happiness; and
- 4) surprise rather than startle.

The baby at this stage has already formed a number of elementary objective perceptions (which Piaget would call perceptual ‘pictures’ rather than cognitions of Piagetian objects), and seems to make what for want of a better term we will call “emotional investments” in these perceptions. For example, Greenspan notes that, “He takes delight in Mommy’s attention and knows when the source of that delight is missing. If Mom becomes preoccupied or distracted while playing with the baby, sadness or dismay settles on the little face” [GREE1: 52-53]. This does not mean, and should not be interpreted as implying, that the child “knows Mommy” as an object distinct from himself. On the contrary, the child has not yet drawn that key *objective* differentiation between the Self and the not-Self. “Mommy” is an appearance within a phenomenon at this stage, and one that is still linked up with the baby’s own activities, and is not yet a separate and independent “person.”

Greenspan holds that the principal catalyst for the child’s development at this level is an emotional bond that develops between the baby and the primary caregivers as a result of interactions between them. He writes:

At this second stage, when caregiver and child mutually fall in love, adults actively and intentionally signal their feelings, but the baby is not yet fully intentional. The parent-child duo behave synchronously rather than in a true give-and-take. They create a matched pair of radiant grins, one on an infant face, the other on the adult’s; a chorus of purrs or coos or giggles; smiles at rocking or being rocked; whoops of delight at swinging or being swung. This exchange begins with the rapturous attention of an infatuated caregiver, which the baby glowingly returns . . .

Without some degree of this ecstatic wooing by at least one adult who adores her, a child may never know the powerful intoxication of human closeness, never abandon herself to the magnetic pull of human relationships, never see other people as full human beings like herself, capable of feeling what she feels. Whether because her nervous system is unable to sustain the sensations of early love or her caregiver is unable to convey them, such a child is at risk of becoming self-absorbed or an unfeeling, self-centered, aggressive individual who can inflict injury without qualm or remorse [GREE1: 50-51].

I think Piaget would be inclined to agree completely with Greenspan with regard to saying that the parent-child behavior is “synchronous rather than a true give-and-take,” but he would warn us not to read too much into this exchange so far as interpreting the *objectivity* of the

infant's cognitions is concerned. To say that the infant "falls in love" with the caregiver would seem to imply that the infant recognizes the caregiver as not only a thing distinct from other things but also as a person – which would imply not only the cognition of "Mommy" as an object but also the representation of this object as having permanence (*Existenz* and *Dasein* even when not immediately perceived by the infant). The evidence overwhelmingly finds against such an interpretation at this stage of the infant's development, although it is clear that during this stage the infant is building up towards the capacity to recognize object permanence – which appears in the fourth sensorimotor stage (age 8 to 12 months). We are on more solid psychological ground if we were to say that the infant "falls in love with the experience and activity" that the caregiver is perceived as an integral *element* within (while remaining undifferentiated from the activity itself).

Still, it is true that the infant appears to show some evidence of *preferences* for some phenomena over others. Greenspan writes:

He smiles at bright colors and objects, too, but not with the special joyful excitement that greets his favorite people. He still does not differentiate between himself and what is not himself. Attaining a sense of union with his mother or other close adult, he is nonetheless beginning to distinguish the inanimate world from the living vibrancy of relationships. Happiness and anger now have degrees of intensity as his pleasure in human company focuses on particular individuals [GREE1: 52].

Piaget would probably warn us to beware of concluding that the child at this stage actually distinguishes, in his own mind, between an inanimate world and either an animate one or even an affective world defined by "the living vibrancy of relationships." Let us repeat: the infant's *objective* world at this stage is not distinct from himself nor differentiated from his own actions.

Observation 97.- Laurent, from the middle of the third month, revealed global reactions of pleasure while looking at the toys hanging from the hood of his bassinet, or at the hood itself, etc. He babbles, arches himself, beats the air with his arms, moves his legs, etc. He thus moves the bassinet and recommences more vigorously. But it is not yet possible to speak of circular reaction: there is no connection felt between the movement of his limbs and the spectacle seen, but only an attitude of joy and of physical exertion. Again, at 0;2 (17) I observe that when his movements induce those of the toys, he stops to contemplate them, far from grasping that it is he who produces them [the motions]; when the toys are motionless, he resumes, and so on . . .

At 0;2 (27), on the other hand, conscious coordination seems definite, for the following four reasons: (1) Laurent was surprised and frightened by the first shake of the rattle, which was unexpected. On the other hand, since the second or third shake, he swung his right arm (connected to the rattle)¹ with regularity, whereas the left remained almost motionless. Now the right could easily move freely without moving the rattle, the string being loose enough to permit Laurent to suck his thumb, for instance, without pulling at the balls [i.e., the rattle]. It therefore seems that the swinging was intentional. (2) Laurent's eye blinks beforehand, as soon as his hand moves and before the rattle moves, as though the child knew he was going to shake it. (3) When Laurent temporarily gives up the game and joins his hands for a moment, the right hand (connected to the rattle) alone

¹ Piaget had attached a string between Laurent's hand and the rattle, which enabled Laurent to shake the rattle by accident and thereby produce by accident an "interesting event."

resumes the movement while the left stays motionless. (4) The regular shakes that Laurent gives the rattle reveal a certain skill; the movement is regular and the child must stretch his arm backward sufficiently to make the rattle sound . . .

At 0;3 (0) I attach the string to the left arm after six days of experiments with the right. The first shake is given by chance: fright, curiosity, etc. Then, at once, there is coordinated circular reaction: this time the right arm is outstretched and barely mobile while the left swings . . . This time it is therefore possible to speak definitely of secondary circular reaction, even though Laurent only learned a week later to coordinate his prehension with vision . . .

At 0;3 (10), after Laurent has learned to grasp what he sees, I place the string, which is attached to the rattle, in his right hand, merely unrolling it a little so that he may grasp it better. For a moment nothing happens but, at the first shake due to chance movements of his hand, the reaction is immediate: Laurent starts when looking at the rattle and then violently strikes his right hand alone, as if he felt the resistance and the effect. The operation lasts fully a quarter of an hour during which Laurent emits peals of laughter. The phenomenon is all the more clear because, the string being slack, the child must stretch his arm sufficiently and put the right amount of effort into it [PIAG1: 160-162].

This observation should be enough to warn us that “joyful excitement” is not necessarily confined to only those experiences that involve other people. What Piaget has done here is to set things up so that it is possible for the infant to initiate (by accident) an “interesting event” (rather than have to wait for his caregiver to initiate it). What ensues is an “exchange” between the infant and the inanimate rattle. However correct Greenspan is about the importance of human interaction in the personality development of the infant – and I think he is most likely entirely correct in this – we must not take the objective significance of this interaction too far.

The important feature in all this is the obvious and clear emotivity that accompanies the activity, and it is this aspect of the second level that is significant from the transcendental-practical perspective. This phenomenon bespeaks of the emerging of a subjective self:

The self now exists in relation to others. It is aware of shared pleasures and joys and even of loss or despair, as when the caregiver doesn't return the infant's overtures. It will, barring unforeseen traumas, now and forever define itself by the sense of relatedness to at least one other person [GREE1: 53].

Two comments are in order here. We pose the first in the form of a question: If, as Greenspan himself writes and as Piaget is clearly certain, the infant does not yet “differentiate between himself and what is not himself,” how can we justify saying, “the self now exists”? To answer this, let us observe that Greenspan qualifies this remark with the phrase “in relation to others.” Put another way, this “self” is not yet perceived as an individuated object. It is, at most, a vague *intuition* and, perhaps, an object concept only in the sense that various cognitions of experience are joined under it as members of a disjunction. (Recall that an object, in Kantian terms, is that which unifies experiences). The representation that we may presume to exist from the evidence (such as observation 97 above, which demonstrates a learned behavior), is however at best a

representation with *aesthetic* rather than *objective* distinctness.²

It is worthwhile here to recall Kant's comment we quoted earlier: "The first act of the capacity of representation is the representation of oneself through which the Subject makes itself into an Object (*apprehensio simplex*), and its representation is intuition, not yet concept." All intuitions and all *new* concepts are the product of reflective (not determining) judgment. Reflective judgments, however, are affective rather than objective judgments. We thus see in the descriptions and observations given above that the psychological evidence appears to favor and support this part of the Kantian theory.

The sense of aliveness that infused the consciousness of the newborn baby flooded with sensations now becomes a sense of affective harmony. Though not yet symbolic or reflective³, a distinct consciousness is beginning to define itself [GREE1: 53].

The second comment is this: The affective harmony of which Greenspan speaks and his "sense of relation" should not be regarded as wholly confined to "relations to others." The infant at this stage knows no "others" in the way we, as adults, typically mean that phrase. The infant also rather clearly shows "affective harmony" and "relations" (relationships) to things other than people, e.g. Laurent and his rattle above. As vital and important as the human relationships are for the child's personality development, we should not presume that these are the only affective relationships in the infant's world at this stage. I would call Greenspan's second level the "level of affective harmony" rather than "intimacy and relating"; but doing so would obscure the social lesson Greenspan wishes to teach us in [GREE1], and I have no objection to his terminology so long as its context is properly delimited.

Level 3: Buds of Intentionality

Greenspan's third level overlaps the second half of the third and the first half of the fourth of Piaget's sensorimotor stages. As we are about to see, there is between Greenspan and Piaget agreement as to certain facts and, at the same time, disagreement as to the interpretation of these facts regarding the emergence of the Self. We will look first at what Greenspan has to say.

This level is characterized by what Greenspan calls "a willed exchange of signals" between the infant and the caregiver. In the infant's actions and behaviors, Greenspan perceives the child as acquiring the ability to participate in a "pre-verbal dialogue" by which he expresses his wants

² Recall that, in Kantian terminology, *distinctness* is a Quality of perfection. Aesthetic distinctness goes to aesthetical perfection, objective to logical perfection.

³ Greenspan and Piaget use the word "reflective" in a similar way; however, their term is not the same as what we mean by "reflective judgment."

in a manner that is “truly interactive” with the caregiver. These interactions all involve physical or somatic learning, as well as behavior and emotion closely tied to physical consequences.

