

# **NOESIS**

Scientific Journal of the Romanian Committee for  
History and Philosophy of Science and Technology

Travaux du Comité Roumain d'Histoire et de  
Philosophie des Science et Technique

NEW SERIES

**TOME I (XL), NO. 2, 2021**





ROMANIAN ACADEMY

# NOESIS

Scientific Journal of the Romanian Committee for  
History and Philosophy of Science and Technology

Travaux du Comité Roumain d'Histoire et de  
Philosophie des Science et Technique

NEW SERIES

**TOME I (XL), NO. 2, 2021**



EDITURA ACADEMIEI ROMÂNE

București, 2022

## EDITORIAL BOARD

<i>Director:</i>	Acad. VIOREL BĂDESCU
<i>Deputy Director:</i>	Prof. MAGDA STAVINSCHI
<i>Editor in Chief:</i>	Prof. DAN GABRIEL SÎMBOTIN
<i>Deputy Editor in Chief:</i>	Prof. NARCIS ZĂRNESCU
<i>Editorial Secretary:</i>	CSIII MIHAELA LUCA, Ph.D
<i>Deputy Editorial Secretaries:</i>	ANA-MARIA LEPĂR, Ph.D PAULA-ALEXANDRA CRUCEANU, Ph.D
<i>Advisory board</i>	Acad. BOGDAN C. SIMIONESCU Acad. DOREL BANABIC Acad. GHEORGHE BENGA Acad. MIRCEA DUMITRU Acad. DUMITRU MURARIU Prof. GHEORGHE M. ȘTEFAN – corresponding Member of the Romanian Academy Assoc. Prof. ANCA CONSTANTIN Prof. GHEORGHE CLITAN Prof. ELENA HELEREA Prof. MARIANA JURIAN Prof. GHEORGHE MANOLEA Prof. ALEXANDRU IOAN HERLEA Prof. GORUN MANOLESCU

*Editors:* Prof. ALEXANDRU BOLOGA (Sciences); Prof. OCTAVIAN BUDA (Sciences); GEORGE CROITORU, PhD (Technology); Eng. MIHAI PALFI (Technology); Assoc. Prof. CĂTĂLIN IONIȚĂ (Logic, Methodology and Philosophy); Prof. SORIN BAICULESCU (Logic, Methodology and Philosophy)

Contact address:  
Romanian Academy  
125, Calea Victoriei, District 1, Cod 010071, București, ROMÂNIA  
Romanian Committee for History and Philosophy of Science and Technology  
noesis@crifst.ro  
<https://noesis.crifst.ro/>  
© 2022 NOESIS

ISSN 1223-4249

© 2022, EDITURA ACADEMIEI ROMÂNE

**Adrese:** Calea 13 Septembrie nr. 13,  
Sector 5, 050711 București, România

Téléphone: (40-21) 318 8146

Fax: (40-21) 318 2444

E-mail: edacad@ear.ro, secretariat.ear@ear.ro

Web: [www.ear.ro](http://www.ear.ro)

# Contents

## PHILOSOPHY OF SCIENCE

LAURA PANĂ, The System of Principles .....	135
HENRIETA A. ȘERBAN, SORIN BAICULESCU, Husserl's Phenomenology and Sergiu Celibidache's Music .....	157

## HISTORY OF SCIENCE AND TECHNOLOGY

VALENTIN I. POPA, Romanian School of Pulp and Paper .....	173
ANDREI VERNESCU, Remembering Romanian Mathematicians: Radu Bădescu .....	183
ALEXANDRU Ș. BOLOGA, Professor Ioan Borcea – Member of the Romanian Freemasonry .....	203

## MEMINERIMUS!

DORINA N. RUSU, Academician Dan Berindei or the Nobility of a Scientist .....	211
---	-----



# PHILOSOPHY OF SCIENCE





# THE SYSTEM OF PRINCIPLES

LAURA PANĂ<sup>1</sup>

*Abstract.* The purpose of this article is to discuss mainly the systemic nature of principle sets or even the systemic feature of the assembly of principles, as well as to present and analyze an impressive series of arguments which support this idea. We will then describe the internal structure of principle systems and we will continue by studying the genesis/construction and evolution of principle systems. In this context, the constructiveness principle and the evolution principle will be specifically analyzed. A typology of systems is constructed, explained and illustrated. The correlation of theoretical and practical principles, as well as the co-evolution of ontical and ontological principles will be studied. Various explanations and illustrations of the active nature of principles will also be provided. The final part of the study deals with the current developments in principles studying and conceiving.

*Keywords:* principle systems, structure of principle systems, principle types, co-evolution of principle types, new developments in principles studying and designing.

Received on 18 February 2022

## INTRODUCTION

The status and role of principles in the structure of a theory, within the limits of a conceptual system or even in the framework of a research model are topics that deserve to be studied today, when more and more numerous and important principles are proposed in both philosophy and science, when various new trends emerge in the fundamental research and when the development of science and technology constantly generates not only new methods, procedures and techniques, but also research perspectives. All these are grounds for formulating some important ideas, such as that the principle has a more complex status than those discussed so far – ontological, gnoseological and methodological – namely, inclusively an axiological and praxiological, but also prospective status and role. Some core objectives of our study are: to discuss the systemic character of the different sets of principles and even of the ensemble of principles, by gathering a large number of arguments that support this feature of the principles; to describe the internal structure of the system of principles; to study the genesis, the construction and evolution of the systems of principles, to clarify the relationship between theoretical and practical principles, as well as to highlight the current developments in principles studying and designing.

<sup>1</sup> Associate Professor, Doctor of Philosophy, member of the RCHPHST of the Romanian Academy.

The principles are formulated not through a soliloquy of brilliant creators, but through a dialogue between philosophical systems, schools or orientations, on the scale of the duration of some thought, research and creation communities, as well as through a *polylogue*, carried over long historical periods. In this unique, continuous and broad philosophical debate, principles can be constituted into systems, and within them, they can be organized even into hierarchies which, however, are not always detected and are often interpreted in different ways by the distinct philosophers. Even the past studies show that the nature, characteristics and functions of the principles are complex. Moreover, the same concept, a relationship between concepts or the same idea can express a principle or a metaprinciple, within different systems of knowledge. By “system of knowledge” we do not necessarily mean here a constituted and relatively stable field of scientific knowledge, such as physics, biology or sociology, but systems of truths built according to specific research purposes or depending on different cognitive attitudes or orientations, in any such kind of disciplines.

The status of the principle in relation to the truth was also discussed, being established that the truth contained in a certain scientific proposition always has a definite content, while the principle may have a very general and very abstract character; the principle can have an even more general meaning than a category, a law or a theory related to a field of knowledge; in other cases, precisely on the basis of its general character, the principle can function as a working hypothesis, as a tool for extending knowledge and, as such, like a barely probable but plausible knowledge; the principle may carry more values or it can have and other values than the truth; often, the principle can be a synthetic result of knowledge and can be used as a tool, norm or guiding value for the action undertaken in a field of activity, be it knowledge or practice (Pană 2011, 53–55).

It follows that, within the cognitive constructions, the principle can also have a methodological function, just as science as a whole cannot be reduced to its theoretical component. But the principle can also have an axiological and even a normative function; it also has a praxiological function, as well as a prospective one. This prospective or anticipatory function of the principle can be exercised both in the theory and in the practice of an activity field.

In order for the results of scientific knowledge to be used in an operational way, it is necessary for the various types of theoretical knowledge to be represented in their entirety, to be assembled and concentrated, and then disseminated through a vision. The specific knowledge acquired in various fields are analyzed and synthesized in their more general meanings, are included in cognitive constructions that allow the transposition of theoretical explanations into methods and norms, and ultimately turned into practical prescriptions, often in the form and with the force of principles.

Given the status and functions of the principle in relation to the various types of activity, in the organization and orientation of individual and community life, we can advance a concise conceptual determination of it and of the system of principles itself. The principles are cognitive, methodological, evaluative, interpretive and prospective syntheses that can establish and guide any type of

activity, theoretical or practical. They are constituted by as many types and varieties of activity and are complex ideational constructions, with multiple roles, often having a universal status and role.

However, most authors deal almost exclusively with the ontological and gnoseological functions of the principle, that is, those of being the primary cause or essence of things, respectively of establishing successive explanations that are increasingly appropriate for the same field of reality. But equally important are its evaluative, prescriptive and prospective functions. More than any other, its ability to motivate, substantiate and guide all types of human, individual or group activity is significant.

Both a narrow and a broad meaning of the concept of “system of principles” will be used in the paper. In a narrow sense, we consider the system of principles that constitute the essence of each theory, conception or vision, which can be generated through individual or collaborative creative activities. Broadly taken, the concept refers to the set of all the principles used in a research model that works in the research community of a cultural era.

#### **HOW PRINCIPLES AND SYSTEMS OF PRINCIPLES ARE BUILT**

The mechanism of establishing a scientific principle can be synthesized as consisting of operations such as generalization and essentialization, but also others as derivation, particularization or specification, which are operations or processes that can be used and for other purposes of knowledge.

However, such operations are not always used systematically or methodically for the purpose of elaborating principles, which can be formulated in a similar way to the phenomenon of discovery, either as results of laborious experimental activities or by the contrary, through intuitions based on the whole intellectual experience of the researcher, either as conclusions of some theoretical studies or of some directed and long reflections. It should be noted here that each principle can manifest itself in many and varied forms, depending on its own degree of complexity and the field in which it operates or which it expresses, as well as on the set of conditions in which the field itself evolves. During the designed mental experiment it will be seen that we often are actually working with multiple expressions of the same principle.

Some complex illustrative examples can be analyzed as edifying for the genesis of the principle. Such an analysis also highlights the two slopes, approximately symmetrical, of the constitution, respectively application of the principle. The ascending and descending branches of the manifestation ways, of functioning and evolution of the principle will be illustrated here first by most general principles and then by the principle of causality.

The descending order of structuring and functioning of the most general ontological principles can start from the

- principle of movement or of dynamism, which supposes the
- principle of change, the next step consisting of the
- principle of action, whose full validity occurs with the emergence of life.

A picture of the descending and ascending branches of the manifestation and application of the principle of causality can be conceived and highlighted even on several levels, each with several steps, going from higher to lower levels of generality, namely the principle of causality manifests itself, from the epistemological perspective, by:

- general causes respectively principles, which act both in the whole existence and in the process of knowing the existence;
- causes which are present and active in each fields of the physical world, which are currently named universal causes;
- particular causes or principles that are detectable and applicable in several fields;
- specific causes which act in a determined domain or regarding a certain aspect of the real world, as well as principles that are valid in different forms and levels of cognition;
- singular causes, respectively principles, that express, respectively explain singularities, be them phenomena, events, states or properties. The express introduction of this category of causes, respectively principles does not contradict the general principle of connection, nor the universal truth that everything has several causes that determine its appearance, persistence, evolution or disappearance, since a series of singularities (entities, states, properties and processes) were already identified and scientifically studied.

The explanation of the cognition process initiates another succession, this time ascending, of the founding and explanatory principles, allowed on the basis of the

- principle of connection, particularized in the
- principle of reflection, and specified in the
- principle of informativeness.

A new beginning, also with an upward evolution, but on another level, in turn with unprecedented steps in the evolution of known nature, is marked by the

- principle of consciousness, followed by the phenomenon and the
- principle of creativity, associated with that of constructiveness, and more recently with the
- principle of calculability.

The phenomenon of creativity, in turn, can be conceived not only as

- individual aptitude, but also as a
- characteristic of social organization and even in a broader sense, as not only a specific human phenomenon, but a
- property of the whole known nature, perhaps of all levels of existence (Pană 2000, 258–263). Under these conditions, we can speak of a phenomenon, respectively of a general principle of creativity.

Thus, we find out how, viewed from an overall perspective on reality, at the same level of generality, two principles can be met: the principle of generation (as an expression of the principle of causality, the strongest one) and the principle of creativity. They reach this level, the first – on a downward path, being directly

derived from or even equivalent to the principle of causality, and the second – progressing from specific and particular manifestations to some general ones.

We can thus observe actually a metaprinciple, that of causality, working for the whole existence, through decreasing strings, respectively increasing as a degree of generality, of the various more concrete forms of causality, at successive levels and in various areas of existence and action, of knowledge and creation.

If applied strictly to the sphere of knowledge, the same scheme of analysis shows that the ascending branch of the evolution of a set of principles is more often and more fully described in this field, while the road from general and abstract to specific and concrete is less frequented. Thus, the way from using the principle of synthesis to practice the principle of analysis and then the principle of constructiveness is rarely followed by the appeal to the principle of action (theoretical and practical).

In turn, this one is only exceptionally finalized in using the principle of efficiency and capitalized in the principle of productivity (more recently applied and in science). However, some thinkers study not only a generic principle of efficiency, but a series of principles designed to evaluate the results of action. These principles can be organized in a system of efficiency principles. A system of criteria for applying the principles of efficiency was also elaborated (Pană 2019, 456–463).

The principle of causality, treated as a metaprinciple, in a previous context, can be- and is identified especially as a principle of generation (of the generation of all things). The latter is even called the principle of birth, of creation, and sometimes, literally, as the principle of creative activity in Aristotle (Aristotle 1965, 207). But it is also a principle of maintaining a system in a given state, through a ... system of causes.

But the same principle of causality refers not only to the emergence or maintenance of systems in a certain state and at the same level of complexity, but also to the change of systems within the same qualitative limits, as well as to their evolution. The phenomenon of evolution complicates the universal picture of causality, as this phenomenon can be ascending or descending, so that the cause can also mean the destructuring, destruction and disappearance of a system.

From the same perspective, that of the universal connection, the principle of causality is linked, in addition to the principle of evolution, and to the principle of development, which is a particular case of evolution. The manifestation of the principle of causality presupposes and expresses also the principle of continuity (which concerns both the stability and change of things), as well as the principle of discontinuity (which also has multiple particularizations).

This description of the way in which they interact, condition and sometimes even generate each other, in the horizons of existence, respectively is based, at the level of metatheory, the various principles, is inspired by the whole succession of philosophical systems.

A system of principles is the essence of every theory, conception or vision, and this system also offers the possibility to explain and preserve the internal unity of these intellectual products, and sometimes even of an entire research model.

Theories are explanatory systems that, in addition to specific sets of concepts, have in their structure: a) principles; b) laws; c) construction, verification, but also interpretation methods; d) knowledge accredited as truths; e) cognition models; f) problems; g) unstructured, semi-structured knowledge, tacit knowledge etc.; h) scientific customs, mentalities, prejudices and preconceptions and even scientific beliefs. Entire works or eloquent passages referring to these latter elements present even at the theoretical level of knowledge can be found, for example, in Bertrand Russell (*Analysis of Mind and Mysticism and Logic*), Marvin Minski (*Society of Mind*), as well as in Lucian Blaga (*Religion and Spirit*).

Principles, taken in a theoretical or metatheoretical sense, although constituted by the relation (effective or cognitive) to reality, do not simply reflect reality (in a descriptive, explanatory or reflective way), but are generated by an active relationship with it, including through the activity of knowledge. In other words, the fact that mankind and its activities are part of reality must be and is conceptualized within the system of principles and especially through the philosophical principles.

The coevolution of ontological and ontological principles, as well as the active character of principles, can be highlighted more directly in the case of social and political sciences and practices. Thus, at least two of the 14 principles developed by W. Wilson and his team of 150 advisers for the post-World War I peace treaty proved to be decisive, namely, that which established and imposed the rights of nationalities and that which forbade the inclusion of secret clauses in international treaties. The first was applied immediately and allowed to reach Greater Romania inclusively, while the second only with the Conference for Security and Cooperation in Europe, held in Helsinki. The latter, however, lost its effectiveness once the major nuclear-weapon powers agreed not to attack each other, but to use those weapons, in the first instance, against their satellite countries. The content of this secret agreement was revealed by Mircea Malița, in his book *Cold War Diplomacy*, Lexington, USA: Creative Space Publishing, 2014. Another set of principles with a decisive role in international life was that regarding human rights, introduced as a secondary topic in the debates, also at the Helsinki Conference, the rigorous application of which changed, in a few years, the history of Europe.

Studied from an ontological perspective, the principles that underlie knowledge about the nature, structure, dynamics and meaning of existence refer to its fundamental properties. In accordance with the tendencies of the current philosophical and scientific culture, but also with our study perspective, as fundamental properties of the existence, which includes the human existence, the following properties, respectively principles can be selected and ordered: a) systemicity, b) structurality, c) infinity, d) connectivity, e) dynamism, f) evolution, g) informativity, h) calculability, i) consciousness. A brief analysis of the meanings and functions of some of these kinds of principles will be attempted in the followings.

## THE PRINCIPLE OF CONSTRUCTIVENESS IN THE SYSTEM OF PRINCIPLES

The emergence, persistence or evolution of a system through the action of one of the manifestations of the principle of causality and by the intervention of the principle of interaction, as well as under the influence of the principle of dynamism and so on – since all principles are active together and act simultaneously – can mean the birth of a natural system, the establishment of a social one, but also the construction of a scientific, philosophical, moral or religious system.

Therefore, the principle of constructiveness is of the same generality; it is perhaps even equivalent to the principle of structurality, if the latter is thought and treated as an active principle, a feature constantly attributed, in this paper, to all principles. As we found out recently, in the Romanian cognitive area, the researcher Ihor Lemnij spoke, at the 16<sup>th</sup> International Congress on the History of Science held in Bucharest, in 1981, about the “construction principle” with reference to the technical field of activity.

In the human world, at least, the principle of constructiveness is not only a distinct one, but also one very important, both from an ontological and gnoseological perspective. Studied and applied especially in the field of research of systematic forms of knowledge, but also in the philosophy of culture and art, the principle of constructiveness is related to that of creation, of any act of generation, be them repetitive, but especially innovative.

By this last aspect, of the emergence or creation of novelty, the principle of constructiveness is correlated, first of all, with the principle of causality, but no less with the principle of action (which is considered, as we have seen, in Aristotle himself, including as a principle of creative action) and thus even with the principle of dynamism and, perhaps, even with the principle of infinity.

Trying to answer the question of whether the principle of constructiveness is valid only on the human scale or even for the whole of existence, three levels of existence can be distinguished in which it operates. If the validity of the principle of constructiveness is easier to argue for the living world and obvious to the human world, the relevance of physical studies for this idea has to be demonstrate.

The stages of understanding the structured and, at the same time, statistic character of physical particles quickly followed one another in the first part of the 20th century, but only quantum and wave mechanics together managed to describe satisfactorily the nature of statistic physical collectives consisting of a large number of objects with a random movement. The research results are expressed in probabilities, mean values and statistical spreads, which acquire significance only synthesized in two important principles, the principle of uncertainty (which refers to two types of relationships: position/momentum and time/energy) and the phenomenon of complementarity, for the understanding of which the need was felt to be formulate, in fact, two principles.

The interpretation of the results found required the introduction of other principles, such as the principle of quantification, the principle of spectral decomposition and the principle of reducing the state function. These could be

considered derived principles, because they stem from experimental results, but considering the structure of the scientific theory they are super-ordinate to both the experimental and the theoretical knowledge on which are based. For the latter reason, they could be considered meta-theoretical, although they refer to practical aspects of the treatment of scientific results obtained.

Given its place and role among other principles, we can assume that the principle of constructiveness has the status of a meta-principle, both in explaining the human world and the whole of existence. But the question of whether or not this principle is a meta-principle can be solved not so much by establishing relations of coordination or subordination between strings of other principles, but by identifying, if possible, its relations of super-ordination to other principles.

The most important argument in favor of its status as a meta-principle is found at the meta-theoretical level, namely, in deciphering the role of the principle of constructiveness in the way of constituting and evolving of the system of principles. At the level of metatheory, the various principles are substantiated, namely, they are mutually substantiated, and the principle of constructiveness is one of these founding principles for others.

The most important thing to emphasize is the universal validity of the principle of constructiveness. In this order of ideas, we will describe other possibilities for structuring the table of principles, in addition to the one presented above, which highlighted the cascade of principles derived from- or associated with the principle of causality.

Thus, the fact that associative, communicative or cooperative type of phenomena, connections and interactions take place at physical, chemical or biotic levels of existence shows that the principle of constructiveness exists and acts in an infinite variety of forms, some of them close to or even integrated in the human level of existence.

If we refer to the way the principle of constructiveness works, we find both similarities and differences between different realms of existence. Thus, in some areas and especially at certain levels of existence, constructiveness takes place through mostly necessary or random connections, through laws of organization or movement, through causal systems or chains, in an automatic way, but we cannot fail to notice that this way of action – automatic – is also valid in both individual and social forms of human action, including in intellectual activities and even in the highest aspects of the spiritual life.

The substantiating power and the wide applicability of the constructiveness principle can be seen in the structure and dynamics of musical compositions, in the laws of proportion and perspective or the complementarity of colors respected in visual arts, as well in the characteristics of the linguistic structures or in the logic of mathematical demonstrations. The possibility of recognition and use by computer programs of structuring models specific to all these fields is another convincing evidence of the universality and utility of this principle, in its spontaneous manifestations or artificial applications, both being able to be and automatic.



Special meanings of constructiveness can be identified in metatheories of scientific knowledge or in meta-logic studies that have as object formal, axiomatic, modal logics etc. All these aspects confirm the metatheoretical status of this principle. Taking into account this status of the principle of constructiveness, we can add that it can be considered, at the same time, as a principle derived from the principle of structurality, but also in relation to the principle of activity.

One can establish, in a similar way, a true genealogy for each principle studied and, finally, a whole general hierarchy of principles. In the case of carrying out such a project, the number of valid and active principles that can appear in the same plane of complexity would be very high, while obtaining an extremely diverse color palette of different principle types.

This brief attempt to establish the identity and position of the principle of constructiveness in relation to other principles is also intended to demonstrate the reciprocal connection and unity of principles, i.e. the systemic character of the set of principles, which will be detailed in the following parts of our study.

#### **THE EVOLUTION PRINCIPLE IN THE SYSTEM OF PRINCIPLES**

Another important principle in the functioning and development of systems is the principle of evolution. At several levels of existence, the principle of constructiveness and the principle of evolution are essentially linked together on the line of causality, because they make a cyber cycle work, in which a system is the effect of constructiveness previously inscribed in its own structure, and the stages of system evolution are nothing else than sequences of its “genetic program”. However, this program is open, at the highest levels of evolution, and evolved systems can innovate beyond environmental selection and random mutations, depending on more complex end-states, such as goals or projects.

Understanding each of the two principles, as well as of the correlation between them, is mediated by a whole set of principles already mentioned or presented: the principle of continuity, the principle of development and the principle of co-evolution. The principle of change, the principle of action and the principle of efficiency are also involved, especially in the study of social phenomena.

The principle of evolution, as a theoretical principle, is used in both philosophy and science, and not only in biology, but also in many other scientific disciplines. However, we will start with the question: can principles be associated with evolution, at the same time with putting them at the foundation of theoretical constructions and considering them as pillars of the philosophical and scientific systems formed with their help?

The answer is affirmative, especially if we consider another aspect of the coordinated manifestation of the principle of constructiveness and the principle of evolution, as happens, for example, in the automatic, spontaneous or technical production of new knowledge. We specify that, when we say here “technical”, we

refer first of all to the set of techniques of the intellectual activity and only secondly to the subset of the computing techniques (Pană 2006 b, 422–427).

