HISTORICAL DEVELOPMENT OF BIOSPELEOLOGY IN ROMANIA AFTER THE DEATH OF EMILE RACOVITZA

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Abstract. This is a modest contribution to the history of science, respectively the *history of the Romanian biospeleology*. Biospeleology, the science created by Emile Racovitza in 1907, knew, after the death of the scientist a second period of great development. This is the thriving period which began 5o years ago, in 1956, with the reorganization of the Institute of Speleology up to 2005, including the retirement of the last biospeleologists belonging to that generation – all more or less distinguished researchers, known as such outside Romania.

The author, an eyewitness of these times, shows how, nine years after the death of Emile Racovitza, the Institute of Speleology – the first in the world – founded by the great biologist in 1920 within the framework of the Faculty of Science of the new Cluj University, was reorganized as an Institute of Speleology *at a national level* in two centers: a main one in Bucharest and a branch in Cluj.

In the following we present the main achievements of the biospeleological teams from Bucharest and Cluj in the period between 1956 and 2005. In the end, we shortly analyse the development perspectives of the Romanian Biospeleology in the future.

INTRODUCTION TO THE HISTORY OF BIOSPELEOLOGY

In order to understand better the development of the biospleoeleogical research in Romania after the death of Emile Racovitza we'll have to remember the main events relating to the birth of Biospeleogy as a science and its development in the first half of the 20th century.

From the very beginning, the history of Biospeleogy was linked to the collaboration between the Romanian and the French biospeleologists. Fate intended this science to be born in France by the substantial contribution of a Romanian biologist – Emile Racovitza – then sub-director of the Arago Laboratory in Banyuls-sur-Mer. Emile Racovitza had predecessors among the European zoologists from the 19th century, who had also studied cavernicolous animals. Thus, J.R. Schiner proposed in 1854 a classification of these animals in troglobites, troglophiles and occasional cavernicolous – a classification still used today with some modifications. But the most important predecessor was Armand Viré (1869–1951) who founded, in 1896, the first subterranean laboratory in the world in the catacombs of the Natural History Museum in Paris, located at 12 m depth, in Lutetian limestone, in order to study the cavernicolous animals brought from various caves in Europe and the USA. Although his results were rightfully criticized by Emile Racovitza and René Jeannel, Viré had the merit to be the first to experiment in the

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subterranean environments and to create, in 1904, the term *Biospéléologie* to describe the science working on the living beings inhabiting the subterranean domain. This term will become with Racovitza "*Biospéologie*" (details in D. DANCĂU & ŞT. NEGREA, 1989, ŞT. NEGREA, 1997, GH. RACOVIŢĂ, 1999 and NEGREA *et al*., 2004). Also, Viré published a synthesis *La faune obscuricole de France* (1900) and another work named *La Biospéléologie* (1904).

The year Viré published his second work, destiny had biologist Emile Racovitza and Georges Pruvot from the Arago Laboratory make an oceanographic campaign with the ship "Roland" in the Baleares Archipelago. Here, on July 15, 1904, young Racovitza discovered, in a freshwater lake from Cueva del Drach in the Mallorca Island, the blind Isopod *Typhlocirolana moraguesi*. The small creature belonging to the aquatic subterranean environment drew the Antarctic explorer'attention on the importance of the subterranean relicts in deciphering the mechanisms of evolution. This discovery made him abandon the bio-oceanographic studies and completely dedicate himself to the exploration of the caves along with a critical evaluation of everything that had been published until then concerning the cavernicolous animals.

A year later, in 1905, Racovitza accompanied by the physician René Jeannel, started the systematic exploration of the caves from the Pyrenees (only in the period between 1905 and 1922, the two explored over 1,400 caves from Europe and Northern Africa). In a short time (1904–1907), Racovitza did what nobody had succeeded before him: he studied numerous caves and, especially, ordered the chaos of data published until then on the subterranean fauna. The results of his work materialized in the famed *Essai sur les problèmes biospéologiques*, published on May 15, 1907 in Paris. In this paper, Racovitza founded a new biological discipline, defined, just like Viré did, as a "science of the life forms from the subterranean environment". In this unique paper, he made a profound analysis of the entire knowledge gathered until then in this domain – quite heterogeneous and contradictory – and elaborated a vast research schedule which will be partially fulfilled by him and his collaborators. Through this paper made at only 39 years, Emile Racovitza remains in the history of science as the creator of Biospeleology.

In 1907, Emile Racovitza founded, at the Arago Laboratory, an international society named *Biospeleogica*. With René Jeannel as deputy, he coordinated from France, and as of 1920 from Romania, the activity of tens of collaborators from the entire world and published his results in *Archives de Zoologie expérimentale et générale* under two titles: *Biospeleogica* and *Enumération des grottes visitées*.

After the end of World War I, on June 27, 1919, Racovitza was invited by the Dirigent Council of Transylvania to accept the Zoology Cathedra of the Romanian University of the Upper Dacia in Cluj. He accepted on only one condition: the creation of an *Institute of Speleology at the Cluj Science Faculty*. In his opinion, this Institute was meant to be the unique in the field in the world so that "all

scientists or students who wish to deal with speleological matters will be forced to come to Cluj, or at least, to feel bound to have a relation with this Institute". On December 18, 1919, Emile Racovitza signed the paper making him the lifetime director of the Institute of Speleology while René Jeannel was the sub-director. On January 27, 1920 they were both appointed Biology professors at the University of Cluj, and on April 26, 1920, King Ferdinand I of Romania promulgated the *Law regarding the founding of an Institute of Speleogy at the University of Cluj* (see details in ŞT. NEGREA, 1998, and 2006, GH. RACOVIȚĂ, 1999).

Thus, in 1920, Emile Racovitza said farewell to France – his second country – and came back to his native country where he settled definitively in Cluj along with his wife and children. Bringing with him the ample collections and the board of the "*Biospeleogica factory*", he made from the capital of Transylvania the very center of the world research on the subterranean fauna. René Jeannel, with his family, also joined him in Cluj. For more than 27 years (1904–1931), if we add the four years during which Jeannel came to Cluj to deliver his course, the two scientists worked side-by-side – the most beautiful years of their lives, described by Jeannel in his book "*Quarante années d'explorations souterraines*" (1950). In 1922, they were joined by the Swiss Pierre-Alfred Chappuis, as a deputy, as C.N. Ionescu from the Jassy University (the first researcher of the cavernicolous fauna from Romania, the author of *Biospeleogia Carpaților Meridionali*) had declined this appointment.

Soon after they came to Cluj, Racovitza and Jeannel started campaigns to collect fauna in the caves from the Apuseni Mountains (mainly), the Southern Carpathians, the Banat Mountains and Dobrogea. Even specialists from abroad participated in these campaigns: entomologist A. Winkler from Vienna, zoologist Louis Fage, professor Ch. Perez, officer A. Magdelaine, the famed geographer Emmanuel de Martonne and even the famous abbot Henri Breuil who discovered, in 1924, the first Paleolithic remains in Transylvania. The results of this campaign were published in *Buletinul Societății de Ştiințe din Cluj*, founded by Racovitza in 1921. But the speleogical campaigns were not restricted to Romania. After the first expedition in Serbia, in 1923, other expeditions followed in Italy, Slovenia, the South of France and Algeria with excellent results. In 1931, after a decade of activity, the new Institute had explored 358 caves (222 thereof in the Carpathians) and 15 volumes were published in the series *Biospeleogica*, comprising 1,825 pages based mainly on the material collected from the caves in Transylvania (details in GH. RACOVIȚĂ, 1999, p. 286–287).

Unfortunately, the thriving period of the first Institute of Speleogy in the world, ended abruptly, after more than a decade of intense activity, in 1931, when, in full economic crisis, the government led by Nicolae Iorga cut all the research funds. The loss of funds meant more than the loss of Jeannel who went to Paris in 1927 to organize the Vivarium from the Jardin des Plantes. Only in 1937, after six years without funds, the Institute of Racovitza received a subvention to buy books

and equipment but nothing for the explorations of caves. Then, the government gave nothing at all. Racovitza's fight with the terrible bureaucracy for the survival of his Institute continued up to 1940, when, by the Vienna Dictate, the northern part of Transylvania was cut from the country. This meant for the University of Cluj having to find refuge in Sibiu and Timişoara. Racovitza took with him only the archives of the Institute – the *Biospeleogica* collections staying in Cluj guarded by P.A. Chappuis who was a foreign citizen. After the war, in August 1945, Racovitza returned to Cluj and started again his work at the Institute of Speleogy, suffering all the hardships brought by the post-war poverty and inflation. But not for many years. Old and sick, he died on November 19, 1947, leaving behind him an Institute in trouble, just when it needed a strong and wise leader, such as he had been. Two years later, P.A. Chappuis left Cluj to work as a sub-director at the Moulis Subterranean Laboratory in France.