As indicated earlier, these willful acts form a child's first circles of communication: baby gurgles, Dad raises his eyebrows, baby smiles, Dad picks up baby, baby pats Dad. Now she aims a smile to get one back; a frown, a smirk, a gurgle, a glance, a giggle each get the recognition of a gesture in return . . . Emotions and sensations lead to richer and more differentiated dialogues as the baby learns ever more expressive and inventive ways of engaging with the world. Twenty, thirty, even forty cycles of communication routinely link up now as pats, waves, smiles, winks, laughs, squeaks, jiggles, and frowns multiply into long gestural conversations that tie the baby to those around her [GREE1: 58].

Now, this is quite a lot to infer from such simple behaviors. First of all, why should we think there is anything “willful” on the child’s part of this “conversation”? The answer is: there does appear to be evidence that the baby does in fact “expect something in return” for his actions.

This pattern can be seen vividly in infancy. In a well-known study of infants at four months of age, mothers of healthy babies were asked to forgo their customary smiles, nods, and affectionate coos and show only blank, expressionless stares. The babies followed a predictable pattern in response, first smiling, cooing, and reaching with more and more intensity, as if to say, "Hey, pay attention! I'm talking to you!" When that failed, they paused momentarily, then tried again, more frantically. In a few minutes they had become irritable and frenetic, their gestures disorganized and increasingly purposeless. At last apathy and disinterest set in and they gave up [GREE1: 56].

Piaget would agree that the infant “wants something” and tries to obtain it through the schemes of activity described above, but he would disagree that we can infer at this point that the infant has a distinct cognition of the mother as a “you.” Furthermore, he would say we may doubt if the infant himself “knows” precisely “what” he wants in any objective sense. A four-month-old infant is at the very beginning of the third sensorimotor stage, which is a stage Piaget characterizes as the stage where “intentional adaptations” take place. He notes, however, that “nothing is more difficult to define than intention” [PIAG1: 147].

Shall it be said, as is frequently done, that an act is intentional when it is determined by representation, contrary to the elementary associations in which the act is controlled by an external stimulus? But if representation is taken in the strict sense of the word, there would not then be intentional acts prior to language - that is to say, before the faculty of thinking of reality by means of signs making up the deficiency of the action. Now intelligence presupposes intention. If, on the other hand, one extends the term representation so that it comprises all consciousness of meanings, intention would exist ever since the simplest associations and almost since the beginning of reflex use . . . [We] see only one method of distinguishing intentional adaptation from the simple circular reactions peculiar to sensorimotor habit: this is to invoke the number of intermediaries coming between the stimulus of the act and its result. When a 2-month-old baby sucks his thumb this cannot be called an intentional act because the coordination of the hand and of sucking is simple and direct. It therefore suffices for the child to maintain, by circular reaction, the favorable movements which satisfy his need, in order that this behavior become habitual. On the other hand, when an 8-month-old child sets aside an obstacle in order to attain an objective, it is possible to call this intention,

because the need set in motion by the stimulus of the act (the object to be grasped) is only satisfied after a more or less lengthy series of intermediary acts (the obstacles to be set aside). Intention is thus determined by consciousness of desire, or of the direction of the act, this awareness being itself a function of the number of intermediary actions necessitated by the principal act . . . But, in another sense, intention involves a reversing in the data of consciousness. There is henceforth the influence of recurrent consciousness of direction impressed on the action or no longer only on its result. Consciousness arises from dis-adaptation and thus proceeds from the periphery to the center [PIAG1: 147-148].

Greenspan in fact agrees with Piaget that at this level the infant is not in possession of distinct and “symbolic” intellectual concepts of his wishes and desires. Rather, “what” the child wants is tied to physical actions and sensations.

From signs of intentional behavior, such as touching Dad's nose or throwing food off the table, we read desires, wishes, motives. At this point motor behavior is our evidence of desire or motivation. Interestingly, without the growing ability to coordinate his muscles due to the development of the nervous system, the child might not be able to construct something as organized as a desire or wish. In other words, the desire or wish most likely cannot yet exist as an idea in its own right. It must be tied to an action that defines it. An action defines a desire in the same way that a verbal symbol will later define an idea; it provides the necessary form or structure to move the intent from the baby's inner world of subjectivity to the outer one of interpersonal objectivity. Without such defining actions, the potential wish may not become an independent wish or desire [GREE1: 59].

This is an observation that will be very important for us, when we later turn to our discussion of practical Reason and the causality of freedom, because it points the way to how we can establish the *objective* validity of such subjective factors as desire and motivation. Greenspan goes on to amplify this point:

While the motor system provides a means of defining and expressing wishes or desires, it is the combination of affect and purposeful motor behavior that defines intent. Earlier on, the baby had needs - to be fed, to be changed, to be held - but did not express them in any intentional form. His hunger or discomfort or glee led to changes in facial expressions, sounds, body posture, and the like. But these changes were purely reactive to the sensations and emotions that he was experiencing. Now the ability to use his arms to reach, grab, pull; his ability to yell in annoyance, rather than because of physical distress (or to giggle to get a giggle back, rather than because of a gas bubble), heralds the child's will. A curious "me," a fearful "me," an angry "me" - all buds of the self - are still not unified. Initially they exist as separate little islands; only later do they coalesce. The self that was no more than a global alertness first became a self related to and engaged with the world. Now a new, willful self sprouts. Consciousness at this point consists of a budding sense of intentionality, of being an agent of willful action [GREE1: 60].

Greenspan thus ties intentionality to the self and, by this, to the idea of the will. There is a lot beginning to coming together here, both for the infant and for our theory. Added to this mixture is Greenspan's hypothesis that the infant at this level is, in fact, engaging in a “pre-verbal dialogue” of some kind. Intention, desire, will, self, and dialogue: let us take up these ideas one by one.

A. Stage 3: As we said earlier, Greenspan's third level overlaps the third and fourth

sensorimotor stages. Let us look at intention as Piaget defines it and as it appears in the third sensorimotor stage.

The third stage, appearing with the prehension of visual objectives, is characterized by the appearance of a behavior pattern which is already almost intentional, in the sense indicated before, which also foretells empirical intelligence but which nonetheless remains intermediary between the acquired association belonging to the second stage and the true act of intelligence. This is the "secondary circular reaction," that is to say, the behavior which consists in rediscovering the gestures which by chance exercised an advantageous action upon things. Such a behavior pattern, in effect, goes beyond acquired association to the extent that almost intentional searching is necessary to reproduce the movements until then performed fortuitously. But it does not yet constitute a typical act of intelligence since this searching simply consists in rediscovering that which has just been done and not in inventing again or in applying the known to new circumstances: the "means" are hardly yet differentiated from the "ends" or at least they are only differentiated after the event, at the time the act is repeated [PIAG1: 150-151].

While Piaget is not willing to say that the infant's actions in the third stage are intentional, from the description just given we can suppose he would not have strongly objected to saying the "buds of intentionality" appear to be at work in the third stage.

From the theoretical point of view, intention therefore denotes the extension of the totalities and relationships acquired during the preceding stage and, by the fact of their extension, their greater dissociation into real totalities and ideal totalities in relationships of fact and relationships of value. As soon as there is intention, in effect, there is a goal to reach and means to use, consequently the influence of consciousness of values (the value or the interest of the intermediary acts serving as *means* is subordinated to that of the goal) and of the ideal (the act to be accomplished is part of an ideal totality or *goal*, in relation to the real totality of the acts already organized) . . . Assimilation, after having proceeded as hitherto, by nearly rigid schemes . . . will henceforth engender more mobile schemes, capable of various involvements and in which we shall find the functional equivalent of the qualitative concepts and of the quantitative relationships peculiar to reflective intelligence [PIAG1: 149].

Piaget is in agreement with the statement given above by Greenspan that "desires" are at this stage bound up with the actions themselves. If "ends" and "means" are still undifferentiated in the third stage, it makes no sense to speak of the child vesting his "desires" in an object, as adults frequently do. For the child in the third sensorimotor stage, objects are not yet seen as "permanent things" that continue to exist when not perceived.

Between three and six months of age, as we have seen elsewhere . . . the child begins to grasp what he sees, to bring before his eyes the objects he touches, in short to coordinate his visual universe with the tactile universe. But not until the age of 9 or 10 months does active search for vanished objects occur in the form of the use of grasping to remove solid objects that may mask or cover the desired object. This intermediate period constitutes our third stage.

But, if this long lapse of time is necessary for transition from prehension of an object at hand to true search for a missing object, it is because the interim is filled with the acquisition of a series of intermediate behavior patterns all of which are necessary to proceed from the mere perceived image to the concept of permanent object. In this connection we can distinguish these five types of

behavior: 1) "visual accommodation to rapid movements"; 2) "interrupted prehension"; 3) "deferred circular reaction"; 4) the "reconstruction of an invisible whole from a visible fraction," and 5) the "removal of obstacles preventing perception." The first of these behaviors merely extends those of the second stage, and the fifth fulfills those of the fourth stage.

Visual accommodation to rapid movements makes possible the anticipation of future positions of the object and consequently endows it with a certain permanence. This permanence of course remains related to the act of accommodation itself, and thus the behavior patterns merely extend those of the second stage; but there is progress in the sense that the anticipated position of the object is a new position and not one observed a moment earlier to which the eyes merely return. Two particular instances are of special importance: reaction to the movement of bodies which disappear from the visual field after having first induced a lateral turn of the head, and reaction to falling movements. Both these behavior patterns seem to have developed under the influence of prehension [PIAG2: 13-14].

A key point in regard to this idea of object permanence in this stage is that the infant appears to make no such investment of "permanence" whatsoever unless the totality of the behavior includes behavior reactions on his part, such as "lateral turning of the head", that involve the child's own body. Such involvement implies that the totality of the child's experience includes sensational feedback from his own muscular exertions and, perhaps, what Piaget elsewhere calls a "feeling of effort." This is why Piaget refers to secondary circular reactions as "procedures destined to make interesting sights last."