Ștefan Odobleja anticipated the possibility of automatic generation of ideas. He was convinced that to make true this prediction did not necessarily require a new technology or even a directed succession and association of ideas, but would, in fact, be a process of self-generation. The Romanian scientist explains the possibility of self-generation of ideas through the phenomenon of consonance, which is also common to the psychic and biotic processes that take place in the “small portable laboratory” which is the very brain of humans (Odobleja 1982, 182).

Such a possibility has an even higher probability of realization, as we can already speak of a production and self-production of free information with the emergence of the information society and especially with its future evolution (Pană 2003, 74–89).

The above considerations can also be associated with the levels of structuring, processing and use of social information and with some representations of structural information (Pană 2008, 120–137), as well as with the interpretation of the categorial system of the philosophy of science and technology.

Principles themselves have an evolution within the knowledge systems, which can be taken as reference systems for both their generation and study. Evolution in this context can mean either a change in the importance and position of a principle within the system of principles, or even a change in the content and meanings of a principle. These changes always occur at the high levels of the knowledge process, they being in turn generated by changes in the cognitive models.

In the framework of a postgraduate course on the History and Philosophy of Science and Technology, organized by the Romanian Academy, we even analyzed the evolution of the Evolution Principle, given its importance for the entire intellectual history, as this principle is present and active in various scientific theories, not only in explaining the evolution of species through natural selection and adaptation.

A more accelerated and obvious form of evolution of principles takes place through intellectual invention (Pană 2006 a, 1147–1164), characteristic of any field of knowledge or action, but attributed mainly, if not exclusively, to the technical field of culture and, especially, to its most productive current expressions, developed mainly at the level of innovation products and services for intellectual work (Pană 2010, 171–195), and more recently, for work in the virtual environment of the computer and the web.

Both the principle of constructiveness and the principle of evolution have an important role in the genesis and functioning of systems, including in the constitution and organization of the system of principles. The principle of constructiveness acts at all the levels of existence, inclusively by the intervention of the principle of evolution. This one, in turn, can determine either changes at the same level of complexity or development. Both these types of evolution can be produced through principles derived from the evolution principle. Therefore, both the constructiveness

principle and the evolution principle are fundamental principles from a theoretical perspective and metaprinciples from a methodological perspective.

An even more general and valuable conclusion can be drawn here, if we take the principle from the ontological perspective, namely that the principles not only condition and substantiate each other, but also realize each other. These truths also explain why, from a gnoseological perspective, the same principle can take place in more systems of principles, a principle can occupy different positions in distinct principle systems or why the power of substantiation of principles is variable, it being determined by their role in various systems of principles and by the knowledge model working in an epoch.

Considering that a number of grounds for the possibility and necessity of the existence of a system of principles have been identified and analyzed above, the result of this research will be presented below.

### TYPES OF PRINCIPLES

First, a distinction between principles that work in the whole existence, studied from the ontological point of view (called, in the Aristotelian tradition, first principles), and the principles that constitute the result of knowing the effects of the action of the first principles, i.e. philosophical and scientific principles, through which the gnoseological perspective is built, will be made here for the clarity of the exposition, the two perspectives being the basis for identifying and increasing the possibilities of humankind in the world.

All the principles highlighted in the previous pages are active principles, they act both at the levels and in the fields of knowledge mentioned, as well as in the physical, biotic and social existence, having decisive and continuous effects on the way of being and evolving of these existence fields. The existence as a whole, the society, as well as our mind are structured and work as they can be described, in their essence, through the set of these principles.

A challenge would be to answer the question whether the same principles can be identified from the two perspectives, whether they act in different ways at certain levels of existence or take different forms and act to varying degrees in different areas.

The principles that underlie knowledge and action are not only the result of generalization, but also of the essentialization of knowledge and practices, and the principle of constructiveness also acts in the process of establishing the system of principles, even from within it.

As we will see, the system of principles can be imagined and represented in various ways, once accepted the idea of the necessary structuring of the principles in systems, together with the idea of the validity of the principle of constructiveness and in the world of principles.

By focusing on some of these principles or metaprinciples, different systems of principles can be built, each of them with an internal structure and a distinct hierarchy of component principles.

Principle systems can be made up of different types of principles, which usually are combined according to different sets of criteria. We will review and briefly characterize further the most important types of principles.

#### **Metaprinciples, general principles, particular principles and specific principles**

The meeting of these categories of principles, explicitly, within the same discipline is characteristic of philosophy, within which theories are general theories and metatheories. Philosophical theories are all general, at least from one point of view, that determined by the fact that they are built on theories made up in other areas of culture, usually scientific. Scientific meta-theories are not, in any of the possible cases, of the same level of generality and validity as the philosophical ones.

#### **Fundamental principles and derived principles**

All philosophical principles are fundamental to other fields of knowledge; moreover, the distinction between fundamental principles and derived principles is made at the level of philosophical knowledge, where, as a rule, there is an explicitly highlighted internal structure of the system of principles. The internal structure of the system of principles is, in most cases, also hierarchical, but the established hierarchy can be different, not only from system to system, but even in the application of principles by the same thinker to distinct problems and in different contexts.

#### **Foundational principles and explanatory principles**

Some of the above made analyzes might suggest that principles are components of knowledge systems that have a rather foundational and less explanatory role. This assessment is confirmed when referring to the functions of philosophical principles in relation to scientific hypotheses or theories, but induces problems in establishing the relationship between principles and between principles and other components of theoretical constructions, both in scientific and philosophical systems. Such problems may be more pronounced in ontological systems, in which the principles that express genetic relationships (causal and conditional or law type) are decisive and automatically take precedence over the systemic and structural ones, while in other thematic areas and methodological approaches, which may have as their object coexistence and coordination relations, the distinction between principles with different types and degrees of influence is difficult to be made or the result of their classification may vary in different principle systems.

#### **Theoretical and practical principles**

A sharp distinction is often made between these types of principles, without taking into account that a) behind some of the principles are whole scientific theories, and sometimes b) within theoretical systems can be found sets of principles resulting from the observation, simulation and modeling of reality; c) theoretical principles are the result of studying the way in which things are structured, manifested and evolve in physical, biotic or social reality; d) theoretical

principles are those that establish, motivate and guide the individual or group towards practical actions with social relevance. Even W. Wilson, who initiated and imposed some of the 14 principles mentioned, managed to formulate them because he also had a thorough theoretical training, including a doctorate in philosophy. He became a politician after being a professor at three different universities, and was even elected rector at Princeton.

#### **Assertive principles, evaluative principles and active principles**

As we have distinguished between theoretic and methodological principles, it is possible and even necessary to distinguish principles such as those mentioned above, the differences between them being both of status and of role, although the distinctions are no longer, in their case, as categorical as others, so that the differences can only be of status, or of role. We have seen, moreover, that there are also complex and profound relationships between theoretical and methodological principles, including some genetic or even of reciprocal exchanges. Evaluative principles operate today, both at theoretical and methodological level, for example in managerial sciences, which have been hypertrophied lately, but are rarely and selectively applied in the practice of natural sciences, and sometimes misused in some of the social sciences, especially during complex and harsh historical periods. The principles here named active apply primarily to action, but our philosophical position obliges us to say that knowledge itself is an action – in our age, perhaps the most effective of the constructive ones – and its successes have crucial practical consequences. The set of active principles, which are fundamental principles, also comprise the Principles of efficiency, that may be seen as derived from them and which are studied in a book published in 2019. Regarding the principles considered fundamental, it can be specified that they have general, particular and specific manifestations. General expressions of the fundamental principles can be the principle of systemicity, the principle of connection, the principle of feedback and the principle of finality, the set of principles of efficiency, the principle of adaptation, the group of principles of learning as well as the principle of creativity (for this latter see Pană, 2000, 258–263 and 273–278).

Particular expressions and forms of fundamental principles can be identified in complex areas of structuring or approaching existence, such as for the field of knowledge, for example, the holistic principle, the principle of induction, the principle of deduction, the principle of idealization, the principle of postdiction, the principle of prediction, the principle of verification, the principle of interpretation, the principle of capitalization or application in practice.

For the field of the Philosophy of science, specific principles can be highlighted, such as the principle of systemic analysis, the principle of structural analysis, the principle of functional analysis, the principle of genetic analysis, the principle of modeling, the principle of integration etc.

In the more general field of the philosophy of knowledge are possible, in exchange, even concretizations of some fundamental principles or even some metaprinciples, such as the principle of continuity, which may not appear explicitly

in any ontological or gnoseological system, but which is present and active in both of these areas, through its multiple expressions.

Such expressions of the principle of continuity in the plane of knowledge are the principle of transition from real to possible, the principle of transition from phenomenon to essence, the principle of transition from concrete to abstract and vice versa, the principle of transition from analysis to synthesis, the principle of transition from understanding to creation or the principle of transition from learning to invention.

The same analysis of the content and validity of principles can be made for other domains of existence, as well as for some deep levels and forms of knowledge. As we have shown in more detail in a previous writing (Pană 2011, 15–40), all the principles highlighted are active principles, they act at the mentioned levels and in the **analyzed** fields, more exactly, they have decisive and continuous effects on the way of being and evolving of these fields.

The principle of action, together with its derivatives (as the set of principles of efficiency) is therefore important from the perspective of this paper, and in discussing how this principle works we can specify forms and expressions of its manifestation at different levels of social organization or in various types of individual activity; in the context of current concerns, the principles of management can be mentioned, differentiated according to various fields of activity.

### THE SYSTEMIC FEATURE OF PRINCIPLE SETS

The fundamental principles of the explanation of existence reflect universal properties of existence and exceed the framework of scientific systems, but between this set of philosophical principles and those formulated in the various sciences there is a **bi-univocal** circulation.

This world of principles that underlie the explanation of the structure and dynamics of existence also has a systemic character, which can be demonstrated by the means specific to the different perspectives of analysis and can be materialized in a succession of arguments, in turn at least aspirationally systemic.

The necessarily systemic character of the sets of principles can be demonstrated both inductively and deductively:

- the set of principles related to a realm of reality has a systemic character, which provides the basis for the set of principles related to the whole reality to be organized as a system;
- the systemic feature, which is proper to the whole existence, also applies to the levels, respectively to the forms of knowledge of existence, and the principles represent the very core of the cognitive systems.

A reflective exploration of the world of principles shows that on the ontical plane the principles are mutually conditioned, and on the ontological plane they are mutually grounded. Following a more detailed analysis, we find that each principle

has its roles (foundational, explanatory, evaluative, praxiological or prospective) and, therefore, its own place in the system **of principles**.

The principles that make up a coherent set of grounds for describing causal, functional, and law type connections in a field of reality or for explaining the body of knowledge about such a field do not constitute a hierarchy of evaluative point of view.

Within a system of principles all principles have the same importance, and a hierarchy can be born if we make up categories or types of principles, but not on levels, but on areas such as:

- cultural (philosophical, scientific, moral, political etc.);
- • theoretical or practical;
- • • methodological (structural, functional etc.), so within these areas and not at the level of general or fundamental principles.

From this point of view, when the researcher speaks of principles of principles or of meta-principles, he or her is in fact dealing with different levels of study of the same property of existence, as we have shown above for the principle of continuity.

All principles have a similar power of determination, and none of them can be eliminated without consequences for the whole system of scientific knowledge in a certain field.

In a very narrow sense, each of the highlighted principles can be thought of and presented as an application of each other principle, precisely by virtue of the systemic character of the set of principles that guide human actions.

Within an explanatory system, as in a normative system, like the moral one, all principles they must be respected and no exceptions or amendments can be allowed in their application, because the theoretical system will be destroyed and the practical system it guides will be altered.

For the final and superior efficiency of an activity system, all the principles of that system must be observed, at the same time and in all respects, this being the main reason for the increasing specialization of the types of activity necessary for their application.

The principles that are part of a theoretical or metatheoretical system themselves prescribe the obligation to observe them to the same extent, in order to ensure the completeness, coherence and independence of a cognitive system. The principles establish both the true value of the formulated knowledge and the use of the whole explanatory power of a theory, but also the capitalization of the whole space of possibilities opened by a new theory, by highlighting all the possible and allowed conclusions.

Those principles which refer to the completeness, coherence or independence of philosophical or scientific systems are formal principles, which belong to the metatheoretical and meta-linguistic level of the study, interpretation, evaluation, orientation and practice of any intellectual activity, but their observance or circumvention has practical effects: regardless of the nature of the activity they concern, their neglect leads to low efficiency, zero efficiency or even counter-efficiency.

It is desirable, therefore, to observe the requirements of principles such as the principle of simplicity or the principle of least effort, to which might be added, for example, according to the Leibnizian system, the Principle of perfection. This one has not only formal meanings, but also of content.

For an ensemble of entities, be it natural or social, material or spiritual, to be a system, it is not necessary for it to be perfect or to have characteristics involved in this quality: to be unchanging and non-evolving, to be homogeneous, finite and closed.

As far as thinking systems are concerned, we can add that they do not have to be complete and definitive in order to satisfy the same requirement of perfection. Thus, different theories can be generated within the same system of ideas, each with its own set of concrete truths regarding the described field and the set of knowledge explained, provided that they are subordinated to the same metatheoretical or theoretical principles that they also have to respect.

### **THE INTERNAL STRUCTURE OF A WHOLE SYSTEM OF PRINCIPLES**

The structure of the system of principles can be highlighted in various forms. We present, below, one of the possible and desirable ones, once the above specifications and options are accepted. The organization of the first two groups of principles is also designed to highlight the continuity between the ontological and gnoseological principles. The last two groups include principles chosen from those that relate to various aspects of the cognitive activity. The scheme presented is not exhaustive, but selective, rather illustrating the considerations formulated so far in this paper.

#### **Fundamental principles:**

- Principle of unity and the Principle of differentiation;
- Principle of structurality and the Principle of dynamism;
- Principle of action and the Principle of constructiveness;
- Principles of evolution and development

#### **General principles:**

- Principle of systemicity, Principle of connectivity;
- Principle of retroaction and Principle of finality, Principles of efficiency;
- Principles of adaptation, Principles of learning, Principles of creativity

#### **Particular principles** (chosen from those which act in the fields of knowledge)

- Principle of holistic perspective, P. of induction, P. of deduction;
- Principle of idealization, P. of possidiction, P. of postdiction, P. of prediction;
- Principle of verification, Principles of interpretation;
- Principle of practical applicability

#### **Specific principles**

- Principle of systemic analysis, Principle of structural analysis;
- Principle of functional analysis and Principle of genetic analysis;



- Principle of analogy, a proximate genre for the Principle of modeling;
- Principle of integration

The internal structure of the system of principles and, implicitly, the system of principles can be conceived and constructed in very different ways, and these can be interesting applications for heuristic seminars, as well as for didactic ones of philosophical or scientific type.

### CURRENT DEVELOPMENTS IN PRINCIPLES STUDYING AND DESIGNING

In this section of the paper the conclusions obtained so far on the nature, structure and dynamics of the world of principles will be applied to the study of how the preoccupation for this metatheoretical field of knowledge evolves today, at the finish of the section the analysis being focused precisely on the phenomenon of scientific knowledge itself from this perspective.

First of all, there is a tendency to formulate less and less general principles, so that in science today norms, methods, rules and procedures predominate, ie prescriptions that are directly useful in action. This trend is also manifested in the Romanian scientific and philosophical literature, for example by highlighting the principles of efficiency, which can be organized in a system, given both their number and diversity, as well as their importance (Pană 2019, 456–468).

Instead, a body of principles of medium generality, which can be applied in many fields of research, development, management and even production is constituted, one which can work in any field of activity. Thus, in a volume that aims to reach a set of principles of a branch of software engineering starting from general principles of this field (Mehrotra and Vershney 2016) the authors arrive at the formulation of principles that are valid in almost all theoretical and practical fields, such as: manage using a phased life-cycle plan; perform continuous validation; maintain disciplined product control; use modern programming practices; maintain clear accountability for results; use better and fewer people.

At the same time, the deepening and specializing of the methodological research is continued, but is visible that this research also produces results that can be of general use. Thus, the use of applications based on metaheuristic algorithms is recommended both in a book that aims to optimize the engineering activity and in another, dedicated to solve any kind of challenging optimization problem, the proposed algorithms being in both cases nature-inspired ones (Xin-She Yang 2010). Such algorithms are genetic algorithms (p. 41–46), ant and **bee-inspired** algorithms (53–62), bat algorithms (97–104), swarm optimization algorithms (63–72), firefly algorithms (81–96), harmony search algorithms (73–80) etc.

Sometimes the stated purpose of some papers, although they contain the term “principle” in the title, remains to be tacitly fulfilled, being made only a few theoretical considerations and being proposed, in fact, tools, methods and algorithms that can be used effectively in more and more special work areas.

This is also the case of a book with the ambition of distinguishing principles of the study and construction of electronic communication systems, a very broad

field today, but the book presents, in fact, electronic communication technologies and even industrial practices related to wireless communication ( phone, satellite or Internet), except for Chapter 1: The Significance of Human Communication (Frenzel 2016, 3–26), which consists of general concepts and technical specifications or Chapter 12: Fundamentals of Networking, Local-Area Networks and Ethernet, which contains elements of the history of Information and Communication Technology (Frenzel 2016, 435–460). It can be said, therefore, that this work is a completely technical one.

It turns out that we are witnessing not only the prevalence of scientific but also technical concerns about principles. Here it should be noted that this article does not fully share the widespread idea that the most numerous and important current developments in society are consequences of technical development. On the contrary, it is considered that the set of principles assumed, postulated, evoked or formulated in this field is the result of the efforts of technologists to rise to the reflective level of inventiveness.

A notable example is a work awarded by the Romanian Academy, written by Vladimir Țicovschi on globalization, in which he argues that some technologies have emerged as- or evolved into metatechnologies. Defined first by M. Drăgănescu, a major representative of the philosophy of science and technology in Romania, metatechnologies are characterized by V. Țicovschi, as: a) results of fundamental and applied top research, as well as of permanent innovation processes, and in terms of the life cycle of technological innovation, they go through only its ascending phase, unlike the usual technologies, which go through the complete cycle, reaching maturity and then decline; b) having the capacity to enhance all categories of traditional technologies, both in terms of products and added value; c) constituted in a synergistic system, in which the synergistic effect produced influences the way of capitalization of the other technologies (Țicovschi 2006, 183–190). The inventory of this type of technologies is impressive, one of which being the metatechnology of continuous innovative learning, described by the same author.

Other researchers, interested in both technologies (whether instrumental or intellectual, material or virtual) and in characteristics of the evolution of philosophy in the same period, discuss the relationship between metaphilosophy and metatechnology, noting that some technologies which have emerged as developments of science become **metatechnologies** because they are used in order to change the possibilities of classical industrial technologies, but also that intellectual technologies play the same role in relation to social and cultural technologies and, implicitly, to the above (Pană 2008, 305–310).

Without an unconditional integration in the so-called technical and, more broadly, economic determinism, we can also note that the orientation of studies on principles is dictated by the dominant social themes. This is illustrated by the vertical development and organization of the current concerns for principles. Thus, if at a first level of this hierarchy we find works like the one signed by Susan J. Morten and Mackenzie Davis, *Principles of Environmental Engineering and*

*Science*, edited at McGraw Hill Education in 2012, at the next level can be situated the book of Simon Dresner, *The Principles of Sustainability* (Taylor and Francis, London, 2008), and at the next level, the one published by Charles J. Kilbert *et al.*, *The Ethics of Sustainability*.

The part two of this book, entitled “The Ethical Principles of Sustainability” studies the core of the ethical framework of sustainability and contains a corpus of four sets of principles regarding: the fair distribution of advantages in society (i.e. principles of a social ecology), the relations to other species in the name of a “community of life”, the underpinning of an ecological economics and the obligations of humankind to future generations. A set of principles that transcend this typology is also evoked – The Hannover Principles –, which gather various kind of requirements, including “Seek constant improvement by sharing knowledge” (Kilbert *et al.* 2012, 266).

The generalization of the ethical debate in science is another current direction in the evolution of studies on principles. Research as a whole becomes the subject of ethical concerns mainly related to the importance, significance and risks of using the results of scientific and technical research. A whole system of ethical concerns for principles has been established, which can be identified in almost all areas of research. Several periods and directions of research can be distinguished: I. After the successes of atomic physics converted into destruction techniques the well-known positions of the scientists themselves appeared; II. Ethical principles continue to be debated, on topics and with specific means, in different scientific fields, at a metatheoretical level of study, as in Bioethics and Technoethics; III. Today, a distinct field of meta-meta-theoretical scientific research is outlined, the Ethics of scientific research.

The field of Bioethics is the most generously represented, a volume that illustrates the very process of diversification of this field being one of those regarding the principles of Biomedical ethics (Beauchamp and Childress 2001). The same tendency of specialization is manifested in the studies of Technoethics, concretized in journals and volumes dedicated that highlight even the elaboration of the Artificial Ethics (Pană 2017).

The Ethics of Scientific Research differs from the Scientific Ethics, which is directly derived from the Philosophical Ethics, because it is not only an ethics practiced with scientific means, but also on scientific topics. The principles of scientific research ethics also refer to aspects related to the functioning of scientific institutions and organizations, to the management activities in research projects, as well as to the problems that appear in science policy. These principles can be found in the General Code of Ethics in Scientific Research which aims not only to comply with moral norms, but also to apply the regulations, standards and even juridical laws suitable for this field in the frame of national and supranational research systems.

Although, as shown above, the theoretical and metatheoretical concerns about principles are clearly outweighed today by the study of themes imposed by natural, social and cultural developments (in the field of the technical culture too), we will strive further to highlight some works dedicated to principles that address the very

issue of knowledge, starting with  $\alpha$ ) the common knowledge, continuing with  $\beta$ ) the scientific one and reaching the development of  $\gamma$ ) knowledge management.

A work that can illustrate the first approach type is the one entitled *General Thinking Concepts*, which constitutes the first volume of the book *The Great Mental Models*. Although the volume signed by R. Beaubien and S. Parrish explores increasingly specific conceptual structures, such as those used in accomplishing the connectionist semantic memory, the principles of semantic networks are also highlighted in order to study and build appropriate mental models, which include a whole hierarchy of thought levels, respectively of conceptual structures (Beaubien and Parrish 2020, 120–123). In the view of the two authors, the understanding of the nine mental models (of which the First Principles Thinking, the Second-Order Thinking and the Probabilistic Thinking are worth mentioning from the selected perspective) can improve problem-approaching, opportunity assessment, and difficult decision-making.

The second approach type is also eloquently represented, although such works are rarer. Thus, one can identify works that are characterized both by reaching the metatheoretical level of the research of principles and by the development of specific design principles for knowledge integration. Starting as a result of some pedagogical concerns, the volume signed by M. Linn and E. Bat-Sheva presents both specific design principles and metaprinciples for knowledge integration, an entire chapter being dedicated to Knowledge integration principles and patterns (Linn and Bat-Sheva 2011, 102).