In the year of Racovitza's death, R. Jeannel, his friend from France, edited the first number from the revue *Notes Biospéologiques* (1947–1958), followed by *Annales de Spéléologie* (1959–1976), by *Mémoires de Biospéologie* (1978–1988) and by *Subterranean Biology*. The Romanian biospeleogists were permanent collaborators of these publications. Obviously, Biospeleogy did not die with its creator. The world center of research of the subterranean fauna had only shifted again to France, where it had been born, by the efforts of the Romanian Emile Racovitza, supported by the French René Jeannel. It moved not to the Arago Laboratory but to the new Subterranean Laboratory in Moulis (Ariège), founded in 1948 at the initiative of Jeannel and led by Albert Vandel, author of the first treaty of Biospeleogy in the world. As we shall see, this center did not remain the sole one in the world for long. The Institute of Emile Racovitza was to rise again like the Phoenix from its own ashes…

REORGANIZATION AT THE NATIONAL LEVEL OF THE INSTITUTE OF SPELEOLOGY FOUNDED BY EMILE RACOVITZA

In 2005, 85 years had passed since the founding of the Institute of Speleogy in Cluj. On this occasion, some had asked: why in Cluj and not in another university? There is a simple explanation: in those years, the freshly established University of Cluj needed renowned professors, and Racovitza, a famed biologist and polar explorer, invited to a cathedra, accepted under the condition to have an Institute of Speleology at the Science Faculty of the Cluj University, where he was to be named director for life. What would have happened if, for instance, he had been called by the Jassy University? As a Moldavian born in this city, where he had writer Ion Creangă as a teacher at the school from the Păcurari district, and naturalist Grigore Cobălcescu at the "Institutele Unite" high-school, he would have

founded the Institute of Speleology in the capital of Moldavia. One more reason was the biospeleogist and professor C.N. Ionescu to whom, as we have shown, he had offered the position of deputy director, but who would not leave Jassy.

So only the historical conjecture determined the founding of the first Institute of Speleology in the world in Cluj and not in some other place. Alright, alright, some may ask, but why nine years after the death of Emile Racovitza, the Institute created by him in Cluj was moved to the capital of Romania? Was it "stolen" by the speleologists in Bucharest? Not at all! Ionel Tabacaru and I are the last researchers still alive who were appointed, beginning July 1, 1956, by an Order of the Education Ministry, at the "*Institute of Speleogy of the P.R.R. Bucharest*" (Fig. 6 – facsimile). In this capacity, I testify for the history of science that the Institute of Emile Racovitza *was included* into an Institute reorganized at a republican level and not "stolen" and it was the historical conjecture from those troubled years to have decided of the new form of organization of Romanian Speleology.

The above mentioned information is based on eye witnesses of the events as well as on the information and documents from a notebook entitled "Notes and Laws" written by the hand of Professor C. Motaş, the director of the reorganized Institute, given to me by one of his heirs, the lawyer Virgil Vârgolici who died on March 10, 2002.

The content of this notebook is much more varied, containing 21 hand written or typed documents transcribed.[1] I will only refer to those linked to the founding and reorganization of the Institute after the death of Racovitza.

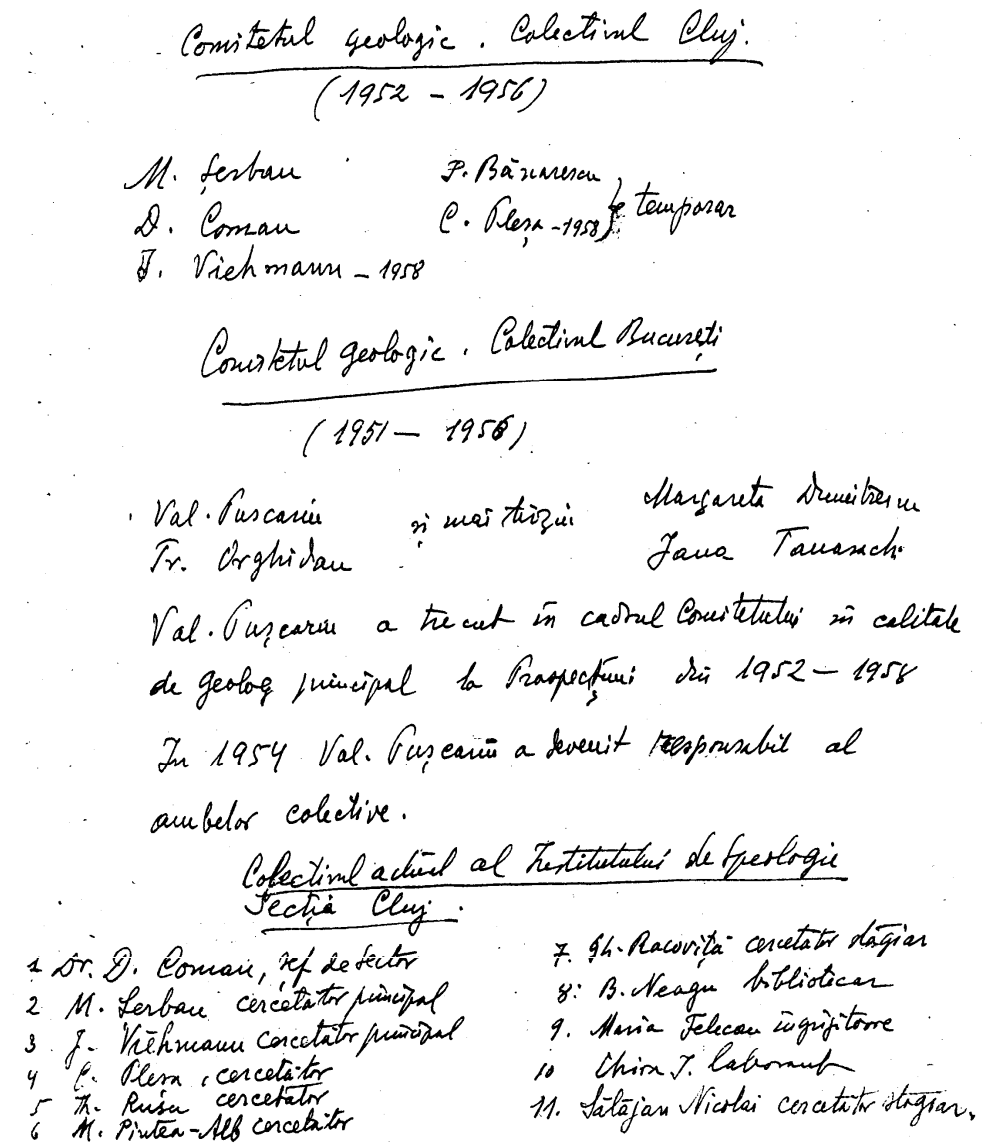
Concerning the "*Law for the founding of the Institute of Speleogy in Cluj*", C. Motaş notes in a telegraphic style: **1.** Voted in the Chamber of Deputies on February 26, 1920; **2.** Voted and adopted by the Senate, along with the contract on March 10, 1920; **3.** Promulgated on April 26, 1920; **4.** Published in the Official Bulletin no. 86 from July 20, 1920, together with the contract between the Chief of the Religion and Public Instruction Sector of the leading Comity, Dr. Valeriu Branişte and Emile G. Racovitza. The President of the Chamber of Deputies was Prof. N. Iorga, and Prof. I. Borcea was Minister of Religion and Education while President of the Senate was Prof. P. Bujor." In the following, on page 2, C. Motaş notes the names of the Institute of Speleology directors between 1920 and 1958: E.G. Racovitza (1920–1947), V.Gh. Radu (1947–1953) and O. Marcu (1953–1958). We also find out the employees of the Institute during the period of Racovitza, named director for life: Dr. René Jeannel – sub-director (1920–1927), Pierre-Alfred Chappuis – deputy director (1922–1949), Val. Puşcariu – assistant (1922–1943), Margareta and Radu Codreanu – assistants (the years are not mentioned), Letiția Chevereşeanu – laboratory assistant, Iuliu Virag –

[1] The notebook, and other original documents, sheets, manuscripts and publications will be donated to the ISER Library to be recorded and kept in the "Prof. Acad. C. Motaş Fund donated by Dr. Ştefan Negrea"

photographer drawer, Clara Nagy – secretary-librarian, Johann Roth – entomologist laboratory assistant and chief of the exploration team, I. Cordoş – chief of the speleological team (from 1922), Dumitru and Florica Flueraş and Ana Buda – caretakers. I. Cordoş, who lived in the Institute building, continued to work led by C. Motaş, until his death. "The laboratory assistant of Emile Racovitza" – as he was introduced to me, Cordoş, gave me in Cluj, in 1957, when commemorating 10 years from the death of the scientist, an off-print from the famous discourse "*Speleogia*", delivered on 13 June 1926 in the solemn assembly from the Romanian Academy in the presence of King Ferdinand. The off-print has an exceptional value since it was Racovitza's "working copy" adding a hand-written list of 122 persons to whom he had sent his reception speech. Worth noting is that on the list at no. 111 one can find the "Reading society" from *Soroneşti* (and not Şurăneşti as the locality with the manor of the Racovitza family is officially named today).