It should be commented at this point that this lack of object permanence in no way contradicts what we said earlier in this treatise with regard to the category of substance and accident. Although the transcendental schema of this category is tied to the *modus* of persistence in subjective time, the category itself contains no notion of objective time. Subjective time is merely the form of inner sense and a pure *a priori* form of intuition; it is not a concept nor a notion of understanding. The persistence of substance speaks only to concepts of different appearances *being understood by the same object concept* and not to any *a priori* notion of permanence in objective time.

Without the involvement of his own bodily motions in attempting to "make an interesting sight last," the Piagetian object appears to be regarded by the infant as what Piaget metaphorically described as "what an occult spirit is to a magician; ready to return if one catches it successfully but obeying no objective law." In the second sensorimotor stage,

Either the image which disappears immediately sinks into oblivion, that is to say, into the affective void, or else it is regretted, desired, and again expected, and the only behavior pattern utilized to rediscover it is the mere repetition of earlier accommodations [PIAG2: 12].

But if this is the case what could explain the progress during the third sensorimotor stage that prepares the infant for the acquisition of object permanence in the fourth stage? Here Piaget makes a remark I think Greenspan would entirely appreciate and applaud. Before any concept of object permanence arises, the infant appears to "attribute to it a sort of affective or subjective

permanence without localization or substantiation” [PIAG2: 13]. We will not recite here all the observations and evidence leading to Piaget’s conclusion that object permanence is begun but not achieved in sensorimotor stage 3. These are well documented in [PIAG2]. Rather, we will merely skip to Piaget’s summary:

In effect, at this stage the child does not know the mechanism of his own actions, and hence does not dissociate them from the things themselves; he knows only their total and undifferentiated scheme . . . comprising in a single act the data of external perception as well as the internal implications that are affective and kinesthetic, etc., in nature. So long as the object is present it is assimilated in that scheme and could not therefore be thought of apart from the acts to which it gives rise. When it disappears, either it is forgotten because it is not sufficiently dynamogenic or else it gives way to a feeling of disappointment or expectation and to the desire to continue that action. Then that which is the essential of circular reaction or reproductive assimilation is produced: a conservation effort. This effort radiates as always in movements extending the action in progress, and if the vanished image is rediscovered it appears merely as the completion of that action. None of this implies substantial permanence: the permanence in question is still only that with which circular reaction in general is impregnated, that is to say definitively the assimilatory activity itself. The child’s universe is still only a totality of pictures emerging from nothingness at the moment of the action, to return to nothingness at the moment when the action is finished. There is added to it only the circumstance that the images subsist longer than in the past; in extending them either he rediscovers the vanished images or else he supposes them to be at disposal in the very situation in which the act in progress began.

Proof that this interpretation is the right one, however painful it may be to our realism, is that the child makes no attempt to search for the object when it is neither within an extension of a gesture made, nor in its initial position; here obs. 28-33 are decisive.

A final remark: The state of affairs at the end of this third stage is still inconsistent. On the one hand, the child tends to attribute a certain visual permanence to images extending his accommodations of sight. On the other hand, he tends to rediscover what falls from his hands and thus to form a sort of tactile object. But there is not yet a merging of these two cycles; the child still does not try to grasp an object that disappears from his visual field without having been in contact with his hands shortly before. It will be the task of the fourth stage to bring about this coordination [PIAG2: 42-44].

All this has consequences for the emergence of the Self. Piaget contends that there is not yet any Self differentiated from the not-Self during the third sensorimotor stage, nor are even any “buds of the self” apparent. But are there, to continue the metaphor, “seeds of selfhood” that can be discerned by the observer? Piaget tells us that to address this question we must examine the child’s conception of causality as it appears during this stage.

How shall we interpret the causality which the child must attribute to these movements of his body, especially of his hands and feet? On the one hand it seems that, during this third stage, the subject becomes conscious of their purposefulness. When Laurent at 0;3 (12), having tried in vain to reproduce the movement of a rattle, consoles himself by looking at the hand he is moving, or when Jacqueline at 0;7 and 0;8 still contemplates the activity of her fingers, there is little doubt that they sense their power and experience a more or less clear awareness of their desire to continue and reproduce these movements. But, on the other hand, it would certainly be rash to attribute to the child of that age a consciousness of self. The self is constituted only by comparison and by contrast

with other selves and with the external environment. During the present stage, another person barely begins to be analyzed through imitation, and action on the material environment is so faintly outlined that it does not yet give rise to any precise feeling of resistance. The child is therefore still very far from being able to attribute his intentions and powers to a "self" conceived as different from a "non-self" and opposed to the external world; the self and the universe still make up only one and the same totality.

If the child becomes conscious of the purposefulness of his movements and of the reality of his power over his hands and feet, he still merely places his effectual purpose and power in an absolute identified with the perceptual world. Awareness of purpose results merely in the dissociation between cause and effect, the cause being identified with the effectual purpose and the effect with the phenomenon perceived. By virtue of this fact, doubtless cause reveals a tendency to become internalized, but it still is not internalized in a self; it is immanent in immediate reality. As to effect, this is naturally placed in the same universe as the other phenomena; it is only to the observer that the child's hands and feet belong to his body for, to the child himself, they are on the same plane of reality as other objects.

But this beginning of differentiation between cause and effect has considerable importance in the structure of causality. At least with regard to his body movements - but we shall see that the same applies to other causal sequences - the child henceforth becomes conscious of the existence of a general cause: the efficacy of desire, of purpose, of effort, etc., in short, the whole dynamism of conscious action. But of course it is never when some phenomenon has been fortuitously observed . . . that this causality is made manifest; the union of efficacy and phenomenalism therefore remains complete and, if the first tends to be distinguished from the second, it nevertheless remains immanent in it [PIAG2: 233-234].

In short, childish causality at this stage is of the type Piaget calls "magico-phenomenalistic" causality. As he genially observes, "precisely because he feels omnipotent, the child cannot yet contrast his own self with the external world" [PIAG2: 237]. As we leave this discussion of the third sensorimotor stage, let us particularly note Piaget's comments regarding the identity of cause with effectual purpose; this point will prove important to us later on.

B. Stage 4: Lest we conclude from the above that Greenspan has judged rashly in his description of his third level of affective development, let us remember that this level overlaps the third sensorimotor stage and the first half of the fourth. We will not have given his hypothesis a fair hearing until we have explored this fourth sensorimotor stage.

Piaget defines **intelligence** as "adaptation to new circumstances," and it is in sensorimotor stage 4 that "intelligence" functionally so-defined can first be inferred from the child's behavior. The "essence" of stage 4 behavior is described as "the application of known means to new situations." It is also marked by the differentiation of ends from means and the beginnings of a practical division between Self and not-Self.

If this stage is to be distinguished from the preceding one with respect to the functioning of intelligence, it is to be distinguished still more with regard to the structure of objects, space, and causality. It marks the beginnings of the permanence of things, of "objective" spatial "groups" and of spatial and objectified causality [PIAG1: 151].

It is in this stage where the behavior Greenspan characterizes as a “pre-verbal dialogue” is noted by Piaget. Piaget also holds that interaction with human beings is vital for the infant’s continued cognitive development but, as we are about to see, Piaget offers a rather different interpretation of the nature of the cognitive element of this behavior. Common to both points of view is inference of intentionality in the infant’s behavior and the affectivity of the thinking Nature of the human being underlying this intentionality.

In this fourth sensorimotor stage the infant is still limited to the use of his repertoire of known sensorimotor schemes in achieving the goals of his actions. However, the crucial difference setting stage 4 apart from stage 3 is that in stage 4 the child does not use secondary circular reactions merely to prolong an activity already underway; rather, he uses them to remove obstacles that stand between him and the objective of his actions. Put another way, his schemes have become *mobile* and capable of being coordinated, with some schemes now serving merely as means to diverse ends. In terms of our earlier theoretical discussion, in stage 4 we have not only the separation of *Obs.OS* into an *Obs.S* and an *Obs.O*, but can also infer the presence of coordinations, *Coord.S*, in type II interactions.

In short, the reactions of the third stage therefore constitute the simple prolongation of the primary circular reactions; they owe only to their complexity the fact of drawing, after the event, a distinction between transitive and final states, between means and ends. On the other hand, the behavior patterns of the fourth stage involve such a distinction from the very outset. The criterion of their appearance is, in effect, the intercoordination of the secondary schemes. Now, in order that two schemes, until then detached, may be coordinated with one another in a single act, the subject must aim to attain an end which is not directly within reach and put to work, with this intention, the schemes thitherto related to other situations. Thereafter the action no longer functions by simple repetition but by subsuming under the principal scheme a more or less long series of transitional schemes. Hence there exists simultaneously the distinction between the end and the means, and the intentional coordination of the schemes. The intelligent act is thus constituted, which does not limit itself merely to reproducing the interesting results, but to arriving at them due to new considerations [PIAG1: 210-211].

Now we have come face to face with the crucial issue of whether we are to say the infant exhibits “goal-directed behavior” or whether we are to speak only of the “goal-directed quality of behavior” as the automaton theory demands. In the previous sensorimotor stages there is no evidence that would conclusively rule out an explanation based upon a complex yet nonetheless automatic series of reactions. What is new in the fourth stage that pushes us to a theory of activity as “goal-directed behavior” from, at least, a practical Standpoint?

With regard to the "purpose" it goes without saying that the child does not decide about it in advance, in the sense that we manage, through reflection, to impose a plan on our conduct, independently of any external suggestion. It is always under pressure of perceived facts, or by prolonging a recent reaction, that the child acts. His acts are still, therefore, in this sense, conservative, and have no function other than the use of his earlier schemes. That conforms,

moreover, to the fundamental law of assimilation and we do not see how it could be otherwise. But - and it is in this sense that the goal is set in advance and that the situation is "new" - obstacles intervene between the act and its result. Where the child wishes to grasp, to swing, to strike, etc. (as many ends as are consistent with primary and secondary circular reactions), circumstances erect barriers he must clear. Hence it is a question of keeping in mind the "goal" to be reached and of trying different known means of surmounting the difficulty. The act of intelligence properly so called develops in that way, to the extent that it is differentiation of the secondary circular reaction and involves to a higher degree the "reversal" in the consciousness which constitutes intention and of which we have spoken before [PIAG1: 212-213].

