

## TOWARDS A PROCESS-PSYCHOLOGY - CONVERGENCIES BETWEEN WHITEHEAD AND PIAGET

Franz Riffert

*In this paper the basic concepts of Jean Piaget's genetic structuralism - structure (wholeness, transformation: accomodation/assimilation, self-regulation) will be compared with Alfred North Whitehead's fundamental notions - actual entity (superject/eternal object, subject/concrescence, final aim). It will be shown that there are many parallels within the content of these concepts and even with the problems which they air. Both approaches are radically processual and relational. The immanent problems of both approaches the so called 'paradox of structuralization' or 'paradox of concrescence' and the problem of the 'identity of persons' will be discussed in detail. It will be shown that Whitehead's proposed solutions for these problems go deeper than Piaget's and so may be a starting point for further developing and clarifying Piaget's approach. It also shows that a Whiteheadian process-psychology must not start on a zero-level but may in principle build up on the empirically corroborated work of Jean Piaget.*

### 1. Why Whitehead and Piaget?

Whitehead as well as Piaget have been among the most influential thinkers of the twentieth century. As far as Whitehead is concerned, his contributions to logic and metaphysics are probably best known. Piaget did fundamental research in the fields of (child-) psychology and epistemology. However trying to show parallels between two thinkers that might seem to have not anything at all in common at first glance needs at least some justification. Are there indeed no traces of influence between these two thinkers and their approaches that might render a detailed comparison plausible?

An answer to this question becomes even more urgent as Piaget only infrequently mentions Whitehead. With one single exception these references are all to *Principia Mathematica* which Whitehead wrote together with B. Russell, and not to any of his later philosophical writings. One is to ask if an attempt to try to draw some parallels between two thinkers has any hope for succes at all! Is it not just a hopeless attempt to find relations between the unrelated and compare the incomparable?

The hope that such an attempt is not a completely barren undertaking from the start, but may even prove to be worthy is substantiated if we take a look at L. v. Bertalanffy's work *aber vom Menschen wissen wir nichts* (Bertalanffy 1970).<sup>1</sup> Here Bertalanffy mentions the fact that at the beginning of our century the "mechanistic world view" (Bertalanffy 1970, 15) has come under attack in different disciplines. Originating from general biology and experimental embriology the critical discussion of materialist mechanicism spread to scientific fields such as psychology, sociology and the philosophical tradition of Neukantianismus. New alternative concepts were developed. All these alternatives rested - according to Bertalanffy - on the common ground of a few central ideas. These ideas made up what Bertalanffy had called the "organismic conception" (Bertalanffy 1970, 14) and which he characterized as follows:

---

<sup>1</sup> That there are some more traces of influence between these two thinkers is shown in detail by Riffert (1994, 44-55). Here these 'missing links' can only be mentioned: First there are H. Bergson and W. James to be mentioned; the fundamental ideas of both influenced the works of Whitehead and Piaget. Finally there runs a direct line of influence from Whitehead to C. H. Waddington and on to J. Piaget.

”Conceiving living systems as wholes in contrast to simply analytic and summative method, dynamic conception in contrast to static or machine-theory of organism; the basic assumption that organisms are primarily active and not reactive systems.” (Bertalanffy 1970, 14)

Wholeness and (self-)activity of the research phenomena, dynamic research perspective and the corresponding methodology are at the core of the organismic paradigm. Bertalanffy mentions that ”in philosophical respects ... especially Whitehead (1925) was one of the important precursors” (Bertalanffy 1970, 115) in the development of the organismic paradigm.

But Bertalanffy does not only subsume Whitehead amongst the forerunners of the organismic paradigm; the same, in his eyes, is true for Piaget: ”Again about at the same time [as Werner’s and Bertalanffy’s developments] the Genevan psychologist Piaget started his research on the cognitive development of the child in a way that can also be subsumed under the term ‘organism’.” (Bertalanffy 1970, 15) So Bertalanffy implicitly states a consensus between these two thinkers concerning the core assumptions of the organismic paradigm.

Piaget himself has characterized Bertalanffy’s organismic conception as promising approach and affirmatively made reference to his central organismic assumptions: ”The structure of organisation too is characterized by three features: open system, dynamic of the exchange processes and primary activity in contrast to a primitively conceived reactivity.” (Piaget 1967, 157) In this quotation only the term ‘system’ may need some explanation. A system is contrasted with a mere aggregate. Such a system is more than the sum of its parts as is the case with aggregates. So we see that Piaget by characterizing the organismic approach by the term ‘system’ intended to refer to the concept of wholeness which underlies this concept.

In this context it is interesting to shift attention to the only reference Piaget makes on Whitehead as a philosopher. Here Piaget - just as Bertalanffy - refers to Whitehead as one of the founders of organicism: ”Already Whitehead in his works on scientific thinking has taken the view that the interpretation of the analysis of reality usually classified as mechanistic cannot be driven to the end and that the terms ‘organism’ and ‘organisation’ have specific characteristics that we have to use.” (Piaget 1972, 244)

All this heightens the probability of finding parallels between Whitehead’s organismic metaphysics and Piaget’s organismic structuralism for it shows that both approaches are committed to an organismic paradigm. So we can turn towards a detailed comparison between these two concepts.

## **2. Whitehead and Piaget: Convergencies in the Basic Concepts**

Parallels between Whitehead’s and Piaget’s approaches can be looked for in two different ways: (1) First one can look for parallels in the basic concepts and assumptions of both approaches. (2) Second it is possible to compare Piaget’s psychological theory with those psychological topics that Whitehead has dealt with to some extent. Such themes are for instance ‘experience’, ‘consciousness’ and ‘person/subject’. In this paper only the first way will be used.<sup>2</sup> At first glance this way of proceeding does not seem to be very promising since Whitehead developed a metaphysical system whereas Piaget is known for his psychological research. Moreover it is not difficult to find several sections in Piaget’s writings that express his deep scepticism concerning metaphysics. (Cf. Piaget 1965) However the problem mentioned is relativized when we take into account that Piaget was not only a psychologist (and still less a

---

<sup>2</sup> For a detailed discussion of the second way see Riffert (1994, 211-333).

child-psychologist - as many have seen and understood him) but an epistemologist. He was a thinker who tried to develop what he has called a 'general structuralism' (Piaget 1968) that should function as the basis for "the possibility of a synthesis" (Piaget 1968, 17) of so different scientific disciplines such as logic, mathematics, physics, biology, chemistry, psychology, sociology and linguistics. (Cf. Piaget 1968)

This aim is very close to Whitehead's metaphysical undertaking. Whitehead too intended to frame a general system that could and should function as an integrative pattern. "Also it [metaphysics] is not a mere juxtaposition of various sciences. It generalizes beyond any special science, and thus provides the interpretative system which expresses their inter-connection." (Whitehead 1958, 86) Of course Whitehead's aim was even more general: not just all sciences should find its place within such an general interpretative scheme, but also our everyday experiences: "Speculative Philosophy is the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted. By this 'interpretation' I mean that everything of which we are conscious, as enjoyed, willed, or thought shall have the character of a particular instance of the general scheme." (Whitehead 1978, 3) So we see that Piaget and Whitehead had a very similar and ambitious tasks in mind.

In order to meet such a requirement a general structuralist theory had to be built on very general ideas. The general concepts and basic assumptions of structuralism should be exemplified in different sciences. By doing so the underlying structuralist concepts and axioms should build the interpretative frame for all sciences. The core concept of his structuralist conception, of course, is the term 'structure'. Piaget qualifies this notion by characterizing it as wholeness, transformation (by accomodation and assimilation) and self-regulation. In his later writings he uses a somewhat different vocabulary - like equilibrium and equilibration - but these new terms can easily be linked to his early concepts just mentioned.

In the following sections these central Paigetian notions will be critically compared to some of the fundamental concepts of Whiteheads organismic process metaphysics such as actual entity, superject/eternal entity, subject/concrescence, subjective aim. This comparison will show parallels between the two conceptions of genetic structuralism and process philosophy. The profoundness of the parallels will become even more evident when the analysis brings to light the same problems with which they both are struggling.

## 2.1 Piaget's Concept of Structure

The term 'structure' is not only the corner stone in Piaget's book *Le structuralisme* but in all of his works. All other "fundamental terms of assimilation, accomodation, adaptation presuppose it, for there is always an assimilation 'of' and an accomodation 'to' a structure." (Fetz 1988, 214)

Before discussing these three aspects of any structure we have to draw an important distinction in order to avoid confusion: Piaget uses the term 'structure' ambivalently: on one occasion the term structure is used to designate concrete entities such as biological organs or psychological concepts. On another occasions the term structure is used to express the patterns concrete entities exemplify. We shall use this term in the following sections univocally as applied to concrete objects - physical, bilological, psychological or sociological. The second meaning of structure - the pattern and form - will consequently be refered to as the wholeness of structures.