After the death of Emile Racovitza, the Institute he had created slowly diminished its activity, especially after Chappuis left. Worth noting are the results of the team of young enthusiasts made up of Mihai Şerban, Dan Coman and R. Givulescu, who continued the study of the Scărişoara Glacier and published their results. Independently of what was happening in Cluj, at the Faculty of Biology in Bucharest, Val. Puşcariu (a biospeleologist educated by Emile Racovitza himself) teamed up with Traian Orghidan (a hydrobiologist educated by C. Motaş, a specialist in phyllopods and hydracarina) and started to explore the caves for the cavernicolous fauna, to make drillings in sand and gravel river beaches and to place traps in wells for the phreatic fauna. In 1951, the Geologic Commmittee, interested in prospecting the chiropterite deposits from the caves, made a proposition, first to the Bucharest team and then to the Cluj team, to start searching and investigate these deposits as a fertilizer source. As a result, two speleogic teams formed within the Geologic Committee, both mentioned in Prof. C. Motaş's above mentioned notebook (page 3): *Bucharest team* (1951–1956) made up of Val. Puşcariu and Tr. Orghidan and, later, Margareta Dumitrescu (a bat specialist) and Jana Tanasache (her assistant) and the *Cluj team* (1952–1956) made up of Mihai Şerban, Dan Coman and Petru Bănărescu (temporarily) and, from, 1958 on, Iosif Viehmann and Corneliu Pleşa (temporarily) (Fig. 1).

Prof. C. Motaş mentions that Val. Puşcariu was also a part of the Geologic Committee as a main geologist in prospections (1952–1958) and from 1954 as a responsible for both teams. As in the years 1951–1954, I was a student and president of the Students Debating Society of Hydrobiology, led by Traian Orghidan, I participated along with the members of the circle in some speleologic campaigns of the Bucharest Team and The Geologic Committee, exploring caves from the Apuseni and Bucegi Mountains, Oltenia and Hunedoara. Of course, our two coordinators, Traian Orghidan for the Hydrobiology Debating Society and Margareta Dumitrescu for the Vertebrate Zoology and Paleontology Circle, saw these circles as a


Comitetul geologic. Colectivul Cluj.
(1952 – 1956)

M. Șerban P. Bănărescu
D. Coman C. Plesa – 1958 } temporar
J. Viehmann – 1958

Comitetul geologic. Colectivul București
(1951 – 1958)

Val. Puscariu și mai târziu Margareta Dumitrescu
Fr. Orghidan Jana Tamanchi

Val. Puşcariu a trecut în cadrul Comitetului în calitate de geolog principal la Prospecțiuni din 1952 – 1958
În 1954 Val. Puşcariu a devenit responsabil al ambelor colective.

Colectivul actual al Institutului de Speologie
Secția Cluj.

1 Dr. D. Coman, șef de sector
2 M. Șerban cercetător principal
3 J. Viehmann cercetător principal
4 C. Plesa, cercetător
5 Th. Ruşu cercetător
6 M. Pintea-Alb cercetător
7. Gh. Racoviță cercetător științific
8. B. Neagu bibliotecar
9. Maria Telecan îngrijitoare
10 Chira I. laborant
11. Sălăjan Nicolai cercetător științific.

Fig. 1. – Speleological teams belonging to the Geological Committees in Bucharest and Cluj, from the notes of C. Motaş (facsimile).

true nursery for the future biospeleologists. They saw in us the researchers of a possible Institute of Speleology reorganized at the national level, reuniting for the benefit of Romanian speleology the two teams of the Geologic Comity and the few researchers still active at the Institute of Speleology and the Science Faculty in Cluj. This is how Val. Puşcariu, former assistant of Racovitza, a passionate of

speleogy, being transferred from Cluj to Bucharest as an assistant to Prof. Radu Codreanu (another assistant of Racovitza) caused the creation of a speleological team at the Faculty of Biology in Bucharest, while after he was named chief of the teams from Bucharest and Cluj he promoted the idea of an Institute of Speleology reuniting all the Romanian speleogists. The idea was put into practice by our "Masters" – T. Orghidan and M. Dumitrescu – who educated us, the future biospeleologists of the golden period of the Romanian speleology. Therefore, they are the true authors of the "Emile Racovitza" Institute of Speleology in its reorganized form from 1956. The more so as they were those who fought for years with the bureaucracy of the communist epoch so that the dream of the Romanian speleologists, already more numerous in Bucharest than in Cluj, may become a reality.

I remember how, at the end of a working day, in his laboratory from the faculty, T. Orghidan kept us informed about the success or the failure of the approaches for the founding of the "Institute of Speleology of the P.R of Romania" with two head-quarters: a central one in Bucharest and a subsidiary in Cluj. These approaches involved famous political, cultural and scientific personalities of the time who favored the project proposed by the two masters. I remember T. Orghidan speaking about the relations with President Petru Groza and Romeo Drăghici, the impresario of George Enescu, and even with the great musician, beside whom T. Orghidan had lived for a while at Sinaia. I regret I did not write all the details of the master's confidences which, after more than half a century, disappeared from my memory. One day, the master told us about the failure of the approaches to create the Institute of Speleology within the Romanian Academy. During the audience, the President of the Academy Traian Săvulescu told him he can not approve the request because there was no personality able to succeed as a director to Emile Racovitza. In reality, there was Prof. C. Motaş but as he was a political convict in 1949 for 20 years of severe prison for imaginary delicts, he could not be proposed. At the Ministry of Education, the masters always found an open door but the approval was always delayed.

The years passed and us, the members of the two scientific debating societies selected by the masters for the Bucharest centre of the reorganized Institute, had finished the faculty, me in 1954 and the others in 1955. As the Institute was not yet established, with the master's help, we were employed as researchers: at the Marine Researches Station founded by Grigore Antipa at Constanţa (Ştefan Negrea, transferred at the 1st of Decembre 1955 at Brăila in order to establish the Hydrobiological Station of the faculty of Biology), at the Sinaia Zoological Station of the same faculty (Ionel Tabacaru and Eugen Şerban) and at the Mining Institute (Petre Samson), each of us eagerly waiting the masters signal to regroup in Bucharest. Other selected members started their Ph.D. at Prof. Margareta Dumitrescu (Elena Terzea and Costin Rădulescu) or just waited for their turn, as they were just students (Vasile Decu, Dan Dancău and Anca Burghele). There were

also those who did not come from the two scientific debating societies (Francisc Botea, Alexandrina Negrea, Maria Georgescu, Magdalena Gruia and Ştefania Avram) or were professors at the Faculty of Biology (Val. Puşcariu, Jana Tanasache and L. Botoşăneanu). Always beside the masters, sustaining them from the beginning were the professors Radu Codreanu and Nicolae Botnariuc from the same Faculty. For the Geology-Paleontology Section of the Institute, Dr. E. Jekelius and Matei Ghica, both geologists, were selected.*

But what happened with the scientist Constantin Motaş during this time? Silenced by emprisonment because he had good relationships with Titel Petrescu (former president of the Social-Democrat Party from Romania), the inconvenient professor suffered the calvary of the communist prisons, beginning with the infernal Aiud. During the seven years of ordeal, in order to maintain his intellectual and moral condition, without books, paper and pencils, he taught his cell-mates oral biology lessons and reciting from Eminescu, Baudelaire and other poets. At his turn, he learned there the English language. Among other terrible things he told me how, one day, after he had left the prisons hospital, he was forced to wash the toilets and how, other time, in a cell with a broken window, he woke up stiff, with snow on him and frost on his mouth. Also from his confidences I found out the reasons of his unexpected release, long before the end of the 20 years of detention. The reasons were the more and more powerful pressures made by the European zoologists and hydracarinologists, led by Karl O. Viets. That's why, in April 1956, Motaş was released from his cell, dressed in civil clothes and sent home.

A few days afterward, he was received by Gheorghe Gheorghiu-Dej, first secretary of the Romanian Communist Party, so the supreme political authority from Romania of that time. After a few excuses for imprisoning him by "error", he proposed Motaş to choose between being again a zoology professor at the faculty of Biology in Bucharest or the director of the "Grigore Antipa" Museum of Natural History, a place he had occupied after the death of Grigore Antipa, the founder of this Museum (1945 – 1949). Without hesitation, Motaş declined both offers, asking instead to be appointed the director of the Institute of Speleology. Seeing the confusion of Gheorghiu-Dej, he explained that during his detention, a group of zoologists, from the Faculty of Biology, passionate of speleology, are trying to reorganize, at a national level, the Institute of Speleogy created by Emile Racovitza at Cluj – an institute now in trouble after his death in 1947. He also told him that their approaches at the Academy had failed as they did not have a scientific personality well-known abroad as a director and they got only promises at the Ministry of Education. "*But now, immediately they have found out I was released – the professor ended his explanation – Orghidan came to me and asked me to be*

* During the years, the Geology-Paleontology Section will develop through the employment of many geographers, geologists, paleontologists and chemists, etc., while the Biospeleology Section will decrease alarmingly, especially after 1985, through retirements and deaths.

their director and I have accepted". Gheorghiu-Dej agreed with him. Thus, C. Motaş entered his office as a former politic convict barely released and emerged as the director of the Institute of Speleology of P.R. of Romania. Or, as he will put it in a conference about Buffon held in 1957 at the Jassy University: "I was in the dark and now I made myself chief of the darkness".

At the 18th of June 1956, was finally published the "*Decision of the Ministerial Council of the Popular Republic of Romania no. 1189/1956 regarding the founding of the Institute of Speleology of the Popular Republic of Romania with the head-quarter in Bucharest*" (Fig. 2 – facsimile):

The Ministerial Council of the Popular Republic of Romania,

Decides:

1. Institute of Speleogy of the Popular Republic of Romania with the head-quarter in Bucharest, within the Education Ministry, is established.

2. The management, scientific and administrative staff will be remunerated in the same way as the staff from the research staff from the Institutes of Scientific Researches of the Academy of the Popular Republic of Romania.