A number of studies aim at Knowledge Management systems designing and implementing in various activity fields. Some of their authors point out that knowledge management has some tacit dimensions, but that, in essence, this field has a conceptual nature and also aims to substantiate the conceptual basis of knowledge. As a result, books such as *Principles of Knowledge Management: Theory, Practice and Cases* offer both models of knowledge and knowledge management, as well as analyzes of facilitators and barriers in applying the principles developed to specific cases (Geisler and Wickramasinghe 2015).

An important weight is given, in this book, to the evolution of Knowledge Management, the authors insisting on the Networked Knowledge Management. They also highlight the interdisciplinary nature of KM, bringing as arguments short descriptions of the areas involved, such as cognitive sciences, semantic networks, expert systems, decision support systems, computer-supported collaborative work, biblioteconomy, relational and object databases, organization science etc. All these can be considered, in their opinion, components of a Knowledge Management Strategy. A number of aspects related to the dynamics of the knowledge economy are also presented.

## CONCLUSIONS AND ANTICIPATIONS

An in-depth study of the world of principles allows the researcher to draw a few conclusions, namely, first of all, that there is a tendency to formulate less and

less general principles, so that in science today norms, methods, rules and procedures predominate, *i.e.* prescriptions that are directly useful in action. This trend is also manifested in the Romanian scientific and philosophical literature, for example by highlighting the principles of efficiency, which can be organized in a system, given both their number and diversity, as well as their importance. As a result, we are witnessing not only the prevalence of scientific but also technical concerns about principles. As we do not fully share the widespread idea that the most important and current developments in society are consequences of technical development, we believe that the many principles assumed, postulated, evoked or formulated in this field is the result of the efforts of technologists to rise to the reflective level of inventiveness. In parallel, a body of principles of medium generality, which can be applied in many fields of research, development, management and even production is constituted, one which can work in any field of activity. Often, however, the stated purpose of works containing the term “principle” in their title remains tacitly fulfilled, in some of these works few general considerations are formulated, being proposed, in fact, tools, methods and algorithms that can be used efficiently in increasingly specialized research or action fields. It is therefore still up to philosophers of science and technology endowed with knowledge in various fields of culture to develop insightful analyzes and comprehensive syntheses that show and stimulate the role of principles in grounding and guiding scientific research and technical inventiveness.

#### REFERENCES

1. Aristotle. *Metaphysics*. Bucharest: Romanian Academy Publishing House 1965.
2. Beaubien, Rhiannon and Parrish, Shane. *General Thinking Concepts*, volume 1 of *The Great Mental Models*, Ottawa: Latticework Publishing Incorporated, 2020.
3. Beauchamp, T. I. and Childress, J. E. *Principles of Biomedical Ethics*. London: Oxford University Press, 2001.
4. Frenzel, Louis E. *Principles of Electronic Communication Systems*. New York: McGraw Hills, 2016.
5. Geisler, Eliezer and Wickramasinghe, Nilmini. *Principles of Knowledge Management: Theory, Practice and Cases*. London and New York: Routledge, 2015.
6. Kilbert, Charles J, Thiele, Leslie, Peterson, Anna and Monroe, Martha. *The Ethics of Sustainability*. New York: John Wiley & Sons, 2012.
7. Linn, Marcia and Bat-Sheva, Eylin. *Science Learning and Instruction: Taking Advantage of Technology to Promote Knowledge Integration. Principles and Practice*. New York and London: Routledge, 2011.
8. Mehrotra, Monica and Vershney, Sapna. *Principles and Practices of Software Engineering*. Oxford: Alpha **Science** International Ltd, 2016.
9. Odobleja, Ștefan. *Consonantal Psychology*. Bucharest: Editura Științifică și Enciclopedică / Scientific and Encyclopedic Publishing House, 1982.
10. Pană, Laura. “An Integrative Model of Brain, Mind, Cognition and Creation”, *Noema*, (7) 1, 2008: 120–137.
11. Pană, Laura. “Artificial Ethics: A Common Way for Human and Artificial Moral Agents and an Emergent Technoethical Field”. In R. Luppicini (ed.), *Evolving Issues Surrounding Technoethics and Society in the Digital Age*, (41–66), Hershey PA: IGI Global Disseminator of Knowledge, 2017.

12. Pană, Laura. "Crucial Intellectual Events in the History of Information Science and Technology", *Noesis*, (35) 1, 2010: 171–195.
13. Pană, Laura. "Intellectics and Inventics", *Kybernetes, The International Journal of Systems and Cybernetics*, (35) 7/8, 2006 **a**, 1147–1164.
14. Pană, Laura. "Knowledge Management and Intellectual Techniques – Intellectual Invention and Its Forms". In Robert Trapl (Ed.), *Cybernetics and Systems II, Proceedings of the Eighteenth European Meeting on Cybernetics and Systems Research*, 422–427, Vienna: University of Vienna, Austrian Society for Cybernetic Studies, Austria, April 18–21, 2006 **b**.
15. Pană, Laura. "Levels and characteristics of social information" in *Noema*, (2) 1, 2003: 74–89.
16. Pană, Laura. "Metaphilosophy and Metatechnology. Linguistic and Philosophical Aspects". In Yolanda-Mirela Catelly, Fabiola Popa, Diana Stoica and Brândușa Răileanu-Prepelită (Eds.), *Language, Culture and Civilization in Contemporaneity*, (305–310), Bucharest: Politehnica Press, 2008.
17. Pană, Laura. *Philosophy of Technical Culture*. Bucharest: Editura Tehnică, (258–263), 2000.
18. Pană, Laura. "Principles of Efficiency". In Laura Pană, *Truth and Reality: Treatise in the Ontology of Values*, Bucharest: Editura Semne, 2019.
19. Pană, Laura. "The Principle as Fundament, as Instrument and as Finality in «Metaphysics»". In Al. Boboc, Cl. Baciuc, S. Bălan, I. Tănăsescu (Eds.), *Studies on the History of World Philosophy*, XIX, (53–55), Bucharest: Romanian Academy Publishing House, 2011.
20. Pană, Laura. "The Cognitive and Active Status of Principle in Science and Philosophy", *Noesis*, (26) 1, 2011: 15–40.
21. Țicovschi, Vladimir. *Globalization and Technology Transfer*, Bucharest: Editura Enciclopedică, 2006.
22. Yang, Xin-She. *Nature-Inspired Metaheuristic Algorithms*, Second Edition, Cambridge: University of Cambridge, 2010.

# HUSSERL'S PHENOMENOLOGY AND SERGIU CELIBIDACHE'S MUSIC

HENRIETA A. ȘERBAN\*, SORIN BAICULESCU\*

Moto: “Classical music, so diverse and yet unitary  
it can still nourish humanity’.

Musical thought, however, remains a manner of thinking,  
although today it is dominantly 'algorithmic' and  
favours an ontological interpretation,

[meanwhile] the new music proposing itself as 'ontological music'  
by the fact that the 'oeuvre' comes through being (simply, by existing)  
and not by what is valid (by its value).”

Alexandru Boboc, *Logos and melos. Prolegomena to a philosophy of music*,  
Bucharest, Editura Academiei, 2020, p. 229.

*Abstract.* Phenomenology describes and classifies phenomena and has established itself as a new way of thinking and as an important philosophical discipline along with the philosophy of Edmund Husserl. Renamed as the “father of phenomenology” Husserl leads the series of the major representatives of phenomenology among which we mention here Heidegger, Sartre, Merleau-Ponty. Husserl approached great themes of phenomenology such as intentionality, consciousness, *qualia*, subjective perspective, self (hence the important intersections of phenomenology with the philosophy of mind and consciousness), but also sound and music. We aim to present initially the main elements of Edmund Husserl's phenomenology, in order to provide an introduction to Sergiu Celibidache's perspective on phenomenology of music. Therefore, the second part of the essay is analysing the way the musician Sergiu Celibidache understood the existence of phenomenology applicable to classical music. We are considering both the resemblances and the differences relatively to Husserl's phenomenology. The objectivity of sound representing a vibration “in movement”, with the ability to influence human consciousness, mainly the inner one, but also the outer one, represents the essential characteristic of the way Celibidache was perceiving the phenomenology of music. We are putting into evidence certain concepts, such as “the purity of sound” – an element generating psychological (philosophical) stress or a meditative mood, correlated with “intentionality”, “significance”, “finality” and the “eidetic”. There is in the music conceived by Sergiu Celibidache an influence of the Buddhist thinking of the ZEN type (which he himself had often declared). In this essay, we are analyzing certain aspects existing in the outlook of the Romanian musician that have a philosophical and mathematical form (transcendent, micro-structural, macro-structural and so on). In the final lines of the essay, Sorin Baiculescu introduces the (essential) notion of fundamental trihedral of the classical music conceived by Sergiu Celibidache, composed of three axes, which represent: a) harmony; b) counterpoint; c) melodicy. There are also to be found some connections with Anton Bruckner's music – Sergiu Celibidache's favourite composer. Finally, we propose the audition of the overture of Wagner's opera “Tannhäuser”, namely the version of the Munich Philharmonica, in 1993, which benefitted by the Romanian conductor's view; its duration is 17:52 minutes, since it is a well-known fact the musician preferred slow rhythms of classical music that may generate a remarkable expressivity.

\* Member of Division for Logic, Methodology and Philosophy of Science of Romanian Academy – The Group for Interdisciplinary Research. This material was prepared for a joint conference of this group.

*Keywords:* phenomenology, sound of classical music, eidetic of music, Edmund Husserl, Sergiu Celibidache.

Received on 16 February 2022

Phenomenology has established itself as a new way of thinking and as an important philosophical discipline along with the philosophy of Edmund Husserl. The name derives from the Greek term *phainómenon*, which means “appearance”. In *The Oxford English Dictionary* (1994), the definition of phenomenology indicates “The science of phenomena that treat phenomena distinct from those associated with being and ontology” and “The branch of science that describes and classifies phenomena.” Phenomenology is a philosophical discipline distinct from others, although it is related to ontology, epistemology, logic and ethics. We notice particularly interesting correlations between phenomenology and existentialism. This interest in phenomenology correlated, starting with the completion and publication of *The Paradigms of Difference in the Philosophy of Communication. Modernism and Postmodernism*, with an associated project of subjectivity within the study of postmodernism, and continued to be intertwined with this orientation towards the “linguistic turn of subjectivity” (Şerban 2007).

The major representatives of phenomenology are Husserl, Heidegger, Sartre, Merleau-Ponty. The great themes of phenomenology are intentionality, consciousness, *qualia*, subjective perspective, the self (hence the important intersections of phenomenology with the philosophy of mind and consciousness). Phenomenology reached maturity in the twentieth century, when great philosophers such as those mentioned above contributed particularly to the development of the field. About sound and music, we find either remarks or more accentuated preoccupations, in Edmund Husserl, but also in Mikel Dufrenne, Martin Heidegger, Paul Ricoeur, Maurice Merleau-Ponty, or Jean-François Lyotard. Mikel Dufrenne, for example, is at the opposite pole from Edmund Husserl, whose approach he considers idealistic: the field of appearance is for Dufrenne, precisely as a field of presence, something we encounter and *not* something we constitute (Dufrenne 2007).

However, Dufrenne and Husserl have in common a special interest in relationships, phenomenology being associated and derived significantly from the study of relationships, without which we could not talk about intentionality, about the Husserlian direction to the object, which brings phenomenology closer to logic.

In this first part we aim to present the main elements of Edmund Husserl’s phenomenology, in order to provide an introduction to the second part of this lecture, namely, Sergiu Celibidache’s perspective on Husserl’s phenomenology of music.

For philosophers, phenomenology is mainly the study of the structures of consciousness as a perceived experience in the first person. For phenomenologists, the central structure of an experience is *intentionality*, that is, that quality of the subjective perception of the experience of being directed towards something, or of being an experience *about* something (about an object). An experience is directed



toward the object through the content of the object or through the associated meaning, which represents the object, in the context created by certain conditions of meaning.

Husserl's first work (published in 1891) addresses, at Brentano's advice, from psychological and empirical standpoints, a philosophy of arithmetic. In this philosophical approach, the number is the result of a mental process of abstraction. The logical principle of non-contradiction is thus a facet of a psychological reality, that is, of the psychological impossibility of accepting two contradictory truths. However, what represented the "psychological method" is a dead end for Husserl, because it is insufficient to legitimize objective logical and mathematical notions. The captured essence of thinking aims at specifying the absolute truth, of universal sentences (which are transparent in notions and mathematical laws, for example), a specification that *cannot* be reduced to psychology, to a psychological product. (Graf 2001, 40–50).

Husserl argues in his phenomenology that logical truth is not reduced to a belief, to something contextually accepted, relatively, for the moment. ("Nothing seems more obvious than the fact that purely logical laws are as a whole, valid a priori"). Yet, can we show (prove) by reasoning alone that logical-mathematical sentences are "true" in an apodictic way (beyond the need for empirical verification)? The psychological subject should not influence the logical-mathematical statements, because they are formal (not experimental). The truth of reasoning that supports mathematical statements does not come from the correctness of a psychological process, but from overcoming subjectivity to reach the area of objectivity, of reasoning. Things as they appear to us are "echoes" (Platonic) of things as they are. In the area of objectiveness (of objective things and reasoning, ultimately, of reality) we detect by reasoning the essences that still exist in the world of phenomena, not only in the high world of the spirit (Welton 2019, Petrescu 2019), Things as they appear to us are nothing else but things as they are (in Husserlian perspective). However, the doctrine of Husserlian essences is not a replica of the Platonic one.

Things (objects, objective things) are not reduced to mental processes (this is the difference from empiricist psychology) nor to "beings" in the world of ideas (this is the difference from Plato's philosophy). Thus, the logical and rational description of objects (which is not a simple abstraction and is no longer exclusively mathematical) becomes possible through the prism of the phenomenon, of pure evidence. This leads us to an *intuition* of *pure essences*, or *eide* ("ideas" in Greek) – ***the method of eidetic reduction*** is based on this intuition. Phenomena manifest both eidetic variations and eidetic invariants – *essences* (Husserl 2011b, 307).

***The eidetic analysis*** highlights, outside the logical-mathematical field itself, the way any object's essence appears to us. The phenomenon is "indebted" to the essence it carries. The phenomenon represents the opportunity to capture the essences. Returning to things themselves presupposes a comprehensive, intelligible and logical description of what is presented to thought. The example of the "tree": in a concrete tree the essence emancipated from a certain point of view is manifested (as it is). But phenomena are the manifestation of an essence

*exclusively* for a consciousness. Assuming the perspective of Husserl's philosophy, this is why we can speak of the (a) noetic activity of consciousness.

The acts of consciousness are acts of aiming, or of vising ("noesis"), *i.e.* intentional acts, which take into account what is aimed at ("noema") (Husserl 2011b, 329–364).

Noesis, which was in Plato the highest form of knowledge of the eternal forms, becomes for Husserl the subjective aspect of knowledge and the act of intentional experience. Noema is contained in the intentional meaning of the act of consciousness. Noema is the *objective content of intentional experience*. Noema is immanent to noesis. Consciousness refers to what is to be manifested, in essence, within intentionality. Consequently, the objectivity of the world is interpreted in an *object-subject relational unity* and not in opposition to the subject. The subject is not exterior, beside things, it is not purely reflective, or outward. Consciousness is the relationship of a subject with an object. 1. *Consciousness is always the consciousness of something (specific)*. 2. *There is reality only for a thinking subject*.

**Epoché** represents the "suspension of judgment" or the act of "putting in parentheses" (*The Idea of a Phenomenology*, 1907, *Cartesian Meditations*, 1931) for the detachment from the everyday, from the mundane, for an authenticity of the intentional activity of consciousness. It is a method that reaffirms the importance of subjectivity and its almost paradoxical ability to understand the deep relationship with the world and to refuse "*complicity*" with the world. As Merleau-Ponty observes, the *epoché is only a means of rediscovering evidence*. Husserl, although he sees the subject as Descartes, as *res cogitans*, nevertheless, he goes further and discovers the intentional life of pure transcendental subjectivity. By **intentionality** the world is included in consciousness and consciousness in the world. The tree in the yard is also in my consciousness – a certain idealism, which is not solipsistic, since Husserl defines objectivity through intersubjectivity (Husserl 2011b).

The world cannot be constituted as a world for one man. In *The Crisis of European Sciences* (1935), Husserl discusses the reality of a *primordial intersubjective focus, as a vision of a common world, the foundation of human scientific, artistic and historical culture*. (Husserl, 2011a) With Husserl, the world is not only a "book written with mathematical signs" (Galileo), but also the intention of man, of subjectivity, which cannot be forgotten.

In this perspective, of subjectivity and intersubjectivity, Edmund Husserl explicitly approaches *sound* as an experience of the presence and consciousness of time, time as a continuity (1991). Although we do not find the word "music", about the phraseology of sounds Husserl wrote: "I am aware of the sound and the duration it fills up with a continuity of 'modes' found in 'continuous' flow". The duration of a sound is always associated with the duration (and existence) of a stream of consciousness. "The same sound heard now is, from the point of view of the flow of consciousness something that is generated [something] past; its duration has expired. [...] Its temporal moment is not removed, but the sound has disappeared in the remote realms of consciousness; the distance between the generative [moment] and the [moment of] right now increases". (Husserl 1994, 45).

The sound imposes itself on the listener's consciousness. For Edmund Husserl, sound is made present in consciousness through its existence and duration, through the movement and change of its appearance in this process of listening. These are also phenomenological categories of the study of sound: present-perception, duration, sound modulations and sound change. The sound passes through the present moment and reaches the "remote realms" of consciousness, in a memory in which it seems to merge, or to "sink" (we can say that it becomes either a short-term memory or a long-term memory). (Husserl 1994, 44).

Although Husserl approaches sounds, he does so by following their dynamics, impact and relationship with consciousness, as well as the inter-relationship of sounds in music, namely in sound (musical) phrases. Sound is not something disconnected, but something that drives connection to awareness, time, change and movement, perception and memory, all categories of subjectivity. Of course, not every sound trigger memory and recollection, not every sound becomes a memory, but many do become memories. We can notice that other sounds than the ones we recognize as music become a memory, such as the crying of our own child, distinct from others, or the audible signals of fire engines.

Husserl discusses the temporality of sounds and their reverberations. The musical sequences are dynamic, the melodic line goes up and down, it comes and goes (almost as in the Blaga's "undulation": "the unconscious spatial horizon 'reaches, with its undulations, up under the arches of consciousness'"), in relationships that can be consonant or dissonant, in harmony or disharmony. (Surdu 2015, 11) The perception of sounds, Husserl implicitly points out, is not about the ascertaining type nor of the quantitative type, but is part of a procedural and phenomenal, relational and subjective approach. Without forcing things, whenever Husserl approaches a phenomenology associated with the inner time of consciousness, the ideas developed are relevant to the phenomenological discussion of musical experience.

The phenomenologist also addresses the difference between the phenomenon of sound recollection or sound sequence (of memory) and that of perception. On the one hand, they work the same way, because they are located in a point of presence, the presence of the self, right "now", and, although recollection and perception carry both sounds from a "now" moment to the end of the experience, and from the development of sound, the connection is pursued in its chain, in consciousness. However, on the other hand, perception differs in its relation to the present and its relation to the past (Husserl 1994, 61).

The perception of music is the perception of an intentionality that takes the forms of "living via experienced feeling" (Bugeanu 1984, 180), as part of subjectivity. The phenomenology of music highlights a certain musical specificity: "Not the 'musical work' represents the object of research of musical phenomenology, but the act of music in its realized form, through the obligatory participation of those who play music, because otherwise music does not lead to the act of living" (Bugeanu, 1984). In his *Lectures on Aesthetics*, Hegel emphasized the importance of a theoretical "organ" and of the soul's interiority in order to truly appreciate the "presence" of music. The "art of objectivity" that music brings with it "acts directly on the feeling itself" (Hegel, 1966).

At the end of this part, we can appreciate in music, following Nietzsche, the “traces” of that “initial eternal force”, Dionysian in nature, and of the “aesthetic intention”, Apollonian in its nature, associated with hope and future projections (Boboc, 2020). In this sense, Lucian Blaga (Blaga 1968, Boboc 2020) also interpreted the importance of the original phenomenon (*Urphänomen*) in Nietzsche, with a central role also in Goethe, in botany or colour theory, as well as in Spengler, where the original phenomenon is culture, understood as a *habitus*, like a plant, (which evolves), presenting a tact and a cultural tempo ... “One can speak of an *Andante* of the Greco-Roman spirit and of an *Allergo con brio* of the Faustian spirit”, that is, about a modern spirit (Spengler 1983).

## II

With the current paper, we shall be “sliding” towards the way Sergiu Celibidache understood the existence of phenomenology applied to music, by presenting the similarities and dissimilarities as compared to the phenomenology conceived by Edmund Husserl. Some of Celibidache’s ideas referring to phenomenology in music were presented (post-mortem) in the essay *On Musical Phenomenology* [*Despre fenomenologia muzicală* – the Romanian version]. (Celibidache 2001)

Like the Romanian musician, we shall describe, first of all, the important characteristics of phenomenology of music, while its definition will result from the context.

In the above-mentioned work, Sergiu Celibidache was depicting, however, “two spaces for analysis” (Celibidache 2012, 14), where the phenomenology of music is occurring as following: “1) putting the sound into evidence (a sound which is not music, but only a moving vibration that might become music) (Celibidache 2012, 13–15); 2) within the study of multiple ways according to which the sound will have a *non-equivocal* impact upon ‘human awareness’. Regarding that framework, the harmonics of the fundamental tone (which is short-lived) are also vibrating; they are epiphenomena (Celibidache 2012, 16) and have a spatial and temporal structure”. (Celibidache 2012, 18).

In her work, *Basic Fundamentals of Phenomenology of Music by Sergiu Celibidache*, Lucia Marin was stating: “Celibidache’s phenomenology of music is an investigation or inquiry into the direct perception and influence of sound and how the sound contributes to the musician’s ability to reach a transcendent performance. He developed this understanding through his study of Eastern philosophy and Edmund Husserl’s philosophy of phenomenology, as well as his own knowledge and engagement with music” (Marin 2015).

Thus, we may talk about the perception of the sound purity within some (phenomenological) *Experiences*, pertaining to creation, as well as the perception of (classical) music, in fact, the whole perception of the essence of the sound is achieved. **The purity of sound** becomes a creator of tensions (generally speaking, increasing ones), along the complete deployment of music, which tend towards a maximum, similar to “philosophical tensions”, determinant for the spirit of the Human Being;

those tensions will thus influence upon the awareness, the pre-conscious and the unconscious (according to Sigmund Freud), by means of their main attribute – **intentionality** (“to be directed towards...” (Celibidache, 2012). The latter has a teleologic aspect and is, in fact, within the musical work, an intentional object. The denouement which reflects a sense of the intentionality, general-intuited, is, within it, an ultimate “point” and has, in fact, a macrostructural “essence”.

With Husserl, intentionality is important for his phenomenology: the mechanism specific for its manifesting is mainly put into evidence by eideticity (the essence of a phenomenon), while the phenomenon is characterizing, in fact, the existence of that part of consciousness oriented towards the external environment of the Human Being (awareness of something), which consequently exists in a (mainly) macrostructural form, as Husserl’s phenomenological theory claimed itself to be devoid of psychologism.

For Celibidache, intentionality is also important for his phenomenology applied to music, this time, also by means of *eideticity*, and thus, characterizing the existence of consciousness in a different way as compared to Husserl: consciousness) is oriented towards the inner regions of the Human Being (directed towards the self of the latter).