A structure can be characterized in analogy to a system which elements are ordered in certain relations to one another. More specifically a structure is "an integral system of self-

regulation transformations” (Piaget 1968, 44; see also 8). In order to gain a better grasp of what Piaget meant by structure we have to take a closer look at the characteristics of a structure. These aspects are (2.11) the static aspect of definite wholeness, (2.12) the dynamic aspect of transformation and (2.13) the aspect of regulation of the dynamic aspect in order to achieve a static integral wholeness again.

### **2.1.1 The Static Aspect of a Structure: Wholeness**

The term ‘wholeness’ Piaget received from the Gestalt-psychologists. They have emphasized that a whole is more than the sum of its parts. (Piaget 1968, 11) Wholes are not just an aggregate, that - being analyzed - would show no more attributes than its parts. On the contrary they are characterized by over-summativity: they are unities that are characterized by qualities which their parts taken by themselves lack. Piaget speaks of ”building-up [composition] laws” (Piaget 1968, 10) that determine the relations of the parts to one another and thereby generate the new attributes of the integral system. Piaget calls this aspect of a structure as the ”organized organisation” (Piaget 1967, 335 fn5).

In emphasizing the wholeness of a structure Piaget dissociates his position from the atomist associationists as held for instance by psychologists or empirical epistemologists of the 19<sup>th</sup> century. He rejects this position because of its inherent one-sidedness: the elements play the decisive role and the whole correspondingly is of a secondary, inferred status. Within this point of view the qualities of the whole are already given with its parts. So the whole is totally reducible to its constituent parts. The associationists hold a position that Piaget has termed ”genesis without structure” (Piaget 1968, 12)

So Piaget seems to side with the Gestalt-people. But this appearance is deceptive too. Piaget criticises the gestalt-approach as well, for being one-sided. He characterizes their position as ”structure without genesis” (Piaget 1968, 12) because they also neglect an important aspect of structure: namely its dynamic aspect. The wholeness of structure can not be adequately conceived of without any consideration of its emergence - and hence without regard to its constituent parts.

Piaget decides to take the middle course between the two extremes of associationism and gestalt-psychology. He calls this position an ”operative structuralism” (Piaget 1968, 11) that ”provides a link in as far as neither the element nor the whole counts but the relations between the elements, expressed differently: the building-up [construction] procedures and - processes ... the whole is the result of these relations or this construction, and its laws are those of the system.” (Piaget 1968, 11) This passage shows that Piaget attributes the more fundamental status to the relations or processes of construction and not to the elements or to the whole. And hence it is only consequent when he maintains: ”[T]o answer the question, what knowledge (or the variety of its appearances) is, one would have to formulate it as follows: how does knowledge grow?” (Piaget 1978, 86) This principle does not only hold in the field of epistemology but is also one of the most basic assumptions of his 'genetic structuralism' (Piaget 1968) This becomes clear when we focus on a quotation Piaget takes from Paul Natrop: ”‘The fieri alone is the factum: all being that sciences try to ascertain must again dissolve into the stream of becoming.’” (Piaget 1978, 86) Piaget does not discuss this eminently metaphysical position any further in his opus. But one thing is clear: Piaget gives priority to the diachronic as against the synchronic method of analysis. (Cf. Piaget 1967, 71)

So far we have seen that the whole is the product of relational processes of construction. But now an answer to the question of what kind this aspect of wholeness of a structure is becomes even more urgent. Along with that question Piaget raises the problem of platonism. He

askes "are the structures constructed or are they more or less eternally prebuilt" (Piaget 1968, 12) And if answered in a platonic mode another question raises: "[A]re these building-up wholenesses eternally existent, but how and created by whom?" (Piaget 1968, 12) This according to Piaget "is actually the central problem of structuralism" (Piaget 1968, 12). Piaget rejects any kind of platonism and takes the side of radical constructivism: "because this construction is the only access to the universe of ideas it [the construction] is self-sufficient, with no need of hypothesizing its result." (Piaget 1973, 141) Piaget's argument against platonism hence is a purely pragmatic one following 'Occam's razor': Since the only forms and ideas human beings are able to grasp are their own constructions any additional assumptions of any kind of reality of ideas is simply superfluous.

On this point Piaget and Whitehead depart from each other fundamentally. Whitehead holds - according to the ontological principle - an immanent platonism: A definite form that may be the wholeness of a structure is part of an actual entity which calls 'God'.

### **2.1.2 Dynamic Aspect of a Structure: Transformation**

Under the heading of 'transformation' Piaget deals with the dynamic aspect of structures. Structures are by no means once and for all given. They change by interacting with a changing environment which itself is built up by structures. Structures are not annihilated when they interact with the changing environment - at least generally they are not. But they usually do not stay the same but are transformed. Piaget maintains that they do not simply change but improve. Within these new structures all their old capabilities are preserved and new ones are developed.

The result of such an interaction with the environment on the one hand is an enlargement and on the other, a differentiation. It is enlarged insofar as it now can deal with more aspects or dimensions of its environment: its field of application is broadened. This enlargement of the field of application can only be brought about by a complementary differentiation of the structure's quality. This qualitative change of the old structure yields a structure that expresses new definite wholeness.

A qualitative change is necessary because the unity of a structure is expressed by a wholeness that is more than the sum of its parts. It follows that new elements cannot simply be integrated to the old structure in an additive manner. Enlargement of a structure implies the creation of a qualitatively new structure by fusing the old structure with the new elements. For instance, a very young child that has developed a behavior scheme (or structure) that allows for grasping a rattle, can without any problem apply this structure to things similar to the rattle. However if the child tries to grasp tiny objects - for instance a ring - the scheme has to be modified in order to adapt to the new features of tiny objects. The child now has to use the fingertips to be able to grasp the small object. The newly developed behavior structure now includes the possibility to grasp rattle-like objects as well as smaller things. So in the new structure the older abilities have been preserved and are supplemented by new ones. Insofar as this new structure is applicable to more objects than the older one, the new one is more stable. Stability in Piaget's view means to be in equilibrium with the environment. For a structure to be in equilibrium with its environment means that a structure can adapt to the changes in the environment. To be in disequilibrium, hence, means that a structure cannot deal with new elements or aspects of its environment. Because the newly developed structure is by definition able to deal with more aspects of its surroundings, it also is more stable.

The process of transformation of structures is an ongoing process which starts from a certain structure with its definite wholeness and results in a qualitatively new (transformed)

structure (in the static sense). This final result itself is the starting point of a new process of transformation that will lead to another level of a more integrated structure. Piaget terms transformation also 'structuring' or 'genesis'. He stresses "that every genesis emerges from a structure and ends in a structure, but inverted each structure has a genesis" (Piaget 1978, 270) This dynamic, according to Piaget, takes place in each science and hence is identifiable by any scientist. "We would like to say that genesis is a relatively determined system of transformations that has a history, and hence in a continuous way, leads from state A to state B, whereby state B is more stable than the original state." (Piaget 1978, 266) This explicitly mentioned position that genesis has a direction towards more complex (integrated) and enlarged structures will be discussed later (2.131)

Now we shall turn to the double-concept of 'assimilation-accomodation'. Piaget introduced this concept in order to specify the process of transformation. The two notions Piaget has adopted from biology: organisms adapt towards the changing environments by assimilating new elements from the environment into their structure (for instance by digestion) and accomodate to the enironment at the same time. There can never be assimilation without accomodation and vice versa. Piaget has formulated a formula that should express the process of transformation (Piaget 1978, 32):

$$(T + I) \rightarrow AT + E.$$

whereby:

T.....old structure

I.....elemnts of the environment (i. e. structures)

AT..new structure that has evolved by accomodating to I

E.....elements of the environment that are excluded from the process of assimilation

→...process of transformation

+.....assimilation

An old structure assimilates new elements from the environment, and thereby accomodates to the new elements. At the same time other environmental elements are excluded from the process of assimilation-accomodation in order to secure the survival of the new structure, which of course cannot assimilate all elements of a given environment. So transformation is a process of changing the definite wholeness of a structure (accomodation) in order to meet the new requirements of environment and thereby being able to integrate new elements.

So far we have presented the process of transformation. But now we shall turn to the last characteristic of a structure: self-regulation.

### **2.1.3 The Regulatory Aspect of Structure: Auto-Regulation**

This third aspect of a structure relates the two afore mentioned aspects of wholeness and transformation to one another. Auto-regulation secures that the process of transformation produces a definite wholeness. Self-regulation "means that those transformations inherent in structure do not transcend its boundaries, but always create only the elements that belong to the structure and conserve its laws." (Piaget 1968, 150)

Only those elements of the environment will be assimilated to that do not destroy the emerging structure. Elements that are not capable of being integrated into a new synthesis are not assimilated; otherwise no new wholeness could be formed because the elements would not allow for integration to this new structure.

