HUMANISM AND SCIENCE

The breach between science and humanism was brought about by the Cartesian ideal of the mathematization of science. In the European culture, neither the Antiquity, nor the Middle Ages or the Renaissance had experienced it, since at that time higher education included arts, mathematics and philosophy in a hierarchically structured whole, while man was seen as a microcosm that reflected the structure of the macrocosm.

This breach widened to the point of mutual elimination as logic and mathematics were formalized at the beginning of our century, and humanism gave up the ideal of the total man, which led to the idea of the "two cultures" present in C.P. Snow's essay. Between the two empires, there have also appeared certain interregnum areas: technology (a result of homo faber, *the creator of objects with the help of science) and humanities or the sciences of the spirit (using as intellectual method comprehension, not explanation).*

The area where mathematics and the experimental method were powerless (because human spirituality, in its search for a sense of existence, opposed a stubborn resistance) was declared a field of false problems or, in the best of cases, mere "wisdom" (Piaget), as if this were unimportant. On the other hand, experimental sciences and the derived technology, which tended to a – partly achieved – objectivity and could not be subdued to subjective aspiration, were anathematized by romantic spirits (such as Heidegger) as instruments of man's dehumanization and as realms of artificiality; they have denied access to the Being, which is reserved only to philosophy and poetry.

Both domains should have been more cautious in proposing themselves as norms. The rigor and objectivity of mathematized sciences were put to a difficult test by the appearance of the logical-mathematical paradoxes, the replacement of Newtonian physics by the relativistic one, and the inevitability of the subject-object interaction in the experimental act, revealed by quantum mechanics. In its turn, art was subjected to a major change (under the pressure of cubism, constructivism and abstractionism), as a result of the

evolution of the old conflict between inspired and elaborated art, which undermined the "normal" sentimental contents and the forms that governed the communication with the public, in favor of an intellectual and conceptual approach. Such a crisis had not occurred since the Renaissance – since the appearance of the Copernican heliocentric model in astronomy and of perspective in painting.

The conflict between sciences and humanism seems to be determined not only by the methodological differences imposed by the dissimilar nature of then objects, but also by the social background of the gradually more specialized subjects. This excessive specialization led to the disappearance of the bonds between man and nature, as well as of those between the various sciences and arts. The attempts at reunification made under the banner of scientific inter- or trans-disciplinarity or of the dialogue of arts still have an air of eclecticism about them, due to the lack of an unifying basis. The genuine instances of unification are those achieved by certain great creators: da Vinci and Pascal or Goethe and Hegel, long ago, Musil and Koestler, more recently.

Brought up in an atmosphere of agonizing romanticism, R. Musil will reject in his novel Der Man ohne Eigenschaften *(1930-1942) the sentimental effusions of artistic dilettantism and the omnipotence of uncontrolled essayism writing. To these he opposes the rigor of physical-mathematical sciences, and, in the absence of an absolute ideal, he treats his own life as a crucial experiment, as a passage to limit, in which the being takes full part, if under conscious supervision. In the act of intuitive knowledge, which is based on analogy, truth and sentiment are in a perfect symbiosis, but they are again dissociated – thinks Ulrich, the author's* alter ego *– in science and art. What Musil tried to do was to build a personality resulted from the cross-breeding of the tree of knowledge and the tree of life, and to lucidly describe this evolution in a literary work that would include all the possibilities of life and of the spirit, from the darkness of the subconscious and of murder, to the heavenly light of the ecstasy of merging with the world and one's fellow men. The dimensions of his project prevented him from finishing his work, but this very non-finitude is in concordance with the deep reason of the author and of contemporary science, which rejects any definite conclusion in the ongoing search for truth.*

Besides his works as a novel writer, which made him famous, in the second part of his life, A. Koestler devised a theory of the scientific and artistic creation. He grounds his theory on the psycho-cognitive act of "bissociation" as a synthesis of various concepts belonging to apparently incongruous (if not utterly contradictory) contextual planes, synthesis achieved by discovering hidden instances of resemblance (The Act of Creation, *1964). In scientific knowledge, one comes to a fusion of planes (relevant of new aspects), which are juxtaposed in artistic creation (in order to create an emotional seism). All thinking acts have an emotional touch determined by the*

proportion in which self-assertive and participative sentiments combine. In science, they are balanced, but in art participative sentiments prevail. Koestler recognizes and describes the social dimension of the "normal" creative act, but also discovers and points out the psychic and emotional depths, as well as the ultimate tendency towards metaphysics and even mystique of the major creative act. In the latter, truth and beauty are just "complementary aspects of an indivisible experience", in which the tragic or absolute plane meets the trivial or daily one. Conscience and freedom are not a matter of nature, but one of degree, evolving from the lower and automatic levels of behavior to the higher and inventive levels of creative thinking.