3. Professor Constantin Motaş is appointed director of the Institute of Speleogy of the Popular Republic of Romania.

4. The remuneration and working plan of the Ministry of Education is supplemented with 90000 lei.

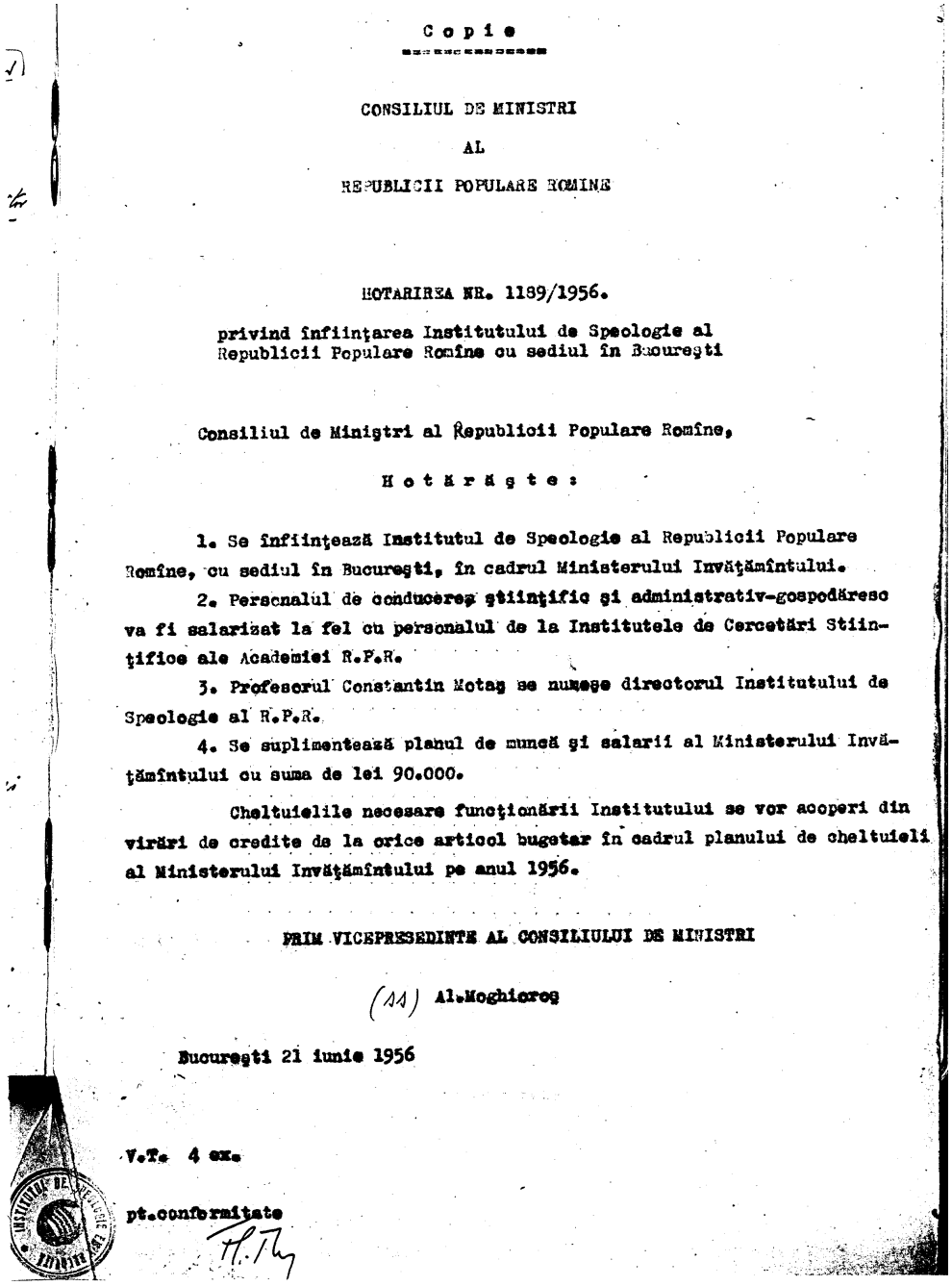
The expenses needed for the functioning of the Institute will be covered by credit transfers from any budgetary articles from the remuneration plan of the Ministry of Education on 1956.

PRIME VICE PRESIDENT OF THE MINISTRY COUNCIL

(ss) Al. Moghioroş

Bucharest, 21st June 1956

The content of this D.C.M. is confusing, the Decision being written probably by an ignorant clerk of the Ministry Council. It would have been written differently if he had spoken with C. Motaş or T. Orghidan. He would have known that this was not about establishing a new Institute with the head-quarters in Bucharest but the reorganization of the old Institute founded by Racovitza at a republican level, with two head-quarters: a new one, named "**central**" in Bucharest and the old one, named "**subsidiary**" in Cluj, in the building from Clinicilor Str. no.5, where Racovitza himself had established



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CONSILIUL DE MINISTRI

AL

REPUBLICII POPULARE ROMINE

HOTARIREA NR. 1189/1956.

privind înfiinţarea Institutului de Speologie al Republicii Populare Romîne cu sediul în Bucureşti

Consiliul de Miniştri al Republicii Populare Romîne,

H o t ă r ă ş t e :

1. Se înfiinţează Institutul de Speologie al Republicii Populare Romîne, cu sediul în Bucureşti, în cadrul Ministerului Învăţămîntului.

2. Personalul de conducere ştiinţific şi administrativ-gospodăresc va fi salarizat la fel cu personalul de la Institutele de Cercetări Stiinţifice ale Academiei R.P.R.

3. Profesorul Constantin Motaş se numeşte directorul Institutului de Speologie al R.P.R.

4. Se suplimentează planul de muncă şi salarii al Ministerului Învăţămîntului cu suma de lei 90.000.

Cheltuielile necesare funcţionării Institutului se vor acoperi din virări de credite de la orice articol bugetar în cadrul planului de cheltuieli al Ministerului Învăţămîntului pe anul 1956.

PRIM VICEPREŞEDINTE AL CONSILIULUI DE MINISTRI

(ss) Al.Moghioroş

Bucureşti 21 iunie 1956

V.T. 4 ex.

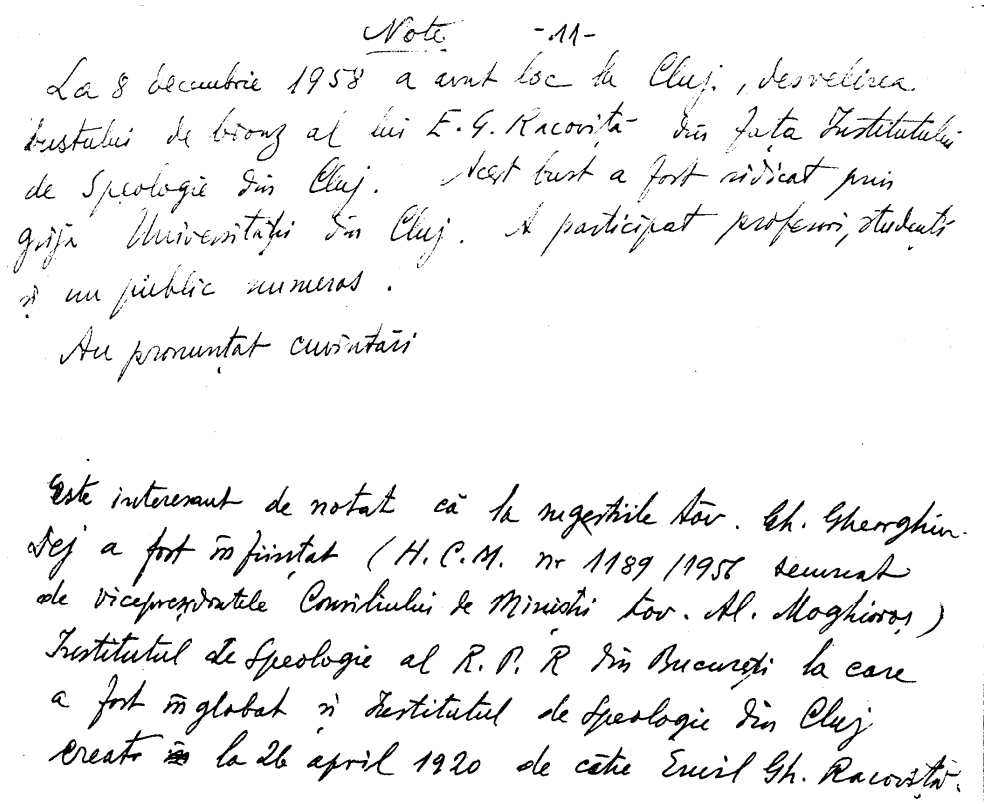
pt.confirmitate

Fig. 2. – Decision of the Council of Ministers of the People' Republic of Romania from the 21st of June 1956 regarding the founding of the "Institute of Speleology of the P.R.R. with its center in Bucharest" (facsimile).

in 1920 his Institute. He would have known that the "Institute of Speleology of the Popular Republic of Romania" had included the Racovitza's Institute with his entire patrimony from Cluj, including his scientific and administrative staff; also, he would have known that an Order of the Education Ministry should have appointed the building for the Bucharest Institute and the scientific and administrative staff. I sustain my affirmation with three documents.