If this is automatism, this "reversal" – essentially putting the "final state" on hold while dealing with the obstacles – makes it an automatism of an anticipatory sort. It is true that an information processing model of the sort used in artificial intelligence theory could represent the logical schema of such an activity. It could do so using "conditional clauses" (IF - THEN constructs) that would basically amount to "IF not-final-state THEN do-until-successful: Scheme 1, Scheme 2, etc. ELSE give-up." However, and this is an important distinction, the difference between an A.I. program and the infant's behavior is that *hitherto no such behavior by the infant was in evidence*. Consequently, we must either conclude that the child "programs himself" to have this "IF-THEN-ELSE" construct or else new brain structures develop that somehow or other have this structure "pre-programmed" into the neural connections. In the first case, if we are to say that the baby "programs himself" how does this differ in any *practical* way from what we normally call "purposive" or "goal-directed" behavior? I submit to you that there is *no practical difference*. If, on the other hand, we say this development is due to some particular biological development, it is a strangely fortunate evolution that would construct new brain structures so conveniently arranged to equip the baby to deal with circumstances that have not been previously experienced. Such a possibility seems to require some kind of biological "Hamilton's principle" – which, mathematically, is a *teleological* form (regardless of whether or not we could derive a suitable Margenau form, i.e. a physically causal form).¹ Once again there is *no practical difference* between this and making the *practical* postulate of "goal-directed behavior." The only issue is how the "goal" is regarded, i.e. what it is that is held to *constitute* the end served by the actions. That which is an "end result" for *soma* can also simultaneously be a "purpose" for *nous*.

A number of examples of stage 4 behavior are given in [PIAG1: 213-225]. Most of these are somewhat lengthy observations and I will leave it to the interested reader to examine them. We will, however, take a look at one of the briefer and simpler observations.

Observation 124.- At 0;8 (8) Jacqueline tries to grasp her celluloid duck but I also grasp it at the same time she does. Then she firmly holds the toy in her right hand and pushes my hand away with her left. I repeat the experiment by grasping only the end of the duck's tail: she again pushes my hand away. At 0;8 (17), after taking a first spoonful of medicine, she pushes away her mother's hand

¹ In artificial neural network theory a mathematical method of this kind is encountered in many types of neural networks. It is an inherent feature of the adaptation algorithms these networks employ.

which extends to her a second one. At 0;9 (20) she tries to place her duck against the wicker of the bassinet but she is bothered by the string of the bell which hangs from the hood. Then she takes the string in her right hand and moves it to the far side of the left arm (the arm holding the duck), and consequently where the string is no longer an obstacle. Same operation shortly afterward.

Unfortunately, we have been unable to determine precisely with regard to Jacqueline, from which circular scheme the action of "removing the obstacle" was differentiated. It was probably not from the scheme of "striking" since she only made the latter manifest shortly before. It must be, rather, the act of holding the object in order to shake, swing, or rub it which gave her the idea of displacing obstacles. It goes without saying that the filiation can vary in each child between the transitional or mobile schemes of the fourth stage and the circular schemes. We merely assert that the subordination of means to ends belonging to the fourth stage begins by a simple coordination of earlier circular schemes [PIAG1: 219-220].

"Removing an obstacle" is not the only behavior observed in the fourth sensorimotor stage. The child also begins to use other objects as "intermediates" (means) to achieve the objective. We will look at one simple example of this.

Observation 128.- Laurent, too, from 0;8 (7) uses my hand as an intermediate to make me resume the activities which interest him. For example, I tap my cheek with my left middle finger, then I drum on my eyeglasses (he laughs). Afterward I put my hand halfway between his eyes and my face. He looks at my glasses, then at my hands, and ends by gently pushing my hand toward my face (see the continuation of these observations, Vol. II, Obs. 144²).

As in the preceding observation, for the child it is a question of prolonging an interesting spectacle. But instead of applying the habitual procedures (Obs. 112-118) without adding anything to them, or of himself reproducing the thing by imitation, Laurent utilizes as means an element of the whole which he has just observed and an element which can be assimilated to his own activity. The other person's hand is comparable to that of the subject and the child simply prolongs its action due to an intermediate whose power he knows by analogy to his own earlier experiences [PIAG1: 224].

From a functional point of view, stage 4 behaviors are indicative of what we call a synthesis of already-known schemes to produce an end result not obtainable through any one of the earlier schemes by itself. We can note Piaget's use of the idea of "making an analogy" in the observation just quoted and remind ourselves that an inference of analogy is an inference of (reflective) judgment. As Piaget put it,

In the behavior patterns now under study . . . it is necessary to improvise means and remove obstacles which separate the intention from its final result. It goes without saying that before inventing new means (which he will do later), the child at first limits himself to applying the schemes with which he is familiar. Moreover the means which are found are borrowed, like the ends themselves, from the schemes of earlier circular reactions. But the chief point was to remember them at the right time and adapt them to the current situation [PIAG1: 228].

Accompanying this functional refinement is a structural refinement in the elements of the type II interactions. Two particular structural refinements are of interest to us here. The first is the development of concepts of object permanence, i.e., the structuring of an *Obs.O* distinct from a mere *Obs.OS*. In this we have the beginnings of a true separation between the Self (*Obs.S*) and

² i.e. [PIAG2: 261].

the not-Self (*Obs.O*), although at this stage these objective appearances are neither well-structured nor complete.

The second refinement is what Piaget calls the “elementary externalization of causality.” Bearing in mind that causality is not something that can be observed, what this means is that, in addition to coordinations of the *Coord.S* variety, we now have evidence of coordinations of the *Coord.O* variety. For example, we have just seen Laurent push on Piaget’s hand so that, in a manner of speaking, the hand “will do what Laurent wants it to do,” namely resume drumming on Piaget’s eyeglasses. These two structural refinements are still not wholly seen by the child as independent objects, for there is a practical grounding of the elements (*S* and *O* of both types) in the *context* of the action as a whole. In other words, the whole of the type II interaction implied is still the dominant ‘reality’ for the baby.

With regard to *Obs.O* type cognitions, there still seems to be in the fourth stage a strong carryover from the third sensorimotor stage in the sense that the “foreground object” is not clearly differentiated from its perceived “background” context. In other words, there is still a melding of overall perceptual elements that recalls to mind James’ “pack-of-cards-is-on-the-table” model. To make the meaning of this a bit clearer, let us look at two other observations.

OBS. 51. At 1;3 (9) Lucienne is in the garden with her mother. Then I arrive; she sees me come, smiles at me, therefore obviously recognizes me (I am at a distance of about 1 meter 50 [cm]). Her mother then asks her: "Where is papa?" Curiously enough, Lucienne immediately turns toward the window of my office where she is accustomed to seeing me and points in that direction. A moment later we repeat the experiment; she has just seen me 1 meter away from her, yet, when her mother pronounces my name, Lucienne again turns toward my office.

Here it may be clearly seen that if I do not represent two archetypes to her, at least I give rise to two distinct behavior patterns not synthesized nor exclusive of one another but merely juxtaposed: "papa at his window" and "papa in the garden."

At 1;6 (7) Lucienne is with Jacqueline who has just spent a week in bed in a separate room and has gotten up today. Lucienne speaks to her, plays with her, etc., but this does not prevent her, a moment later, from climbing the stairs which lead to Jacqueline's empty bed and laughing before entering the room as she does every day; therefore she certainly expects to find Jacqueline in bed and looks surprised at her own mistake [PIAG2: 58-59].

Lucienne at this age is past the fourth sensorimotor stage and well into the fifth stage. It is clear from this and other observations that the object-in-a-context is a fairly robust form of cognition. This is not entirely unlike the kind of absent-minded behavior seen sometimes in adults when, for example, I look in my desk drawer for a pen that a few moments before I had set down on my desk. When working at my laboratory bench, I frequently set a tool down in one place and a few minutes later reach for that tool in the place where I had originally picked it up, rather than where I had last set it down. However, unlike the adult case, it is difficult to attribute stage 4 children’s behavior to “absent-mindedness” because they have just *seen* the object in one place and yet look for it in another without an intervening distraction. The second observation illustrates this:

OBS. 52. Let us cite an observation made not on our children but on an older cousin who suggested to us all the foregoing studies. Gérard, at 13 months, knows how to walk, and is playing ball in a large room. He throws the ball, or rather lets it drop in front of him and, either on his feet or on all fours, hurries to pick it up. At a given moment the ball rolls under an armchair. Gérard sees it and, not without some difficulty, takes it out in order to resume the game. Then the ball rolls under a sofa at the other end of the room. Gérard has seen it pass under the fringe of the sofa; he bends down to recover it. But as the sofa is deeper than the armchair and the fringe does prevent a clear view, Gérard gives up after a moment; he gets up, crosses the room, goes right under the armchair and carefully explores the place where the ball was before [PIAG2: 59].

Piaget examines the possibility that “such strange behavior” should be attributed to some kind of absent-mindedness or difficulties of memory, or whether instead it should be attributed to difficulties in spatial localization. He concludes that the case is neither one or, more accurately, a kind of synthesis of the two that he calls “incomplete formation of the object concept” arising from lingering structures from the third sensorimotor stage.