Historians and philosophers of science such as Th. Kuhn and K. Popper have tried to explain the evolution of science and its present nature. The scientific revolutions of our century led Th. Kuhn to the idea of their dependence (not of their exclusive determination) on the social organization of the "normal", i.e. the experts' science, through the collective mentality of the scientific community. From this perspective, even experimental facts, serving as basis for the scientific theories, are allegedly selected in accordance with the scientific "paradigm" guiding the researchers (The Structure of Scientific Revolutions, *1962, 1970).*

In his turn, K. Popper expanded his outlook on research from the natural sciences to those of the spirit, arguing that the former do not start from – as it is wrongly contended (mainly by the neo-positivists) –, but follow a tetradic pattern, just like historical research: from the questions raised by a faulty explanation, to a more adequately explanatory tentative theory, then to a critical discussion (that tries to identify – through experiment and argumentation – the weak points through which the respective theory could be partly or entirely invalidated), and hence, to a new range of problems. Moreover, in reply to Kuhn's theory, which he considered subjectivistic, Popper asserts the existence of a third world (besides the physical and the psychical ones), that allegedly preserves the products of the human mind. This would be created and permanently enlarged by the people, but having validity independent of their existence (i.e. knowledge without a knowing subject). Popper admitted that this world might also include, besides problems, theories and critical debates, the artistic achievements of all kinds (Objective Knowledge, *1972, 1979;* The Myth of the Framework, *1995).*

In the Romanian culture, because of the tradition initiated by the Junimea *group, the conflict between science and art or between exact sciences and humanities did not last long. Scientific education held a small percentage in the overall picture, so those with a scientific training could neither form a trend nor set up an opposition. It was only after World War I that Nae Ionescu's attack (from "metaphysical" positions) against natural sciences could take place, but it was precariously argued and remained somehow isolated, as not even his disciples followed him. C. Noica had an attempt of undermining art in an essay against Goethe, which is rather weird for*

somebody who was a remote partisan of Heidegger and entertained a passion for logic and mathematics. It can, however, be explained (as Al. Paleologu has shown) by the structure of Noica's personality, who was opaque to the artistic phenomenon.

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In order to determine the relation between humanism and science, I have tried to confine myself to two well-defined fields: literature and the mathematized sciences. The former, because it is more explicit than fine arts and music and capable of covering a larger area, the latter because we have seen that the breach began and developed with the mathematization of sciences.

I have selected three representative authors for each field: Camil Petrescu, Ion Barbu and Alice Voinescu for literature, Grigore C. Moisil, Anton Dumitriu and Octav Onicescu for science. I. Barbu has a special situation, as he can be said to belong to both "parties", but since he is better known as a literary man, I have included him in the first group.

The main criterion in selecting the texts by each author has been that of trying to get answers to two major issues. First of all, the nature and the relations of humanism and science (with their specific goals and means), and secondly the image of man and of his situation in the world (between determinism and freedom). The second issue has led me to a closer examination of the outlooks on the tragic and destiny, especially as presented in the works by Camil Petrescu, A. Voinescu and A. Dumitriu.

In the case of each author, I have selected texts referring to their own field as well as to the opposite one, in a dialogue (partly staged here, but one that also took place in reality) and a reciprocity of perspectives that would allow us to make a more objective assessment. To get the objective invariant, one has to have the variations first.

The order of the authors is not chronological, but rather structural, being determined by the author's stand with regard to the humanism-science relation. I have placed Camil Petrescu and Moisil first, for they were exceptional revolutionaries in their respective fields and held most radical positions. The natural reaction follows, asking for a return to origins, and finally, the moderate, synthetic position. As we shall see, all three attitudes refer not to the local and momentary situation, but to the global and long-term one.

