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Vilem Flusser.

Morphogenesis.

For: ARTFORUM

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That Greek word, which means "birth of form", would have had a curious sound in ancient Greek ears. How can forms be born, are they not timeless? Indeed, if one looks at the world, one may see that it is so. Take cows for an example: each individual cow is born and dies, but its form is always the same, and it somehow passes from cow to cow without any noticeable distortion. The cow form is a timeless container through which the individual cows flow, and he who is interested in cows should concentrate on the form and not on the shapeless contents that flow through it. The concentration on forms is called "theory", and it is the foundation of Greek philosophy and science. Theory shows the timeless forms to be stored somewhere, (in "heaven"), and that store orders the forms according to the rules of logic: "higher" forms are stored away in higher cup-boards than "lower" ones, and they contain them. For instance: the form "animal" contains the form "cow", and one may deduce the second one from the first one. He who uses logic may thus recover all the forms, one after the other, as they stand there timelessly in heaven. Take a potter for an example: if he wants to put his clay into a "new" shape, he must use logic to discover his shape as it stands there in the heavenly cup-board.

This is not how we do it: we do not discover new shapes, we invent them. Our artists are "creative", (or at least: they believe so). The reason is that we no longer take the forms to be timeless. Our world has grown much older than it was at the time of the Ancients. It can no longer be measured in millenia but in tens of billions of years, so that man, (that inhabitant of the island of meters/seconds), can no longer serve as the measure of all things. Seen from such dimensions, the forms show themselves to change with time, they have become unstable. The form of the cow changes with biological evolution, and the present shape of the universe is a transitory stage between the form the universe had shortly after the big bang and the shapeless state into which it is tending. In fact: the universe tends progressively to lose all forms, (second principle of thermodynamics), and this loss of form, (entropy), is the measure of time, of progress. Now if the forms are seen to appear and disappear with time, "theory" is no longer understood to be a contemplation, but a shaping of forms, and morphogenesis, (the birth of new forms), becomes a problem. Indeed: it becomes one of the basic problems where art is concerned. "Art" becomes, among other things, the method to "creatively" invent hitherto inexistent forms. It no longer imitates timeless forms, ("mimesis"), but it now invents them, ("poiesis"): the artist becomes God-like. Not for very long, however.

Because the problem of morphogenesis poses this question: how is a new form born, (created)? There are two answers: (1) several old forms are combined to constitute a new one. (Examples: a chimaera, where the form of a goat is combined with the forms of a lion and a serpent; and a Geep, where the form of a goa is combined with the form of a sheep to constitute a new beast). (2) something new is added to an old form. (Example: a chess game with an elephant between the

knight and the castle). We may call the fist answer "variational creation", and the second one "transcendental creation", and we may say, intuitively, that an artist is the more God-like, the more he uses the method implied in the second answer. If we consider the matter more closely, however, we will be in trouble.

(1) Consider biological morphogenesis as an example of variational creation. All the possible shapes of living beings are encoded within the genetic information as virtualities, and some of them become apparent, (real), as time goes on and as those virtual shapes are being varied by chance or by somm other more complex factors. The sum of those virtual variations of shapes is limited, (because, after all, the genetic information is itself limited), but it is a very big sum. It is probably bigger than the sum of the molecules that constitute the world. Very probably the duration of the world is itself limited, and it will lose all forms, (the forms of life on Earth much earlier than the astronomical forms). Therefore many of the possible shapes of living things, (biomorphs), will never become apparent, (real), even if evolution shoud be accelerated by genetic engineering assisted by computers. Thus it appears that variational creation may never exhaust its virtualities, and that it therefore constitutes a very challenging commitment. (This is a strong argument in favor of the computer artists.)

(2) Consider now how transcendental creation looks like. Where does the new thing that is added to an old form comes from? Let the biological morphogenesis serve again as an example. Evolution has divided life on Earth into two branches, (animals and plants), and those two branches do not seem to cross ever. If you could put eyes into wheat, or leaves into horses, would that not be "transcendental creation"? Because you would have added something new, (a "noise"), into an old form, by adding an element of the set of botanics into the set of zoology, and thus producing a new form. There may be a few examples of this happening in nature, (some algae seem to serve as optical organs for some oysters), but might it not be said that wheat equipped with eyes and horses equipped with leaves cannot be expected ever to arise from natural evolution? Those are "impossible" forms, and he who creates them is a God-like artist. But do not get too excited about this. Because if you produce horses with leaves, (horses capable of photosynthesis), you have made something much less interesting than are horses equipped with wings, (horses capable of flying). In the first case you have infringed the rules of evolution, (you have been "romantic"), and in the second case you have stretched those rules to a limit, (you have been "classic"). And to play a game without obeying its rules is nc fun. Variational creation may be more interesting than transcendental creation. (This is a strong argument against geniusses.)

This rapid discussion of morphogenesis was meant as an introduction to what the computer artists are doing. They use computers to vary forms. In doing so, they are committed against the universe which tends to lose forms. Such an opposition to nature used to be called "spirit". Of course: nature too sometimes varies forms, the evolution of life is an example. But it does so by chance, whereas the computer artists do it by deliberation. This is the reason why computer art may become the dominant expression of "spirit" in the future.