At this point we have to deal with the surprising fact that Piaget almost nowhere in his work, has ever dealt with the problem of the destruction of structures. One of these rare passages may be quoted here: "The whole, hence, will be transformed in its structure if only one of its elements is changed. That means that either death enters, hence decay occurs, or that something continuous as a totality." (Piaget 1975, 31) One can only speculate why Piaget has only very infrequently mentioned this possibility of decay or destruction of structures and nowhere in his work it is discussed it thoroughly. Of course one could argue that he was primarily interested in the growth of structures and not in their possible decay. But then we have to ask how one can hope to construct an adequate theory of structures and their growth without taking into account and explaining the possibility of decay and destruction. So here Piaget's approach shows some deficiencies.

## **2.2 Whitehead: Actual Entity**

In Whitehead's system the notion of an actual entity designates the core concept. Among the eight categories of existence (Whitehead 1978, 22), the category of actual entities is singled out because of its unique importance and centrality: "Actual entities ... are the final real things of which the world is made up. There is no going behind actual entities to find anything more real." (Whitehead 1978, 18) All that exists is constituted by, or derived from actual entities. So actual entities in Whitehead's approach take the place of Piaget's structures.

An actual entity too has a static, a dynamic and a self-regulatory aspect. Whitehead calls these aspects 'superject', 'subject' and 'subjective aim'. "An actual entity is at once the subject experiencing and the superject of its experiences. It is the subject-superject, and neither half of this description can for a moment be lost sight of." (Whitehead 1978, 29) As for Piaget each structure is at once a genesis (transformation) and the result of that transformation, the emerged definite structure, for Whitehead an actual entity is the emerging subject as well as the definite outcome of this emergence: the superject. Once this distinction between a dynamic and a static aspect, is made it takes only one step towards postulating two different strategies of research: a genetic and a morphological one. Each actual entity, hence, can "be considered genetically and morphologically." (Whitehead 1978, 219) Piaget speaks of a 'synchronic' (static) and a 'diachronic' (dynamic) way of analyzing structures. (See for instance Piaget 1967, 71) Both thinkers agree that both ways of investigation have to complement each other in order to do justice to reality. But they also agree that the dynamic aspect is the more fundamental one. Whereas Piaget stresses the fact that to understand what knowledge is means to know how it grows, Whitehead formulated the more general process principle: "[H]ow an

actual entity *becomes* constitutes *what* an actual entity *is*.” (Whitehead 1978, 23) So both gave priority to the diachronic/genetic method of research.

Before continuing by comparing the two basic concepts with each other another basic concept of Whitehead’s system first has to be introduced. To designate the dynamic aspect of an actual entity, Whitehead also uses another notion: concrescence. Just as the etymology of this notion suggests, it stresses the growing together of diverse elements into a new unit: an actual entity. The difference between ‘subject’ and ‘concrescence’ lies in the different aspects of the process they emphasize: whereas the notion ‘subject’ stresses *the internal unity of the process*, the term ‘concrescence’ stresses the fact that the process is an *integration of diverse and definite elements*. After this terminological clarification we may continue by comparing in detail Whitehead’s term actual entity to Piaget’s structure.

### 2.2.1 Wholeness - Superject

The superject is the final synthesis of the process of concrescence of an actual entity. As such, it is more than a “mere multiplicity” (Whitehead 1978, 44) of elements, and hence any new element entering into this synthesis would change its definite quality. (Whitehead 1978, 44ff) This implies that according to Whitehead an actual entity “in no sense is ... the sum of its parts.” (Whitehead 1978, 140) Here we find that Whitehead just like Piaget sides with the gestalt-psychologists: the whole is characterized by ‘over-summativity’, and Whitehead illustrates this aspect by referring to the composition of a picture. “The pattern of colours is ‘given’ for us. But an extra patch of red does not constitute a mere addition; it alters the whole balance. Thus in an actual entity, the balanced unity of the total ‘givenness’ excludes anything that is not given. (Whitehead 1978, 44f)

An actual entity achieves its definite unity or wholeness by realizing an eternal object. (Whitehead 1978, 23) Eternal objects - also called platonic forms by Whitehead - exist *before* their realization in and through an actual entity. But that does not mean that they exist apart and devoid of all actual entities; all eternal objects together make up God’s primordial nature. Since God is an actual entity eternal objects are derivative of at least one actual entity. So Whitehead holds a naturalized platonism, since God as an actual entity is not transcendent, but immanent. On this point, as we have already mentioned, Piaget diverges from Whitehead. Discussing the problem of the existence of mathematical patterns Piaget holds a pragmatic position: “Sure, one can always say the subject acquires only structures that exist virtually eternal, and since the logico-mathematical realities still are more of a possibility than of reality one can be content with this platonism for one’s own use.” (Piaget 1968, 66) But immediately Piaget adds that this ‘platonism for one’s own use’ does not suffice if one tries to develop an epistemology, because the inevitable question that is not to be answered in a satisfactory way is raised: “where does that virtual have its place” (Piaget 1968, 66). According to Piaget, this question cannot be answered in a satisfactory manner He continues: “To base it on essences is just a *petitio principii*. To look for it in the physical world is untenable. To relate it to the organic life is more fruitful yet, if one is conscious of the fact that algebra is not contented in the activities of bacteria and viruses.” (Piaget 1968, 66) As we have already seen, Whitehead’s answer to Piaget’s question is: eternal objects are within an actual entity and hence within the universe. This one actual entity that encompasses all eternal objects Whitehead calls ‘God’ or more accurately: the primordial nature of God. In as far as Whitehead conceives God as an exemplification of his metaphysical principles his solution of the problem is immanent rather than transcendent. Furthermore, it is interesting on this point to draw one’s attention to the 5<sup>th</sup> category of obligations, namely the category of conceptual reversion. This category establishes the possibility of genuine constructions of new patterns

category establishes the possibility of genuine constructions of new patterns within the process of concrescence without recurrence to God: "It is the category by which novelty enters the world." (Whitehead 1978, 249) Postulating this category, Whitehead comes very close to Piaget's position on that topic, for this category means that "[t]here is a secondary origination of conceptual feelings with data which are partially identical to, and partially diverse from, the eternal objects forming the data in the first phase of the mental pole." (Whitehead 1978, 26) So this category opens the possibility to construct out of the given data new patterns that are not simply given for the subject. Since God's primordial nature is an element in the data of any concrescence that seems to mean that the subject is able to construct new eternal objects. As promising as this (extreme?) interpretation of the category of reversion may seem for our attempt to relate Piaget's and Whitehead's approach to one another, one must not forget that Whitehead abolished this category (Whitehead 1978, 250), when he recognized that this category contradicted the central ontological principle. According to this principle everything that exists has to be either an actual entity or has to be derived by abstraction from an actual entity. (Whitehead 1978, 73) Since a construction of an eternal entity ex nihilo violates this metaphysical principle, Whitehead abolished it.

Piaget instead holds the position, that the pattern that gives the process of structuralization its definite unity, is created in and through the process of structuralization itself; hence there is no need for any place the patterns to exist before they are constructed in the act of structuralization. Although Whitehead in his purified version (after abolishing the category of conceptual reversion), characterizes the formation of an actual entity as an act of "self-creation" (Whitehead 1978, 47) that - as far as concerned with patterns of definiteness - only refers to (1) to the selection of preexisting eternal objects and (2) to the mode of integration (subjective form) of the eternal object into the process of concrescence of an actual entity.

So although it is evident that Piaget and Whitehead hold different positions it should have become clear that they are closer than one might expect at first glance and superficial reading. If Whitehead's concept of eternal objects is reformed, or even abolished - as many thought it to be possible without essential loss<sup>3</sup> - and the category of conceptual reversion is revived, Whitehead's position fits quite well to Piaget's position. But there is also another possibility (that I prefer): In *Le structuralism* Piaget characterizes a God that could be compatible with the structuralist approach he favours and that could be referred to when looking for a place eternally existing structures could be localized: "God [has] ceased to be unmoving and he constructs constantly ever 'stronger' systems" (Piaget 1968, 135). This God seems to bear some similarity to Whitehead's conception of god - at least to the consequent nature of god. So Piaget seemed to see a possibility to interpret the genetic structuralism in a less naturalized way. However one wishes to side on one thing so far has become clear: Whitehead's and Piaget's position can easily be made consistent.

### 2.2.2 Transformation - Subject/Concrescence

An actual entity is more than the final realization of a definite pattern. An actual entity in its essence is a process: a process of concrescence or growing together.