It is possible that during this third stage the object is still not the same to the child as it is to us: a substantial body, individualized and displaced in space without depending on the action context in which it is inserted. Thus the object is, perhaps, to the child, only a particularly striking aspect of the total picture in which it is contained; at least it would not manifest so many "moments of freedom" as do our images. Hence there would not be one chain, one doll, one watch, one ball, etc., individualized, permanent, and independent of the child's activity, that is, of the special positions in which the activity takes place or has taken place, but there would still exist only images such as "ball-under-the-armchair," "doll-attached-to-the-hammock," "watch-under-a-cushion," "papa-at-his-window," etc. Certainly the same object reappearing in different practical positions or contexts is recognized, identified, and endowed with permanence as such. In this sense it is relatively independent. But, without being truly conceived as having several copies, the object may manifest itself to the child as assuming a limited number of distinct forms of a nature intermediate between unity and plurality, and in this sense it remains part of its context. Obs. 51 permits us to understand this hypothesis: when Lucienne looks for me at the window when she knows that I am beside her two behavior patterns are obviously involved, "papa-at-his-window" and "papa-in-front-of-oneself"; and, if Lucienne does not hesitate to consider the two papas as being one and the same person, she nevertheless does not succeed in abstracting this person from the total pictures with which he is connected sufficiently to refrain from looking for him in two places simultaneously. *A fortiori*, in obs. 52, the child who does not find the "ball-under-the-sofa" does not hesitate to look for the "ball-under-the-armchair" since here there are two distinct totalities . . . In a general way, in all the observations in which the child searches in A for what he has seen disappear in B, the explanation should be sought in the fact that the object is not yet sufficiently individualized to be dissociated from the global behavior related to position A [PIAG2: 62-63].

Despite this peculiar context-defined character of objects *Obs.O*, the fourth stage child nonetheless succeeds in beginning to attribute to them an “externalized” kind of causality of a very primitive sort in the sense that, for the first time, this attributed causality does not depend on *Obs.S* and *Coord.S* structures, i.e. on the child’s own actions. Piaget summarized this as follows:

But during the intermediate stage which we are about to study and which in the main extends from 0;9 to 0;11, neither the spatialization nor the objectification of causes leads to a complete dissociation of these causes in relation to the action itself: objects begin to acquire causality in

themselves instead of being conceived as wholly subject to activity, but they acquire this intrinsic causality only in situations in which activity is itself involved. In other words, the causality of objects henceforth constitutes a pole opposite to that of the action itself, but these two poles are opposed only to the degree in which they appear simultaneously. The external world is not yet conceived as a system of actions among which a particular activity may be inserted, but whose existence and efficiency do not depend on this activity [PIAG2: 256-257].

Hence, the fourth sensorimotor stage marks the transition point where we can finally observe in the child's behavior clear evidence of a demarcation drawn between an "external world" and the Self. The boundary line at this point, however, seems to be drawn as a dotted line rather than a clean break because the child's cognition of externalized objects does not appear to be completely divested from factors that depend on the Self, particularly with regard to causality. In Piaget's words, "this fourth stage corresponds, logically and chronologically, to the period in which causality becomes detached from the child's action without, however, being attributed once and for all to objects independent of the self." Metaphorically speaking, the child has ceased to be the universe and has become merely its king.

This metaphor is appropriate merely in the sense that, for the first time, the child appears to regard external objects as "independent centers of actions" (in Piaget's words) but this independence is still subject to the efficacy of the child's own procedures. Hence, touching Piaget's hand is, in the mind of the child, sufficient to set the hand's own "powers" in motion so that the hand will drum upon Piaget's eyeglasses.

But what sort of experiences are required in order that the child is able to form such a view? Here Piaget and Greenspan are entirely in agreement: the necessary experiences are those which have to do with the child's interactions with people.

In this respect, the first forms of spatial and objective causality are forms directly connected with manual activity: drawing to oneself or pushing away. From the beginning of the third stage . . . the child learns how to grasp; he knows, therefore, that on seeing an object he needs only to stretch out his hand and take the object to bring it nearer to his eyes or mouth. This elementary experiment would constitute the point of departure of spatial causality if the hand were conceived from the outside as an intermediary between the object and the body itself. But as we have seen, the act of grasping is, on the contrary, apprehended by consciousness only globally and in the form of magico-phenomenalistic efficacy . . . When will such a scheme give rise to causality? We think from the time when the relation of hand and object are perceived from the outside, objectively, and the existence of this external perception can be definitely established only from the moment the child perceives this relation with respect to someone else [PIAG2: 258-259].

We can perhaps easily see why experiences of interpersonal "exchanges" are necessary to this important step in the fissioning of the child's world into a Self and a not-Self: People *do* things – make faces and noises, pick the child up, etc.; balls, rattles, and other inanimate things do not without the direct application of the child's own body. Piaget cites a number of experimental observations, leading to the following conclusion.

There is in these behavior patterns proof of a simultaneous objectification and spatialization of causality. Objectification occurs precisely to the extent that someone else's body becomes, in the child's eyes, an autonomous center of causal activity. But spatialization of causality is also present in the sense that to secure the repetition of an interesting phenomenon, the child is no longer limited to acting through efficacy on someone else's hand as if this hand, also through efficacy, would set in motion the expected phenomenon. He pushes the hand and if it does not go to the desired place he takes it there himself and puts it in contact with the object on which it is supposed to perform its action [PIAG2: 262].

In other words, the child has discovered that he cannot “by willpower alone” make the adult's hand resume tickling or drumming on eyeglasses, or whatever. Sometimes the hand has to be acted upon (by pushing it, grasping and moving it, etc.) to make it do what the child wants it to do. The child still regards the adult's hand as subject to his desires, but not in the same way his *own* hand seems to be. The other person has become a center of particular activities (those of interest to the child), but the adult's activities are seen as bound up with the efficacy of the child's own actions.

In short, the child's action on persons during this fourth stage seems to reveal an intermediate causality, already partly objectified and spatialized (since the persons already constitute external centers of particular activity) but not yet freed from the efficacy of the child's own movement (since the centers of activity are conceived as always depending on his personal procedures) [PIAG2: 265-266].

This conclusion from the logical-practical viewpoint is entirely harmonious with the transcendental-practical viewpoint of Greenspan described earlier. One thing more remains for us to note: Piaget's work also shows that the child will form similar concepts with regard to non-living objects, particularly if a psychologist intervenes to make an object appear to the child to move “on its own.” (For example, a string can be tied to a toy and tugged upon by the adult outside the child's view). Piaget cites three observations (observations 145-147) in [PIAG2: 266-267] to demonstrate this. Thus, since dolls and bells and other such objects do not display emotions, we must be cautious and not assume that the child at this level of development actually reads adults as “having the same kind of feelings” the child experiences. The child seems not yet to be at the point where he is capable of making such an objective determination.

Level 4: Purpose and Interaction

We have spent a great deal of time and gone into such detail with level 3 and its corresponding sensorimotor stages because this level and these stages mark an important transition in the child's development, namely the first observable evidence of the beginning of the differentiation between the Self and the not-Self. This fundamental cognitive and affective development reaches

completion (although not completion in all *details* of *Existenz*) in level 4, which overlaps the latter half of the fourth and all of the fifth stage of sensorimotor intelligence.

Let us recall the curious stage of objectification the child exhibits in sensorimotor stage 4. Things (Piagetian objects) are recognized in a curiously context-dependent manner, e.g. “papa-at-his-window” or “Jacqueline-in-the-bed.” There also appears to be, as Greenspan observed, a similar context-dependent objectification of the Self where, in this case, the context is an affective one: there seems to be a “happy-me” and an “angry-me”, etc. During level 4 there is a progressive unification of these different context-dependent selves while, at the same time, the fifth sensorimotor stage of development is producing a unification of the externalized yet context-dependent objects through the development of cognitions of objective relationships that differentiate the objects from that context dependency; “papa” becomes simply “papa” whether he is at his window or not. The Self comes to be seen as an object among objects.

In what manner does this occur? What can we observe in the child’s behavior that offers up the evidence we require for a *Realerklärung* of this process? We will look at this development from our two practical perspectives.

A. Transcendental-practical unification: There seems to be a “right-here, right-now quality” to the level 3 child’s sense of self. The “happy me” can give way to the “angry me” with no apparent appreciation by the “angry me” that moments before he was the “happy me”. Greenspan describes this, and the development which follows in level 4, in the following way:

At twelve or thirteen months, this self is still in disparate though rather large parts. The happy “me” has subsumed the curious and exploratory and assertive “me,” but it lies quite far from the angry or sad “me.” When a twelve- to fourteen-month-old gets angry at someone, he may have no sense that just moments ago he was playing happily with that person. If he had a gun, one suspects, he’d shoot without remorse. By fifteen months or so, however, a dawning awareness that a relationship of trust and security can coexist with anger has often begun to moderate his temper. The sense of self now consists of larger and larger unified parts, although significant splits still remain. Indeed, in some adults, the happy side doesn’t know the angry one; Dr. Jekyll and Mr. Hyde live in the same skin but never meet.

By eighteen or twenty months, a child angry at a loved one would use a gun to threaten but would not shoot. His rage now has a different quality; it seems more qualified, more complex, like the anger of a long-married couple who know that no quarrel . . . can sever the ties that bind them. The child has managed to merge two quite different “me”s, an angry one and a loving one, into a single overriding self [GREE1: 68-69].

How does this merger come about? From the emotional displays the child makes evident, Greenspan offers an hypothesis that we will see is the direct affective counterpart to the process Piaget describes in logical-practical terms. The key idea is the connection in a *series* of a complete *cycle* of affect-laden experiences through which the child comes to view his disparate selves as, in our terminology, mere accidents of one and the same Self.

One can describe this process as an evolution from the “right-here right-now quality” of apperception to an inner sense of *Existenz* that takes into account a broader scope of perceptions, both affective and objective, that lends a more developed continuity to the Self-manifold in a way that calls to mind Dr. Damasio’s model of a “core consciousness” and an “extended consciousness” [DAMA1]. Dr. Greenspan tells us

The solid achievement of the fourth [level] is the coalescence of larger and larger parts of the self through the bringing together of many intentions and affects. This organization arises in action. The child can connect his anger with his happiness if he experiences both within a single episode. Playing with Mommy, for example, he becomes frustrated because she won't let him pull off her glasses. She tells him no, and when he tries again to grab them, she tells him no again. Perhaps she holds him at arm's length and gives him her "Stop it, I mean business" look. When he scowls, she playfully scowls back . . . Then with a few more grumpy protests he goes back to their earlier game. He senses that the anger and the happiness both belong to him, and his sense of self begins to integrate a "me" that can be angry and one that can be happy at almost the same time. The integration happens because he experiences, and his caregivers tolerate, a wide range of feelings.