We should remark that, for the two of them, both the consciousness oriented towards the outer regions, and the one oriented towards the inner regions, have intentionality. Knowledge occurs in both situations of the existence of consciousness. When oriented towards the outer regions, one may say (most times) that “it has objectivity”, while when oriented towards the inner regions, one may conclude that “it has subjectivity”. In the dedicated works, the ontology of subjectivity has been identified (Deac 2003).

According to the *Encyclopedia of Philosophy and Human Sciences*, “Immanuel Kant is splitting the self-awareness into a consciousness of the intellect and a consciousness of the inner feeling (pure and empirical a-perception), by means of which the ego is, at the same time, a subject of thought, as well as an object of a-perception” (Encyclopedia 2007).

We consider that Sergiu Celibidache had, in fact, both forms of self-awareness, an aspect which we may also encounter in the musical phenomenology he was promoting, but also in his art of conducting, in the transcendence towards which he was continuously aiming, as a deed proper to his music, without passing through certain forms of transcendentalism. That was also an outcome of his system of thinking (of the Buddhist type, the ZEN form), which he considered applicable to his own person (similarly to another great artist – the American violinist – Yehudi Menuhin).

Since Husserl was, first of all, a mathematician, he had a certain “instrumentism” in science, and thus he placed himself near enough to what is being achieved in “neuroscience”; in fact, he was a forerunner of the latter, by the fact that he did not recognize the psychological thinking (Logical Researches – vol. I), although, initially, he had taken it into consideration (“*Philosophy of Arithmetic*” [*Philosophie der Arithmetik*]), and so, he placed himself, by his thinking, next to the mathematician-logician-philosopher Gottlob Frege.

As a corollary to what has been said so far, we may remark the similarity existing between the “pure” structure of music and the “pure” structure of mathematics (the author submitted an essay with this very subject matter within the Group for Interdisciplinary Research included in the Division of Logic, Methodology and Philosophy of Science – The Romanian Academy).

In music, as Pascal Benteoiu was remarking in his work *Image and Significance* (Benteoiu, 1973), there is a certain “bedding” that contains “infinitesimal”, “micro-structural” and “macro-structural” layers, to which we could also add the transcendental and transcendent levels, according to our personal opinion (on the latter we would place Sergiu Celibidache, by the “understanding”, “perception” of the respective field).

Concerning the Romanian musician, we remark an emphasized orientation towards the “Inner Universe” connected to transcendence, proper (subjective) to it, irreducible to “something” in particular, inexplicable by means of language. In fact, we can also identify the characteristic of his phenomenology. By means of a certain splitting that may occur between language and thinking, we may find similarities between the phenomenology proper to Sergiu Celibidache and mathematic intuitionism.

In music, we can identify a certain form of consciousness, the **awareness** being considered as correlated (the word used by Sergiu Celibidache) to **intuition**.

Maximum tension induced by music may be followed (or not) by a possible relaxation. The former (maximum or minimum tension) may be obtained by means of a **reduction** in the form of **epoché (putting between brackets or suspending)**, with a (mainly) **eidetic** nature (eliminating or striving to eliminate what represents the non-essential, in fact, multiplicities).

The form of total perception, achieved by means of reduction, cannot be obtained. In his work, *Phénoménologie de la perception*, ed. 1945, Maurice Merleau-Ponty – a promoter of phenomenology, was referring to the fact that “a complete reduction is impossible”, implying, in fact, also for music, it is impossible to achieve a complete induction (as in mathematics) that would allocate a maximum certainty, since, in fact, what is occurring are conjectures, not generalizations, limitations as concern the aspects of wholeness. Kurt Gödel’s theorems justify our allegation (supra-system, system, undecidability and so on). Gödel would have understood all Celibidache’s concerns, but would have demonstrated that all he was searching was, in fact, undecidable by the human being. With Heidegger II, one may intuit, maybe in the sense of a previous metaphysics, the regions of the existence of the transcendence of the Human Being (as a “domain” of the Divinity), that in fact, the Romanian musician was also searching for, by means of music. The musician declared, with all the emphasis implied by his personality, that he was a great believer in Divinity, in transcendence. Music creation is, sometimes also supervenient (see also “Emergence” published within the journal “Noema” XIV in the year 2015).

The wholeness of music (of the musical object which “is becoming”...) is, by means of such a mechanism, an **intentional object**, impossible to be obtained without reduction.

We should remind that transcendental reduction, as well as the gnoseological (philosophic) one, consist of the removal of what differs from pure consciousness; the respective expression is used, together with the expression – eidetic reduction – according to the situation.

At the musical level, occurs a process that we may consider to be **epoché**, when we can remove (by putting between brackets) all perturbator factors, sometimes impure, multiplicities that might prejudice the quality of the sound, possible to become music, within a transformational process which aims towards certain transcendental regions (for some people, even directly towards transcendent), in order to achieve homogeneity within unity/whole/absolute.

We should remark that the mechanisms proper to Husserlian phenomenology, such as epoché (reduction), integration, become also possible within Celibidache's phenomenology, except for the form of intentionality, Husserl considering the latter directed towards the outer consciousness, while the Romanian musician considering it as being directed towards the inner self.

Sergiu Celibidache considered that in his phenomenological conception occurs “a new, unique and primary setting-up, which requires only one condition: that of the existing relationships, which are mutually completing and complementing one another, (relationships) among parts or ways of being” (Celibidache 2012).

We may remark the similarity with the Yin-Yang principle of unity/complementarity (the cosmic duality of all energies in Nature, all joining into a whole, into a unity that is generating complementarity). Within this framework, occurs the existence of a temporal simultaneity, too.

The author makes a distinction between the idiom “new setting up”, generating simplicity within complexity, aiming at obtaining the whole by means of music and consequently at “recreating unity out of distinction”, which, in fact, is a form of a deconstruction, followed by a reconstruction aiming at obtaining the whole. The author strived, in fact, to build the whole, right from the start (the initial moment), by means of music. The procedure he introduced, that of the “new setting up”, is called by him “integration”. The latter has nothing to do with the mathematic and formal-logic concept of the recreation of unity out of distinction” (Celibidache 2012, 30). “Integration”, “unity”, “the whole”, are terms we can also find in the Buddhist thinking systems.

In music, Sergiu Celibidache was influenced, in his phenomenological thinking, by the German philosopher Nicolai Hartmann.

We are of the opinion that the term proper for being used in music would have been “transcendental” (in the Kantian spirit) not “transcendent”. For the latter, we have doubts on the correct, sufficient understanding by means of music. We are probably going to aim at the “transcendent” regions when we sufficiently “understand” all that is effectively represented by the “transcendental” region for our human being. Husserl was stating: “[...] how can knowledge reach something that is transcendent to it?” (Celibidache, 2012). However, maybe in a still inexplicable way, with the Romanian musician, the passage of unity, of the whole obtained by means of music was achieved directly, within transcendent “spaces”. He used to repeat, sometimes, the following profoundly significant sentence: “...I am not there because I am not there...” (the influence of the Buddhist thinking system, which is visible

with his self-inclusion within a “whole” achieved by means of music, in its turn, directly included into the transcendent (e.g.,: the last 4–5 minutes of “Bolero” – Maurice Ravel, 1971, recording with the Philharmonic Orchestra in Copenhagen). Celibidache stated that the aim of music consists in obtaining the supreme truth (probably included within a Real space, different from the reality as physically perceived by the Human Being, empiric; to that goal, in fact, what occurs is the joining together of the imaginary space and of the symbolic space, within which, there are, effectively, some spaces supporting the Human Being in every achievement (especially, we should pay due attention to the symbolic space) (the Borromean regions/knots/circles, also used by Jacques Lacan in his studies). (Lacan 1982, 4–13)

The great art creations, as well as musical works are intentional, in fact, they can be placed between reality and the Real, a reason why they are often becoming inexplicable, especially when they are examined by using (asymptotically) transcendent regions.

We have found a number of essential coordinates which directed Sergiu Celibidache towards the phenomenology of music: a) musical structure, required; b) adequate playing (taking into account the structure); c) dimension of the spacing and timing required by the form of music. Harmony, tempo..., which he considered to be included in the structure, while phenomenology also generated the “depth of musical purity” he had been continuously searching for and requesting to others, in all situations. The sound was “the nucleus”, the coming essence of music, which had to be **pure**, while instrumental multiplicity was to be taken over, ultimately and totally by the musician, as selective, non-redundant information to be “melted”, in fact, into the unity of the whole.

As an exercise of phenomenological reduction, the musician distinguished, within some particular expressions, a vertical “pressure” related to the orchestra he was in charge of and a horizontal “pressure”, related to the melody he had to obtain together with that orchestra<sup>1</sup>.

He had a new understanding of music, close to less conventional, emergent forms that influenced the pure awareness of perception, a reason he didn’t agree with musical recordings that were distorting music<sup>2</sup>.

By accepting musical phenomenology, Sergiu Celibidache considered as important the optimal generating of a **maximum tension** obtained by means of an **intensity of maximum level** of sound, some other times, however, the former is “accompanied” by an extreme non-intensity. Both were determined by harmony

<sup>1</sup> For these reasons, in his rehearsals (usually, 8–10) many rough “no”-s were uttered; he had great exigences as concerns perfection and he considered that rehearsals did not exist at all, since they would always be something else (...for the first time), and then, upon the end of rehearsals, in case he considered them satisfactory, there was that supreme “yes”, then, would follow the deploying of music “publicly”, where he would try to transmit a real message, attentively prepared, by means of music. He would say that microphones were distorting music, were affecting the quality of sound that was trying to become music (the latter represented, in fact, an unmatched movement of consciousness).

<sup>2</sup> We are currently encountering similar situations with the Romanian pianist Radu Lupu (Lausanne), who has generally refused recordings that may distort the purity of sound.



and melodicity existing on the framework of tempos much slower than the ordinary ones<sup>3</sup>, generating expressivity, considered to be required, within well-balanced limits, and superior (by their gravity) to faster tempos.

The great Romanian musician would say: “[...] perception is floating between a clear consciousness and a pure reality” (Celibidache 2012).

In the same spirit, he would say that “he who has ‘reached’ real music can understand real music and its phenomenology, and he will be always next to it, as it will be his companion on his way towards true liberty” (Celibidache 2012, 52).

Essentially, in the work *Über musikalische Phänomenologie* (Celibidache 2001), the Romanian author referred exclusively to the following aspects pertaining to the phenomenology of music: a) intentionality; b) reduction (epoché or putting between brackets); c) tension obtained by means of music; d) integration of music within a whole (unity), e) aiming towards pure consciousness (inspiration of the Buddhist type (the ZEN form) (oriented towards the “self” of each one of us, continuously vectorized towards the direction of the affective universe), reminding of the necessity of achieving a (musical) expansion (deployment of music, existing within a time progress), of obtaining a “culmination”, of generating emotion (significant separation from the natural (physical) course of the time flow, specific to Buddhism) and of contrast .

We should remark, in the framework of what has been presented, the fact that the Romanian musician probably had a capability of perceiving superior harmonics, which are impossible to be heard by ordinary humans.

Consciousness, regulated by means of music, in the sense of including the latter, in the sense of the relationships among the intervals within it, will become free, non-dualist, implying freedom, and by means of integration will be obtained (as a possibility) the whole, a new setting-up will result, (within a cybernetic “process” of the bio-psycho-feedback/psycho-feedback form) there is a functional operator – phenomenological reduction (some are Master Celibidache’s remarks). The relationship existing among the sounds that are becoming music within a process of reduction, while the Human Being, in his conception, was placed above human perceivable consciousness, but was, in fact, however, only an attribute of intersubjectivity also operating upon the relationship between music and the public participating to a concert. Thus, we may distinguish the importance of an external listener, who should come close to music, and be included into the latter’s “space” (probably inserted also to other “spaces”), since, otherwise the full understanding of music cannot become possible. The image created by the music executed by the artist/orchestra is important, by the fact that music could be better understood by the listener, while observing, however, the composer’s prescriptions, that can never be achieved infinitesimally, “in integrum”. In fact, between music and image occurs an isomorphism known in mathematics and philosophy, and the triads music – image – transcendental and music – image – transcendent are useful for knowledge.

<sup>3</sup> Example: The playing of Wagner’s overture at the opera *Tannhäuser*, conducted by Sergiu Celibidache has a duration of 04:16 minutes, than the same music executed under the conduction of another great musician – Claudio Abbado.

“Human spirit is becoming indivisible, in the ontological sense (*ekagrata* – Sanskrit language)” (Sergiu Celibidache). With the interpretation of the Romanian musician, “Noema” represented the whole process of (correct) perception of sounds, while “Noesis” consisted in unity, the whole resulting from the relationship of the perceived sounds (Roca, 2017). Both “Noema” and “Noesis” may occur only within a process where the functional operator is the reduction of the *epoché* form.

Within the framework of the phenomenology of music, we could also analyse the “intentional” concept, named “formation”, which also exists with Husserl (pertaining to the process of obtaining the representation of the whole by means of music, accompanied by evidence and truth, of the intuition occurring within musical creation). The forming of “the other one” represents a concept also analysed within the Group for Interdisciplinary Research conference in January 2021, and in the context of the phenomenology of music it may imply, however, to consider and regulate from the phenomenological point of view, the triadic relationships orchestra – conductor – public or the tetradic relationship orchestra – conductor – me – you.

Within a phenomenological context, we propose, in this case, too, to achieve a reference system usable in music within the fundamental trihedral with three axes (1. Harmony; 2. Counterpoint; 3. Melodicity), within which we may obtain the region (optimal surface) formed by the set of points for which the three components H – C – M record an optimal level, intuited from the musical – phenomenological “angle”, built with the help of AI” (see in a previous issue of this journal Sorin Baiculescu, *Method, logic, philosophy and science in the music of Johann Sebastian Bach and Wolfgang Amadeus Mozart*, 2017).

*We are attaching the respective essay, since we consider that Master Celibidache, in the (initially) reminded work, at page 40, was referring to Bach as the greatest phenomenologist of music whom the world had known (however, we dare to say that Mozart, too, can be placed in a region close to transcendent “spaces” generated by music). (Maybe) it is useful to read that essay, keeping in mind the idea of thinking of a possible approach, in the complementary framework of the phenomenology of music, together with its main subject. The above-mentioned essay represents a personal analysis of some scientific and philosophical domains that its title refers too, applied to the music of the two composers, without being a work of musical critique. The essay was submitted by its author for publishing in English, for the current year within the journal “Noesis” (the first number of the new series), which has an interdisciplinary profile.*

At the end of the second part of our presentation concerning Celibidache’s phenomenology of music, we shall take an example of the referenced issues, by means of the overture of Wagner’s opera “**Tannhäuser**” (required time: 17:52 min.) – a work that was played in the year 1993 by the Munchen Philharmonica conducted by Sergiu Celibidache, three years before he passed away.

Important remark:

Celibidache’s great admiration for the music of the Austrian composer Anton Bruckner is well-known: the latter determined the high quality of musical information within his works.

Bruckner generated “a new universe”, which he was thinking of by means of music; at the same time, by listening carefully to that music, we can identify the ethical value of his works. Anton Bruckner’s personality, at least to the extent it is reflected in his music, was close to the personality of Sergiu Celibidache (a volcanic, bright character, connected to the permanent “turmoil” of his personality, with a very exactly elaborated music that contains melodicy, majestic abstraction, purity, uproar, grandeur, luminosity). We recommend that each of those implied in the audition of this conference should take examples from Bruckner’s music (possibly the nine symphonies), as they were interpreted by Master Celibidache, since the time required for those examples would be insufficient here, even if we had adopted the idea of a compared analysis. Choosing only some selections, useful in order to support such an idea, does not present as a good solution, since that might “damage”, by reduction, the very “wholeness” of music, its unity, which Celibidache remarked as necessary. The example chosen for the current lectures is mainly showing the “maximum tension” that can be reached by means of music, as well as the expansiveness of the latter.

#### Remarks:

1. Our common essay was prepared initially for a common conference and captures (as we consider and we would like it to be) an interesting and admirable (creative, developing) encounter between music (by means of phenomenology and some third aspects) and philosophy, generally speaking (by means of phenomenology). The conference has the (very) carefully chosen title “Husserl’s Phenomenology and the Music of Sergiu Celibidache” not “Husserl’s Phenomenology and the Phenomenology of Sergiu Celibidache’s Music” that would have represented something else. The two aspects are, of course, intermingling.

#### REFERENCES:

1. • Books: Rawls, John. *Political Liberalism*. New York: Columbia University Press, 2006.
2. • Chapters: Bilborrow, Richard E. “Concepts, Definitions and Data Collection Approaches”. In *International Handbook of Migration and Population Distribution*, edited by Michael J. White, 109–126. New York, London: Springer, 2016.
3. • Journal article: Akkerman, Sanne F. and Bakker, Arthur. “Boundary Crossing and Boundary Objects.”, *Review of Educational Research* 81 (2011): 132–169.
4. \*\*\**Vocabulaire technique et critique de la philosophie*. Paris: French Philosophy Society, 1968.
5. \*\*\* *Dictionary of philosophy and logic*. Coord. Antony Flew, in translation. Bucharest: Ed. Humanitas, 1996, [1979].
6. \*\*\* *Oxford Dictionary of Philosophy*, ed. Simon Blackburn (ed.). Oxford: Oxford University Press, 1994.
7. \*\*\* *Dictionary of History and Philosophy of Science*. Coord. Dominique Lecourt. Iași: Ed. Polirom, 2009 [1999].
8. \*\*\* *Dictionnaire de la Musique*. Paris: Editions Larousse, 2005.
9. \*\*\* *Dictionnaire des Symboles*. Sous la direction de Jean Chevalier, avec la contribution de Alain Gheerbrant. Paris : Robert Laffont, 1982, [1969].
10. Baiculescu, Sorin, “The Emergence”. *Noema* XIV (2015):147–170.

11. Bentoiu, Pascal. *Image and Significance*. Bucharest: Editura Muzicală a Uniunii Compozitorilor, 1973.
12. Blaga, Lucian. *Zări și etape [Horizons and stages]*. Bucharest: Editura pentru Literatură, 1968.
13. Boboc, Alexandru. *Logos și melos. Prolegomene la o filosofie a muzicii [Logos and Melos. Prolegomena to a Philosophy of Music]*. Bucharest: Editura Academiei, 2020.
14. Bugeanu, C. *Fenomenologia muzicii [The Phenomenology of Music]*, in *Dicționar de termeni muzicali [Dictionary of Musical Terms]*. Bucharest: Editura științifică și enciclopedică, 1984.
15. Celibidache, Sergiu. *Despre fenomenologia muzicală [On Musical Phenomenology]*. Bucharest: Ed. Spandugino, 2012.
16. Celibidache, S. *Über musikalische Phänomenologie*. München and Augsburg: Triptychon Verlag, 2001.
17. da Costa, Newton. *Classic and Non-classic logics – an essay on fundamentals of logic*. Bucharest: Editura Tehnică, 2004, [1997].
18. Deac, Ioan. *Ontology of Subjectivity*. Bucharest: Ed. Paideia, 2003.
19. Dufrenne, Mikel. *The Phenomenology of Aesthetic Experience* (1953), transl. by Edward Casey. Evanston: Northwestern University Press, 1973.
20. Graf, Alain. *Marii filosofi contemporani [Great Contemporary Philosophers]*, Iași, Editura Institutului European, 2001.
21. Hegel, G. W. F. *Prelegeri de estetică [Lectures of Aesthetics]*, Vol. II. Bucharest: Editura Academiei, 1966, 286–288.
22. Husserl, Edmund. *Criza științelor europene și fenomenologia transcendențială*, transl. by Christian Ferencz-Flatz. Bucharest: Editura Humanitas, 2011a.
23. Husserl, Edmund. *Idei privitoare la o fenomenologie pură și la o filozofie fenomenologică. Cartea întâi: Introducere generală în fenomenologia pură*, traducere de Christian Ferencz-Flatz. Bucharest: Ed. Humanitas, 2011b.
24. Husserl, Edmund. *On the Phenomenology of the Consciousness of Internal Time* (1893–1917), translated by John Barnett Brough. Dordrecht: Kluwer Academic Publishers, 1991.
25. Husserl, Edmund. *Early Writings in the Philosophy of Logic and Mathematics*, translated by D. Willard. Dordrecht: Kluwer Academic Publishers, 1994.
26. Lacan, J. „Le symbolique, l’imaginaire et le reel,” *Bulletin de l’Association Freudienne*, 1 (1982): 4–13.
27. Marin, Lucia. *Basic Fundamentals of Phenomenology of Music by Sergiu Celibidache*. University of Kentucky, 2015.
28. Petrescu, Camil. *Edmund Husserl. O introducere în filosofia fenomenologică [Edmund Husserl. An Introduction in the Phenomenological Philosophy]*. Baia Mare: Editura Actaeon Books, 2019.
29. Roca, Juan Antonio. *Fenomenologia de la musica de Sergiu Celibidache y su influencia en la direcion de orquesta en Espana*, PhD Thesis, 2017.
30. Salvetti, G. *La nascita del Novecento*. Torino: EDT Torino, 1991.
31. Schönberg, Arnold. *Style and Idea*, New York, USA: Philosophical Library, 1950.
32. Schweitzer, Albert. *J. S. Bach*. Dover : Dover Publication Inc., 1966.
33. Surdu, Alexandru. „Ondulațiunea universală și sufletul românesc” [„The Universal Undulation and the Romanian Soul”], *Studii de istorie a filosofiei românești XI* (2015): 11–18.
34. Șerban, Henrieta Anișoara. *Paradigmele diferenței în filosofia comunicării. Modernism și postmodernism [The Paradigms of Difference in the Philosophy of Communication. Modernism and Postmodernism]*. Bucharest: The Institute of Political Sciences and International Relations „Ion I. C. Brătianu” Publishing House of the Romanian Academy, 2007.
35. Spengler, Oswald. *Der Untergang des Abendlandes. Umriss einer Morphologie der Weltgeschichte*. München: C. H. Beck, 1983.
36. Tănăsescu, Dragoș. *Lipatti*. Bucharest: Ed. Meridiane, 1965.
37. Welton, D. (ed.). *The Essential Husserl*. Bloomington: Indiana University Press, 1999.

# HISTORY OF SCIENCE AND TECHNOLOGY



# ROMANIAN SCHOOL OF PULP AND PAPER<sup>1</sup>

VALENTIN I. POPA\*

*Abstract.* The aim of the current paper is to present highlights in the history of paper manufacturing on the territory of Romania. Founded at the Polytechnic Institute of Iași in 1949, the Romanian School of pulp and paper has had outstanding educational and research results, which benefit from national and international recognition. Research results have been disseminated by means of the International Symposium on Cellulose Chemistry and Technology founded in Iași, with its associated peer reviewed international journal “Cellulose Chemistry and Technology”, among other means. This field of knowledge is of topical interest, against the background of the academic, research and general interest in sustainable development.

*Keywords:* Romanian school of pulp and paper, Chemical engineers, Sustainable Development, Biorefining, Biomass.

Received on 10 June 2022

The beginnings of pulp and paper education coincide with the emergence of this industry on the territories of the Romanian Principalities and with the first higher education initiatives introduced at the Michaelian Academy in Iași, founded on June 14, 1835.