1. The olographic note from page 11 of the Motaş's notebook with "Notes and Laws" which, in translation has the following content:

"*It is interesting to note that at the suggestions of com. Gh. Gheorghiu-Dej was established (H.C.M. no. 1189/1956, signed by the vice-president of the Ministry Council, com. Al. Moghioroş) the Institute of Speleology of the Popular Republic of Romania from Bucharest in which was included the Institute of Speleology from Cluj created at the 26th of April 1920 by Emile Gh. Racovitza*".

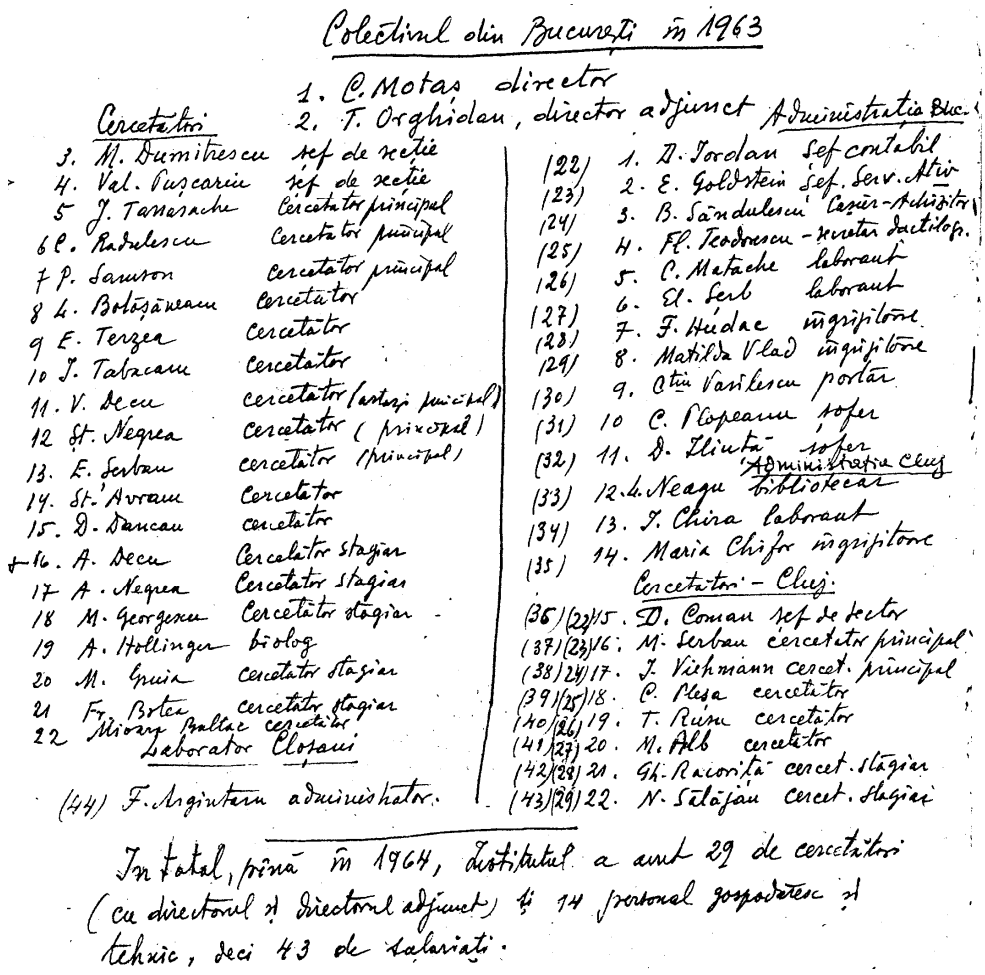

Note -11-
La 8 decembrie 1958 a avut loc la Cluj, dezvelirea
bustului de bronz al lui E. G. Racoviță din fața Institutului
de Speologie din Cluj. Acest bust a fost ridicat prin
grija Universității din Cluj. A participat profesori, studenți
și un public numeros.
Au pronunțat cuvântări

Este interesant de notat că la sugestiile tov. Gh. Gheorghiu-
Dej a fost înființat (H.C.M. nr 1189/1958 semnat
de vicepreședintele Consiliului de Miniștri tov. Al. Moghioroș)
Institutul de Speologie al R.P.R din București la care
a fost înglobat și Institutul de Speologie din Cluj
Creat în la 26 aprilie 1920 de către Emil Gh. Racoviță

Fig. 3. – Note belonging to C. Motaş specifying the inclusion of the Institute of Speleology in Cluj into the new "Institute of Speleology of the P.R.R." (facsimile).

2. The olographic list added by C. Motaş between pages 2 and 3 of his notebook (Fig. 4 – facsimile) which contains both the names of the researchers

from Bucharest in 1963 (no. 1 – 22 on the list) and from Cluj (no. 36–45).The list also contains the names of the administrative staff from Bucharest and Cluj (nr. 22bis – 35) and that of the administrator of the Cloşani Laboratory (no. 44)


Colectivul din Bucureşti în 1963

1. C. Motaş director
2. T. Orghidan, director adjunct

Cercetători

3. M. Dumitrescu şef de secţie
4. Val. Puşcariu şef de secţie
5. J. Tamaşache Cercetător principal
6. C. Radulescu Cercetător principal
7. P. Samuron Cercetător principal
8. A. Bolăşăneanu Cercetător
9. E. Terzea Cercetător
10. I. Tabăcaru Cercetător
11. V. Decu cercetător (asistent principal)
12. Şt. Negrea cercetător (principal)
13. E. Serban cercetător (principal)
14. St. Avram Cercetător
15. D. Dancau cercetător
16. A. Decu Cercetător stagiar
17. A. Negrea Cercetător stagiar
18. M. Georgescu Cercetător stagiar
19. A. Hollinger biolog
20. M. Gruia Cercetător stagiar
21. Fr. Botea cercetător stagiar
22. Miorita Ballue cercetător

Laborator Cloşani

(44) F. Arginteanu administrator

Administraţia Buc.

(22) 1. D. Iordan Şef contabil
(23) 2. E. Goldstein Şef Serv. Adm.
(24) 3. B. Săndulescu Casier-dactilogr.
(25) 4. Fl. Teodorescu - secretar dactilogr.
(26) 5. C. Matache laborant
(27) 6. Şt. Serb laborant
(28) 7. F. Hudac îngrijitoare
(29) 8. Matilda Vlad îngrijitoare
(30) 9. Ctin Vasilescu portar
(31) 10 C. Popeanu şofer
(32) 11. D. Ilinţă şofer

Administraţia Cluj

(33) 12. L. Neagu bibliotecar
(34) 13. I. Chira laborant
(35) 14. Maria Chifor îngrijitoare

Cercetători - Cluj:

(36)(22)15. D. Coman şef de sector
(37)(23)16. M. Serban cercetător principal
(38)(24)17. I. Viehmann cercet. principal
(39)(25)18. C. Plesa cercetător
(40)(26)19. T. Rusu cercetător
(41)(27)20. M. Alb cercetător
(42)(28)21. Gh. Racoviţă cercet. stagiar
(43)(29)22. N. Sălăjan cercet. stagiar

În total, până în 1964, Institutul a avut 29 de cercetători (cu directorul şi directorul adjunct) şi 14 personal gospodăresc şi tehnic, deci 43 de salariaţi.

Fig. 4. – Hand written list placed by C. Motaş between the pages 2 and 3 of the notebook "Notes and Laws" containing the researchers and the administrative staff of the Institute of Speleology in Bucharest abd Cluj in 1963 (facsimile).

Under the list, C. Motaş wrote: "Up to 1964, the Institute [including Cluj, o.n] had 29 researchers (with the director and director adjunct) and 14 administrative and technical staff, so 43 employees".

3. The olographic list from page 3, continuing on page 4 of the previously mentioned notebook, in fact a variant of the one from point 2, with a few more names and others lacking.

As an eyewitness of those times, I can testify for the posterity that Prof. C. Motaş had exactly noted in his personal archive all the events linked with the Institute of Speleology before and after Racovitza.

At the 18th of July 1956, was published the "*Order of the Education Ministry no. 1312 regarding the employement of the scientific and administrative staff of the Institute of Speleology of the Popular Republic of Romania*" with the following contents:

18th of July 1956
In conformity with D.C.M. no. 1189/1956
Minister Deputy

DISPOSES

*1. At the **1st of July 1956**, the following scientific and administrative from the Institute of Speleogy of the Popular Republic of Romania Buc[harest] with the places and the remunerations for each of them, is appointed:*

Biology Sector

Chief sector ½ norm……..Dumitrescu Marg[areta]……lei 800
Main researcher ½ norm……Tanasache Jana……" 650
Researcher……..Ştefan Negrea……."1000
from the Hydro[bio}logical Station Brăila
Researcher……Tabacaru I[onel]……"1000
from Sinaia Zoological Station

Geology-Paleontology Section

Chief sector ½ norm……Dr. Jekelius E……lei 800
Researcher……Samson Petre……."1000
from the Mining Institute
Preparator 1/2 norm…….Ghica Matei……."350
Assistant laboratory…..Cuza Matache……."450
Dactilograph-secretary….Georgescu Maria……"530
Mechanic……Mălăescu George……."462, 80
CFR retired
Caretaker……..Dimache Elena……."265

2. The General Direction of the Higher Education will apply the dispositions of this order.

Minister Deputy

C. Drăgulescu

From this list is clear that not all the researchers educated by the Masters could be employed from the beginning in the Bucharest collective due to the small number of places. In this situation, in order not to loose them, they favored the researchers who, finishing their studies, already worked for a year or two in various stations and institutes from the country. Those without a place will be step-by-step employed as the Institute received new places. Thus, the number of the researchers from Bucharest rose from 8 in 1956 (including the director, director adjunct and the chiefs of the two sections) to 22 in 1963; we were all biologists, three of us specialized in Paleontology: Elena Terzea, C. Rădulescu and P. Samson. During the same time interval, the collective from Cluj rose to 8 researchers, also biologists, with the exception of T. Rusu, a geographer. Remarkably, the name of T. Orghidan, the main "architect" of the "Institute of Speleology of the Popular Republic of Romania" does not appear neither in the D.C.M. no. 1189/1956 nor in the Order of the Education Ministry no. 1312/1956. The mistery was elucidated with the archive of Motaş. In a "*Short note*" glued between pages 2 and 3, at point 3, C. Motaş notes:

Through the decision of the Education Ministry no. 334a from the 4th of March 1957, Tr. Orghidan was appointed scientific director adjunct of the Institute of Speleogy of the Popular Republic of Romania. The decision was signed by Al. Ionescu Bujor, director of the Higher Education.