This integration happens over time. When I play with toddlers of different ages and manage to get them mad at me, I see different reactions. The anger of a twelve-month-old seems unbuffered by any awareness that I'm the person he liked or even loved a few minutes ago. This child, I feel, would definitely pull the trigger. By eighteen months, however, his anger is quite different. It can be intense, but underlying it is the recognition that I'm the same person whom he was enjoying playing with a few minutes ago [GREE1: 69-70].

This is, of course, merely a description of the process and not an explanation. However, it is a description of precisely the kind of phenomenon that our theory must explain. What we must especially note in this description is that this development takes place in the context of *actions* in which the child encounters resistance to some of his intentional acts but within the totality of a single episode in which the cycle of emotions runs full course (e.g., happiness-anger-happiness). Greenspan comments that the caregiver who calls a ‘time out’ during this developmental level, and thus interrupts this cycle, deprives the child from experiencing the *closure* of the cycle, and that this can have important consequences for the child’s personality development.

Put in more Piagetian terms, the rupturing of this cycle of adaptation prevents the formation of a higher level of equilibration. Piaget, of course, is primarily concerned with cognitive aspects of child development, but he acknowledges the role of affectivity in this process, as we will discuss in more detail later in this treatise. The point here and now is that this cycle of experience always involves actions, that these actions are intentional and purposive in the Piagetian sense, as we will discuss in a moment, and that the child’s emotive behavior involves the appearance of displays we attribute to what we will call feelings of *satisfaction* and *frustration*.

This is, indeed, quite a complicated practical process and to fully grasp its significance we will need to look also at its logical-practical aspects. With regard to the transcendental-practical side of it, what is important for us to note is that the successful end result of this process is a more unified affective coherence of the Self.

As the child's interactive world grows more complex and he engages in more presymbolic bargaining, his sense of self permits more organization, so that he can play an active role in his world through directed plans and objectives. His neurological hardwiring¹ now supports much larger units: for the child, the happy "me" and the "me" that wants the apple and the "me" that can get a kiss can all combine into the "me" that is happy when he gets an apple or a kiss. Happiness is no longer a series of fragmented sensations, but one connected experience that may include going for a walk with Mommy and visiting Grandma and playing with the dog. This presymbolic but coherent sense of self emerges as the islands of emotion, intention, and motivation that defined the earlier, fragmented "me" now coalesce into a larger, more unified "me" [GREE1: 68].

B. Logical-practical unification: From the logical-practical perspective, the fifth sensori-motor stage is "primarily the stage of elaboration of the 'object'." As Piaget goes on to say,

It is characterized, in effect, by the formation of new schemes which are due no longer to a simple reproduction of fortuitous results but to a sort of experimentation or search for novelty as such. Moreover, in correlation with this same tendency, the fifth stage is recognizable by the appearance of a higher type of coordination of schemes: the coordination directed by the search for new "means" [PIAG1: 264].

Piaget calls the behavior pattern characteristic of the fifth stage the "tertiary circular reaction." In the previous stages, the "resistance to assimilation" of the external Piagetian objects with which the child comes into contact makes accommodation necessary in order for assimilation to succeed. Because the child's attention and effort goes into simple "conservative" behavior (reproduction of interesting results), accommodative activity is barely differentiated (and in the early stages not differentiated at all) from the assimilation. Assimilation resists novelty, and therefore the earlier stages are characterized by seeking to reproduce the familiar rather than to explore the new. This is precisely what changes in the fifth sensorimotor stage.

Tertiary circular reaction is quite different: if it also arises by way of differentiation, from the secondary circular schemes, this differentiation is no longer imposed by the environment but is, so to speak, accepted and even desired in itself. In effect, not succeeding in assimilating certain objects or situations to the schemes hitherto examined, the child manifests an unexpected behavior pattern: he tries, through a sort of experimentation, to find out in which respect the object or event is new. In other words, he will not only submit to but even provoke new results instead of being satisfied merely to reproduce them once they have been revealed fortuitously. The child discovers in this way that which has been called in scientific language the "experiment in order to see." But, of course, the new result, though sought after for its own sake, demands to be reproduced and the initial experiment is immediately accompanied by circular reaction. But, there too, a difference contrasts these "tertiary" reactions to the "secondary" reactions. When the child repeats the movements which led him to the interesting result, he no longer repeats them just as they are but gradates and varies them, in such a way as to discover fluctuations in the result. The "experiment in order to see,"

¹ Elsewhere, Greenspan tells us quite frankly that we are far from a complete neurological theory with regard to the phenomenon we are presently studying. If we are to accept Greenspan's presentation as self-consistent, we must not take this isolated phrase - "neurological hardwiring" - to imply that Greenspan is adopting the view that such "hardwiring" causes the integration. His view, rather, seems to be that the continuing maturation of the central nervous system establishes the capability for this more advanced behavior to take place. Such would be a view entirely consistent with our own theory of the complete reciprocity between *soma* and *nous* required by the principle of the *psyche* in an Organized Being.

consequently, from the very beginning, has the tendency to extend to the conquest of the external environment [PIAG1: 266-267].

These experiments are not at all complicated by adult standards, but they are a significant advancement for the child. They include, for example, the discovery that you cannot pick something up while you are standing on it, but that you can if you do not stand on it. Most of the examples Piaget describes are somewhat lengthy, and so we will limit ourselves here to one of the simpler examples.

Observation 141.- This first example will make us understand the transition between secondary and "tertiary" reactions: that of the well-known behavior pattern by means of which the child explores distant space and constructs his representation of movements, the behavior pattern of letting go or throwing objects in order subsequently to pick them up.

One recalls (Obs. 140) how, at 0;10 (2) Laurent discovered in "exploring" a case of soap, the possibility of throwing this object and letting it fall. Now, what interested him at first was not the objective phenomenon of the fall - that is to say, the object's trajectory - but the very act of letting go. He therefore limited himself, at the beginning, merely to reproducing the result observed fortuitously, which still constitutes a "secondary" reaction, "derived," it is true, but of typical structure.

On the other hand, at 0;10 (10) the reaction changes and becomes "tertiary." That day Laurent² manipulates a small piece of bread (without any alimentary interest: he has never eaten any and has no thought of tasting it) and lets it go continually. He even breaks off fragments which he lets drop. Now, in contradistinction to what has happened on the preceding days, he pays no attention to the act of letting go whereas he watches with great interest the body in motion; in particular, he looks at it for a long time when it has fallen, and picks it up when he can.

At 0;10 (11) Laurent is lying on his back but nevertheless resumes his experiments of the day before. He grasps in succession a celluloid swan, a box, etc., stretches out his arm and lets them fall. He distinctly varies the positions of the fall. Sometimes he stretches out his arm vertically, sometimes he holds it obliquely, in front of or behind his eyes, etc. When the object falls on a new position (for example on his pillow), he lets it fall two or three times more on the same place, as though to study the spatial relation; then he modifies the situation. At a certain moment the swan falls near his mouth: now, he does not suck it (even though this object habitually serves this purpose), but drops it three times more while merely making the gesture of opening his mouth [PIAG1: 268-269].

Structurally, once the child has acquired mobile schemes in the fourth stage, he attempts to apply these schemes to all new objects he encounters and, in doing so, discovers the "resistance" of some of these objects to being assimilated into these schemes. This leads, Piaget tells us, to the objects becoming interesting in their own right, rather than merely being perceived within the global activity. More specifically, the act of accommodation *itself* captures the child's attention and interest. As Piaget puts it, "Accommodation becomes an end in itself, separate from assimilation but complementary." These two new interests arise concurrently and lead to further development of objectification, spatialization (i.e., the cognition of external relationships), and the objectification of causality. It appears as if these three developments are linked in the fifth

² Laurent, possibly in part because Piaget had worked with him quite extensively, was a somewhat precocious child. Typically, stage 5 behavior is seen at age 12 months, but Laurent tended to be an early learner.

stage and do not follow each other in a particular order.

Accommodation to novelties acquires interest precisely by reason of the two tendencies which we have just called to mind. To begin with the second one, it is clear that to the extent that the child, seeking to assimilate new objects, will encounter resistance, he will become interested in the unforeseen properties which he will thus discover. This interest in novelty, therefore - however paradoxical this assertion may seem - results from assimilation itself. If the new object or phenomenon had no connection with the schemes of assimilation they would not be of interest and that is why, in fact, they rouse nothing in the child who is too young (even if he already knows how to grasp) except visual or auditory attention. Whereas to the extent that they are almost assimilable, they rouse an interest and an attempt at accommodation still greater than if they were assimilable immediately. That is why, the more complex the system of the schemes of assimilation, the greater the interest in novelty in general. New events have more opportunities at animating at least one particular scheme according as the ensemble of the schemes formed is large . . .

With regard to interest in the external results of acts, characteristic of the secondary circular reactions, it is also sooner or later a source of accommodation for the sake of accommodation. In effect, as we shall emphasize in connection with the concept of object and of causality, the very progress of assimilatory utilization of material objects results in substantiating them. For example, a hanging object which one can shake, swing, strike and finally drop, becomes little by little an independent center of forces and ceases to be simply an element of a self-enclosed cycle circumscribed by the scheme of assimilation. Now at the time when causality thus becomes objectified and the universe becomes stocked with centers of forces, it is apparent that the child's effort will no longer only consist in making things enter into known schemes, but also, in the case of thwarting of the immediate assimilation, in discovering which are the properties of these centers of forces. For example, in Observation 145, it can clearly be seen how the attempts to "cause rolling" engender attitudes of expectation, surprise, and almost anxiety and great astonishment [as when the stick rolls at 1;4 (0)] which reveals the progressive spontaneity that the child concedes to things. This is not yet the place to speak of people, to whom the child naturally attributes a still greater spontaneity. In short, the objectification of causality is the source of experimentation [PIAG1: 276-278].