As if anticipating what was going to happen at the industrial level, on January 14, 1843, the educational division of the Michaelian Academy asked Professor Alexandru Costinescu, head of the Departments for Analytical and descriptive geometry and for Civil engineering, to prepare for the public exhibition occasioned by the winter semester session several designs, including the design of a paper factory (Popa 2014f).

Here is a description of paper manufacturing made by historian C.G. Giurescu (Giurescu 1974): “The structuring of technical education in the Romanian Principalities, in the middle of the last century, was also driven by the progressive spirit of young people trained in European universities, impressed by the scientific and technical achievements of the era in the fields of lighting gas, beet sugar, synthetic dyes, matches, photography, electric generators and cars, etc. In addition, the development of small industry in the Romanian Principalities (milling, tanning, the manufacturing of lumber, paper, baize, etc.) required a specialized education”.

Paper and cardboard factories have been reported since the 16<sup>th</sup>–18<sup>th</sup> centuries in Transylvania and the 17<sup>th</sup>–18<sup>th</sup> century in Wallachia, which used hemp, linen and

<sup>1</sup> The current paper is based on an article published by the author in Romanian „Școala românească de celuloză și hârtie”, *Revista de Politica Științei și Scientometrie – Serie Nouă* 5 (1), 2016, pp. 14–20. Parts of this article was published in Valentin I. Popa, “Academician Cristofor I. Simionescu – Founder of the Romanian School of Natural and Synthetic Polymers”, *Memoirs of the Scientific Sections of the Romanian Academy* XL, 2017, pp. 13–21.

\* Professor emeritus, PhD, “Gheorghe Asachi” Technical University of Iași

cotton cloths as raw materials. In the 19<sup>th</sup> and 20<sup>th</sup> centuries, factories using wood appeared. In “Description of Transylvania” from 1867, E.A. Bielz showed that at that time there were 14 “paper factories and paper mills”, of which two with continuous paper machines at Orlat and Cârța de Sus and twelve with hand paper and machine paper. It is not specified which of them used wood, but it is thought that such factories were those from Sibiu, Brașov, Cluj and Făgăraș. In 1857, two modern factories were established: one in Petrești, financed by merchants from Sibiu and taken over in 1871 by Austrian capitalists, and another in Zărnești, founded by Romanians from Brașov. At the beginning, it used cloth as raw material, then straw was added in 1864, and wood in 1872, installing the first defibrator, after which two others followed in 1880. In “Gazeta Transilvaniei” information is provided about the factory in Zărnești, which had machines brought from Belgium. In Bucharest newspapers it is stated that “the mechanical paper factory from Zărnești is recommended with all kinds of white and blue printing and writing paper, with moderate prices”. The factory warehouse is in Brașov. In “Gazeta de Moldavia” two announcements appeared: the factory has for sale any kind of paper at prices “however cheap” and a factory warehouse had opened in Iași. Finally, “Telegraful Român” from Sibiu pointed out that the paper factory in Zărnești started its activity “in a very stately building” with a machine brought from England.

On January 17, 1881, the law encouraging the paper industry was promulgated and in the same year it was decided to establish the “Letea” paper factory in Bacău, which in 1885 began large-scale production, using modern machinery. In 1882, brothers Carol and Samuel Schiel built a cardboard factory in Bușteni, using wood as raw material. In 1906, they did the same in Piatra Neamț; in addition to a sawmill, a paper factory was also established. Earlier in 1841, Gheorghe Asachi had built a paper factory here, where paper was manufactured on a round sieving machine and used rags as raw material. In Scăeni in Prahova, a new cardboard factory had been in place since 1883; cellulose, initially imported, was manufactured from 1883 onwards, by the factory in Cheia on Teleajen.

In order not to compete on the domestic market, as early as 1903, the paper production and distribution union “Paper Sales Bureau” was established, which in 1931, in the midst of the crisis, turned into the “Paper Sales Office” for paper produced in the country. It was a monopolistic body, one of those bodies that worked alongside “Distribution” for oil and its derivatives. Together with the Offices for sugar, tin, etc. it dominated the domestic market by imposing their prices and defending the latter against import by means of protectionist laws.

In 1900, at the Paris Universal Exhibition organized on the Champs-de-Mars, in the Place de la Concorde and in the Bois de Vincennes, the Romanian paper industry was also represented (Pârvulescu 2013).

As an object of study, paper appears in the Laboratory of Technological Chemistry (Director PhD Prof. Cristea Niculescu Otin, assistant I. Hanganu, junior teaching assistant Gh. Alexa). Pulp was talked about in the Technological Chemistry course. In the Syllabus for the 1918–1919 academic year from the University of Iași, republished in 1918, there is a presentation of the Laboratory of Technological



Chemistry. “It gives graduates the opportunity to bring together all their general knowledge and become familiar with as many industrial problems as possible”.

Since 1923, courses at the Institute of Technological Chemistry (which was set up following Law No. 133 of September 13, 1923) lasted for 4 years and under the name Industrial chemistry a course of specialized Technological chemistry was taught by Gheorghe Alexa, appointed substitute associate professor on November 1, 1921, with special topics on Organic Chemical Technology (cellulose, paper, artificial textile fibers, sugar, fats, oils, tanning, explosives, war gases, dry distillation of wood, varnishes and paints). Professional practice lasted for 3 months, with fees being charged for laboratory classes.

At the same time, research was carried out in the field of natural products, resulting in scientific works or doctoral dissertations: C. Niculescu Otin, M. Dima, *Chemisch Technische Untersuchungen Über Die Aus Traubenkernen Ausgenen Oele Verschiedern Weigegenden Rumäniens/ Chemical-technical research on the oils extracted from grape seeds from various wine-growing regions in Romania*, published in *Allgemeine Oel-und Fett- Zeitung*, 1933, Heft 2, pp.71–77 and Heft 3, pp.135–144; *Einige Datten Über Des Traubenöls/ Some data on the behavior of grape seed oils*, published in *Allgemeine Oel-und Fett-Zeitung*, 1934, Heft 3, pp.107–115; Gh. Huidovici, PhD thesis, *The characterization of Romanian spruce bark as a tannin and new contributions to the improvement of that extract*, published in 1931. In 1935, Haralamb Vasiliu, professor at the Departments of Agricultural Chemistry and Food Chemistry, with special contributions to the implementation of chemical engineering education at the Polytechnic Institute of Iași, published variants for the molecular structures of pulp and starch (Rozmarin 1984). In 1946–1948, academics from Polytechnic Institute of Iași provided consultation for the post-war recovery of the pulp and paper industry in Romania.

The Education Reform Law of 1948 allowed for the establishment of specialization routes. In 1949, the Faculty of Industrial Chemistry in Iași was reorganized into two specialization routes: the Inorganic industries route and the Organic industries route. The latter comprised 3 specializations, namely: Organic syntheses, Pulp and paper, and Leather and tanning extracts.

In 1955, the Pulp and paper route expanded to become Pulp, Paper and Artificial Fiber Technology. Later, through the contribution of the founders and their followers, a valuable school was created, recognized domestically and internationally. Its history was extensively presented in a monographic work published in 1999 (Obrocea *et al.* 1999) (on the occasion of the 12<sup>th</sup> International Symposium on Chemistry and Technology of Pulp and Paper, Iași) and updated in 2012 (Măluțan *et al.* 2012) (a monograph published on the occasion of the 100<sup>th</sup> anniversary of chemical engineering education in Iași).

After the Second World War, to the existing 12 mills with reduced production capacities, the next stage of industrialization (1960–1970) added 7 large combined pulp and paper mills and 3 new investments in synthetic fiber mills. In this context, it was necessary to ensure the necessary conditions for the training of engineers, which resulted in the establishment in 1948, and then the development of the Pulp and Paper Technology section (Poppel *et al.* 1995). Previously,

specialists were trained in a broader specialization in the faculties of Industrial chemistry of the polytechnic institutes in Romania.

In the 1949–1950 academic year, the Pulp section established in the previous year in Bucharest was transferred to Iași, and the responsibility for organizing this specialization rested with academician Cristofor Simionescu, at that time an associate professor. A nucleus of academics was formed consisting of Eng. Associate prof. Vasile Diaconescu (later professor) and future professors Elena Calistru and Emanuel Poppel. The team was then completed with Dorel Feldman, Grigore Stejar, Elena Corlățeanu, Gheorghe Rozmarin, who over the years contributed to the training of specialists in the field of pulp, paper and artificial fibers and the development of certain directions for scientific research (Popa b1995, Popa&Irimia 2000).

Historically speaking, the pulp, paper and fiber school has gone through several developmental stages. Parallel to overcoming the difficulties inherent at the beginning, the first research on the valorization of vegetable proteins, paper gluing, the obtaining of protein-cellulosic fibers, high-yield celluloses, the synthesis of cellulosic derivatives, and the first successes of professional affirmation were recorded (1949–1952) (Popa a1992).

The following years (1952–1963) were marked by major concerns with regard to the development of educational spaces and the improvement of research conditions. During this period, the crystallization of the research results meant the defence of the first doctoral dissertations in the fields of: cellulose fractionation (Elena Calistru), reed pre-hydrolysis (Dorel Feldman), applied chemistry research in paper technology (Emanuel Popel), preparation of carboxymethyl cellulose (Nicolae Asandei), cellulose destruction (Gheorghe Rozmarin). At the same time, the first satisfactions offered by the department's graduates also appeared. They participated in and contributed to industrial developments, asserted themselves in management functions, initiated research areas in the departmental institute and successfully addressed the design issues required for new investments. During the same period, the first research groups dealing with aspects of wood chemistry were organized at the “Petru Poni” Institute of Macromolecular Chemistry in Iași, in which teaching staff from the Pulp department also participated. Thus, important contributions were made to the chemical characterization of woody species in our country and the study of plant tumors was successfully approached. A group led by Professor Simionescu elaborated the theory of tumor development and practically verified the role of antioxidants in the inhibition of plant cancer. It is a field that is currently intensively studied at the international and national level with important consequences in the genetic manipulation of plant organisms and in the use of natural antioxidants to regulate metabolic processes in the world of plants, microorganisms, animals and the human body (Simionescu *et al.* 1961). Thus, through genetic manipulation it is possible to modify the chemical composition of wood and the size of cellulose fibers. Polyphenolic compounds with antioxidant properties can be separated from various plant resources (forestry and agro-food waste) through a biorefining process (technology proposed by the researchers from the department together with those from the “Petru Poni” Institute, and which

allows for the fractional separation and recovery of all usable components for their chemical and energetic value) (Bujor *et al.* 2015).

The accumulation of a rich experience in the field of scientific investigation has allowed for the systematic approach of reed lignin chemistry in the framework of a doctoral thesis. This study, bravely carried out at a time when lignin structure formulas due to Freudenberg and Adler (well-known lignin chemists) were being published, was completed with a model of the structure of reed lignin and with the highlighting of some interesting modification reactions of the aromatic polymer (nitration, diazotization, coupling, to obtain dyes and grafting).

In terms of fundamental contributions, the behavior of lignins isolated from different species of deciduous, conifers and annual plants was also studied in mechanochemical destruction processes. Using a wide range of experimental conditions (grinding in active-nitrogen monoxide and inert-nitrogen atmospheres) the transformations produced by a set of investigative techniques were highlighted.

Another field in which numerous contributions were obtained is that of the modification of cellulose and other polysaccharides by grafting reactions. At that time, numerous initiation systems, an important number of monomers, as well as the structural and behavioral properties of modified celluloses were investigated. The possibilities of using grafted cellulose as a support for the controlled release of drugs or for the immobilization of some enzymes were tested. Currently, the aforementioned transformations are again of interest for researchers considering the possibilities offered by cellulose as a biodegradable material and the modifications that can be applied to ensure natural polymer-synthetic polymer compatibility, with the intention of obtaining composite materials.

The research directions tackled were not random or conjunctural, as they were consistent with those found in similar schools worldwide (Simionescu 1972). As a result, the fields investigated allowed Romanian specialists to obtain original results that contributed to occupying leading positions in the field of pulp, paper and artificial fibers (1963–1973).

The moment of international confrontation had come. September 1961 saw the first success, the First International Symposium on Cellulose Chemistry and Technology. The event became traditional and 13 editions were organized under the leadership of Professor Simionescu. The 14<sup>th</sup> edition was dedicated to the 90<sup>th</sup> anniversary of Professor Simionescu's birth. Over time, the international symposia have benefited from the participation of prestigious personalities in the field, from various countries around the world. It was thus possible to create the first international contacts, the academics in the department being able to carry out visits and exchanges of experiences, research internships, or to work as associate professors in various scientific centers in France, Germany, Austria, Cuba, North Korea, Canada, Finland, the Soviet Union, the USA, etc.

The aforementioned fertile period was characterized by a publishing activity consisting in several monographs in which the results of Romanian researchers were systematized: C. Simionescu, M. Grigoraș, A. Cernătescu-Asandei "Chimia lemnului din România" [Chemistry of Wood in Romania] (Editura Academiei, Bucharest, 1964), C. Simionescu, M. Grigoraș, A. Cernătescu-Asandei, Gh. Rozmarin, "Chimia

lemnului din România: Plopul și salcia” [Chemistry of Wood: The Poplar and the Willow] (Editura Academiei, Bucharest, 1973); C. Simionescu, Gh. Rozmarin, “Chimia stufului” [Chemistry of Reed] (Editura Tehnică, Bucharest, 1966); C. Simionescu, V. Rusan, V.I. Popa “Chimia algelor marine” [Chemistry of Seaweed], Editura Academiei, Bucharest, 1974) and in articles accepted by valuable foreign magazines.

In 1954, the “Petru Poni” Institute of Macromolecular Chemistry, established in 1951, had the task of carrying out a systematic study, the results of which are presented in the monograph dedicated to the Chemistry of wood. The work is unique in its way, because according to my knowledge, few countries have such monographs; it includes a large volume of experimental data, being still of great use to both foresters and chemists. Moreover, if we take into account the fact that the consequences of pollution have predominantly manifested themselves over the last 25–30 years, and the forest can represent an indisputable barometer of the phenomenon, it would not be without interest to resume investigations in the field of wood chemistry in the characterized areas previously, to determine to what extent the level of pollution is reflected in the biosynthesis processes and in the structural changes that have occurred. The Romanian Academy, the Academy of Agricultural and Forestry Sciences, or the Ministry of the Environment could finance a research project in this regard, the results of which would also be useful for securing and managing forest resources, being unanimously recognized that trees record the consequences of all environmental changes and participate in depollution processes, contributing to the reduction of carbon dioxide content in the atmosphere. The research activity in the field of wood chemistry later continued with the characterization of some species of deciduous trees – the poplar and the willow (this is another original contribution that is also worth mentioning, one which predated some concerns that would appear later in Western Europe, financed even by means of European programs). The poplar and the willow as fast-growing woody species represent the hope of transforming the plant world into sources of energy and raw materials. Along the same lines, we find the efforts to study annual plants – reeds and grass straws. The research carried out represented the basis of some technological processes applied in Romania and which are currently cited in works published by researchers from abroad. Unfortunately, the field was abandoned in our country after 1989, while it is relaunched in many European countries or other areas of the world, and foreign specialists visit us to be inspired by our experience.

Following the proposal of some foreign specialists, formulated on the occasion of the 1965 symposium, the Cellulose Chemistry and Technology Journal was founded in Iași (1966), with an international editorial board, listed by ISI since 1992, and which in 2016 celebrated 50 years of continuous publication by the Publishing House of the Romanian Academy. This Journal, together with the already existing Romanian journal – Celuloza și Hârtie/Pulp and Paper (published since 1951) – allowed for the exchange with journals and books published abroad, thus offering Romanian researchers permanent contact with similar research centers around the world, even in the most difficult conditions of the period before 1989.

In the 50 years, the Journal has proven to be of real importance to ensure the participation of Romanian researchers in the exchange of information, to make their contributions known, as well as to bring to the country more than 50 journal titles and 30–40 books annually. On the occasion of several international symposia, meetings were organized with the members of the editorial board who appreciated the important role of the journal for its contribution to the worldwide circulation of scientific values, over the years the journal constituting a bridge between East and West or between North and South.

The recognition of the school in Iași is also confirmed by the fact that young people from Zaire, Greece, Hungary, North Korea, Gabon, Vietnam and Syria are among the department's graduates, and nine other specialists from abroad (North Korea, Bulgaria, India, Egypt, Algeria) completed their Doctoral dissertations at the department.

Professor Simionescu's activity and implicitly his contribution to the creation and development of the Romanian pulp and paper school were appreciated in 1976 when the American Chemical Society included him among the 20 medallists on the occasion of the United States Bicentennial and invited him to publish a synthesis of Romanian research in a special volume dedicated to this anniversary. The jubilee medal was bestowed to Professor Simionescu by the US Ambassador to Romania on the occasion of the first Romanian-American seminar organized in Iași in 1976.

It should be mentioned that the international appreciation gained by some of the teaching staff also resulted in their election in the International Academy of Wood Science (C. Simionescu, E. Poppel, Gh. Rozmarin, V.I. Popa), the American Chemical Society, or other scientific bodies. Professor Nicolae Asandei was elected a corresponding member of the Romanian Academy, and Professor Valentin Popa is a corresponding member of the Technical Sciences Academy of Romania.

Continuing the research activity of the first generation of teaching staff in the department, graduates publish or patent the scientific results, publish monographs in Romania and abroad, participate in research contracts with national and international funding (Horizon 2000, CEE: FILTRAL, LIGNOMAT, BICOP, PNII: BIOSUN, ELHART, PAPREST PNII-PAPHERCON, FP7- SORT IT, FP6- Ecobinders, EPPIC – European Pulp and Paper Industry more Competitive, EUROLIGNIN, Europolysaccharides and numerous COST actions).

Important contributions have been made in the field of synthetic papers resulting in numerous publications, patents and products that could be put into practice today as well. In a complex research program, the problem of the valorization of plant biomass was addressed, completed with the proposal of a state-of-the-art technology, which is called biorefining (Popa a1992).

After 1974, the department benefited from new facilities, and in 1980 a pilot paper-making machine with a production capacity of 500 t/year came into operation, intended for research and student practice. Unfortunately, after 1989, like other research and production spaces of the Technical University, the paper machine disappeared, its place being taken by entertainment spaces.

After 1989, as a result of the transition to the market economy, in Romania, as in other Eastern European countries, the production of pulp and paper decreased.

Currently, however, the statistical data highlight a revival trend due to re-technologizing, privatization and modernization actions, cooperation with companies and investors from the West, as well as the orientation towards new markets. However, as regards higher education, the school in Iași remains unique for this specialization in Romania (Poppel *et al.* 1995).

With Romania's joining of the Bologna process, the Pulp and paper specialization becomes the Paper engineering specialization, to take into account the transformations that have occurred in Romania at the industrial level, and the education program is carried out in three cycles, Bachelor's, Master's and Doctoral studies, by the Department of Natural and Synthetic Polymers. Recently, 6 Doctoral supervisors have been active in the department.

Throughout its existence, the activity of the Pulp and paper school has resulted in a large number of graduates, doctors, numerous works published in Romania and abroad, monographs, patents and research projects with domestic and international funding. Moreover, the department periodically organizes short-term post-graduate courses as part of continuing education programs (Raw materials and recycling, Recent trends in the field of pulp and paper technology, Application of biotechnological processes in paper manufacturing, Management, etc.).

Nowadays, the main research directions pursued are the following:

– **The chemistry of plant resources.** The chemical composition and anatomical-morphological structure of different categories of raw materials, the supramolecular organization and the reactivity of the matrix components of wood (extractables, lignin, polysaccharides; the kinetics of the hydrolysis of hemicelluloses and the formation of furfural from different plant raw materials using salt and acid catalysts; the valorization of cellolignins) are studied from prehydrolysis and residual lignins; structural polymorphism of celluloses and its influence in chemical and enzymatic reactions; bioadhesives.

– **The biosynthesis and biodegradation of the main chemical components of plant biomass.** The influence of some polluting agents on the biosynthesis processes of the chemical components in plant biomass and their implications in bioremediation processes is studied, as well as: the role of some polyphenolic compounds separated by the biomass biorefining process on the metabolic processes of plants, animals and microorganisms; antioxidants and biocides based on lignins and polyphenols; the action of enzymes with hemicellulase and cellulase activity on polysaccharides with applications in cellulose biobleaching, deinking and waste paper recycling; possibilities of carrying out some reactions using enzymes or mimetic catalysts; the creation of composite materials based on natural and synthetic polymers and the study of biostability and physical-mechanical properties.

– **Delignification procedures.** Research is carried out on wood delignification using different reactive agents (organic solvents: alcohols, formic and acetic acids) and alkaline solutions in the absence or presence of catalysts, in conventional or modified versions. The development of low-pollution processes for pulp bleaching is also being pursued. The potential of some agricultural waste such as cereal straw and technical plants (rapeseed, sunflower) to replace wood in the manufacture of cellulose is being studied.

– **The chemistry and physics of paper.** The development of bioadditives based on natural polymers or their derivatives (chitosan, starch, lignins) is aimed both for the control of chemical-colloidal processes, as process additives, and as functional additives for the development of specific properties (resistance or barrier); the study of the papermaking properties of cellulose from annual plants, as well as of increasing the papermaking potential of the secondary fibers from waste paper through enzymatic de-inking treatments, the correlation with the paper properties; in the physics of paper, studies are carried out on rheology for stretching and compression (calendering), hydrodynamics and rheology of fibrous suspensions, optics and friction phenomena, structure and transfer phenomena (filtering structures); stability of document type paper to the action of environmental factors.

It should be noted that the field of pulp and paper fully corresponds to the concept of sustainable development as it is based on renewable and recyclable resources, and processing technologies can be compatible with the environment when chemical processes are associated with biotechnological ones.

The energy, raw materials and food crisis that is currently manifesting worldwide is causing important changes in the thinking of specialists regarding, on the one hand, the reintegration into the economic circuit of secondary resources, and on the other hand, regarding the evaluation and increase of renewable ones (Area&Popa, 2014). One of the great challenges of our society is to find a sustainable way to obtain “bioproducts” from renewable resources. From this point of view, the raw materials of agricultural and forestry origin have a composition that allows for their use for the manufacturing of chemical compounds, materials, fibers, fuels or energy. Therefore, the application of the concept of biorefining is currently being discussed in order to maximize the exploitation of biomass with the aim of creating products with added value (Popa d2011). Biorefining involves the development of new methods for the fractionation of biomass into extractable substances, hemicelluloses, cellulose and lignin in their native form and their subsequent valorization in different categories of products to replace those of petrochemical origin. The transformations that can be applied can be done on the principles of green chemistry. Biomass can be provided by agricultural by-products, municipal waste, forestry and wood processing waste, as well as dedicated crops. The latter could be achieved without affecting the land intended for agriculture to ensure food resources.

The complex composition of the plant biomass, the problems of recovery and integral valorization of the components and some of the difficulties of the pulp and paper industry have led to the concept of biorefining in which all the compounds acquire chemical or energetic value, with possibilities to substitute products of petrochemical origin with applications in known high tonnage industries, as well as in those with the most demanding destinations (food, pharmaceutical, cosmetic and medical industries) (Popa e2013, Dumitriu&Popa 2013).