At the 23rd of June, in Bucharest, I received the news of the D.C.M concerning the establishment of the Institute of Speleology of the Popular Republic of Romania was from Prof. Margareta Dumitrescu who was writing the paper of my transfer from the Hydrological Station from Brăila and the one for Ionel Tabacaru from Sinaia Zoological Station. Although at the 18th of June was published the Order of the Education Ministry concerning the scientific and administrative staff (Fig. 7 – facsimile), I came in Bucharest only on the 13th of August after I gave the inventory and the function of delegated director of the Brăila Hydrobiological Station to my successor, Dimitrie Radu.

The Institute of Speleology was already temporarily established in the two big rooms from the ground floor of the building from Dr. Ştefan Capşa no. 8, near the Cotroceni palace – the former rest and guest house of Queen Maria, taken by the communist government. In fact, it was a part of the space given to Prof. C. Motaş after his release from prison, in April 1956, which he had given to the Institute until we acquired our own building. This temporary state will last for …18 years!

I spend the first years at the Institute of Speleology in the same laboratory with Prof. C. Motaş, Jana Tanasache, Lazăr Botoşăneanu, Alexandrina Negrea and a dactylographer. As my place was beside the professor's desk, I used fully his presence daily, except for Sunday, working from morning to evening, with a lunch break. I have learned this working rhythm during my student years from our

master, Traian Orghidan, who, in turn, had learned it, as a student, than as an assistant, also from Motaş. Thus, the motto of C. Motaş, "*work is the most precious good of man*" was not an empty word. Only during the field trips (sometimes alone, sometimes accompanied by Motaş or Orghidan), lasting for a month, changed this rhythm. I do remember the first speleogical campaigns which started in 1956. We did not have a nice "dowry" but we had the enthusiasm and energy of ten speleologists. What was the "dowry"? A "Molotov" truck with wooden boxes on which we slept, worked and ate. In these boxes, our team kept the exploring materials and the working and protection equipment. Some thick cords, heavy hemp ladders with wood steps, lamps with carbide and well-used bulbs, tents like sieves, ragged overalls, burnt in some places by the lamps flames, tired shoes, mining helmets. That was all. But what did we care? We were happy to explore and chart unknown caves, to collect cavernicolous fauna. We returned to the Institute laden with samples from tens of caves which we sorted and studied, side by side with our chiefs, Motaş or Orghidan, until late in the night.

With the same youthful enthusiasm we all took place in bulding the "*Speleological Research Station*" Cloşani, including the experimental laboratory from the cave with the same name. The idea to build this station and this laboratory belonged to Traian Orghidan and Margareta Dumitrescu. I had the chance to be a part of the field team led by the two Masters who explored the caves from Hunedoara and Oltenia – one of the aims being to choose the laboratory cave and the locality in which to build the Speleological Station. After choosing Cloşani Cave, we started in 1959 to build the subterranean laboratory and the house; the opening took place in 1961.

Also during those unforgettable years, Professor Motaş fought to start again the publishing of the series "*Works of the Institute of Speleology*" published between 1926–1939 by Emile Racovitza, under the title: "*Works of the «Emile Racovitza» Institute of Speleology*". The first double number (no. 1-2 with 600 pages was published in 1963. The "Foreword", signed by C. Motaş, refers to the main achievements of the two collectives, from Bucharest and Cluj, from the reorganization of the Institute of Speleology (1956) until his retirement (1963). Two years after the reorganization of the Institute, at 10–12 of May 1958, in Bucharest, was held the first scientific session and a part of the scientific communications were published in this volume. The volume starts with a group of speeches held in Cluj, at the 8th of December 1957, at the celebration of 10 years since the death of Emile Racovitza and the inauguration of his bronze bust placed at the entrance of the Institute founded by him in 1920. The volume also contains the letters received from personalities from the country and abroad. Very impressive is the letter of René Jeannel, then the honorary director of the National Museum of Natural History from Paris, sent to C. Motaş:

Mon cher collègue,

Je m'associe de tout coeur à la commémoration de E.G. Racovitza organisée par l'Institut de Spéologie de Cluj.

Les plus belles années de ma carrière furent assurement celles que j'ai passées dans votre Institut, auprès de Racovitza qui fut pour moi, á la fin, un grand ami et un Maître. Car c'est bien lui qui m'a appris mon métier de naturaliste qu'il a exercé lui-même avec méthode et science pendant toute sa vie. Je lui dois le meilleur de ma formation et lui en garde une reconnaissance qui s'étend aussi á votre pays.

Dans cet esprit, mon cher collègue, je vous adresse l'assurance de mes sentiments les plus cordialement dévoués.

Dr. R. JEANNEL

The most part of this volume (p. 69–600) is occupied by the physical speleology and biospeleology papers presented at the session. Beside the works of our masters, among which we note the monographic study of the karstic complex from Vârgişului Gorges (T. Orghidan and M. Dumitrescu) and the ample study on the Chiroptera from Romania (M. Dumitrescu, J. Tanasachi* and T. Orghidan), were published papers of the young generation: I. Viehmann (the genesis of the cave pearls and thet of the stalagmitic formations), I. Tabacaru (the post-embrionary development of some cavernicolous species of diplopods), Şt. Negrea (lithobiids from caves), V. Decu (cavernicolous beetles in the conception of Jeannel), D. Dancău (subterranean amphipods of the genus *Niphargus*), A. Decu-Burghele (cavernicolous diptera), I. Căpuşe and M. Georgescu (cave lepidopters) and A. Negrea in collaboration with Al. Grossu (cavernicolous gasteropods). They were the first works of the generation raised by the Masters to be presented at a session with papers based on material collected by themselves from caves and which already foretold the impetuous development of the Romanian Biospeleology after the death of Racovitza.

Concerning the reorganization of the "Institute of Speleogy of the Popular Republic of Romania", it's worth remembering that in the year 1957, it was named after its founder, Emile Racovitza. This is what C. Motaş noted in the in his notebook at page 5:

In order to spread the name of E. Racovitza the Institute of Speleology was named after him: D.C.M. no. 1910 from the 10th of December 1957, published in

* Although all speleologists spelled her name with an *e* and in the papers of the Institute it was also written with an *e* (Tanasache), she published her papers with a final *I* (Tanasachi).

the Official Bulletin no. 79 from the 15th of December 1957. (ss) President of the Ministry Council Chivu Stoica.

Through this decision, the name of Racovitza was given not only to the Institute, but also to the School from Şurăneşti, the Medium School from [street?] *Mihai-Vodă – Bucureşti. His name was also given to a student hostel and a ship.*

It was also decided to spread his name and informations about his life and scientific career. The house from Şurăneşti was declared a historic monument ["a cultural one" – see further]. *A commemorative documentary about his life and work and a commemorative stamp (in fact two) will be made. "The expenses for the realization of these actions will be made within the framework of the expenses for the year 1957 and those which will be approved for 1958 for the ministers and institution appointed in this Decision, which have to organize this commemoration*".

The typewritten copy of this D.C.M. is glued in the notebook and noted with the number 7, while D.C.M no. 1619 from the 3rd of October 1957 – in which the house from Şurăneşti (Dăneşti commune) was declared a "cultural monument" was copied with ink on page 8 of the notebook.

Worth mentioning is the following important document, copied by C. Motaş in his personal archive, on page 6

Ministry Council of the Popular Republic of Romania

DECISION

concerning the shift of the "Emile Racovitza" Institute of Speleology from the Education and Culture Minister to the Academy of the Popular Republic of Romania

The Ministry Council of the Popular Republic of Romania decides:

1. The "Emile Racovitza" Institute of Speleogy from Bucharest, functioning within the framework of the Education and Culture Minister shifts from the 1st of January 1960, with all his means, under the Academy of the Popular Republic of Romania.

2. The Minister of Finances, the State Comity of Planning, the Academy of the Popular Republic of Romania and the Education and Culture Minister will take all the measures for the shift of the expense plan and the manpower, for 1960, of the "Emile Racovitza" Institute of Speleogy to the Academy of the Popular Republic of Romania.

President of the Ministry Council

(ss) Chivu Stoica

Bucharest, the 10th of February 1960
No. 130

for conformity
(ss.) undecipherable
Bureau of secret documents
(stamp of M.I.C.)