There are several things we need to note from this summary. The first of these is that Piaget clearly holds that affective factors – interest, expectation, surprise, anxiety, and even behaviors that exhibit what we usually call curiosity – are clearly exhibited by the child in the course of these behaviors and appear to play an important central role. Another is the exhibition of what appears to be indicative of a particular sort of childish purpose. The child appears to be interested in “accommodation for the sake of accommodation” – a behavior that has a bearing on a central idea in Chapter 13, namely, the idea of “good” or “goodness.” Yet another factor in these behaviors involves the role that appears to be played when the child seems to attribute spontaneity to what he observes. In the fourth stage, the child clearly seems to view an external event as something requiring his own intervention through personal tactile contact to make the somewhat externalized object “do what it is supposed to do.” In the fifth stage, however, the child appears to become aware of results that he himself has neither caused through tactile contact nor, apparently, through the efficacy of his own desires – hence the “surprise” reaction. Finally, there is the appearance that the child seems to relate this spontaneity to a growing idea of externalized, objectified causality he seems to place, for the first time, inside the object itself. Hence he seems

to regard objects as endowed with some power of spontaneity and to view them as, in Piaget's words, "centers of force." Other people, as the most spontaneous of external Piagetian objects, naturally attract the greater interest of the child.

As is the case in the fourth stage, Piaget holds that affectivity is involved in both the activation and retardation of intentional actions. This remains true thereafter, and its role seems to be especially important in the fifth stage. In addition, Piaget holds that "feelings of success or failure" appear to be manifested in these behaviors and will remain important thereafter. Finally, he also agrees with Greenspan that the child comes to invest affections in others, which we might call the "externalization of affection."

Objectification, spatialization, and the development of the child's conception of causality all work hand in hand in the emergence of the Self.

With the tertiary circular reaction . . . a reversal of direction occurs: such a behavior pattern consists in experiments in order to see intended to discover the unknown properties and particular activities that each new object comprises. The mental orientation which characterizes such behavior is the same as that which marks the objectification of causality: interest is brought to bear on the objects themselves and no longer on the movement intended to utilize them, and objects acquire, for the first time, a solidity forcing the subject to accommodate himself to it and expressed in the form of causality independent of and external to the self.

On the sensorimotor plane . . . it happens . . . that the objectification of causality is always on par with its spatialization. The spatialization of causality begins with a spatialization of the action itself practiced upon things. To the extent he discovers the need for intermediaries and spatial contacts in order to act, the child renounces causality through efficacy and substitutes for it a truly physical causality. This tendency, the beginnings of which we have analyzed apropos of the fourth stage, is definitely established in the behavior patterns we have called "discovery of new means through active experimentation" . . . In other words, the act of multiplying the intermediaries between the action itself and its external result involves the same process of externalization as does experimentation with the properties of objects; in both cases the subject learns how to dissociate, if not as yet his own self from the external world, at least an internal pole of effort and an external pole of objective resistance; in both cases, causality tends to be objectified in spatialized connections, while causality through efficacy tends to be internalized and no longer applied only to the connections uniting intention to the movement of the body itself [PIAG2: 280-281].

Piagetian "efficacy" is a term that means the child assumes his own feelings, emotions and desires are responsible for the events in the world. Its "renouncement" has an important result.

To the extent the child renounces considering external phenomena as the mere extension of his own actions and confers upon them, along with objectivity and spatiality, a causal structure which is truly physical and independent of the self, it is very probable that he becomes aware of his own activity as a direct power exerted by his intentions upon his organism. In other words, just as phenomenalism is transformed into spatial causality by being differentiated from efficacy, efficacy, in turn, does not disappear but is confined to the realm of the activity itself and changes into simply psychological causality.

If our hypotheses are correct, the evolutionary process with which the causality of the first five stages complies is that of a gradual dissociation starting from an initial state of undifferentiation in

which efficacy and phenomenalism are indissolubly united. The primitive universe (of the earliest stages) is a confused totality of sensory images each of which seems to the subject simultaneously to obey certain given regulations (phenomenalism) and to extend certain attitudes of desire and effort (efficacy) . . . On the other hand, from the fourth stage on, and above all during the fifth, a break of equilibrium occurs. Certain causal sequences begin to be dissociated from purposefulness, either partially (fourth stage) or completely (fifth stage), since causality is simultaneously objectified and spatialized. Thereafter, phenomenalism is differentiated from efficacy and is consequently transformed into physical causality. Does this mean efficacy is forced to disappear entirely? Not at all; it is merely confined to the realm of the connections which the child now recognizes between his intentions and the movements of his body and doubtless also between these movements and those of someone else's body. Causality through efficacy thus becomes psychological causality, the latter existing only in contrast to physical causality . . .

A second question arises here: that of the causal relations established by the child between his own body and the objects in the environment. If it is true that henceforth the child distinguishes two types of causality . . . how will the subject conceive of the relations between his body and the action of things?

It is this point which shows most clearly the reversal of direction peculiar to the behavior patterns of the present stage as compared to those of the preceding stages. As we have already seen, not only does the child spatialize the causal relations which characterize his action upon things but also, as we shall now try to establish, he conceives of his action as partly depending on the laws of the external world. This last point is fundamental. Up to this time the child's own activity . . . has been conceived as the center of production of the movements of the universe. But now, that activity is not only established as limited in power by a totality of actions independent of the self, but is also recognized as subject to pressures emanating from an external universe. More precisely, the child ceases to place his own activity in the center of the world and instead conceives of it as maintaining relations of mutual dependence with objects. Instead of monopolizing the only causality possible, he becomes a mere cause among other causes.³ Now, let us note, such a transformation is exactly on par with that which, in the course of the same stage, characterizes the evolution of objects and of space as a whole [PIAG2: 287-290].

Piaget goes on to cite further observations that appear to support these hypotheses and which appear to rule out other possible interpretations. He does clearly note that the application of these forms of causality are, in the fifth stage, still strictly limited to the data of perception. The child at this stage is not yet capable of conceiving abstract causes or esoteric forces of the sort which physics studies. (We are, after all, still talking about toddlers.) He is “incapable of imagining absent causes of a present effect.”

This brings us to the objective of this section: the empirical description of the emergence of the Self in childish cognition. The child, of course, still has a long development, both affective and cognitive, ahead of him, and it is with this further development that Greenspan's remaining levels are concerned. However, now is not the time to delve into these developments and we must instead examine the implications of what we have learned in this section for practical anthropology.

³ The child's conception of the nature of these “other causes” tends to be very anthropomorphic, as we noted earlier. It would be wrong to assume that the distinction recognized by the child between himself as a cause and other things as causes in any way places the two sides of this real division on even footing. The young child assumes that the nature of other things as causes is the same as his own.

§ 6. Practical Implications of the Evolution of the Self

We have seen from the psychological evidence of the preceding section that our most fundamental concepts of objectification are established by practical schemes that develop in the sensorimotor phase of intelligence. Cognition of the *Existenz* of both the Self and the not-Self arise together and evolve gradually through the infant's growing recognition of and attention to what he seems to regard as appearances of spontaneity. The child's early ideas of causality are clearly tied to his practical development of coordinations, *Coord.S* and *Coord.O*. In appearance the child's behaviors point to the development of ideas of causality through an evolution from a mere "feeling of efficacy" to a cognition of a disjunction between an externally spatialized causality (physical causality) and an interiorized causality (psychological, i.e. non-physical, causality). This objectification of causality appears to arise from the differentiation of Piagetian "phenomenalism" from the efficacy that all earlier childish behavior appears to imply.

In terms of our theory, these early stages of childish cognition clearly show that the child does form representations of objects (in Kant's sense of these words rather than Piaget's usages), but that these "Piagetian pictures" are not initially vested with meanings that take in such elementary significations as object permanence or independence. Put another way, it is not the recognition of Kantian objects that is lacking in a Piagetian picture; rather the signification of the meaning these pictures hold for the child is what distinguishes a Kantian object from the Piagetian object. The Piagetian object is what in our terminology we call a thing. It is through and with the objectification of causality that these pictures cease for the child to be merely pictures – appearances contained within the experience of his own activity – and become instead phenomena. From this achievement in cognition the child can then go on to form ideas of relationships among external things and between these things and his Self.

This is what was meant earlier when it was said all our ideas of things involve at their root the idea of individuality. It is indeed the absence or incomplete development of maxims for thinking 'individuality' that is lacking up through the fourth sensorimotor stage of development. We now see that a maxim for thinking 'individuality' arises from the child's earliest concepts of cause and effect objectification (i.e., not the category of causality and dependency, for this is merely the pure *a priori* notion of a rule for the construction of concepts, but rather from the thinking of concepts of appearances as the things we call "the" cause and "the" effect). Inasmuch as all our later ideas of "causes" and "causality" bear traces of the earliest maxims of thinking individuality, and because such a maxim involves in some manner a relationship to the Self, we can now better appreciate James' objection to automatism "pulling the pall over" non-physical (psychological) causality while not being equally critical of the idea of physical causality.

Causality is never an observable; it is an object of inference. In this, Hume was entirely correct. Causality, without a modifying adjective, is an *Unsache* thing, and if we ask for a primitive definition of this idea, such a definition we now see must be grounded entirely in practical ideas because it is an idea whose roots are immanent in entirely practical experience. Practical experience, which is the root of maxims of individuality as well as causality, provides the ground for the objective validity of the idea of psychological causality, which by another name we know as the *practical idea* of the causality of freedom. This objective validity is practical, rather than theoretical, and now that we have seen the evidence from the empirically observable evolution of the child's conception of objectification and the Self, we are in a better position to appreciate that practical objective validity is far from being the inferior to theoretical objective validity. Rather, it is in a very elementary way the more fundamental of these two types of objective validity. This realization is what Kant was getting at when he said that objective reality is grounded in practical, not speculative, Reason [KANT4: 178 (5: 47)].

Now, the empirical findings of the evolution of the Self present us with appearances to which a practical theory of Reason must be able to connect up. We have seen that the development of cognitions of all objects viewed as things is bound up with affective factors vaguely described by words such as emotions, intentions, purpose, drives, desire and the like. These factors involve the practical Quality of mental actions, and the empirical evidence clearly shows: ***without affectivity objectivity does not develop.***

Furthermore, the cognition of all external objects and the cognition of Self are bound together early in life at a deep and fundamental level. Piaget's theory shows us that later development of object concepts occurs through a regulated process of equilibration that conserves mental structures even while modifying them through accommodation. Thus, this is to say that our later maxims of reasoning objectively contain at their roots the effects of these early structures and the affective factors that accompany their formation. While it is often assumed by most people that part of being an adult involves the ability to banish these affective factors and "think rationally," this long-held presupposition is refuted by the scientific evidence. As an example, we will look at one of Dr. Damasio's patients, a man known as "Elliot" [DAMA2: 34-51].