Therefore, we can appreciate that the Pulp and paper school in Romania not only maintains its relevance, but provides opportunities for the development of a new education system as well as for inter- and trans-disciplinary research.

## BIBLIOGRAPHY

1. Area M.C. and Popa V. I., *Wood Fibres for Papermaking*, Smithers Rapra, 2014.
2. Bujor C.O., Talmaciu I.A., Volf I., and Popa V.I., Biorefining to recover aromatic compounds with biological properties, *Tappi J.*, 14 (3) (2015): 187–193.
3. Dumitriu S. (founder editor) and Popa V. I. (editor), *Polymeric Biomaterials* (2 vols), *Structure and function* (vol I); *Medicinal and Pharmaceutical Applications* (vol II), CRC Press/Taylor&Francis, 2013.
4. Giurescu, G.C., *Istoria pădurii românești din cele mai vechi timpuri pâna astăzi*, București, Ed. Ceres, 1974. [The history of the Romanian forest from ancient times until today].
5. Mălușan T., Popa V.I., Cașcaval D., coord., *100 de Ani de Învățământ de Inginerie Chimică la Iași, 1912–2012*, Iași, Editura Politehniun, 2012. [100 Years of Chemical Engineering Education in Iași]
6. Obrocea P., Popa V.I., Bobu, E., Gavrilescu, *Școala Românească de Celuloză și Hârtie, 1949–1999*, Bacău, Editura Plumb, 1999. [The Romanian Pulp and Paper School, 1949–1999].
7. Părvulescu I., *În intimitatea secolului 19*, București, Humanitas, 2013. [In the privacy of the 19th century].
8. Popa V.I., a, 40 Years of Romanian education and research in the field of cellulose and paper, *Cellulose Chem. Technol.*, 26 (6), (1992): 649–661.
9. Popa V.I., b, Cristofor I. Simionescu – Founder of Pulp and Paper Romanian School *Zilele Academice Ieșene*, Oct., 5–8, 1995, Iași.
10. Popa V.I. c, and Irimia C., Professor Cristofor I. Simionescu on his 80<sup>th</sup> birth anniversary, *Buletinul Institutului Politehnic Iasi*, Tomul XLVI(L), Fasc.1–2, (2000): 7–9.
11. Popa V.I., d, Editor, *Polysaccharides in medicinal and pharmaceutical applications*, Smithers Rapra, 2011.
12. Popa V.I., „Școala românească de celuloză și hârtie”, *Revista de Politică Științei și Scientometrie – Serie Noua* 5 (1), (2016): 14–20.
13. Popa V.I., Academician Cristofor I. Simionescu – Founder of the Romanian School of Natural and Synthetic Polymers, *Memoirs of the Scientific Sections of the Romanian Academy* XL, 2017: 13–21.
14. Popa V.I., e, Editor, *Pulp production and processing: from papermaking to high-tech products*, Smithers Rapra, 2013.
15. Popa, V.I., f, Începuturile educației și industriei în domeniul celulozei și hârtiei în România, *Celuloză și Hârtie*, 63(4), (2014); 3–4. [The beginnings of pulp and paper education and industry in Romania].
16. Poppel E., Borhan G., Stanciu C., and Popa V.I., Romanian Scientific Research in the field of Pulp and Paper (Paper presented at Paper Science Meeting, Oct., 18, 1995, Manchester, U.K.), *Celuloză și Hârtie*, 44 (4), (1995): 6–9.
17. Rozmarin Gh. *Fundamentări macromoleculare ale chimiei lemnului*, București, Editura Tehnică, 1984. [Macromolecular foundations of wood chemistry].
18. Simionescu C.I, Calistru E., Simionescu N., Hrihorov M., Acțiunea antioxidanților asupra procesului de dezvoltare a tumorilor vegetale, *St. Cercet. Șt. Chim.*, 12, (1961): 241–249. [The action of antioxidants on the development process of plant tumors].
19. Simionescu C.I., Considerations on present-day problems regarding the chemistry and technology of cellulose and paper, *Cellulose Chem. Technol.*, 6 (1) (1972): 9–15.



# REMEMBERING ROMANIAN MATHEMATICIANS: RADU BĂDESCU

ANDREI VERNESCU<sup>1</sup>

*Abstract.* We present some aspects related to the life and the work of one of the most prominent Romanian mathematicians, Radu Bădescu (1904–1988). We show some letters addressed to him by important foreign mathematicians.

*Keywords:* integro-differential equations, functional analysis, functional equations, applied mathematics.

Received on 10 May 2022

*Radu Bădescu* (April 8, 1904 – September 13, 1988) was one of the most distinguished Romanian mathematicians of the generation born in the first decade of the 20th century. This generation also contains *G. Vrănceanu* (1900–1979), *D. V. Ionescu* (1901–1985), *A. Ghika* (1902–1964), *G. Călugăreanu* (1902–1976), *N. Ciorănescu* (1903–1957), *M. Nicolescu* (1903–1975), *Gr. C. Moisil* (1906–1973), *G. Mihoc* (1906–1981), *T. Popoviciu* (1906–1975), *M. Haimovici* (1906–1973) and *N. Teodorescu* (1908–2000).



*Radu Bădescu* studied at the University of Cluj, assisted a year at many lectures given at Sorbonne, in Paris, by *Picard*, *Goursat*, *Montel*, *Appell*, *Hadamard* and other illustrious French mathematicians and defended his PhD. Thesis in 1929, at the Université de Genève, where he worked with *Rolin Wavre* (1896–1949), *Henri Fehr* (1870–1954) and *Dmitry Mirimanoff* (1861–1945). This thesis was entitled *Recherches sur une équation intégrale*.

In 1930 he became a doctor-docent at the same university.

The main preoccupations of *Radu Bădescu* belong to the domains of the integro-differential equations, the functional analysis, the functional equations and the applied mathematics in the industrial domain, mathematical fundaments analyzed at the level of 1967 by *George Șt. Andonie* in the well-known book “History of Mathematics in Romania”, in the 3rd volume, pp.53–60, (*Andonie* 1967).

All the mathematicians of that period kept scientific relations with foreign mathematicians; therefore we will show some letters addressed to *Radu Bădescu* by several important mathematicians: *Paul Montel*, *Mauro Picone*, *Jacques Hadamard*, *Georges de Rham*, *Lothar Collatz*, *Paul Alexandroff*, *Jovan Karamata*, *N. Mushelishvili*, *Octav Onicescu*, *Theodor Angheluță*, *George Călugăreanu*.

Among the books written by *Radu Bădescu* we point out two fundamental ones, concerning the integrals and the functional equations: one of them that was dedicated

<sup>1</sup> Ph.D., Retired Associate Professor, Valahia University of Târgoviște, Romania, [avernescu@gmail.com](mailto:avernescu@gmail.com)

to functional equations (Bădescu, 1959) and another, which was subsequent to the period we are dealing with (Bădescu, Maican, 1968). He had also made a substantial contribution to the revision and completion before publication of the excellent treatise on special mathematics of Nicolae Ciorănescu (Ciorănescu, 1963), the illustrious former professor and head of department of mathematics at the Polytechnic Institute.

A first gesture of appreciation had been made by Miron Nicolescu through a report to the Technical Publishing House, and then a first examination of the manuscript was accomplished by Nicolae Teodorescu, but the care of the book had returned to Radu Bădescu, the new head of the department and the former younger colleague of the late professor Nicolae Ciorănescu.

After publication, Radu Bădescu informed some of the older mathematicians or from his generation abroad, about these books. As it turned out, he sent them books and they replied sending him letters of appreciation.

We present below some letters in facsimile that were written to Radu Bădescu by some of the most famous mathematicians of the years 1960–1970.

**Paul Montel** (1876–1975). French mathematician, professor at the Sorbonne, member of the French Academy of Sciences. He had important contributions in the field of complex analysis. He was the doctoral supervisor of the Romanian mathematicians Alexandru Ghika, Miron Nicolescu and Tiberiu Popoviciu, former members of the Romanian Academy, and Nicolae Ciorănescu.



UNIVERSITÉ DE PARIS  
FACULTÉ DES SCIENCES  
INSTITUT HENRI POINCARÉ  
11 rue Pierre Curie  
PARIS 5<sup>e</sup>

10 décembre 1959

Mon cher Collègue & Ami,  
Je vous de recevoir votre  
lettre datée du 27. 10. 59 (?)  
D'autre part, je n'ai pas reçu  
votre livre "Introduction à  
l'étude des équations fonctionnelles"  
J'ai reçu des livres de M.  
Nicolescu et, tout récemment,  
les "Spatii linicare ordonate"  
de M. Cristescu. Je fais faire  
des recherches à l'Institut H.  
Poincaré pour votre livre.  
J'aimerais publier dans le  
Bulletin des Sc. math. des analyses  
des ouvrages récents. Mais,  
depuis la mort de Sorgerce,  
je n'ai personne à Paris pou-  
vant étudier un ouvrage de  
mathématiques écrit en roumain.

Je demanderai peut-être à  
M. Stoilcov de me charger.  
Votre bien amicalement dévoué

Paul Montel

J'aurais été bien heureux  
de vous revoir à Bucarest en  
56 mais l'âge inexorable  
ne faulte plus mes désira-  
ments. Merci de votre cor-  
dial souvenir.

pm.

The 10<sup>th</sup> of December, 1959

My dear Colleague & Friend,

I have just received your letter dated 27.10. 59 (??). Besides, I have not received your book "Introduction to the study of functional equations".

I received Mr. Nicolescu's books and, very recently, Mr. Cristescu's "Spații liniare ordonate". I am having research done at the H. Poincare Institute for your book.

I would like to publish in the *Bulletin des Sc. math.*, analyzes of Romanian works. But since Sergescu's death, I have no one in Paris who can study a mathematical work written in Romanian.

Maybe I'll ask Mr. Stoilow to do it.

Yours sincerely devoted

Paul Montel

I would have been very happy to see you again in Bucharest in 56, but the inexorable age no longer facilitates my travels. Thank you for your warm memory.

PM

UNIVERSITÉ DE PARIS  
FACULTÉ DES SCIENCES

INSTITUT HENRI POINCARÉ  
11 rue Pierre Curie  
PARIS 5<sup>e</sup>

5 mai 1960

Mon cher Collègue,  
Je ne me rappelle pas si, l'année dernière, j'ai écrit en décembre votre livre.

En tout cas, j'ai eu récemment l'occasion de l'étudier et je trouve à vous dire l'excellente impression que j'en ai retirée. Malgré ma connaissance insuffisante de la langue roumaine, je n'ai pas eu de difficultés trop grandes, aidé par les équations et la simplicité de certains termes mathématiques.

Votre livre est remarquablement clair & vous savez bien allier les points de vue modernes aux habitudes classiques et faire en sorte que les principales idées principales qui se rattachent à votre sujet.

J'ai eu l'occasion de m'occuper incidemment d'équations fonctionnelles dans mon dernier livre "Sur les récurrences & leurs applications".

Une lettre récente de T. Popoviciu m'a raconté la captation de la revue roumaine *Mathematica*. Cela m'a fait grand plaisir & je vous en remercie de première instance.

Écrivez-moi, mon cher Collègue, votre bien affectueux souvenir.

Paul Montel

The 5<sup>th</sup> of May, 1960

My dear Colleague,

I don't remember if, when I wrote to you last December, I had already received your book.

Anyway, I recently had the opportunity to study it and I want to tell you the excellent impression I got. Despite my insufficient knowledge of the Romanian language, I didn't have too many difficulties, helped by the equations and the similarity of certain mathematical terms.

Your book is remarkably clear and you know how to combine modern points of view with classical habits and to review the main disciplines which relate to your subject.

I had the opportunity to deal with functional equations in my last book, On Recurrences and Their Applications.

A recent letter from Tib. Popoviciu informed me of the reappearance of the Romanian journal *Mathematica*. It gave me great pleasure and I want to receive the first booklet.

Believe me, my dear colleague, your lovingly devoted

Paul Montel

UNIVERSITÉ DE PARIS  
FACULTÉ DES SCIENCES  
INSTITUT HENRI POINCARÉ  
11 rue Pierre Curie  
PARIS 5<sup>e</sup>

1<sup>er</sup> décembre 1962,

Mon cher Collègue,

J'ai attendu quelque temps après votre lettre pour recevoir l'ouvrage que vous avez eu la bonté de m'adresser.

Je suis très touché de votre pensée. L'ouvrage de Ciorănescu est pour moi un précieux souvenir et ma, faite connaissance du roumain, aidée par ses équations, me permettra une lecture aisée.

Notre ami Miron Nicolescu a bien jugé l'ouvrage et vous avez magnifiquement réussi dans votre présentation et dans la tâche pieuse de nous restituer la pensée et jusqu'à l'expression de cette pensée de l'auteur.

Dites à la famille Ciorănescu mes profondes condoléances et la vive estime que j'ai eue pour lui.

Votre lettre et votre envoi excellent en moi la souvenir de nombreux

souvenirs que j'ai faits dans votre pays, de l'accueil cordial que vous m'avez toujours fait, des amitiés solides que j'y ai nouées et que la mort défait peu à peu.

Je vous suis d'ailleurs, mon cher collègue, de l'expression de mes sentiments affectueux et de ma

Paul Montel

The 1<sup>st</sup> of December, 1962

My dear Colleague,

I waited some time after your letter to receive the work you had the goodness to send me.

I am very touched by your thought. Ciorănescu's book is a precious memory for me and my poor knowledge of Romanian, helped by the equations will allow me to read it easily.

Our friend Miron Nicolescu has judged the work well and you have succeeded magnificently in your presentation and in the pious task of restoring to us and even the expression of this pansy of the author.

Tell the Ciorănescu family my deep condolences and the deep esteem I had for him.

Your letter and your consignment awaken in me the memory of the many that I have made in your country, of the cordial welcome that you have always given me, of the solid friendships that I have made and that death undoes little by little.

Please accept, my dear Colleague, the expression of my affectionately devoted sentiments.

Paul Montel

UNIVERSITÉ DE PARIS  
FACULTÉ DES SCIENCES

INSTITUT HENRI POINCARÉ

11 rue Pierre Curie  
PARIS 5<sup>e</sup>

27 février 1964

Mon cher Collègue,  
Votre lettre vient de m'arriver.  
Je déplore le fâcheux accident  
qui vous a fracturé une côte et  
je souhaite que votre cure à  
Olănești achève rapidement de  
vous rétablir.

Votre Note en collaboration avec  
M. Teodoresco avait été transmise  
à M. Parodi, de l'Académie des  
Sciences, ancien directeur des chemins  
de fer. Elle soumise à deux spécia-  
listes des voix fencés et je vous ai  
envoyé leurs conclusions.

Je vous ai téléphoné à M. Parodi  
et il est convenu qu'il recevra  
volontiers les explications que vous  
lui enverrez et en parlera avec  
les ingénieurs spécialisés et l'on  
arrivera ainsi, je l'espère à  
trouver un terrain d'entente.

Voici son adresse:

Monsieur H. Parodi,  
Membre de l'Académie des Sciences,  
rue Spontini, 80

Paris - XVI<sup>e</sup>

Voilà avec amicalité dévouée

Paul Montel

The 27<sup>th</sup> of February, 1964

My dear Colleague,

Your letter has just arrived. I deplore the unfortunate accident which fractured your rib and I hope that your treatment at Olănești will quickly complete your recovery.

Your Note in collaboration with Mr. Teodoresco had been transmitted to Mr. Parodi, of the Academy of Sciences, former director of the railways. He submitted it to two voice specialists and I sent you their conclusions.

I have just phoned Mr. Parodi and it has been agreed that he will gladly accept the explanations that you send to him and will discuss them with the specialized engineers and thus, I hope, we will find common ground.

Here is his address

Mr. H. Parodi, Member of the Academy of Sciences, Spontinistraat, 80,  
Paris - XVI e

Yours sincerely devoted.

Paul Montel

**Mauro Picone** (1885–1977). Italian mathematician, professor of analysis in several cities in Italy. He had many results in mathematical analysis and was also a pioneer in applied mathematics, creating the first such Institute.



ACCADEMIA NAZIONALE DEI LINCEI

L'ACCADEMICO AMMINISTRATORE

Roma, 17 giugno 1966



Al Prof. Radu BADESCO  
Istituto Politecnico  
C. Dorobanti 232

BUCAREST

R.S.R. (Romania)

Mio caro Amico,

finalmente la Commissione che fu nominata in una seduta della Classe di Scienze Fisiche di questa Accademia per riferire sulla Memoria dal titolo: "Sur un problème fréquemment rencontré dans l'industrie extractive", che io presentai nella seduta del 13 novembre 1965, ha compilato una relazione favorevole alla pubblicazione della Memoria stessa da parte di questa Accademia.

Sono lieto perciò di annunziarLe che la Memoria stessa sarà al più presto pubblicata dopo che Lei avrà corretto, il numero delle volte che crederà necessario, le relative bozze.

Augurandomi che la collaborazione che Lei dà a questa Accademia possa continuare in futuro e col proposito di rivederLa a Bucarest nel prossimo settembre durante la celebrazione del centenario dell'Accademia della Repubblica Popolare Romana, Le invio i miei più cordiali saluti.

Rome, the 17<sup>th</sup> of June, 1966

My dear Friend,

Finally the Commission which was appointed in a session of the Physical Sciences Class of this Academy to refer to the Memory entitled: "Sur un problème fréquemment rencontré dans l'industrie extractive" ("On a problem frequently encountered in the extractive industry") which I presented in the session from November 13, 1965, has compiled a report favorable to the publication of the Memoria itself by this Academy.

I am pleased to announce that the Memo itself will be published as soon as possible after you have corrected the number of times you think necessary, the relative drafts.

Hoping that the collaboration you give to this Academy may continue in the future and with the intention of seeing you again in Bucharest next September during the celebration of the centenary of the Academy of the Romanian People's Republic, I send you my best regards.

(ss) Mauro Picone



EMIA NAZIONALE DEI LINCEI

ACCADEMICO AMMINISTRATORE

Roma, 27 marzo 1969

Ill.mo Prof. Radu BADESCU  
 Institut Polytechnique  
 C. Dorobanti 232

BUGAREST (3)

(Romania)

Mio caro Radu Badescu,

ricevo il libro: "Integrale utilizate in mecanica, fizica, tehnica si calculul lor" e vivamente La ringrazio.

L'ho già scorso, per quanto affrettatamente, e ho potuto constatare la ricchezza e la varietà della materia in esso esposta con chiarezza ed eleganza.

Io La prego di volere mandarmene un'altra copia che presenterei in una prossima seduta di questa Accademia, illustrandone il contenuto.

Coi più vivi ringraziamenti e rallegramenti, Le invio i miei più cordiali saluti, nella speranza di potere presto riverderci.

Rome, the 27<sup>th</sup> of March, 1969

My dear Radu Badescu,

I receive the book „Integrale utilizate în mecanică, fizică, tehnică și calculul lor” (“Integrals used in mechanics, physics, technology and their calculation”) and I warmly thank you.

I have already gone through it, albeit hastily, and I have been able to see the richness and variety of the material displayed in it with clarity and elegance.

I beg you to send me another copy which I would present in a future session of this Academy, illustrating its content.

With the warmest thanks and congratulations, I send you my best regards, in the hope of being able to see you again soon.

(ss) Mauro Picone



ACCADEMIA NAZIONALE DEI LINCEI

L'ACCADEMICO AMMINISTRATORE

Via della Lungara 10  
Roma

Roma, 7 giugno 1969

Al Prof. Radu BADESCO  
Institut Polytechnique  
C. Dorobanti 232

BUCAREST (3)

(Romania)

Caro Prof. Badesco,

ricevo la Nota Sua, di Cornelia Nanes e Ioan Sebesan dal titolo: "Intégrales Riemanniennes généralisées dans les espaces  $C^m$  ( $m > 1$ ).

L'ho scorsa e l'ho trovata interessante. La presenterò nella prossima seduta della Classe di Scienze Fisiche di questa Accademia che avrà luogo il giorno 12 giugno p.v.

Ho gradito apprendervi che essa ha un legame con le mie Note riguardanti il calcolo di un integrale per decomposizione in prodotto dell'integrando.

Nel plico contenente la Sua lettera, la Nota dei Comptes rendus dal titolo: "Intégrales riemanniennes généralisées dans les espaces  $R^m$ " è anche compreso un grosso fascicolo firmato dal Prof. Dott. Sager che reca ricerche di fisiologia e non so quale destinazione dare a tale fascicolo. Che forse questo sia stato incluso nel detto plico per errore?

Voglia rispondermi su ciò e dirmi dove devo spedire il fascicolo stesso.

Con la speranza di presto poterLa rivedere nel prossimo settembre a Bucarest, Le invio i miei più cordiali saluti.

(Mauro Picone)

Rome, the 7<sup>th</sup> of June, 1969

Dear Professor Badesco,

I receive your Note, by Cornelia Nanes and Ioan Sebesan entitled: „Intégrales Riemanniennes généralisées dans les espaces  $C^m$  ( $m > 1$ )”, (“Generalized Riemannian integrals in spaces  $C^m$  ( $m > 1$ )”).

I went through it and found it interesting. They presented it in the next session of the Physical Sciences Class of this Academy which will take place on June 12<sup>th</sup>.

I liked to learn that it has a link with my Notes concerning the calculation of an integral by decomposition into a product of the integrand.

In the envelope containing your letter, the Note of the Comptes rendus entitled “Intégrales” and also including a large dossier signed by Prof Dr. Sager which contains research on physiology and I do not know what destination to give to this dossier. was this included in the said envelope by mistake?

Please answer me on this and tell me where to send the file itself.

With the hope of soon being able to see you again next September in Bucharest, I send you my best regards,

(ss) Mauro Picone





ACCADEMIA NAZIONALE DEI LINCEI

L'ACCADEMICO AMMINISTRATORE

Roma, 29 novembre 1969

Al Prof. Radu BADESCO  
 Institut Polytechnique  
 C. Dorobanti 23E

BUCAREST (3)  
 (Romania)

Mio caro Prof. Badesco,

grande piacere mi ha fatto la Sua affettuosissima lettera del 19 novembre scorso, alla quale rispondo con un deplorabile ritardo per essere stato fino ad oggi completamente assorbito da lavori per questa Accademia.

Anche a me ha recato molto dolore non poter ricevere il diploma della Laurea honoris causa conferitomi da codesta Università, tra i cari Amici romeni!

La consegna di tale diploma ebbe luogo, come Le avrà riferito il comune Amico Onicescu, nella sontuosa residenza dell'Accademia Romana a Roma, nel corso di una cerimonia presenziata dal vostro Ambasciatore a Roma, cerimonia che riuscì molto significativa anche in virtù dei ricordati legami che uniscono le due sorelle Italia e Romania.

La simpatia che mi lega ai Matematici romeni è, mio caro Amico, fondata non solo sulla comune origine latina, ma anche sul valore della produzione matematica romana che ha sempre destato la mia ammirazione.

Molto mi congratulo con Lei per la traduzione decisa dagli Editori Masson di Parigi e Teubner di Lipsia del Suo libro: "Intégrales utilisées en Mécanique, Physique, Technique, et leur calcul", ciò varrà a diffondere l'interessante contenuto di tale Sua ammirata opera

In un plico a parte Le spedisco due mie ultime pubblicazioni. Si abbia, mio caro Badesco, i miei più cordiali saluti.