As a subject, an actual entity is the process of its own self-creation. This process can be characterized as growing together and thereby finally realizing a definite pattern. These processes are the only actualities that constitute the universe. The datum of this process of growing together are the preceding actual entities. So an actual entity emerges from other actual entities

---

<sup>3</sup> This position for instance was held by Hartshorne (1935), Lowe (1941, 115 fn 12; different in 1966, 321), Shahan (1950) and Fitch (1950).

which build its datum. This parallels Piaget's position that a structure evolves by integrating the old structure and new environmental elements which of course are nothing else than structures themselves or aspects of such structures.

Of course Piaget does not discuss this process - as we have mentioned before - on metaphysical grounds but rather on biological or psychological grounds. So he deals with what Whitehead would have called societies. That being the case it leaves no wonder that Piaget emphasised the aspect of continuity between the ongoing structuralizations that must secure a complex organ (biological structure) or psychical structure. To emphasise continuity he stresses the role of the old (complex) structure in the process of structuralization. Apart from this emphasis the process of structuralization and concrescence show deep parallels.

We have seen that Piaget tried to structure this process with the double-category of assimilation and accommodation. He even expressed the process in a formula (see: 2.12). According to Whitehead an actual entity - just like a structure in Piaget's system - emerges by a process of integration of diverse elements into a definite unity or wholeness. So there should be no problem to interpret Piaget's formula in Whiteheadian terms. That this can be done without any difficulty is shown here by substituting Piaget's terms by Whiteheadian ones:

$(T + I) \rightarrow AT + E$	whereby:
	T, I...datum of the process of concrescence:
	perished actual entities
	AT...new actual entity
	E.....negatively prehended actual entities that are excluded from the process of concrescence
	→.....process of concrescence

In an enduring society i. e. a personally ordered society 'T' would be the immediate precursor of the newly developing actual entity. 'I' would be actual entities that build the environment of that actual entity.

That this substitution of the original notions of the variables in Piaget's formula of structuralization by Whiteheadian terms without any difficulty and thereby leaving the meaning unchanged is a good indication that our attempt to search for parallels between the two approaches has been quite successful.

But let us leave this general level of this formula for a while and switch to the field of interacting societies: Whitehead comments on it: "There are thus two sides to the machinery involved in the development of nature. On one side, there is a given environment with organisms adopting themselves to it. ... The other side of the evolutionary machinery, the neglected side, is expressed by the word *creativity*. The organisms can create their own environment." (Whitehead 1967a, 111; see also Whitehead 1958, 7f) So we see that Whitehead although not using the terms 'assimilation' and 'accommodation' sees them nevertheless both at work in the development of nature. And contrary to many darwinists he - just as did Piaget repeatedly - emphasizes the active side of this dipolar process: assimilation.

In Whitehead's account societies come closest to Piaget's (complex) structures. And it is interesting to see that these societies interact constantly with their environment (i.e. mainly other societies). If for instance we return to a personally structured society: A personal society is defined by a definite pattern. This pattern has to be reproduced and altered according to the changes of the environment. New elements have to be integrated (positively prehended) and others have to be excluded from integration (negative prehension). So the society that has just

perished throws its pattern on to a new emerging society that raises out of the 'old' and yet perished societies and other environmental effects. Thereby the pattern that is passed on is modified - accommodated to the prehended new elements - and on the other side new elements are integrated into this structure. So a new pattern is realized. "So the process of concrescence is an interactional process of adaptation: a process of growing together.

There is even one passage in Whitehead's writings where he even uses the term 'assimilation'. In his essay 'The Rhythmic Claims of Freedom and Discipline' (Whitehead 1967b, 29-43) he writes: "It must never be forgotten that education is not a process of packing articles in a trunk. Such a simile is entirely inapplicable. It is, of course, a process completely of its own peculiar genus. Its nearest analogy is the assimilation of food by a living organism" (Whitehead 1967b, 33). This is the same analogy Piaget uses to introduce the double-category of assimilation-accomodation. Whitehead has no equivalent for the notion-pair assimilation-accomodation but on the metaphysical level the terms 'concrecence', 'integration' and 'reintegration' (see Whitehead 1978, 245) suffice the same function.

### **2.2.3 Self-Regulation - Subjective Aim**

Concrecence is a regulated process that leads to new actual entities. Piaget's structuralizations end in new definite unities namely structures and Whitehead's concrecences bring about new actual entities exemplifying eternal objects. Whitehead introduces the concept of subjective aim (Whitehead 1978, 19) in order to do justice to this regulative aspect. "This subjective aim is the subject itself determining its own self-creation as one creature." (1978, 69) The subjective aim can be conceived as an eternal object that from the initial phase guides the (a-temporal) process of melting together of the diverse elements of the immediate past. (1978, 102) Without this tendency towards an end (pattern) no definite unity of a superject could be reached. The subjective aim determines which perished actual entities are positively prehended and thereby integrated and what elements of the immediate past are negatively prehended and so excluded from the process of the realization of the aimed at pattern.

All that comes very close to Piaget's position on self-regulation. And since this is the case Whitehead runs into the same troubles as did Piaget: the circularity of the conception of self-regulation. This will be discussed next.

## **3. The Paradox of Becoming**

Both thinkers hold radically relational and process-oriented positions. Now that the parallels between the basic concepts of the two approaches have been discussed in detail, we shall shift our attention to a main problem both thinkers are confronted with: the paradox of becoming.

### 3.1 The Paradox of Equilibration

Self-regulation of structuralizations is one of the essential features of a structure. According to Piaget, it is this self-regulation of structures that saves the structures from being destroyed, by assimilating new incompatible elements. So the structure is "conserved in a way that the introduced changes are an enrichment." (Piaget 1968, 16) According to Piaget structuralization normally produces a new improved structure. However this raises the problem that the new structure has to be in some way be present at the outset of the process of its own production, because that seems to be the only way to conceive how those elements, which are not capable of integration into the new structure, are excluded from the process of assimilation. Piaget has stated that this situation is "disturbingly similar to a vicious circle" (Piaget 1975, 30). For it seems that "the cycle of interaction ... is the cause as well as the result of the regulations." (Piaget 1975, 30) In one of his latest books *L'équilibration des structures cognitives* Piaget's tries to solve the problem by giving priority to the wholeness: "But in each biological and cognitive system the whole must be characterized as more original; it does not evolve from the combination of parts, but the parts evolve by differentiation from it." (Piaget 1975, 30)

This decision in favour of the whole as against the parts, however, has consequences which cannot be Piaget's intention. For if we take serious, that the parts (elements that are to be integrated into a new definite structure) evolve by differentiation out of the whole, so the grave question raises if thereby, the parts are formed in advance by the whole. Stated in different words: does this solution not abolish accomodation? If so, is Piaget's theory still the same? For a regulation that abolishes one of two interacting elements is no regulation at all. Broughton stated the problem clearly: "Piaget has emphasized the 'activ subject' at the expenses of the active environment." (Broughton 1981, 273) And he goes on by demonstrating that this position leads to consequences that cannot be accepted: "How can a world that is constructed by the subject resist to construction of the subject?" (Broughton 1981, 274) Here we find one of the reasons why Piaget often is interpreted as a radical constructivist (see for instance v. Glasersfeld 1994). For if the constructed whole (subject/ person) is given absolute priority, the parts (environmental aspects) are reduced to creations of the wholes (subjects/persons). Moreover this late position is contradicting Piaget's earlier writings. In his book *Biologie et connaissance* for instance Piaget explicitly rejects his later position "the whole does not precede the parts" (Piaget 1967, 334). The late Piaget has given up his midway position between whole and parts, subject and objects.

Moreover Ros has argued that Piaget's proposed solution is no solution at all: "For on the one hand the 'equilibration majorant' is defined as an equilibration that leads to a new wholeness. But if this is true, the whole on the other hand is not to be conceived as the regulator of this transition - Piaget does do just exactly that." (Ros 1983, 67)

Hence Piaget's proposed solution either is not an adequate solution or one of the central assumptions of his early approach has to be given up, namely that of assimilative-accomodative interaction of subject and object (See: Piaget 1967, 175; Piaget 1978; 35, Piaget 1975, 15). This alteration of interactionist core assumption is so central that - if accepted - one hardly can speak of the same theory anymore. What about Whitehead? Did he face the same problem? And if so, was he able to propose a better solution?