The last pages of the notebook (p. 13 and 14) contain two documents copied by Prof. C. Motaş by hand, but without any comment.

The first document is a decision of the Academy of the Popular Republic of Romania with the following content:

DECISION no. 308

The President of the Academy of the Popular Republic of Romania

Taking into account the dispositions of art. 180 from D.C.M. no. 1175/1962 regarding the retirement of the employees above the maximum age limit.

Noting the situation of the employees above the age of 70 years; based on art. 72 from the Statute for the organization and functioning of the Academy of the Popular Republic of Romania approved by H.C.M. no.123/1963:

DECIDES

Art. 1. At the 31st of July 1963, based on art. 180 from D.C.M. no. 1175/1962, are released from their functions the employees included in the annex part of this decision.

Art. 2. The Direction Manpower and the Direction of Financial Planning and Accountancy are authorized to fulfill the dispositions of this decision.

Bucharest, today 1st of July 1963
President of the P.R.R Academy
(ss) Acad. I.G. Murgulescu

Excerpt from the annex:
Institute of Speleology
Prof. Motaş Constantin……post no. 80111……director……3000 lei……..72
for conformity, *for conf.*
C. Motaş *(ss) undecipherable*

The second document contains an address of the Planning Office of the P.R.R. Academy with the following content:

1. The P.R.R Academy with the address no. 20505/1963 approved the elimination from the Your Personal establishment of a post with a monthly payroll of lei 3000 beginning with the 1st of August 1963.

(ss) Chief of Planning office *Departmental manager*
Malacopol *V. Georgescu*
Registered at the Institute [of Speleogy, o.n] at no. 1370 from the 8th of July 1963.
Post no. 81001 – director 300 lei.

2. In the Functions Statute from the Planning Office (ss) Malacopol and under no. 25947 from the 1st pf September 1963, there is no post of director at the Institute of Speleology.

The news of the retirement of our director fell like a lightning both upon Prof. C. Motaş, who, on the 8th of July was 72, and on us, the researchers. I remember how started to spread. Was there someone trying to dissolve the "Emile Racovitza" Institute of Speleology? Was someone trying to take his place "from behind"? Only this could explain why he was put before an accomplished fact, without any warning, without any derogation – as he was a scientist with an international fame, a former member of the Romanian Academy (before it was changed into the Academy of the Popular Republic of Romania), and he was in full scientific and managerial activity, as a director and successor of Emile Racovitza. We will never know as there are no documents and no eyewitnesses alive.

What happened to Professor Motaş under the dictatorial communist regime did not happen to Emile Racovitza and to Grigore Antipa under the previous, capitalist regime. *Great biologists of their stature, founders or leaders of institutes, founders of scientific schools, researchers with an international fame requested to study the biodiversity or other aspects abroad, had to be respectfully kept in the research institutes as long as their health allows it, as it happens in the West, and not treated by "Mister Bureaucracy" as some clerks, barely waiting to be retired. The country looses, the Romanian and universal science looses!*

Without a director, the management of the "Emile Racovitza" Institute of Speleology was taken by the scientific director, Traian Orghidan, subsequently appointed director (I do not know the precise date as I did not find the decision of appointment).

Profesor Motaş resigned himself with difficulty. From the moment of his retirement, he left his desk from the laboratory for the desk from his working room of the family apartment, which was above the Institute at the first floor of the building. Few of us still visited him for an advice, an excerpt or a book, and among those few, only us the Negrea family became very close to him. I still see him just as in those moments, at his desk, with his white hair limited to a white crown, glasses with thick frames that enlarged his myope eyes, with the ever-present lavaliere – all giving him the distinguished aspect of a "classic" scientist. Talking with him, you would immediately notice his erudition, his zest and healthy humor, the fine irony, all as they were in his youth despite the seven years spent in a cell. He was an encyclopedic mind with an amazing memory. For instance, I listened to

him reciting the entire "Luceafărul" and the "Letters" of Mihai Eminescu with the diction and the intonation of an artist. He was prolific, up-to-date, both scientifically and culturally. He was an excellent orator and an inspired painter who drew on what was available and with what was available. I have at home many of his drawings and aquarelles made during or immediately after the the excursions with our car, him with his wife, Ştefănica, I with my wife Alexandrina (Didina) through Bucharest – he liked the Zoological garden and Expoflora from Herăstrău Park – or in the country – he had a preference for Predeal, Sinaia, Buşteni, Cozia, Horezu and other localities from the mountainous region of Oltenia.

Due to the prestige of Professor C. Motaş, a great man of science and culture, the laboratory I was sharing with Didina was visited by many people, brought in by Motaş. There was, for instance, his former collaborator Victor Angelescu, returning from Buenos Aires after many years especially to see him. There was Ion Ţuculescu, the famous painter, who regarded himself as a biologist and a specialist in protozoans and was very proud about his monograph on Lake Techirghiol. In 1960, Professor Motaş introduced me and L. Botoşăneanu to him for a collaboration concerning the spring fauna from the Romanian Plain. Only the premature death of the painter stopped this project. In the end, I made the book about the springs and the phreatic waters from the Romanian Plain with Professor Motaş, an achievement who made us, Botoşăneanu and I, well known abroad.

I respectfully remember the last meetings with Professor Motaş. I was always finding him at his desk laden with manuscripts, books, revues, dictionaries. On the walls, there were pictures received from abroad, drawings and aquarelles – his own or gifts. At the end of 1979, he called me to give me the foreword of my book, "*Prin peşterile lumii*" – which was under press. He wanted to give it to me personally so he would be able to tell me how much he had liked it, especially the pages evoking the childhood of a future naturalist, pages he described as: "There could not be a more beautiful writing. They show the author, being a Moldavian, as a very good narrator and an emulator of our great writer Ion Creangă". I was not suspecting then how close his end was and that I and Didina will see him alive just once.

Truly, on Thursday, the 10th of January 1980, when I visited him with Didina to tell him that my book with his foreword was published, he had a haggard look and breathed heavily. "Dornescu [professor of Comparative Anatomy, o. n.] thinks that the atrophy of the legs muscles has started; I am afraid I will be paralyse", said him. "Do not listen to Old Dornescu, replied Didina, your cough will pass and, in the spring, will start again the trips with our car". "I would like to go even to Snagov or Băneasa!", he sobbed. As we left, I promised him I would come back on Sunday, the 13th of January with the tensiometer and the first copy of my book with his foreword. "At least in that way I will be published", wistfully commented the Professor, remembering the times when he published a lot.

These were the last of his words and the last time we saw him alive (on Sunday the Professor was no longer at home). On Friday he was hospitalized urgently together with his wife at the clinic of the doctor Ion Emil Bruckner from the Colentina Hospital. His diagnostic was "acute pulmonary edeme". Tuesday, the 15th of January, a phone call jarred me from the microscope where I was working in the laboratory. It was Mrs. Motaş. Crying, she gave me the incredible news: "Tică is gone, he left me alone. He died today in my arms at half past 14. You are the first I am calling as Tică cared a lot about you and Didina, he saw you as his children. Give me an advice, what shall I do?" Of course not only us, but the entire Institute, led by Traian Orghidan, Professor Radu Codreanu and many others rushed to help her. Friday, the 18th of January, the scientist Constantin Motaş, dressed up following the ancient way, left the building of our Institute from the Mihail Moxa Street, where he was laid down, following the road without a return to the Bellu Cemetery, the plot of the Romanian Academy – where, subsequently, was buried also his beloved wife, Ştefana, the granddaughter of the painter Octav Băncilă.

MAIN ACHIEVEMENTS OF THE BIOSPELEOLOGICAL COLLECTIVES FROM BUCHAREST AND CLUJ BETWEEN 1956 AND 2005

Half a century passed from 1956, the year when the Institute was reorganized. This is the period when the Romanian Biospeleology had known his second golden period during which many of Racovitza's wishes were realized. It is about the *extensive study* of the terrestrial and aquatic fauna (the biodiversity as it is named today), combined with the *intensive study* (at the level of the population and the biocoenosis) and the beginning of the *experimental study* (the post-embryonic development at some cavernicolous species) in the terrariums of the Subterranean Laboratory of the Speleological Researches from Cloşani.

Let us see what exploratory and laboratory teams formed the 30 biospeleologists from Bucharest and the 5 from Cluj. For the subterranean aquatic fauna, C. Motaş, founder of Phreatobiology, developed a team made up by himself, Francisc Botea and Eugen Şerban. This team collaborated with Dan Dancău, Dan Danielopol and researchers specializing both in terrestrial and aquatic fauna: L. Botoşăneanu, Iosif Căpuşe, Ionel Tabacaru, Alexandrina and Ştefan Negrea. In Cluj, but without making up a team within the subsidiary, Corneliu Pleşa, Mihai Şerban, Dan Coman and Maria Pintea-Alb were working on subterranean aquatic fauna. We also have to remember the small team made up by C. Motaş, Traian Orghidan and Jana Tanasache, since the 40' of the last century for the study of the hidracariens from the interstitial waters, collected from sand and gravel river beaches with the Karaman-Chappuis method – an environment defined in 1955 by Traian

Orghidan as the "*hyporheic biotope*" – a term subsequently accepted and used by the entire world.