Rome, the 29<sup>th</sup> of November, 1969

My dear Prof. Badesco,

Your very affectionate letter of last November 19<sup>th</sup> gave me great pleasure, to which I reply with a regrettable delay for having been completely absorbed up to now in works for this Academy.

It also caused me a lot of pain not to be able to receive the degree of honoris causa conferred on me by this university, among dear Romanian friends!

The delivery of this diploma took place, as your mutual friend Onicescu told you, in the sumptuous residence of the Romanian Academy in Rome, during a ceremony performed by your Ambassador in Rome, a ceremony that was very significant also by virtue of the aforementioned links that unite the two sisters Italy and Romania.

The sympathy that binds me to Romanian mathematicians is, my dear friend, founded not only on some Latin origin, but also on the value of Romanian mathematical production which has always aroused my admiration.

I very much congratulate you on the decisive translation by the Masson Publishers of Paris and Teubner of Leipzig of your book „Intégrales utilisées en Mécanique, Physique, Techniques et leur calcul”, which will be able to spread the interesting content of your admired work.

In a separate envelope I am sending you two of my latest publications.

My dear Badesco, my best regards.

(ss) Mauro Picone

**Jacques Hadamard** (1865–1863). French mathematician, professor at the Sorbonne and Collège de France, member of the French Academy of Sciences, who achieved important results in many fields of mathematics.



*Institut de France  
Académie des Sciences*

*Paris, le* 24 Juin 1960  
*Quai Conti, n° 23*

Mon cher Collègue

Je vous remercie de votre envoi que je considère comme un souvenir qui me touche beaucoup .

A mon grand regret, je n'ai pu lire votre ouvrage, étant souffrant en ce moment et obligé de me reposer complètement .

Quand je serai remis, j'en prendrai connaissance et vous envoie mes sentiments très amicaux

*J. Hadamard*

The 24<sup>th</sup> of June, 1960

My dear Colleague,

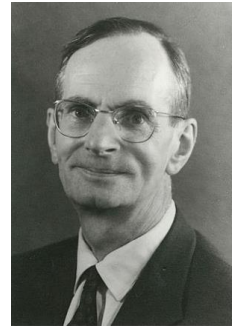
I thank you for your sending which I consider as a memory which touches me a lot.

To my great regret, I was unable to read your work, being unwell at the moment and obliged to rest completely.

When I recover, I will take notice and [I] send you my very friendly feelings.

J. Hadamard

**Georges de Rham** (1903–1990). Swiss mathematician, professor of mathematical analysis at the Universities of Lausanne and Geneva. He had important results in differential topology.



Lausanne, le 13. 4. 1960

Cher Monsieur,

Il va bien sûr de votre  
 livre sur l'introduction à l'étude  
 des équations fonctionnelles, et de votre  
 lettre, qui m'ont fait beaucoup  
 plaisir. Je vous en remercie et vous prie  
 de lui adresser mes salutations  
 et mes cordiales  
 salutations

G. de Rham

Lausanne, the 13<sup>th</sup> of April, 1960

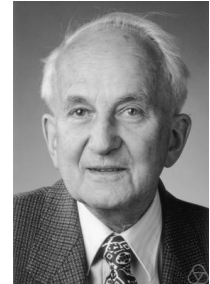
Dear Sir,

Thank you sincerely for your book on the introduction to the study of functional equations and for your letter which made me very happy.

I am sending you under cover [...] a few small off-prints with my best memories and my cordial greetings.

G. de Rham

**Lothar Collatz** (1910–1990). German mathematician, professor at various German universities. He remains as a promoter of mathematics applied to numerical calculation, with important contributions in functional analysis and to the theory of differential and integral equations.



UNIVERSITÄT HAMBURG

Institut für Angewandte Mathematik  
2 Hamburg 13, Rothenbaumchaussee 67/69

Herrn  
Professor Radu Bădescu  
Str. Dobobanti 232  
B u k a r e s t (63)/Rumänien

INSTITUT FÜR  
ANGEWANDTE MATHEMATIK

Prof. Dr. Dr. h.c. Lothar Collatz

Fernsprecher: 44 19 7 2020  
Behördennetz: 9.09 ( " )

Hamburg, den 21. April 1970

Sehr geehrter Herr Kollege Bădescu !

Haben Sie herzlichen Dank für die Übersendung Ihrer Sonderdrucke und Ihres interessanten Buches über Funktionalgleichungen. Es ist zwar in rumänischer Sprache geschrieben, aber aufgrund der zahlreichen Formeln kann ich mir doch einen Eindruck von dem Inhalt verschaffen. Sie haben einen reichhaltigen Stoff zusammengetragen, und ich wünsche Ihrem Buche einen recht guten Erfolg.

Werden Sie auch im Mai zur Tagung nach Varna/Bulgarien kommen? Ich habe vor, dorthin zu fahren und würde mich freuen, Sie dort treffen zu können.

Mit freundlichen Grüßen bin ich

Ihr sehr ergebener

*L. Collatz*

Hamburg, the 21<sup>st</sup> of April, 1970

Dear colleague Bădescu,

Thank you very much for sending your offprints and your interesting book on functional equations. Although it is written in Romanian, the numerous formulas allow me to get an idea of the content. You have amassed a wealth of material and I wish your book every success.

Will you also come to the conference in Varna/Bulgaria in May?

I intend to go there and I would be happy to meet you there.

Sincerely, I am your very devoted

Lothar Collatz

**Pavel S. Alexandrov** (1896–1982). Soviet mathematician. He had important contributions to set theory and topology and wrote about three hundred papers.



Moscou V-234,  
Université, Faculté ~~mécanico~~-mathématique.

Le 15 avril 1960

Monsieur et cher Collègue,  
j'ai bien reçu votre très intéressant livre  
"Introduction à l'étude des équations fonctionnelles", ainsi que votre aimable lettre du  
21 mars et je vous <sup>en</sup> remercie vivement.  
Vous avez parfaitement raison en supposant  
qu'aucune difficulté de langue ne m'empêche  
de lire le bel ouvrage que vous avez bien  
voulu de m'offrir.

Croyez, Monsieur et cher Collègue,  
à ma parfaite considération et à mes sentiments  
très dévoués.

*P. Alexandrov*  
Paul Alexandroff.

Moscow V-234  
University, Mechanical-Mathematical-Faculty

The 15<sup>th</sup> of April, 1960

Sir and dear Colleague,

I have received your very interesting book “Introduction to the study of functional equations”, as well as your kind letter of March 21 and I thank you very much for it.

You have made perfect sense assuming that no language difficulty prevents me from reading the great work that you were kind enough to offer me.

Believe, Sir and dear Colleague, in my perfect consideration and my very devoted feelings.

P. Alexandroff

**Nicoloz I. Mushelişvili** (1896–1976). Soviet Georgian mathematician, physicist and engineer which had results in Mechanics and especially in theory of elasticity. He was one of the founders of the Georgian SSR Academy of Sciences (now Georgian Academy of Sciences) and was its first President (1941–1972),



ს ა ქ ა რ ტ ვ ე ლ ო ს ს ს რ ა მ ც ე ნ ო რ ე ბ ა თ ა ა ქ ა დ ე მ ი ი ს ა რ მ ე მ ო რ ო ბ ო  
 ПРЕЗИДЕНТ АКАДЕМИИ НАУК ГРУЗИНСКОЙ ССР  
 თბილისი, ძერჟინსკის ქ. № 8. ტელ. 3-54-64  
 Тбилиси, ул. Дзержинского № 8  
 Тел. 3-54-64

„ 8 „ იანვარი 1960 წ.რ.

Дорогой профессор,

Очень благодарен Вам за присылку Вашей книги, которая мне  
 очень интересна. Хотя и не знаю румынского языка, надеюсь, что  
 смогу понять самое существенное.

С глубоким уважением

Н.Мусхелишвили

Tbilisi, the 8<sup>th</sup> of January, 1960

Dear Professor,

Thank you very much for sending your book which interests me very much. Although I do not know the Romanian language, I hope and consider that I will be able to understand the main essential things.

With deep consideration

N. Mushelişvili

**Jovan Karamata** (1902–1967). Serbian mathematician of Aromanian origin. He had contributions in mathematical analysis. He was one of the founders of the Serbian Academy of Sciences and Arts.



L'ENSEIGNEMENT  
**MATHÉMATIQUE**  
*Revue internationale*

Secrétariat:  
*Institut de Mathématiques*  
*Université - Genève (Suisse)*

Genève, le 3 mai 1963

M. Prof. R. Badesco  
C. Dorobanti 232  
Bucarest 3

Cher Monsieur Badesco,

Je vous remercie vivement de votre aimable lettre du 23 mars, et de vos deux travaux, et je m'excuse de n'avoir pu y répondre plus tôt, mais votre lettre est arrivée pendant les vacances universitaires, qui sont de plus d'un mois à cette époque.

Votre article "Sur une équation différentielle linéaire à coefficients variables" sera publiée dans L'Enseignement Mathématique, mais je ne peux pas encore vous donner de précision quant à la date de parution. J'ai transmis votre second article aux Archives des Sciences physiques et Naturelles, dont la rédaction vous répondra directement.

Dès que l'article sera composé, vous recevrez des épreuves à corriger.

Veillez recevoir, cher Monsieur Badesco, l'expression des mes sentiments les meilleurs

J. Karamata

Geneve, the 3<sup>rd</sup> of May, 1963

Dear Mr. Badesco,

I thank you very much for your kind letter of March 23, and for your two works, and I apologize for not having been able to answer them, but your letter arrived during the university holidays, which are more than a month at this time.

Your article "On a linear differential equation with variable coefficients" will be published in L'Enseignement Mathématique, but I cannot yet give you any precise details as to the date of publication. I have forwarded your second article to the Archives of Physical and Natural Sciences, whose redaction will answer you directly.

As soon as the article is composed, you will receive proofs to correct.  
Please accept, dear Monsieur Badesco, the expression of my best feelings.

J. Karamata

**Octav Onicescu** (1892–1983). Romanian mathematician, professor at the University of Bucharest, member of Romanian Academy. He had important contributions in probabilistic theory, mechanics and analysis.



*Centre International  
des Sciences Mécaniques*



*International Centre  
for Mechanical Sciences*

1 - UDINE, Palazzo del Torso  
Piazza Garibaldi, 11

The Rector  
Prof. Octav Onicescu

*Bucuresti, 9 Martie 1969*

*Trăite prietene,*

*Lucrarea dvs. este în a colabratului dvs. Maican pe  
foarte mândru pe biroul meu, unde a apărut foarte miraculos de câte-va  
zile. Fui prin foarte bine ca a apărut în i-mez succesul depis  
pe cauză vestă.*

*Cu salutări călduroase, al d'el*

*Octav Onicescu*

Bucharest, the 9<sup>th</sup> of March, 1969

Dear friend,

The work of you and your collaborator Maican sits very proudly on my desk, where it has miraculously appeared for several days. I'm glad it appeared and I wish him the entire success he deserves.

Yours sincerely,  
Octav Onicescu



**Theodor Angheluță** (1882–1964). Romanian mathematician, professor at the Babeș-Bolyai University and Technical University of Cluj-Napoca. He had contributions in mathematical analysis.



### *Subite Domnule Coleg*

Sunt adânc înduioșat de aducerea aminte și urările primite dintr-un subțel căld și curat. Rândurile D-voastră, scrise cu mare înțelegere și înțelegere grele, ca o carte omni de știință și îndrumătorul timp-retului, m'au asigurată de rodul bogat ce veți da în știință și la Catedră. Asta am urămint, căci de-a-mul ce urămiți câte singurul care va duce țara noastră la cea mai înaltă cultură. De aici și numai de aici, Subite Domnule Coleg, va dobândi țara gloria și fericirea la care aspiră. Fără cultura la lumină să fie întotdeauna îndreptarul lumii noastre.

Vă rog să nu acutați nicio clipă să am luat manifestarea, dala Universității din Cluj, asupra mea. Știti, sunt sigur, că am să-mă străduiesc de vanitate departe și efemeră. Serbarea a fost a studenților

pe atunci dormind de o cultură la meargă și multă.

Dacă voadată aveți nevoie de o carte sau o informație, vă rog să-mi scriți. Dar chiar și fără de la scris când puteți, ca să știu ce faceți.

Odată cu multă amabilitate, recunoscătoare, vă rog primite amintirile mele dragi și salutări din toată inima

*Th. Angheluță*

22 mai 1957

*Cluj*

Dear Colleague,

I am deeply moved by the remembrance and wishes of a warm and pure soul. Your lines, written with great understanding of the heavy task of the scientist and the guide of the youth, have assured me of the rich fruit that you will give in Science and Culture. This is what we pursued, because the path you follow is the only one that will bring our country to the highest culture. From here and only from here, Beloved Colleague, the country will gain the glory and happiness it aspires to.

May the light of culture always be the guide of our youth.

Please do not believe for a moment that I took the manifestation from the University of Cluj on me. You know, I'm sure I was a stranger to vain and ephemeral vanities. The celebration was of the students of that time, eager for a solid and abundant culture.

If you ever need a book or information, please write to me. But even without that, write when you can so I know what you're doing.

With my grateful thanks, please receive my fondest memories and best regards.

Th. Angheluță  
The 22<sup>nd</sup> of May, 1957, Cluj.

**George Călugăreanu** (1902–1976). Romanian mathematician, professor at Babeș-Bolyai University, member of the Romanian Academy. He had results in complex analysis as well as in differential geometry and algebraic topology



Cluj, 25 iunie 1969.

Subite coleg,

Fi' restitui scriitorului lui Șparac, cu  
oarecare întârziere din cauza examenelor.  
Am vorbit cu familia Popoviciu care  
m-a informat că nu s-a publicat arti-  
colul în chestiune așa cum se promisese  
inițial, din cauză că s-a cerut autorului  
să facă unele modificări în manuscris,  
și la recenta cerere dâmbul nu a răspuns.  
Acum s-a reluat corespondența cu Șparac,  
și dâmba Popoviciu spune că articolul va  
șpara în numărul următor al revistei.  
T. Popoviciu nu prea e la curent, și eu  
i se pune problema trimite la dâmba Popoviciu.  
Dâmba spune că nu e nevoie să-i scrie eu  
direct lui Șparac, deoarece totul e aranjat.  
Cu cele mai bune sentimente

G. Călugăreanu

Cluj, the 25<sup>th</sup> of June, 1969

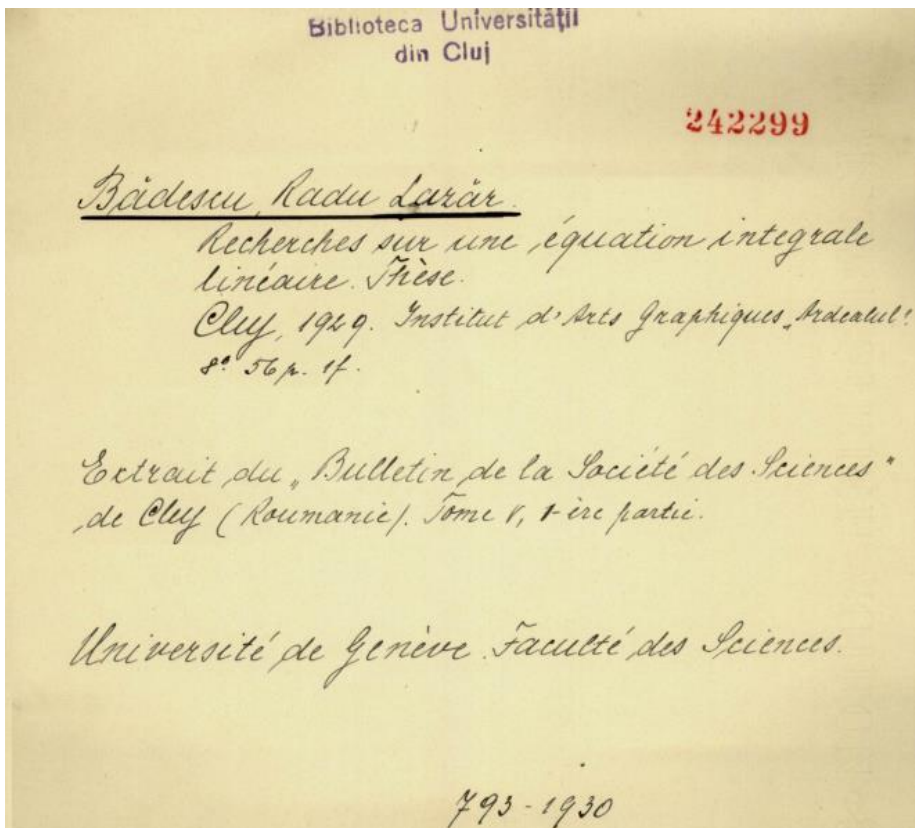
Dear Colleague,

I return your letter to Šparac, with some delay due to exams.

I spoke to the Popoviciu family who informed me that the article in question was not published as originally promoted, because the author was asked to make some changes to the manuscript and he did not respond to this request. Correspondence with Šparac and Mrs has now resumed. Popoviciu says the article will appear in the next issue of the magazine. T. Popoviciu is not very aware and when he is asked the problem, he sends it to Mrs. Popoviciu. She says I don't need to write directly to Šparac, because everything is arranged.

With the best feelings

G. Călugăreanu



Excerpt from "Bulletin de la Société des Sciences de Cluj (Roumanie). Tome I, 1<sup>ère</sup> partie."

**Acknowledgment.** I am indebted to Dr. Ioana Popescu (born Vlădescu) for making available with great kindness the letters addressed to her uncle, the mathematician Radu Bădescu, and the photo-portrait.

I would like to thank Dr. Magda Stavinschi for the encouragement of the publication of this text, as well as for the recommendations given, which I have taken into account and which have brought real improvements.

#### REFERENCES

1. Andonie, George. *Șt. Istoria matematicii în România*, Editura Științifică și Enciclopedică, București, 1965–1967.
2. Bădescu, Radu. *Introducere în studiul ecuațiilor funcționale. Alternativa lui Fredholm*. Ed. Tehnică, Academia R.P.R., colecția „Știință și tehnică”, nr. 16, București, 1959.
3. Bădescu, Radu and Maican, Constantin. *Integrale utilizate în mecanică, fizică, tehnică și calculul lor*, Editura Tehnică, București, 1968.
4. Ciorănescu, Nicolae. *Tratat de matematici speciale*, revăzut și completat de prof. Radu Bădescu, Editura Tehnică, București, Ediția I, 1962, Ediția a II-a, 1963.

## PROFESSOR IOAN BORCEA – MEMBER OF THE ROMANIAN FREEMASSONRY

ALEXANDRU Ș. BOLOGA\*

*Abstract.* Professor Ioan Borcea is alongside to Emil Racovitza and Grigore Antipa one of the most meritorious initiators of the Romanian biological oceanography. His most significant achievement is the foundation of the first Romanian marine biological research establishment at the Black Sea, i.e. “King Ferdinand I” Marine Zoological Station, in Agigea, in 1926. Upon Professor R. Codreanu’s suggestion, the founder’s name was given to the station’s name, i.e. “*Professor Ioan Borcea*” Marine Zoological (later on Biological) Station, in 1956. In his honor, the Station has continued to exist until nowadays. Among many other professional and public dignities, recognitions and honors, I. Borcea was also a member of the Romanian Freemasonry, namely “Dimitrie Cantemir” Lodge from Iassy. In the Freemasonic spirit, there are few written testimonies on Borcea’s activity and involvement in this organization. In fact, his membership to this secret society – that is spread in various countries and whose members, organized into lodges, are adherents to the principle of brotherhood and recognize each other through signs and emblems – is mentioned parcimoniously only by H. Nestorescu-Bălcești (1993) and E.M. Dobrescu (2003).

*Keywords:* Ioan Borcea, the Romanian Freemasonry, “Dimitrie Cantemir” Lodge Iassy.  
Received on 28 April 2021

*Preparator* [person who, in European universities, sets up the equipment on the professors’ teaching desk for the upcoming lecture] (1900), lecturer (1906) and professor (1912) Ioan Borcea (1879–1936), (Fig. 1) from the University of Iassy, was one of the most remarkable Romanian biologists. He became a zoologist, concerned especially with the Black Sea fauna, the relics of the Black Sea, the Caspian Sea and Razim Lake. He brought special contributions in the field of theoretical and applied entomology. He progressively promoted general biology and ecology. Among many other dignities, organizational, administrative and scientific merits, as well as public recognition, he was elected as corresponding member of the Romanian Academy in 1919 (Bologa and Bavaru 2018) and was co-founder of the Academy of Romanian Scientists (1935) and of some scientific societies in the country and abroad.



Fig.1 Professor Ioan Borcea

\* Ph.D., Academy of Romanian Scientists, Constanța Branch, E-mail: bologa1813@yahoo.ro

His main accomplishment, which survived to this date, is represented by the foundation of the **Marine Zoological Station, Agigea (Constanța)**, in 1926 (Bologa 1996, 2004, 2014, 2016, 2017a,b; Bologa *et al.* 2013). He was director of this Station in the last 10 years of his life, until his premature death, in full creative force. The achievements obtained shortly remained in the archives of the “Alexandru I. Cuza” University of Iassy. Thus, he is also one of the creators of the Romanian biological oceanography.

The special results obtained by I. Borcea and the members of his research team in the Station brought him rapid fame in Romania and abroad, particularly in France and Italy, where he had some close relationships.

Dr. Maria S. Celan is likewise a reference name in Agigea. She is the first and most prestigious researcher of the green, brown and red macrophytes at the Romanian Black Sea seaside (Bologa 1989, 1991, 2017a,b, 2018, 2019, 2020).

After the establishment of the Romanian Marine Research Institute in Constanța, in 1970 (Bologa 1995; Bologa and Bavaru 2018), the Station operated as one of its sections between 1970 and 1989. After 1990, it was returned to the above-mentioned university. Over the years, the uninterrupted existence of the Station was celebrated, i.e. the 30<sup>th</sup>, the 40<sup>th</sup>, the 70<sup>th</sup>, the 75<sup>th</sup> and the 80<sup>th</sup> anniversary (Bologa *et al.* 2013).



Fig. 2 “Prof. Ioan Borcea” Marine Zoological/ Biological Station, Agigea (1926)

It is less known that Professor I. Borcea was also a **freemason**. According to the Romanian historian D.G.R. Șerbănescu and to the French historian Jacques Pierre, the history of Freemasonry in Romania (Nestorescu-Bălcești 2005; Nestorescu-Bălcești and Lăzărescu 1997; Wikipedia a) is closely related to Romania’s history. For instance, the Freemasons played a decisive role in the 19<sup>th</sup> century. In the “forty-eighters” (“pașoptiști”) era – this name is derived from the 1848 Revolution – in the centre of Bucharest, along with the current National Museum of History, there was a “Farmazonă street“, which disappeared after the regularization of the Dâmbovița river and the urban reorganization in the late 19<sup>th</sup> century. This case i.e. the fact that freemasonry was popular in Romania and that in the Wallachian capital there was a commemorative street bearing its name – is unique in the world (Wikipedia a).