### 3.2 Paradox of Concrecence and the ‘Epochal Theory of Time’

An actual entity is its own becoming. On the one side a new actual entity is about to emerge but on the other it has to guide this process of its own self-creation which seems impossible, since it does not exist yet. But without this guidance there is no fair chance the actual entity will ever come into existence. In other words: that which is about to emerge and so has to be realized yet has to effect its own process of becoming. This paradox has been criticized severely by different thinkers. For instance Gentry puts the question as follows: "How shall the subject's response, the reaction etc. to the datum or the selective and discriminating functions that are ascribed to prehensions be explained, if there is not postulated an existing subject?" (Gentry, 1938, 518) And Eslick brings it to the point when he writes: "Here we have to do it with something very mysterious. As the subject of its own feelings, the subject exists before its own existence ... The principle of contradiction is violated: a thing cannot at the same time exist and not exist." (Eslick 1958, 512)

Whitehead was well aware of this problem. He tried to solve it by his epochal theory of time. In attempting to find a solution he did not try to solve the problem by eliminating one factor of the process of interaction, like Piaget did when he gave absolute priority to the subject (assimilation). On the contrary: the epochal theory of time allows Whitehead to hold on to his radically relationalist position.

The afore mentioned paradox of becoming is essentially a problem of succession, in time because the problem is that of a subject that has to exist *before* its own existence, in order to secure its own coming-into-existence. Now Whitehead maintains that within the process of concrecence there "is not the temporal succession: such a view is exactly what is denied by the epochal theory of time. Each phase of the genetic process presupposes the entire quantum, and so does each feeling in each phase. The subjective unity dominating the process forbids the division of that extensive quantum which originates with the primary phase of the subjective aim." (Whitehead 1978, 283) Rather the product of this process is temporal extension but not the concrecence itself. Hence its unity is not dividable into 'before' and 'after'. That implies that the creation of an actual entity follows a principle of 'all or nothing'. Either it comes into existence - then as a whole - or it does not - then there is nothing at all of it.

Whitehead relies on W. James for support of this - at first sight unquestionably strange - concept. (Whitehead 1978, 68) On the other hand Whitehead argues that this contradiction is due to the deficiencies of our languages that rests on a basic subject-predicate structure. Hence this contradiction, is fictitious. "If the subject-predicate form of statement be taken to be metaphysically ultimate, it is impossible to express this doctrine of feelings and their superject." (Whitehead 1978, 222) <sup>4</sup>This structure of language supports a substance-attribute approach in metaphysics by supplying it with evidence. Hence Whitehead takes the only available way to argue for his position. He gives an indirect argument for his theory: he shows that the contradicting thesis, namely that each process or sub-process can be divided into temporal successive phases, leads into contradictions as well so that the question at least remains an open one. Doing that he falls back on an old argument by Zenon: the paradox of the flying arrow. A brief discussion of this argument will be given now.

---

<sup>4</sup> There have been many attempts to explain Whitehead's epochal theory of time positively. One of the most intelligible - at least for me - is that of W. Christian provided in his essay 'Some Aspects of Whitehead's Metaphysics' (1983).

”The argument as far as it is valid, elicits a contradiction from the two premises: (i) that in a becoming something (*res vera*) becomes, and (ii) that every act of becoming is divisible into earlier and later sections which are themselves acts of becoming.” (Whitehead 1978, 68)

The second premise states that each earlier section of becoming itself is divideable into new sections and so on infinitely (ii). Hence nothing can become at all since hence any act of becoming presupposes the earlier sections of its own becoming which themselves divisible cannot come into existence, since they themselves presuppose earlier phases of their becoming, in order to be able to become and so on. And so this premise (ii) contradicts premise (i) that states that in any act of becoming something comes into existence.

”Consider, for example, an act of becoming during one second. The act is divisible into two acts, one during the earlier half of the second, the other during the later half of the second. Thus that which beomes during the whole second presupposes that which becomes during the first half-second. Analogously, that which becomes during the first half-second presupposes that which becomes during the first quarter-second, and so on indefinitely. Thus if we consider the process of becoming up to the beginning of the second question, and ask what then becomes, no answer can be given. For, whatever creature we indicate presupposes an earlier creature which became after the beginning of the second and antecedently to the indicated creature. Therefore there is nothing which becomes, so as to effect a transition into the second in question.” (Whitehead 1978, 68)

This last inferred sentence contradicts premise (i). So we have to abolish one of the two premises in order to solve the contradiction. Whitehead decided to reject premise (ii). He infers from his indirect argument: ”The conclusion is that in every act of becoming there is the becoming of something with temporal extension; but that the act itself is not extensive, in the sense that it is divisible into earlier and later acts of becoming which correspond to the extensive divisibility of what has become.” (Whitehead 1978, 69) That is an exact statement of Whitehead’s epochal theory of time.

Of course Whitehead - and many critics have called attention to that fact<sup>5</sup> - describes the process of concrescence by using temporal terms such as ”succession”, ”antecedent”, ”continuity” and ”until” (see for instance Whitehead 1978, 26). This is due to the impossibility of talking within a language with a subject-predicate structure about processes in any other way than by using such terms.

The same line of argumentation is expressed by the physicist D. Bohm. He maintains that the subject-predicate structure of language is not able to express subatomic processes adequately. (Bohm 191987, 51-99) Hence he has proposed a more dynamic mode of language: ”Hence it is clear that the rhei-mode is based on a world view, that differs absolutely from the common use of langugae.” (Bohm 1987, 75) That modern quantum physics quarrals with analogue problems like Whitehead’s approach is supportive of Whitehead’s position. That is epecially so because in reference to the epochal theory of time he claims that ”the cosmological outlook, which is here adopted, is perfectly consistent with the demands for discontinuity which have been urged from the side of physics. Also if the concept of temporalisation as a successive realization of epochal durations be adopted, the difficulty of Zeno is evaded.” (Whitehead 1967a, 136) Bohm confirms this impression when he declares that his ”declared starting point in the whole equals that of Whitehead.” (Bohm 1987, 77)

---

<sup>5</sup> So for instance R. B. Edwards (1975, 202), R. Neville (1971, 198), V. C. Chappell (1963, 73), W. Pannenberg (1986, 190), Hammerschmidt (1947), Christian (1967) and Leclerc (1958) among many others.

Kesselring in dealing with the same paradox in Piaget's approach namely that of structuralization refers to the deficiencies of our language(s) and its underlying analytical thinking to give consistent descriptions of processes too: "The ... paradoxes are not the results of contradictions that could, in principle, be avoided or into which one has involved without noticing and which one could be charged of by an opponent, but rather they are consequences of the lack of ability of analytical thinking apply to the dynamic structures that biological as well as cognitive processes express." (Kesselring 1981, 126)

As we have already seen Piaget was fully aware of that problem. In one of his late works - as we have seen - Piaget tried to solve the problem by giving priority to the whole and thereby devaluing the role of the parts. "But in any biological and cognitive system the whole must be characterized as more original; it does not emerge from the connection of its parts but the parts emerge by differentiation from it." (Piaget 1975, 30) Whitehead on the contrary does not move off his relational position. Instead he develops the epochal theory of time which allowed him to hold the middle relational position between an overemphasis of the subject (wholeness) as Kant did and an overemphasis of objects (parts) as Hume did. So Whitehead's reflections on the relational approach go deeper than Piaget's and are even compatible with the basic features of contemporary (quantum) physics. (For detailed accounts on that topic see for instance: Shimony 1967; Wallack 1980, 262; Tanaka 1997; Eastman 1997; Papatheodorou & Hiley 1997; Finkelstein & Kallfelz 1997; Fagg 1997; Rosen 1997.)

So far we have seen that Piaget and Whitehead have developed two systems of thought that are parallel - even concerning the inherent problems.

#### **4. The Concept of Person**

In this section the accounts of the terms 'person' (Whitehead) and 'subject' (Piaget) will be discussed and compared. Today the term 'subject' usually involves a whole series of associated notions: subjectivity, person, self, individuum, substance, ... Many definitions for these terms and their interconnections have been proposed and so a confusing situation has evolved in that field. With reference to the term 'person' Theunissen states: "The term substance here is confronted with the concept of person, there it is identified. Here the person appears as the individual, there as its opposite. One sees between person and subject no difference the other one sees an insurmountable gap. For the one, personality and Ego coincide, for others they do not even affect each other. And while one when saying 'person' means the self, the other one understands it as that which has to be overcome by the becoming of the self." (Theunissen 1966, 465) Theunissen tries to get some system into this multiplicity of approaches by contrasting two prototypic concepts of person:

- (1) the relationalist concept of person
- (2) the substantialist (absolute) concept of person. (Theunissen 1966, 463)

The relational position characterizes the person as "a being in and out (Theunissen 1966, 463) The relations are constitutional for the person. It follows that a person cannot even be thought of without its relations to its environment. This position according to Theunissen is derived from the domain of the theater. "The being-in-the role of the actor is the model form which the being in relations of the person has been read of. ...He [the person] is not behind or above the role, not somebody which as one that is an already existent would perform in a role, but solely the role in each one performs." (Theunissen 1966, 483)

The absolute substantialist view of person defines the person as self-sufficient and independent of its relations. A person here is conceived as a pre-relational and thereby a self-sustaining entity: a substance. This substantialist approach conceptualizes the person as the bearer of relations that exists before and hence independent of these relations. Referring to its theatrical origin Theunissen states: "But the actor also can be detached from its role and be viewed as the bearer of the role. Individuum on its own was at the place of origin of the term of empty *substratum*, that was left after abstraction of the role." (Theunissen 1966, 484)

This distinction drawn by Theunissen is helpful as a principle of order in our context, for it facilitates to show the parallels between Whitehead's and Piaget's approaches; it will be demonstrated that Whitehead just as Piaget held relationalist concepts of person.