Elliot was a man in his thirties who had been a successful business and family man with a responsible job and excellent social skills. It was his misfortune to develop a brain tumor that damaged parts of the frontal lobes of his brain. Although the tumor was successfully removed, after surgery Elliot displayed a disturbing personality change. He ceased to be able to make appropriate decisions and take appropriate actions. He became unable to keep track of his main work goals, for example, and instead spent his time doing other minor tasks. He lost his job, was unable to hold other jobs, went into several questionable business ventures, and eventually went

bankrupt. His marriage ended in divorce, a second marriage soon after likewise ended in divorce. For a man who had previously demonstrated good business and personal acumen, his fall was, to say the least, puzzling to all who knew him.

Elliot's problem was due to a neurological condition that impaired his decision making ability. His memory and other conscious capacities seemed to be intact, but he was unable to plan what he was going to do even for the next several hours, much less for the weeks and months ahead. Dr. Damasio described what was missing:

At first glance, there was nothing out of the ordinary about Elliot's emotions . . . On a more probing analysis, however, something was missing, and I had overlooked much of the prime evidence for this: Elliot was able to recount the tragedy of his life with a detachment that was out of step with the magnitude of the events. He was always controlled, always describing scenes as a dispassionate, uninvolved spectator. Nowhere was there a sense of his own suffering, even though he was the protagonist . . . Elliot was exerting no restraint whatsoever on his affect. He was calm. He was relaxed. His narratives flowed effortlessly. He was not inhibiting the expression of internal emotional resonance or hushing inner turmoil. He simply did not have any turmoil to hush [DAMA2: 44].

The neurological damage resulting from his brain tumor had left Elliot without the ability to feel emotion accompanying his experiences. Dr. Damasio describes in some details the tests and examinations he and his colleagues undertook to understand what was wrong with Elliot. His eventual conclusion was that the reduction in Elliot's ability to respond emotionally to events was impairing his decision-making process. As Damasio summarized,

I began to think that the cold-bloodedness of Elliot's reasoning prevented him from assigning different values to different options, and made his decision-making landscape hopelessly flat. It might also be that the same cold-bloodedness made his mental landscape too shifty and unsustained for the time required to make response selections, in other words, a subtle rather than basic defect in working memory which might alter the remainder of the reasoning process required for a decision to emerge [DAMA2: 51].

Elliot's case is dramatic, but by no means unique. Affectivity affects our schemes for decision-making and reasoning.

Now because of the indispensable role of these subjective factors in the exercise of the faculty of understanding, we have no objectively valid option other than to include them in our theory. This means, however, that from the beginning we are forced to admit intelligible objects, including merely intelligible causes, in the systematic framework of our theory. The subjective factors, e.g. desire, intention, purpose, emotion, etc., are established, insofar as their *Dasein* is concerned, by empirically observable effects. But, clearly, these factors are left in entirely too vague a state of description in present day psychology. They are "clearer to us" rather than "clearer by nature" (as Aristotle said) and, consequently, they are empirically descriptive but inadequate for a *Realerklärung* of the phenomenon of mind. What we must have is a clear and

distinct idea of what is necessary for the possibility of this factor in how reasoning works. This in turn means we require primitives and principles and we must provide a *Realdefinition* for the factors that ground their *practical* possibility.

Because objectivity and subjectivity are so interlinked in the behaviors that ground the objective validity of our ideas of subjective factors, we cannot apply at the very outset the sort of scientific reductionism prevalent in neuroscience by which the subjective factors are excluded with the hope that they can be re-inserted later in the guise of epiphenomena. Such an initial reduction is nothing else than what Greenspan called “the ancient split between emotion and cognition.” Equally, we cannot “mechanize” our objective ideas of the subjective factors in the guise of occult forces or, for that matter, putative physical forces of some as yet unknown type (e.g., “mind dust”). We have no ground for any such supposition because the *Dasein* of subjective factors is grounded merely from a practical, and not a theoretical, Standpoint.

This does not mean there exists no physical correlate in the *soma* for these subjective factors. On the contrary, we must hold that a somatic correlate does in fact exist because this inference is required by the principle of the community of *nous*, *soma*, and *psyche* in the Organized Being. Furthermore, the evidence from neuroscience that brain function and mind function are tied together is overwhelming. But because our knowledge of the central nervous system is based on the sensible objects of neuroscience (and the supersensible objects of biophysics and biochemistry that go along with these in neural theory), whereas the subjective factors are objects of a merely intelligible character, we must treat their noetic character in its own right. How, other than by fiat, can we expect to match the somatic objects to such a slippery idea as “emotion” and so on if we do not clearly understand the real character and properties of that which we are seeking to understand? Our ideas for this real character of the subjective factors must have objective validity and, owing to the supersensible nature of these when we regard them as objects, this objective validity can be none other than a practical objective validity.

We *can*, however, take note from the beginning of a basic *logical* distinction clearly presented in the way we observe and describe the subjective factors. On the one hand, some of these factors are descriptive of the Subject’s “mental state” as this state is inferred from physical observables of the somatic state. These are factors that are broadly described or classified by such terms as “emotions” and “feelings.” The practical-object ideas we will use in connection with this class of factors begin with those we call affective perceptions – a term reminding us that these subjective factors are represented in consciousness but are not represented as cognitions of appearances. We will see later on that these ideas take the context of their objective validity from sensibility and the process of *aesthetical* reflective judgment. Our exposition of these ideas will be presented when we discuss the judicial Standpoint in Chapter 14.

On the other hand, the second class of subjective factors are those involving such inferred ideas as *purpose*, *motivation*, and *intention*. They are ideas of a more explicitly “teleological” character inasmuch as they speak to such phenomena of reasoning in decision-making and choice. These ideas are “cold” in the sense that we do not infer them from the somatic state but, rather, from the organization (the “goal-seeking quality”) of behavioral actions. Piaget provides us with a criterion, taken from his normative convention, of observable conditions under which he says the psychologist-observer may infer “intention” but we need to recognize that Piaget’s criterion is not a definition of intention but merely is a maxim for inferring the *Dasein* of intention. Piaget’s theory does not say “intention begins in the fourth sensorimotor stage”; it says, “we know that we are observing intentional behavior in the fourth sensorimotor stage.”

Included also in this second class of subjective factors is one of the most contentious and slippery ideas of all: the idea of “will” (or, if one prefers, “willpower”). Given Piaget’s findings from the logical-practical perspective and Greenspan’s findings from the transcendental-practical perspective, a “picture” of the phenomenon of will starts to emerge. In appearance, childish behavior at the lowest Greenspan levels and earliest stages of sensorimotor life are most consistent with Kant’s *arbitrium brutum* description of choice (in German, *Willkür*). This, we recall, refers to a being whose choices are determined *solely* by sensuous conditions. If I make only brute choices, being angry at you is a sufficient determining condition for me to shoot you. To engage in unfounded speculation for a moment to reach for a metaphor, if we were to hold that ants “have a mind” and “make choices” then from what we know about antish behavior it would appear that they are creatures whose “power of choice” is *arbitrium brutum*.¹ In the later stages and higher levels (as the child’s substructures of the Self are reciprocally assimilated and behavior becomes less immediately determined by perceptions “in the here and now”) we see the development of behavioral capacities that tend in appearance toward the emergence of a power of choice that meets Kant’s definition of *arbitrium liberum*.

This evolution indicates that the idea of practical freedom of choice seen as *free will*, and regarded as a practical capacity of mind, is not innate in the sense of being an objectively valid “power” we can say is actually present at birth. What the evidence rather suggests is that practical freedom is a *potential* capability (a *Vermögen* rather than a *Kraft*) that develops along with other mental capacities. The power of choice is thus to be regarded as the idea of a *Willkürsvermögen* rather than a *Willkürskraft*. On the basis of observable behavior, it is only the idea of the former, and not the latter, that holds practical objective validity.

¹ Unlike an amoeba, an ant does have a brain. It consists of only a few hundred neurons. Do ants make choices? I have no idea, but I’m inclined to doubt it. On the other hand, leaf-cutter ants display behavior involving activities that could well be called “agriculture” (they grow fungi in their nests). Some other species of ants “practice animal husbandry” by attending to aphids (known as “ant cows”) which they use to secure honeydew from plants. The phenomenon is called “symbiosis” in biology. It does make one wonder.

The distinction is an important one because it completely sets aside any need to posit a “spirit” or a “soul” as some kind of occult entity whose essence is to “contain the free will.” The practical and objectively valid free will is vested in the potential capacity to develop schemes of behavior and affective schemata that free the Organized Being from having all its actions and behaviors immediately determined solely from the “here and now” of immediate sensuous conditions. That teleological and selfish considerations may come into play (“if I shoot him, I’ll go to jail”) or that the noetic state is in reciprocity with a somatic neural state is completely irrelevant to the practical objective validity of the idea of an innate *Willkürsvermögen*. It is in this way that the causality of freedom has practical objective validity even though the idea of an object to stand as the cause of this causality must be denied theoretical objective validity because of the purely intelligible character of this idea of *Willkürsvermögen*. The trail that leads from observable behavioral effect to practical cause of the effect ends with the organic unity of the Organized Being. To go farther than this is to pass into the impenetrable darkness of the speculatively transcendent. The *objective source* of all ontology is the Organized Being, and so we must say that Protagoras was right: *Man is the measure of all things*.

Practical objects of this second class belong to the topic of the theory of pure practical Reason and belong exclusively to the practical Standpoint. But how must we view practical Reason in order for our understanding to have objective validity? This requires that we place the *idea* of the power of pure Reason in its proper context and understand how the *Existenz* of pure Reason stands in relationship to sensible appearances. We take up this task in Chapter 12.