A concise evocation of the foundation and evolution of the Romanian Freemasonry is presented in *Mapamond francmasonic (Freemason World)* (Dobrescu 1997). 1934 is rightly considered the most important year of the Romanian interwar Freemasonry, as on January 24 the United Romanian Freemasonry is established – the Federation of the Great National Lodge from Romania – “Mihail Sadoveanu” faction with the Great Orient of Romania (Emil I. Papiniu). Several documents on the formation of the autochthonous Freemasonry are reproduced.

An article published in “Jurnalul Masonic” (December 14, 2011) stated that Dimitrie Cantemir, the Lord of Moldavia, more appreciated and respected as Dimitrie Cantemiroglu (Cantemir's son) (Fig. 3) seemed to have been forgotten by his Brothers. There is no secret that many Masons have claimed Cantemir over time, just as there is no secret that even more people have started to forget him or to recall him only in circumstances considered by them as opportune (Wikipedia d).



Fig. 3 Dimitrie Cantemir (October 26, 1673 – August 21, 1723)<sup>1</sup>

Geo Bogza – a Romanian avant-garde theorist, poet, and journalist, known for his left-wing and communist political opinions (Wikipedia f) – wrote about this historically significant character in his note *Cantemir*, published in the daily newspaper “Contemporanul”, on October 26, 1973: “He was a European scholar, although in this country few people knew how to read and write, and yet he was not ashamed to be a Romanian. He was a great scholar, although his generation had little instruction, and yet he was not ashamed to be a Romanian. He lived when no one suspected that Mihai Eminescu would be born on these lands, and yet he was not ashamed to be a Romanian.” (Bogza 1979)

Dimitrie Cantemir's membership (Wikipedia b) to the various initiation societies of the time has been hotly debated on various occasions. Nevertheless, it

<sup>1</sup> <http://1.bp.blogspot.com/-HzqcFt9luLU/UqaFCu33ZsI/AAAAAAAAAZg/Ki9BtB0wAJ0/s11600/dimitrie+cantemirfranc+mason+apmr+agentia+masonica+presa+stiri+romana+marele+orient+constantinopol+istanbul+turcia+imperiu+otoman+carturar+rozacrucian.jpg>

was not uncommon for an enlightened person of that age to be part of the cultural and scientific elite of the time. It is said that D. Cantemir was a Rosicrucian (Fig. 4) and his head was buried in a Scottish cemetery on the Rosslyn Family domain (Wikipedia d).

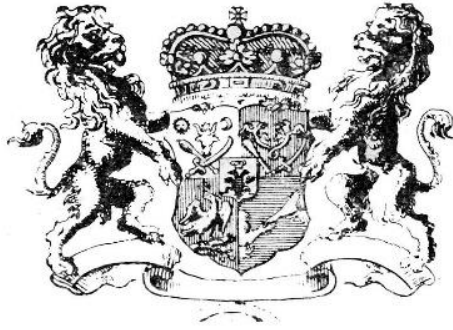


Fig. 4 Dimitrie Cantemir in the era of the Illuminati, between Freemasonry and Rosicrucianism (Wikipedia d)

A Masonic Lodge with the distinctive title “Dimitrie Cantemir” existed in the interwar period in Iassy, Mihail Sadoveanu being one of its Venerable Masters (Wikipedia e). After 1989, other Lodges took this name. Often forgotten in the tribute to the Brothers passed to the Eternal Orient, D. Cantemir remains in the history of the Romanian Masonry as one of its most prominent members (Wikipedia d).

In order to mark more or less forcedly his Masonry membership, stamps were also issued in this respect; in a private collection in Romania, there is a painting with Dimitrie Cantemir, illustrating Masonic symbols (Wikipedia d).

His name resonates very little in the Romanian culture as it sounds in the Turkish one nowadays or, more recently, in England, where the “Dimitrie Cantemir” Institute / “Cantemir” Institute was founded (Wikipedia d).

Professor Ioan Borcea was a member of the Romanian Freemasonry and a dignitary of “**Dimitrie Cantemir**” Lodge in Iassy (Fig. 5).

There are very few written references about I. Borcea’s membership of the Romanian Freemasonry. Among these, we mention the confirmation of his participation in the solemn meeting in Iassy of United Romanian Freemasonry, position 444: **Borcea, Ion** (Buhociu-Bacău, 1879–1936), professor and politician, minister (p. 246). This meeting took place on January 27, 1935 (Nestorescu-Bălcești 1993). His membership is also acknowledged in *Iluștri francmasoni (Illustrious Freemasons)*, among other Romanian members, p. 146 (Dobrescu 2003).

According to the answer given by the National Archives, County Service Iassy, No. SJANIS-2597-R/27.08.2018, to the author, in its funds and collections there is no information on “Dimitrie Cantemir” Freemasonic League in Iassy, or on activity carried out in this league by Professor Ioan Borcea. There are some data about him in the fund of “Alexandru Ioan Cuza” University. Here, we found



information on his scientific and didactic activity, such as his appointment in university degrees, various reports, the damages produced to the laboratory he was managing (as the location of the Romanian Army's intendance service in the First World War), the participation in various examination committees, letters of condolence on his death, etc. (National Archives, Iassy, 2018).

Moreover, Ioan Borcea is not mentioned in the recent booklet *Francmasoneria pe teritoriul Dobrogei 1875–2005 (Freemasonry on the Territory of Dobrogea 1875–2005)* (Grigore 2006), the place where he founded the above mentioned Marine Zoological Station, in Agigea.



Fig. 5 Freemason Ioan Borcea

As far as the numerous remarkable patriotic freemasons in the Romanian Masonry are concerned, among which Professor Ioan Borcea, the autochthonous and international free-masonry also registers today highly controversial public figures that control important segments of the Romanian society (xxx, *Tricolorul* 2008).

#### ACKNOWLEDGEMENTS

The author expresses his gratitude to Professor Vasile Sârbu, Dr. Silviu Moldovan and to Dr. Mircea-Dragomir Andrei for their help in completing the bibliography and iconography of this article.

#### REFERENCES:

1. Bogza G., *Privești și sentimente*, București: Albatros. 1979.
2. Bologa A.S., Hommage au Dr. Maria S. Celan, *Cryptogamie, Algol.*, 10, 1, 1–6 (1989).
3. Bologa A.S., “Maria S. Celan – a remarkable pioneer of the Romanian marine Benthic algology”, *Noesis*, 17, (1991), 131–136.
4. Bologa A.S., “25 years from the founding of the Romanian Marine Research Institute”, Jubilee Symposium, Constanța, 15 September, (1995), 1–11.
5. Bologa A.S., “Marine biological research around the Black Sea”, *Noesis*, 22, (1996) 53–64.

6. Bologa A.S., “Development of marine biological institutions around the sea”, in *Ocean Bridging the Millennia – A Spectrum of Historical Accounts*, UNESCO, China Ocean Press (2004), 209–222.
7. Bologa A.S., “Date arhivistice privind prima Stațiune de cercetări marine românești de la Agigea”, *Noema*, XIII, (2014), 265–280 /
8. Bologa A.S., “Archival data on the first Romanian Marine Research Station at Agigea, Constantza county (1926)”, *Noesis*, XXXVIII–XXXIX (2013–2014), 87–102.
9. Bologa A.S., “Cercetarea marină românească la peste 100 de ani”, in *Profesor universitar dr. Valentin Ciorbea la 70 de ani – O viață în stajul muzei Clio*, V. Coman, L. Stelian, N. (Grigore) Paraschiv (coord.), Ed. Etnologică, 2016, 547–552.
10. Bologa A. S., *În fuga anilor ...*, Ed. Ex Ponto, Constanța, 2017a.
11. Bologa A.S., “120 de ani de la nașterea conf. dr. biolog Maria S. Celan – I. Personalialia”, *Stud. și com. / DIS*, X, (2017b) 161–238.
12. Bologa A.Ș., “120 de ani de la nașterea conf. dr. biolog Maria Celan – II. Corespondența științifică, C.R.I.F.S.T.”, *St. comun. / DIS*, XI, *DIS*, (2018), 95–151.
13. Bologa A.Ș. “120 de ani de la nașterea conf. dr. biolog Maria Celan – III, Completări documentare de la dr. ing. Cristian D. Stoiculescu, C.R.I.F.S.T.”, *St. comun. / DIS*, XII, (2019), 86–106.
14. Bologa A.Ș., *Maria S. Celan – conferențiar doctor biolog – o viață de sacrificiu dedicată științei românești și universale*, Constanta: Ed. Ex Ponto, 2020.
15. Bologa A.S., Bologa A.F., Charlier R.H., “Ioan Borcea and the first Romanian
16. Marine Zoological Station at Agigea (1926)”. In *Places, People, Tools – Oceanography in the Mediterranean and Beyond*, Napoli: Gianinni, 2013, 173–184.
17. Bologa A.S., Bavaru A., “Historical development of marine sciences in Romania”, *Annals Ser. Biol. Sci.*, 7, 1, (2018) 5–25.
18. Dobrescu E.M., *Mapamond francmasonic*, Bucuresti: Ed. Nemira, 1997.
19. Dobrescu E.M., *Iluștri francmasoni*, Bucuresti: Ed. Nemira, 2003.
20. Grigore B., *Francmasoneria pe teritoriul Dobrogei 1875–2005*, Constanta: Ed. Mintenia, 2006.
21. Nestorescu-Bălcești H., *Ordinul Masonic Român, Mai puțină legendă și mai mult adevăr*, Bucuresti: Casa de Editură și Presă Șansa 1993.
22. Nestorescu-Bălcești H., *Enciclopedia Ilustrată a Francmasoneriei din România*, 3 vol., Ed. Phobos 2005.
23. Nestorescu-Bălcești H., Lăzărescu D.A., *Românii în Francmasoneria universală*, Ed. Nestor. 1997
24. Wikipedia a, Istoria francmasoneriei în România.
25. Wikipedia b, Dimitrie Cantemir.
26. Wikipedia c, Listă de masoni români.
27. Wikipedia d, Dimitrie Cantemir, unul din marii inițiați ai României, între uitarea națională Fraților săi și recunoașterea internațională, 28 ianuarie 2013.
28. Wikipedia e, Mihail Sadoveanu.
29. Wikipedia f, Geo Bogza.
30. <http://1.bp.blogspot.com/-HzqcFt9luLU/UqaFCu33ZsI/AAAAAAAAAZg/Ki9BtB0wAJ0/s11600/dimitrie+cantemirfranc+mason+apmr+agentia+masonica+presa+stiri+romana+marele+orient+constantinopol+istanbul+turcia+imperiu+otoman+carturar+rozacrucian.jpg>
31. “Masoneria jefuiește România”. *Tricolorul*, V, 27 Mars, 1/3, (2008).
32. Letter of the National Archives, County Service Iassy, No. SJANIS-2507-R2 / 27.08.2018.

**MEMINERIMUS!**



## ACADEMICIAN DAN BERINDEI OR THE NOBILITY OF A SCIENTIST

ACAD. DORINA N. RUSU\*



Received on 20 June 2022

To retell about academician Dan Berindei means to reconstruct a troubled life, full of tragedies but also of victories, of sorrows but also of joys, a fulfilled life, lived in dignity, with dedication for others, for the science, but also to the Romanian Academy.

Descendant of a family that has a history of hundreds of years, a direct descendant of the ruler Constantin Brâncoveanu, with forerunners who stood out in the construction of modern Romania, academician Dan Berindei expressed his love for the nation's past from an early age. The first urges to read, especially historical topics, coming from the grandmother from his mother's side, continued at "Clemența" School and at "Șpiru Haret" High School, opened the way to university studies. He attended the courses of the Faculty of History in Bucharest, where he had the chance to have as teachers some of the most important historians of the last century: Gheorghe I. Brătianu, Constantin C. Giurescu, Victor Papacostea, Nicolae Bănescu, Ion Petrovici, Ioan Hudiță, from whom he learned the rigor of scientific research and the clarity of his presentation.

At the proposal of Professor Victor Papacostea, he was employed as a scientific researcher of the Institute of Balkan Research (1946–1948), then of the History and Philosophy Institute of the Romanian Academy in Bucharest (1948–1952). Although started so promisingly, his career was brutally interrupted by his abusive removal from research work. He was given to live, like so many families from that period of sad memory, a drama hard to imagine today. His parents, wife and in-laws were arrested, and his daughter, Ruxandra, was born in prison. In order to support his other child, Mihnea, he had to perform unskilled, humiliating work. He had to fight a continuous battle from which, with dignity and tenacity, he managed to emerge victorious. His love for history was also a guiding light during that period, on which he leaned whenever he had a moment of respite. In 1955 he was re-employed as a researcher of the Institute of History in Bucharest, which in 1965 was named after the great scientist Nicolae Iorga. Was identified with the institute and through everything he achieved, he proudly represented.

\* Member of the Romanian Academy

He was attracted from the beginning by the 19<sup>th</sup> century Romania, “of nationalities”, highlighting, in the European context, the modern affirmation of Romanians and Romania. His work is impressive: almost 90 books written as an author, co-author or coordinator and over 700 studies and articles published in prestigious Romanian and foreign magazines. This is not the place to analyze his entire work. However, it should be mentioned that in his books and studies, the historian Dan Berindei managed to make a complete fresco of the main moments of the modern becoming of the Romanian state: the revolutions of 1821 and 1848, the Union of Principalities and the era of reforms under Alexandru Ioan Cuza, the modernization of the young modern Romanian state during Charles I of Romania’s reign, the War for Independence, going as far as the Great Union. He captured the most important economic, social, political and cultural transformations that Romanian society experienced during the turbulent nineteenth century, all analyzed in close connection with the events that took place in Europe. In fact, the diplomatic actions carried out by the young modern Romanian state, the establishment of relations with the main states on the European continent and outside it were issues he approached he many times, devoting interesting volumes and studies, based on information gathered in mainly from foreign archives and libraries.



The historian Dan Berindei was attracted by the great personalities of the Romanian people, considered as role models for today’s and tomorrow’s generations. In this sense, he left warmly written pages about great forerunners, stating that “portraits give life to the general course of becoming – they «enliven» it, «color» it, «humanize» it in a way” and that “models are exemplary, as a model – learns, educates, suggests ways to follow, exits from complicated situations that sometimes seem insurmountable”. At the same time, he was convinced that “portraits have another purpose, especially nowadays: to provide forgotten or unknown examples from the past”. Starting from this a belief, the historian Dan Berindei brought back to life, in pages full of flavor and emotion, figures of rulers and kings, of historians and writers, characterized succinctly but eloquently, in the title: “Stephen the Great, the Foundation of National Discourse”, “Neagoe Basarab,

the Wise Builder”, “Mihai Viteazul, the Voivode-symbol of Unity”, “Matei Basarab, the Ruler with Measure”, “Dimitrie Cantemir, the Scholar Prince”, “Tudor Vladimirescu, Pioneer of New Times”, “Alexandru Ioan Cuza, Lord of the Union”, “Carol I, the Wise King “,” King Ferdinand, the Loyal One “,” Miron Costin, the Learned Chronicler”, “Gheorghe Lazăr, the One Who Spreads the Teaching”, „Nicolae Bălcescu, the Ideologue of the Modern Revolution”, “Ion C. Brătianu, the Innovator of Romania”, “Mihail Kogălniceanu, the Enlightenment”, “Costache Negri, the Devoted Diplomat”, “Santa Ion Roată, the Wise Pontaș Deputy”, “Alexandru D. Xenopol, Historian”, “Nicolae Iorga, the Historical Immortal”, “Vasile Alecsandri, the Happy Poet”, “I. L. Caragiale, the scrutineer of the society of the Old Kingdom”, “George Călinescu, the Skillful Literary Critic and Historian”, to which are added many other worthy models to be brought back to life by the historian Dan Berindei. They are joined by the publication of the 18 volumes of the *Political Journal* of his father-in-law, professor and historian Ioan Hudiță, a true fresco of contemporary Romanian life, in the pages of which are evoked some of the most important political, academic and cultural personalities of the second half of the last century.

Over the years, the preoccupations of the historian Dan Berindei have focused on genealogy and heraldry, establishing himself as one of the most knowledgeable specialists in the field both through published works and through the activity carried out for over four decades at the head of the Commission of Heraldry, Genealogy and Sigillography of the Romanian Academy, but also as a member of the International Confederation of Genealogy and Heraldry.

The works whose author was Dan Berindei cover very diverse subjects. Among these are the ones dedicated to the city where he was born, lived and created his whole life, to which he dedicated his doctoral thesis: *The City of Bucharest, Residence and Capital of Wallachia 1459–1862*, published in 1962 and republished in 2012, in which symbolically reconnected with his great-grandfather, the architect Dimitrie Berindei, the author of the first modern study dedicated to the city situated on Dâmbovița river, as in the Bucharest tourist guide he had the opportunity to present some of the emblematic buildings signed by his grandfather, the architect Ion D. Berindei: “Cantacuzino” Palace, “Assan” House, “Emil Costinescu” and “Admiral Urseanu” villas, etc.

Another representative work of the historian – *The Modern Romanian National Culture* – cannot be overlooked. Starting from the idea that “The culture of an epoch reflects not only its own evolution, but preserves and evokes the very image of society in the given period, and cultural phenomena contribute to the understanding, in the fullest forms, of general history, first of all mutations and transformations of society”, Dan Berindei, in the mentioned volume, which brings together studies and communications held mainly abroad, wanted to demonstrate the role of culture in maintaining the unity of the Romanian people, but also in the complex process that underpinned modern Romania.

True to his conception that “the historian is not only a recorder of facts and events, but must also be their serene and disinterested commentator”, Dan Berindei

was a true “man of the city”. He has repeatedly expressed his opinion on the political, economic, social and cultural aspects of the contemporary period, the articles published in numerous publications being brought together in independent volumes: *In the Middle of the City* (2009), *Our Problems and the Country* (2013), *The Way Things Are. How I see the World after 90 Years* (2015). The concern for the future of the country in the context of the many and profound transformations that the world is experiencing today is one of his main topics.

The historian Dan Berindei knew, in his writings, to masterfully combine analysis with synthesis, editing sources with the preparation of monographs, based on rich information, often unpublished, all written in a sober but easily accessible style, which gives them a wide addressability.

Dan Berindei was an example of serving history not only in writing, but also in the qualities he possessed over time. In scientific events abroad, as well as in international organizations, he proved to be a true ambassador of Romanian historiography. For 50 years Dan Berindei has been an active presence at all world history congresses and has held, in the most important universities and academic centers in Europe, hundreds of conferences, thus contributing to a better knowledge of the history of Romanians and Romania, abroad.

Such a rich activity could not but enjoy a well-deserved recognition both in the country and outside. He was elected, over the years, a member of prestigious bodies: the European Academy of Sciences, Arts and Letters, the Polish Academy of Sciences and Letters in Krakow, the Modern History Society of France, the International Heraldry Confederation, the International Commission on Slave Studies, International Commission on the History of International Relations, etc.

However, the institution with which he felt most connected and which he considered “his little homeland” was the Romanian Academy, characterized as “a precious gem, a point of reference, of constancy and stability”.

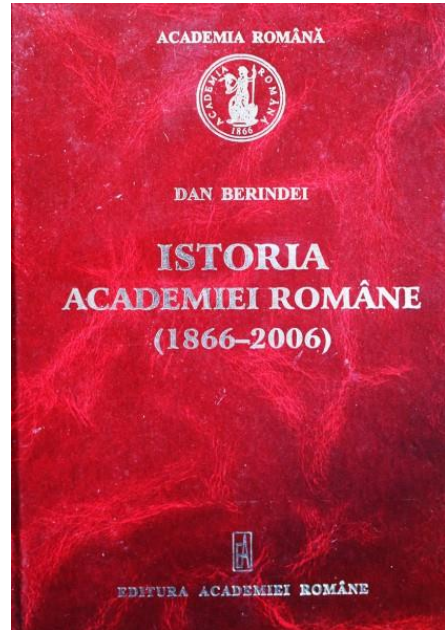
His election as a corresponding member (1991), then full member (1992), chairman of the Department of Historical Sciences and Archeology for a quarter of a century, vice-chairman of the High Forum of Culture and Science for eight years came as a natural recognition of a tireless work of organizing historical research and domestic and international events in the field. He was involved in coordinating the two editions of the *History of Romanians* treaty, being also the author of one of the volumes, in coordinating the institutes and research centers within the Department and their publications. He accepted the leadership of the Heraldry, Genealogy and Sigillography Commission, of the Romanian-Polish Joint History Commission, of the Romanian Committee for the History and Philosophy of Science and Technology of the Romanian Academy, but also of one of the institutes of the Romanian Academy.

He dedicated one of his most important works to the history of the Romanian Academy, which had two editions issued on the occasion of the 140th and 150th anniversaries of the founding of the High Court, respectively, succeeding, as he confessed, “to reconstruct, in stages, the history of this first cultural Parliament of all Romanians”, to follow “the perseverance of its members, elites of the nation,



in order to achieve their scientific goals, but, especially, in order to defend and affirm their own people”. Academician Dan Berindei saw the Academy “as a bridge to the world, itself representing and gathering science and wisdom and maintaining connections with the scientific world, but incessantly thinking of the place of its own nation, which had to be affirmed in the realm of culture and science”.

Starting from the place that the Romanian Academy had since its establishment in the Romanian society, the academician Dan Berindei was permanently preoccupied with the role that the highest forum of science and culture must have in the contemporary society, militating for the respect its members and the institution as a whole deserve. According to him, the Romanian Academy “should not be isolated in an ivory globe, but directly involved in science, culture and art, to follow what is happening in Romanian society and in the world and to advise its compatriots and first of all the country’s leading factors regarding the ways of the future, but also about the important problems that our society is facing... Nowadays – he confessed – the Romanian Academy remains a competent and disinterested advisor, animated by the desire to build and help the development the society as a whole, which has the positive contribution to a multifaceted affirmation of this country”.



His attachment to the Romanian Academy also materialized in the donation he made: the forest and the Dobrotești estate, Teleorman county, a gesture of great generosity, also the one made to Craiova, to which he donated his impressive library 76 years of age.

As a human being, Dan Berindei was jovial, always open to dialogue, to evoking the events and personalities he had known throughout his life. Good speaker, captivating orator, no matter the occasion: scientific sessions, books launches or on other occasions when the eloquence of the scientist was harmoniously intertwined with his oratorical grace. Unforgettable will remain, for example, the conferences held in the Palace of the Romanian Patriarchate on the occasion of the celebration of the Union of Principalities on January 24, or the moment of presenting the reception speech in the Hall of the Romanian Academy when he spoke with emotion about the *Pașoptist Generation*.

Just as he once urged his contemporaries to look for role models, so did academician Dan Berindei himself remain a model of truth, honesty and scientific rigor. Throughout his work, he marked Romanian culture for almost a century.

By the way he promoted the Romanian values in the country and abroad, he is as he was characterized, “an authentic patriot and a European without ostentation”. By the way he knew how to turn the tragedy of his life into hope, the evils that appeared in forgiveness was a model of how life should be valued, being an example of high nobility of soul.

We will always be grateful to him for the scientific and moral legacy he left us, which overwhelms us, but also forces us to keep it and carry it on.





**IMPRIMAT ÎN ROMÂNIA**