I have assumed that both the selected texts and the authors' general positions can be understood only in the context of their creation and life experience, so I have flanked the texts by a bio-bibliographical presentation and an interpretation of the author's work.

I will not deny that this selection and arrangement of texts was governed by my own view on the relation humanism-science, i.e. that they support and supplement each other, despite certain partial disagreements.

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Towards the end of this endeavor, I realized that putting together certain pieces I was familiar with separately had resulted in an image different from what I would have expected. Some contrasts grew in intensity, others faded away, likewise, the finesse of nuances; even the significance of each fragment sometimes changed.

But the most unexpected discovery (for which I had the data, but they had not been put together) was that these authors – who had been quite close despite their differences – drew closer due their rationalistic beliefs and organized themselves first (1940-1942) – Barbilian, Moisil and others – around the Seminar in the Philosophy of Science headed by Onicescu, and later (1942-1947) – Moisil, Onicescu, Barbilian, Camil Petrescu and others – in the Science and Knowledge *group and around the* Caiete de filosofie / Philosophy Notebooks *review led by A. Dumitriu.*

On the other hand, some of their articles had been published in The Royal Foundations Review, whose editor-in-chief was – until 1941 and then after 1944 – Camil Petrescu. Others had been schoolmates at Spiru Haret High School (Camil Petrescu, Vianu and Barbilian, then M. Eliade, Noica and Moisil). In this group, we should mention Mircea Florian, who deserves to be studied and whose books have been massively republished recently.

A. Voinescu may seem an outsider, but she was connected to the group mainly through C. Rădulescu-Motru, whose niece she was, and in whose magazine (The European Idea) *she published some of her articles. And C. Rădulescu-Motru and P.P. Negulescu can be considered the mentors of the group, mainly through their philosophical orientation, but also through their direct relations, as some of the members of the group were their students or collaborators.*

I think that the rationalist group had a major influence in Romanian culture both through their works and through the collectives some of them presided (mainly Onicescu, Moisil and Camil Petrescu, but also Alice Voinescu). The assessment of this influence would deserve a separate study.

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I will try to summarize in a few sentences the positions of the selected authors, in order to provide a more general picture. Camil Petrescu and Moisil are the supporters (and promoters) of the idea of expanding the methods of their fields (intuition and mathematics, respectively) into the neighboring or even more distant domains, which was somehow to be expected. We are however surprised to discover that, in the case of Camil Petrescu, art takes over the traditional goal of science: truth; while, in the case of Moisil, science and mathematics try to transmit the researchers' sentiments. In fact, they imagine a total participation of the author in his work, which is howev-

er oriented towards communication and objectification. The former describes the passivity of the outer world and the dramatic need that man should accept the objective circumstances, while the latter advocates human freedom and the plasticity of the world with regard to the subjects' actions.

The reactive attitude has its own paradoxes. On the one hand, the poet Ion Barbu struggles to impose the supremacy of mathematics, while the mathematician Dan Barbilian sacrifices clarity and communicability by using the style of hermetic poetry; on the other hand, A. Dumitriu (a mathematician by education) defends the humanities against the invasion of mathematics. The return they advocated to the Pindaric ode and to Aristotelian philosophy does not take into consideration the evolution of humankind from a collectivist stage to an individualistic one, which led to the appearance of other poetic genres in Hellas too. And it respectively ignores the progress of experimental science and technology, which ask for a different epistemology than the ancient contemplative one. This does not mean that knowledge did not experience the emulation with the past.

Lastly, the moderates suffer form eclecticism: they seek a balance between freedom and necessity, between innovation and tradition, but they do not succeed in offering a feasible solution for their coexistence and interaction.

I see no other solution to the current state of the active consciousness involved in the process of knowing, to the relative objectivity and efficiency of science, to the relative freedom of man and the necessity of the world, except the acceptance of the interconditioning and interaction between man and the world (directly or through the agency of the society), with all the inertia (passiveness) and also the dynamism (the plasticity) of both. On the other hand, I think that the subject and the object cannot become identical in the act of knowing; they can only be similar (through the reification of man and the humanization of the world), and this, never perfectly and never definitively. Man changes the world in accordance with himself, but he too changes in accordance with the world. Knowledge does not mean being, it means becoming.

(L. B.)

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