#### **4.1 Subject in Whitehead's Approach: Person**

It was already mentioned that Whitehead used the term 'subject' in an extraordinary way. Within his system it designates a metaphysical notion, namely the private aspect of the concrescence of an actual entity. To refer to that which today usually is termed 'subject' he introduces the notion 'person'.

A (human) person, according to Whitehead, is a series of actual entities. Such a serially ordered society is technically called personal society in Whitehead's system. It is not man as a whole. Man is a "complex structure" (Whitehead 1978, 109): different kinds of societies are hierarchically interwoven into one complex unity. (Whitehead 1967a, 206, Whitehead 1968, 25) The body itself a complex of societies of different levels is ordered in a way that allows a personal society to sustain on top of that hierarchy. This personal society with its "dominant members" (Whitehead 1978, 102, see also Whitehead 1968, 23) integrates the subordinate societies and their reactions towards environmental changes into a unity and thereby secures the survival of that complexity called man.<sup>6</sup> Because of its sequential order a personal society shares the main characteristics of an actual entity.

Rejecting what he called the 'subjectivist principle' (Whitehead 1978, 157) Whitehead withdrew from any substantialist concepts of person. In doing so he at same time dissociated from empiricism (cf. Hume) as well as from transcendentalism (cf. Kant). If a person is conceived as a 'protosubstance' (first substance) in the Aristotelian sense, by definition only attributes and not substances themselves can be experienced by persons (which themselves are first substances). For, according to Aristotle, substances can neither inherit in, nor be predicated of other substances. (See Aristotle (Met. V 7, 1017b [24])) In Hume's case that implies that there is nothing like a 'substance' at all, since only what can be experienced can exist. In Kant's case this leads to a complete ignorance about the substance or 'noumenon' (Ding an sich).

Whitehead by conceiving the (human) person as a serially ordered society kept distance to both conceptions. His position takes the *via media* between the two extremes of empiricism and transcendentalism: an actual entity is as well the product of the environment (to a certain extent) as a process self-determination (to a certain extent). To put it in Piaget's terms: an actual entity grows together by assimilation and accommodation.

There are at least two aspects of an actual entity that distinguishes it from a 'first substance': First it is (1) radically relational and second it is (2) active. And since a person is constituted by a sequence of actual entities, these two characteristics are essential to persons too.

---

<sup>6</sup> Of course this distinction between subordinate societies and the dominant or personal society as just introduced is oversimplified as Whitehead himself has emphasised (1968, 24f)

(1) Relationality means "that all actual things are subjects, each prehending the universe from which it arises." (Whitehead 1978, 56f) Since an actual entity emerges out of its immediate past environment, each member of the living personal society which is nothing else than such actual entities. It grows together out of the environment, which includes its own predecessor. An actual entity is nothing else than its relations to its immediate past. It does not exist before these relations. It is rather 'being-related'.

(2) A growing together of an actual entity is not a mere passive occurrence. The emerging actual entity shapes itself around the environmental conditions. In this restricted sense it is an act of self-creation. Whitehead rejects the so called 'sensationalist principle' (Whitehead 1978, 157) which states that experience is a passive registration of something simply given. Whitehead shows that even Hume violated this sensationalist principle: supposed we present a continuity of shades of a certain colour leaving one tone it would according to Hume be possible for a viewer to add this tone autonomously. (Whitehead 1978, 260f) What for Hume was a violation of an important principle is for Whitehead a central principle itself: the constructive activity of an actual entity. Whitehead illustrates this position by using a theater-metaphor: The process of concrescence of a new actual entity out of the just perished world is "not a mere representation of the cause. It is the cumulation of the universe and not a stage play about it." (Whitehead 1978, 237) By this activity novelty enters the world. In respect to human beings this is a necessary condition of their freedom.

Now that we have characterized Whitehead's concept of person there is still one important problem left: the problem of identity. Whitehead is well aware of this problem. (See: Whitehead 1967a, 186f) The problem can be stated as a logical dilemma (more special: a constructive dilemma):

On the one side the identity of a human person has to be secured. This is done by the concept of a serially ordered society which passes on a certain pattern from the just perished actual entity to the emerging one. And exactly this feature of securing the identity between actual entities of one society threatens the possibility for flexible response the environmental change. Adequate (re)action towards environmental changes means integration of new elements into the unity of an actual entity; thereby its unifying pattern has to be changed. So the new actual entity must by definition be qualitatively different from the preceding one which threatens the continuity, and hence identity, between the two actual entities in question.

The problem hence can be stated as a constructive dilemma with the following argument form:<sup>7</sup>

- |              |                        |                              |
|--------------|------------------------|------------------------------|
| (1)          | $P \vee \neg P$        | (1), (2), (3)..... premises  |
| (2)          | $P \rightarrow R$      | .....negation                |
| (3)          | $\neg P \rightarrow Q$ | .....disjunction             |
| $\therefore$ | $R \vee Q$             | .....implication             |
|              |                        | $\therefore$ .....conclusion |

In words:

- (1) The (human) person is a serially ordered society or it is not a serially
- (2) If the human person is a serially ordered Society, then the (human) person cannot bring about new acts.
- (3) If the (human) person is not a serially ordered society, then it has no identity.

---

<sup>7</sup> For a detailed account of the logical dilemmata see W. C. Salmon (1973, 68-71).

∴ The (human) person cannot bring about new acts or it has no identity.

Since a constructive dilemma is a valid logical argument, there is only one way out of the problem: by differentiating at least one of the premises. And that is exactly the strategy Whitehead takes: He introduces a new form of personal society: namely the *living* personal society. The principle of inheritance of the defining pattern is kept. But - if I understand Whitehead correctly on that point - by the construction of propositions the members of a living personal society are freed from the grip of the immediate past. But still the question remains as to how identity is secured. Propositions loosen the grip of the past by producing novelty. This is, according to Whitehead, their main function: to be a "lure for feeling" (Whitehead 1978, 25).

How can identity be protected in a society which members, by definition, produce novelties? Whitehead never has dealt extensively with that question. He made a few sketchy remarks on the topic that need interpretation. This we shall undertake now.

There are mainly two sections in *Process and Reality* that give a glimpse in which direction Whitehead thought a solution to be possible: "We - as enduring objects with personal order - objectify the occasions of our own past with peculiar completeness in our immediate present." (Whitehead 1978, 161) And: "An enduring personality in the temporal world is a route of occasions in which the successors with some peculiar completeness sum up their predecessors." (Whitehead 1978, 350) An alternative to the static inheritance of the defining pattern of a personal society a living personal society changes its pattern by intergrating new elements into its newly developing unity but under the condition that the old pattern of unity is somewhat 'conserved' in the new unifying pattern. So the old pattern becomes qualitatively transformed, but still is 'summed up' in the new one and thereby preserved on a new - more complex - level of unity. To arrive at a unity that synthesizes the old pattern without (essential) loss and new, sometimes very strange environmental elements, indeed needs a great flexibility in developing new patterns. Such flexibility only can be attained by constructing propositions.

#### **4.2 Person in Piaget's Approach: Subject**

What now is Piaget's concept of a (human) person? First we have to mention that Piaget in general uses the term subject to designate what Whitehead has termed 'person'. Piaget distinguishes between two kinds of 'subjects': the epistemic and the empirical subject. He was mainly interested in the epistemic subject. While the empirical subject is the concrete subject - *this individual* - the epistemic subject is defined as that which "is common to all [empirical] subjects at a certain stage [of development]." (Piaget 1968, 133) So statements about the epistemic subjects are general statements about all subjects. But what is the epistemic subject? The answer is easy if one remembers that Piaget holds the position that reality is built up by structures only. Hence the epistemic subject has to be a structure. To put it in Piaget's own words: "The subject exists, because the 'being' of the structures in general is their structuralization." (Piaget 1968, 134) So Piaget just like Whitehead rejects an underlying substratum of the process of structuralization and so avoids the reification of the subject. The subject has to be a structure. But structures change continuously while interacting with the environment. There are not many sections in Piaget's work that deal with that question. So Piaget's position needs clarifying interpretation. First Piaget maintains that "the organism is the origin of the subject (Piaget 1968, 50). This is in accord with Whitehead's position because the living personal society needs an adequate surrounding in order to be able to survive. This environment is the body. So the subject seems to be tightly connected to the bodily structures.

