

Vilém Flusser

On Rabies

In "Biologie und Geist"¹(Biology and Spirit), A. Portmann presents a troubling problem intimately connected to all the problems of open and closed structures, and the relationship between genesis and structure. The problem is presented by Portmann in a somewhat different context from that which will be the focus in this article. It is often the case that great thinkers are great not only for what they say, but also for what they suggest. The problem is as follows:

From the (for example, human) patient's point of view, Canine Rabies or Lyssa is contracted in the following manner: a rabid dog opens a bloody wound which is contaminated by the animal's saliva carrying a virus. The virus migrates along exposed nerves in the wound until it reaches the brain where it spreads. In the brain it causes the following specific changes in human behaviour: it augments aggressivity, produces a compulsion to bite, causes a tendency to wander around restlessly, increases the secretion of saliva, hinders the movements of the oesophagus until swallowing is impossible, and causes an aversion to liquids (hydrophobia). The virus specifically targets areas of the brain in order to modify the patient's behaviour. Concurrently, some of the virus migrates outwards to the salivary glands, where it is stored. In the "natural" course of the disease, the patient, motivated by changes in behaviour, bites another mammal, at which point its muscles become progressively paralysed, and the patient dies.

From the human patient's point of view, the symptoms described here are chaotic. For example: for the structure of human beings, there is no obvious relationship between wandering restlessly and having an aversion to water. But from the point of view of the virus, the symptoms form a perfectly coherent structure aimed at preserving and spreading the virus. These have the "purpose" of permitting transmission of the virus from one carrier to another, whereby the vital cycle of the virus can repeat.

From a structural point of view the virus is much inferior to human beings, provided that complexity is the main criterion for primacy in the hierarchy of structures. Actually, viruses are considered to be the most primary forms of life, (so primary that some refuse to consider them truly alive), and human beings are considered as the most advanced form of life. "Advanced", but not "evolved". From a genetic point of view, the rabies virus is more evolved than human beings,

¹ Adolf Portmann, *Biologie und Geist*. Rhein-Verlag AG, Zürich 1956. Adolf Portmann (1897-1982) was a Swiss zoologist.

since the existence of this virus already presupposes the existence of mammals like human beings. If the degree of "evolution" is evaluated according to when forms emerged chronologically, the rabies virus is more evolved than human beings.

But by what right can we say that the structure of human being is more advanced, and that of the virus more primitive? By the right of macroscopic and microscopic observation of the two organisms. This kind of comparison will show relative complexity in human structure, and relative simplicity in the structure of the virus. But the example of rabies suggests that the virus must have a submicroscopic layer of structure, one of great complexity. Such complexity that it allows the virus to select, for example, the exact nerve and brain centres in human beings appropriate to the "purposes" of the virus. In fact, this structural layer is so complex that it causes vertigo in our imaginative capacity which seeks to grasp it. It nevertheless remains a possibility to me, that the complexity is actually in our imaginations, and not in the imagined phenomenon, because this imagination operates with models such as albumin, supermolecules and ribonucleic acids, models that may be somewhat inappropriate. But I will leave this epistemological problem aside.

The argument developed so far suggests the following outcome: If we want to establish a hierarchy of living beings, we can resort to two criteria (among others): the genetic and the structural. Under genetic criteria, the rabies virus is superior to human being. Under structural criteria, human being seems, at first sight, to be superior to the virus, but this superiority is problematised by a situation in which the virus has recourse to human structure for its superior "purposes". This result is unsatisfactory, and not only from a subjective point of view (since we are human beings and not viruses). It is unsatisfactory because there are other situations that demonstrate the superiority of human being over the virus (for example the situation of combatting rabies). This is why the argument should be extended.

The behaviour of the virus is highly stereotyped. Although biology cannot tell us at present what exact influences produce the behaviour of the virus, and whether they are of a chemical, electrical or other order, biology can affirm that the behaviour is somehow preordained in the structure of the virus. The virus reacts in an entirely predictable way, and the prediction is based on knowledge of its structure. It is a relatively closed structure. Human behaviour is much less predictable.

Although there are hereditary impregnations in the human structure that predispose human beings to certain forms of behaviour, they do not determine that behaviour entirely. Human beings react less "instinctively" than the virus. Human beings not only react, but also occasionally act. (Although the term "action" is problematic in the context of biology). Talking about the action of the virus on the human body is a mistake, talking about a human being's action on the virus is not so radically a mistake. The human structure is relatively open.

We can therefore try to build a hierarchy of living beings, having as criterion the relative openness of their structures. One living entity will be superior to another, to the extent that its behaviour will be motivated less by hereditary factors, and more by other factors. This hierarchy will have nothing to do with the complexity of behaviour. A behaviour more motivated by hereditary factors may well be more complex than a behaviour less motivated by such factors. (Compare the behaviour of the bee and the horse.) I do not know if biology already has enough knowledge to establish such a hierarchy. But there is hope that human beings will occupy a very high place in this hierarchy.

It's a great hope because the comparison between human beings and their closest relatives, the primates, reveals a relatively large openness of the human structure. Human beings are born in a state that can be considered fetal from the point of view of primates. They reach the structural perfection of newborn chimpanzees, for example, only one year after being born. So that their structure, at birth, is less fixed, and acquires its fixedness in social circumstances, and not, like the chimpanzee, in utero. The motives of their behaviour will be more social, and less hereditary, than the motives in chimpanzee behaviour. This explains, in part, that the most typical of human behaviours, language, is highly social (conventional), and not very instinctual. According to this criterion, human beings are superior to primates.

But the following problem arises: why do we say that primates are the closest relatives of human beings? The kinship was established according to genetic criteria (common descent), and according to structural criteria (similarity of forms), but not according to the criteria of structural openness. There may well be other living beings much less related from a genetic and structurally static point of view, but much closer with regard to the character of their structure: an uninhibited fantasy may suggest, for example, dolphins, and an even more uninhibited one, for example, the giant octopuses. This is a problem to be solved in the future by biology, certainly assisted by cybernetics as a discipline that studies the relative openness of structures.

Of course, "structural openness" has something to do with freedom, but not as much as it might seem at first sight. If human behaviour is more open than that of the chimpanzee (and much more so than that of the virus), the level of comparison is in the inherited motives. But inherited motives are replaced, in human beings largely by social (cultural) motives that determine behaviour as much as hereditary motives do. Human beings are not necessarily freer than chimpanzees because they are less instinctual. If Nazism is despicable and disgusting because it wants to reduce human behaviour to inherited factors, the attempts to explain it with social motives (such as Marxism that resorts to economic and political motives, and Jungism that resorts to psychological and archetypal motives) are not necessarily less degenerate. But this explanation opens up, at least, the possibility of unmotivated behaviour, ("hyperfunctional," as they say in biology), which would be

free behaviour. In this sense, the two latter explanations mentioned are much more open and intelligent than the cretinous explanation of Nazism, which is anti-biological, precisely because it uses an badly digested biology.

The criteria of open and closed structures for the establishment of hierarchies is new. It avoids the excesses of genetics (of historicism), and of a static and formalist structuralism. Possibly, the criterion will open up a new methodology, not only in biology, but in all sciences and in all disciplines (for example in aesthetics, where it begins to articulate itself powerfully). And this criterion will certainly open up new aspects of the problem of freedom. This is what a reflection on the disease of Rabies suggests.

(translated by Baruch Gottlieb)