According to Piaget man is a complex of structures which are hierarchically ordered and which members intensively interact with each other. Hence Piaget distinguishes between three types of equilibration (Piaget 1975, 166). These are the equilibrations between

- (1) the subject and the objects
- (2) the subsystems (substructures) of the organism ( for instance organs)
- (3) the subject and the subordinated systems, which organize the substructures "to a hierarchical order" (Piaget 1975, 166).

For a discussion of the (human) subject only type three is primarily relevant because it deals with the question how the subject is related to the body. Piaget mentions that equilibrations of type three "dominates the other two." (Piaget 1975, 166) If this were not the case very easily harmful equilibrations on those levels could take place that might even threaten the existence of the whole organism. "This ability to preserve the whole hence is the regulator, which can at any time force a direction on the [subordinated] regulations and that with an imperative demand: either the integration of the new assimilation and accommodation into the whole cycle is possible or this cycle is interrupted, the system having given up." (Piaget 1975, 176f)

That implies that the subject from Piaget's point of view is on top of the hierarchy, continuously equilibrating between the influences of the internal substructures, the external changes (structuralizations) and its own goals. That suggests to conceive the enduring subject as a sequence of structurings of the structures on top of the hierarchy. This interpretation of course is in accord with Whitehead's position on the (human) subject. Though Piaget himself does nowhere in his work discuss this problem, it is hard to see how else his conception of the subject as a structure can do justice to temporal endurance. Of course this position raises the same problem as Whitehead's: the problem of the subject's identity over time.

Since Piaget nowhere explicitly takes the view of the temporally continuing subject as a linear series of structurings there of course cannot be found any passages on the problem this position involves. The problem emerges because a sequence of structurings by definition permanently changes the unifying pattern. In what sense are these different structures that constitute subject identical? There is only one passage - as far as I can see - where Piaget touches the problem at least slightly. He writes: "[T]he assimilation is also a factor of permanence and continuity of the forms of the organism." (Piaget 1968, 70) Even in that passage we do not find the terms 'identity' and 'subject'. But Piaget writes of 'permanence' and 'continuity'.

But how can assimilation be 'a factor of permanence'? Isn't it just the contrary: is assimilation not necessarily associated with the need to accommodate to the assimilated elements? Here the notion of the 'equilibration majorant' may help to understand the quotation. Equilibrations (structurizations) are reactions to disturbing environmental occasions. By altering the pattern (wholeness) of the old structure these new elements can be integrated and so lose their aspect of disturbance. These modifications of the structures definite character of wholeness is not to be conceived simply as a change; it is rather - as Piaget has put it - an "enrichment" (Piaget 1975, 38) of the old structure: The new structure secures the old possibilities along with the development of new ones. So Piaget's few expressions on the problem of topic of the (human) subject easily can be interpreted in accordance with Whitehead's position.

But there are even more parallels. For Piaget too the (human) subject is characterized as (1) radically relational and (2) as essentially active.

(1) According to Piaget the process of structuralization is an act of intergation of environmental influences into the thereby altered structure. And it is primarily this process of development that exists not the developed structure. Piaget expresses this fact by calling the subject an "organ of relations" (Piaget 1968, 68). There is only one possibility to conceive the subject as an organ of relations: "the subject ... owns no structure before it constructs them" (Piaget 1968, 69). So the subject is the process of its own construction in interaction with the environment.

(2) In order to be an organ of relations the subject must be active. Piaget has stated that the subject "is so to speak the center of activity." (Piaget 1964, 206) or "the center of functioning" (Piaget 1968, 68). Piaget himself expresses this fact in a theater-metaphor: "In one word, even in the domain of perception the subject is not simply the theater on which stage plays take place, independent of the subject and in advance, regulated by laws of an autonomous physical equilibration; it is the player and often enough even the author of these structurings which it establishes ... through an active equilibration of external interferences and their compensations, hence through continuous self-regulation." (Piaget 1968, 58) And Piaget is well aware that he dissociates from the empiricists on that topic - just as did Whitehead. While Hume conceived perception as a passive act of copying external stimuli, Piaget is "in contradiction to this passive conception of the act of perception." (Piaget 1978, 25) Rather in his view "the stimuli have to be dissociated from the noise, that means the individuum has to decide with all risks of gain or loss of information that such decisions involve" (Piaget 1972, 81). So it is the active subject that creates the act of perception out of the multiplicity of stimuli by deciding what stimuli are to be integrated into the emerging structure and which of them are to be neglected and driven into the background of mere noise. But Piaget departs from transcendentalism in the sense of radical constructivism as well. He decides for the middle way: "Of course the subject needs *objective* information be become aware of its own actions but it also needs many subjective components." (Piaget 1978, 26 italics mine) And here again the aspect of activity meets the aspect of relationalism: the subject is active in relating itself to the environment and thereby creating itself in an ongoing process.

So finally we again have found deep parallels between Whitehead's and Piaget's accounts of person/subject.

## 5. Final Remarks and Some Future Issues

The result of this comparison indicates that a process psychology, which is - as far as I can see - yet to be developed, can build on Piaget's empirically corroborated theory. Since Piaget's approach has deeply influenced developmental psychology and also the so-called social-cognitive approach there is good hope that Whitehead's metaphysics is consonant with at least some recent approaches in the field of psychology.

We also have seen that Whitehead's analysis and proposed solutions on several topics (personal identity and paradox of becoming) go deeper and are more promising than Piaget's. So the Piagetian approach might profit from this comparison with Whitehead's philosophy. The process approach may introduce interesting new ideas that might be leading to the testing of new hypotheses.

Besides these advantages in contentions a radical process approach in psychology involves profound consequences on methodological issues too. I would like to mention just a few here.

For instance the concept of reliability defined as test-retest-reliability has to be reexamined carefully if the human person is conceived as interacting with its environment and thereby constantly changing. For test-retest-reliability - if I am to put it a bit ironically - seems to be a measure that shows the *insensitivity* of a test towards change! Of course I do not argue against the concept of reliability in terms of test-retest in general. This criterion is very important in the fields of morphological (static) investigations. What I want to point at is simply that within an eminently processual approach there is an urgent need for the development of genetic (dynamic) research tools and corresponding criteria.

Also within a process-view the human person has to be conceived of as unique, for the person's interactions with the very special environments from birth on (and even before birth) lead to the development of idiosyncratic personality patterns. And on the basis of these unique patterns the person construes *his/her situations* i.e. s/he gives psychological meaning to it. No person ever simply responded to pure stimulus (objective situations) - as Jean Piaget and George Kelly have realized quite early in this century - but only to experienced and hence meaningful situations. Hence the radical behaviorist approach must fail from the start. But for the protagonists of a process psychology the task remains to develop instruments which do justice to this idiosyncratic patterning of human persons and their activities be it experience or action. Here the process psychologists may examine the - admittedly very few - different idiographic tools already developed in the field of psychology. Here George Kelly's grid-technic seems to be one of the most promising ones (Kelly 1955, Fransella & Bannister 1977).

We are touching here the issue of transsituational consistency or situation-specificity in human agency that has been discussed by one of the main proponents of the social-cognitive approach, Walter Mischel (1968, 1973; see also: Patry 1991a, 1991b, 1998; Riffert 1998). Mischel demands that there are no traits in humans that transcend all kinds of different situations. Humans are constantly interacting with unique environments and hence adopt themselves to ever changing specific situations. Rather than using static personality questionnaires a process approach should favor the analysis of behavior-situation-cognition units in order to do justice to these continuously ongoing interactions (see for instance Mischel & Shoda 1995). Instead of expecting from a measure to yield similar scores for the same subjects (population) on different occasions (as is usual with classical ANOVA designs in psychology and experimental education) within a process-approach it is more promising to try to predict under what conditions stability and/or change are more likely to occur in the same person in different situation(typ)s. Such a perspective in investigation would be more relevant to psychotherapy and education.

These very few remarks on methodological issues may show that implementing a process-approach in the field of psychology - while surely a promising and necessary task - at the moment is nothing more than vision.<sup>8</sup> Only hard work on very different issues will transform it into a reality. But visions are lures for feelings. So vision is the first and necessary task towards realizing the goal of developing a process psychology.

---

<sup>8</sup> The widespread and substantial interest in the implications of Process Philosophy for the psychological domain finally led to the foundation of the APP (Association of Process Psychology) at the Third International Whitehead Conference in summer 1998. It is an encouraging sign that the task of developing a Process Psychology is about to start in different parts of the world.

## Literaturverzeichnis

- Bertalanffy L.v. (1970): ...aber vom Menschen wissen wir nichts. Düsseldorf: Econ.
- Bohm D. (1987): Wholeness and the Implicate Order. London: Kegan.
- Broughton J. M. (1981): Piaget's Structural Developmental Psychology III: Function and the Problem of Knowledge. *Human Development*, 24, 257-285.
- Chappell V. C. (1963): Whitehead's Theory of Becoming. In: G. Kline (Ed.): *A. N. Whitehead: Essays on His Philosophy*. New Jersey: Prentice Hall.
- Christian W. (1967): *An Interpretation of Whitehead's Metaphysics*. New Haven: Yale University Press.
- Christian W. (1983): Some Aspects of Whitehead's Metaphysics. In: L. Ford & G. Kline (Eds.): *Explorations in Whitehead's Philosophy*. New York: Fordham University Press.
- Eastman T. (1997): Process Thought and natural Science. *Process Studies*, 26, 239-246.
- Edwards R. B. (1975): The Human Self: An Actual Entity or a Society? *Process Studies*, 5/3, 195-203.
- Eslick L. (1958): Substance, Change and Causality in Whitehead. *Philosophical and Phenomenological Research*, 18, 503-513.
- Fagg L. (1997): Electromagnetism, Time and Immanence in Whitehead's Metaphysics. *Process Studies* 26, 308-317.
- Fetz R. L. Für eine Verbindung Whiteheadscher und Piagetscher Ansätze. In: H. Holz & E. Wolf-Gazo (Hrsg.): *Whitehead and the Idea of Process*. München: Alber.
- Fetz R. L. (1988a) *Struktur und Genese - Jean Piagets Transformation der Philosophie*. Bern: Haupt.
- Fetz R.L. (1988b): On the Formation of Ontological Concepts: The Relationship Between the Theories of Whitehead and Piaget. *Process Studies*, 17/4, 262-272.
- Finkelstein D. & Kallfelz W. M. (1997): Organism and Physics. *Process Studies*, 26, 279-292.
- Fitch B. (1950): Actuality, Possibility and Being. *Review of Metaphysics*, 3, 367-384.
- Fransella F. & Bannister D. (1977): *A Manual for Repertory Grid Technique* London: Academic Press.
- Gentry G. (1938): Prehensions as an Explanatory Process. *The Journal of Philosophy*, 35, 517-522.
- Glaserfeld E.v. (1994): Piagets konstruktivistisches Modell. In: G. Rusch & S. J. Schmidt (Hrsg.): *Piaget und der radikale Konstruktivismus*. Frankfurt a. M.: Suhrkamp.
- Hammerschmidt W. W. (1947): *Whitehead's Philosophy of Time*. New York: Russell & Russell.
- Hartshorne Ch. (1935): On Some Criticism of Whitehead's Philosophy. *Philosophical Review*, 44, 323-344.
- Kesselring Th. (1981) *Entwicklung und Widerspruch - Ein Vergleich zwischen Piagets genetischer Erkenntnistheorie und Hegels Dialektik*. Frankfurt a. M.: Suhrkamp.
- Kelly G. A. (1955): *The Psychology of Personal Constructs* 2 vols. New York: Wiley.
- Leclerc I. (1958): *Whitehead's Metaphysics*. New York: Humanities Press.
- Lowe V. (1941): Wiliam James and Whitehead's Doctrine of Prehension. *The Journal of Philosophy*, 38, 113-126.
- Lowe V. (1966): *Understanding Whitehead*. Baltimore: John Hopkins Press.
- Neville R. (1971): Genetic Succession, Time, and Becoming. *Process Studies*, 1/3, 194-198.
- Mischel W. (1968): *Personality and Assessment* New York (Wiley).
- Mischel W. (1973): 'Toward a Cognitive Social Learning Reconceptualization of Personality' in: *Psychological Review* 80, 252-283.
- Mischel W. & Shoda Y. (1995): 'A Cognitive-Affective System Theory of Personality: Reconceptualizing Situations, Dispositions, Dynamics, and Invariance in Personality Structure', in: *Psychological Rview* 102, 246-268.
- Pannenberg W. (1986): Atom, Dauer, Gestalt: Schwierigkeiten mit der Prozeßphilosophie. In: F. Rapp & R. Wiehl (Hrsg.): *Whiteheads Metaphysik der Kreativität*. Freiburg: Alber.
- Papatheodorou C. & Hiley B. (1997): Process, Temporality and Space-Time. *Process Studies*, 26, 247-278.
- Patry J.-L. (1991a): *Transsituationale Konsistenz des Verhaltens und Handelns in der Erziehung* Peter-Lang Verlag (Frankfurt a. M.).
- Patry J.-L. (1991b): 'Der Geltungsbereich sozialwissenschaftlicher Aussagen. Das Problem der Situationsspezifität', in: *Zeitschrift für Sozialpsychologie* 223-244.
- Patry J.-L. (1998): 'Kaktus und Salat - Zur Situationsspezifität in der Erziehung', in: J.-L. Patry & F. Riffert (Eds.): *Situationsspezifität in pädagogischen Handlungsfeldern* Studienverlag (Innsbruck) in print.
- Piaget J. (1950-1973): *Introduction a epistemologie gentique*. Tome I-III, Paris: Presses Universitaires de France.
- Piaget J. (1964): *Six etudes de psychologie*. Geneve: Gonthier.
- Piaget J. (1965): *Sagesse et illusions de la philosophie*. Paris: Presses Universitaires de France

- Piaget J. (1967): *Biologie et Connaissance*. Paris: Gallimard.
- Piaget J. (1968): *Le structuralism*. Paris: Presses Universitaires.
- Piaget J. (1972a): *Epistemologie des sciences de l'homme*. Paris: Presses Universitaires de France
- Piaget J. (1972b): *Problemes de psychologie genetique*. Geneve: Gonthier.
- Piaget J. (1973): *L'epistemologie genetique*. Paris: Presses Universitaires de France.
- Piaget J. (1975): *L'equilibracion des structure cognitives. Problemes centrale du development*. Paris: Presses Universitaires de France.
- Piaget J. (1978): *Piaget's Theory*. In: Carmichael's *Manual of Child Psychology*. New York: Wiley.
- Riffert F. (1994): *Whitehead und Piaget - Zur interdisziplinären Relevanz der Prozeßphilosophie*. Wien: Peter Lang.
- Riffert F. (1998): 'Verhalten, Emotionen, Ziele - Zur Situationsspezifität in Unterrichtsfächern', in: J.-L. Patry & F. Riffert (Eds.): *Situationsspezifität in pädagogischen Handlungsfeldern* Studienverlag (Innsbruck) in print.
- Ros A. (1983): *Die genetische Epistemologie Jean Piagets: Resultate und offene Probleme*. Tübingen: Mohr (Philosophische Rundschau, Beiheft 9).
- Rosen J. (1997): *Response to Hartshorne Concerning Symmetry and Asymmetry in Physics*. *Process Studies*, 26, 318-323.
- Rotman B. (1983): *Jean Piaget: Psychologist of the Real*. Hassocks: Harvester Press.
- Salmon W.C. (1973): *Logic*. Englewood Cliffs: Prentice Hall.
- Shahan I. P. (1950): *Whitehead's Theory of Experience*. New York: King's Crown Press.
- Shimony A. (1967): *Quantum Physics and the Philosophy of Whitehead*. M. Wartofsky & R. Cohen (Eds.): *Boston Studies in the Philosophy of Science*. Vol. I, New York: Humanities Press.
- Tanaka Y. (1997): *Bell's Theorem and the Theory of Relativity - An Interpretation of Quantum Correlation at a Distance based on the Philosophy of Organism*. [http://www.asahi-net.or.jp/~sn2y-tnt/tanaka\\_3\\_s.html](http://www.asahi-net.or.jp/~sn2y-tnt/tanaka_3_s.html).
- Theunissen M. (1966): *Skeptische Betrachtungen über den anthropologischen Personbegriff*. In: H. Rombach (Hrsg.): München: Alber.
- Wallack F. B. (1980): *The Epochal Nature of Process in Whitehead's Metaphysics*. Albany: State University of New York Press.
- Whitehead A. N. (1958): *The Function of Reason*. Boston: Beacon Press (1929).
- Whitehead A. N. (1967a): *Adventures of Ideas*. New York: Free Press (1933).
- Whitehead A. N. (1967b): *The Aims of Education*. New York: Free Press (1929).
- Whitehead A. N. (1968): *Modes of Thoughts*. New York: Free Press (1938).
- Whitehead A. N. (1978): *Process and Reality*. (Corrected Edition) New York: Free Press (1929).