The terrestrial subterranean fauna was studied by teams which investigated both the speleic and the edaphic environments from various karstic areas for tens of years. The team made up by Traian Orghidan, Margareta Dumitrescu, Jana Tanasache and Maria Georgescu greatly contributed to the knowledge of the fauna from the karst of Dobrogea, Vârghişului Gorges and Hunedoara. The team of Vasile Decu and Anca Decu-Burghele, often joined by Ionel Tabacaru, Dan Dancău and Dan Danielopol – the latter studying the aquatic fauna from caves and wells- favoured the karst from the Southern Carpathians between Olt and the Timiş-Cerna Corridor with some extensions toward the East and the West. The team of Dan Dancău, Eugen Şerban and Ştefania Avram investigated tens of caves from the upper basin of Cerna River for years. The team of Lazăr Botoşăneanu and Alexandrina and Ştefan Negrea studied hundreds of caves, the soil and it's annex fauna from the Banat Mountains, Cerna Valley and Poiana Ruscă. A great help to them was the "Exploratorii" Speleologic Club from Reşiţa led by Günther Karban and Mihail Ţiglă between 1961 and 1985, and from 1990 by Bogdan Bădescu. Between 1980 and 1984, Ştefan and Alexandrina Negrea, together with the amateur biospeleologists Günther Karban and Radu Bala from CSER, studied tens of unexplored caves from the basins of Caraş and Bârzava. After 2000, the researches were extended to the Superficial Mesovoid Substratum (MSS) by Eugen Nițu and my disciple in Chilopoda, Victoria Ilie-Boitan. It seems the Banat Mountains, although being the best investigated in Romania from a biospeleological point of view, still attract the young biospeleologists appointed in 2005. Thus, Anca Dragu already started the intensive investigation of the bat colonies from these Mountains and Victoria Ilie continues her study of the MSS.

Worth noting is that after 1990 there were no permanent teams working in well delimited karstic areas. The number of biospeleologists post-Racovitza decreased by many *deaths* (Constantin Motaş, Traian Orghidan, Margareta Dumitrescu, Jana Tanasache, Francisc Botea before 1990 and Dan Dancău, Iosif Căpuşe, E. Şerban, Ana Hollinger after 1990), by *retirements* (Ştefania Avram, Maria Georgescu, Alexandrina Negrea, Mioara Baltac) or by going abroad (Lazăr Botoşăneanu, Anca Burghele, Dan Danielopol, Ilinca Juvara-Balş). As there was no employment of young biologists for the vacant posts, the number of biospeleologists diminished, from over 30 in the years 1963-1980 to only 10 in 2003 when I took over the Department of Biospeleology and Karst Edaphobiology. Among the former biospeleologists there were only five (Ionel Tabacaru, Vasile Decu, Magdalena Gruia, Vasilica Iavorschi and myself) and five more appointed after 1990 (Eugen Nițu, Andrei Giurginca, Victoria Ilie, Augustin Nae and Ionuț Popa). On the 1st of July 2005, the last senior researchers I, from the golden period of the post-Racovitza Biospeleology left the institute in retirement: Şt. Negrea,

I. Tabacaru, V. Decu and Magdalena Gruia. In their place were appointed, a senior researcher III (Alexandra Hillebrand) and three research assistants: Anca Dragu, Rodica Plăiaşu and Raluca Băncilă.

In Cluj, the low number of biospeleologists rarely allowed the study with permanent teams. In the last 50 years, Valeriu Puşcariu from Bucharest, together with Iosif Viehmann and Theodor Russu formed a team to study the caves from Caraşului Gorges – but they investigated the endokarstic phenomena and not the cavernicolous fauna. The Glacier from Scărişoara was a priority for seasonal team investigations, a fact allowing to Gheoghe Racovitza to make an ample ecological study on the population of the bathysciin coleopter *Pholeuon proserpinae.* Complex team studies were also made on other important caves from the Apuseni Mountains and the Tăuşoare Cave from Rodnei Mountains. Unlike Bucharest, the number of biospeleologists did not decrease but grew due to Gheorghe Racoviţa and Oana Moldovan, after her Ph.D. in France. Among the young biospeleologists who specialized in France, Austria and Holland, we have to mention Sanda Iepure, Daniela Borda and Traian Brad.

The biospeleogists from Bucharest and Cluj were grouped in this way: those from Bucharest made up the "Section of Biospeleology", at present named the "Department of Biospeleogy and Karst Edaphobiology", successively led by Margareta Dumitrescu (1956 – 1985), Vasile Decu (1990–2002), Ştefan Negrea (2003–2005) and from the 1st of July 2005, by Eugen Nitzu. The biospeleologists from Cluj, along with the geographers and geologists were included in a "Subsidiary", successively led by Dan Coman, Gh. Racoviţa, Emil Silvestru, Oana Moldovan and, at present, Bogdan Onac (among them, Silvestru and Onac are not biologists).

In the following, I enumerate, thematically grouped, the main achievements of the biospeleologists from Bucharest and Cluj in the period 1956–2005, without enlarging too much the bibliography with all the works; for this see D. DANCĂU & ŞT. NEGREA (1989), V. DECU and GH. RACOVITZA (1994), ŞT. NEGREA (1999), ŞT. NEGREA & V. BOITAN (2001), ŞT. NEGREA *et al.* (2004).

1. Studies concerning the biodiversity in the subterranean environments: the consistent monograph based on original data "Cercetări asupra biologiei izvoarelor şi apelor freatice din partea centrală a Câmpiei Române" (C. MOTAŞ, L. BOTOŞĂNEANU, ŞT. NEGREA, 1962); monographs of the caves Fundata, Gura Dobrogei and Limanu (M. DUMITRESCU and T. ORGHIDAN, 1958, 1965) and those from the Vârghişului Gorges (idem); the monograph of the cave from Vadu Crişului (I. VIEHMANN, C. PLEŞA and T. RUSU, 1964); the series of papers concerning the caves from the upper basin of Cerna (S. AVRAM, D. DANCĂU, and E. ŞERBAN, 1964–1968); the ample book "Recherches sur les grottes du Banat et d'Oltenie" (L. BOTOŞĂNEANU, A. NEGREA, ŞT. NEGREA, A. DECU, V. DECU and M. BLEAHU, 1967) – published in Paris and regarded by the foreign reviewers as a

model of regional speleogical monograph; the complex atlas "Porțile de Fier", at which all biospeleologists had collaborated (the Romanian and English editions, 1972); the volume "Speleologia" in the monograph series "Porțile de Fier" (editors T. ORGHIDAN and ŞT. NEGREA, 1979), distinguished with the Romanian Academy Prize; the book "Peşteri din România", a richly illustrated synthesis (M. BLEAHU, V. DECU, ŞT. NEGREA, C. PLEŞA, I. POVARĂ and I. VIEHMANN, 1976); "Stygofauna mundi" – 740 pages volume (edited by L. BOTOŞĂNEANU, 1986) in which over 60 authors, among them Dan Danielopol, present in detail the fauna of the subterranean waters; the book "Biodiversitatea în mediile subterane din România" (authors: ŞT. NEGREA, A. NEGREA and A. ARDELEAN, 2004) includes both the terrestrial and the aquatic fauna; "Monografia carstului din Munții Pădurea Craiului" (editors: GH. RACOVIȚĂ, O. MOLDOVAN and B. ONAC, 2002); the chapter "Biodiversity in terrestrial habitats" in "Encyclopaedia of Caves and Karst Science" (editor J. GUNN, 2003); "Faunistic List of Romania – terrestrial and freshwater species" (editors: O. MOLDOVAN, M. CÂMPEAN, D. BORDA, S. IEPURE and V. ILIE, under press in 2007), containing all the species from the terrestrial and aquatic subterranean environments.

2. Ecological studies: the discovery and defining of new environments: the hyporheic biotope, accepted by the majority of the specialists (T. ORGHIDAN, 1955, 1959) and the higropetric and lithoclasic biotopes (T. ORGHIDAN, M. DUMITRESCU and M. GEORGESCU, 1964, 1969); the defining of Freatobiology as a new branch of Limnology (C. MOTAŞ, 1958, 1962, 1963); the description of new blind species of dendrocelids from the karstic springs of Banat Mountains with considerations on the subterranean aquatic fauna (R. and D. CODREANU, 1967); the periodicity of reproduction at cavernicolous animals (C. PLEŞA, 1967); the papers about the interstitial fauna of the Crişul Repede basin (F. BOTEA and C. PLEŞA, 1968) and about the aqueducts stygofauna (C. PLEŞA, 1981); the synthesis concerning the fauna of the subterranean waters from Banat Mountains (L. BOTOŞĂNEANU, 1871); the study of the guano biocoenosis from 7 caves from Oltenia and Danube Gorges (A. and V. DECU, 1964) and from 78 caves from Banat Mountains (A. and ŞT. NEGREA, 1971); the paper "Some considerations on the bat guano-synusia" (V. DECU, 1986); the parietal biocoenosis of some caves from Oltenia (C. MOTAŞ, V. DECU and A. BURGHELE, 1967); the study of the parietal biocoenosis of 115 caves from Banat Mountains (ŞT. NEGREA and A. NEGREA, 1968 and 1972); the study of the floor biocoenosis from 118 caves from Banat Mountains (ŞT. NEGREA and A. NEGREA, 1977) – the first regional monograph of this kind in the world with an original classification of the caves and the definition of the main characteristics of the terrestrial cavernicolous biocoenosis from the caves of the temperate zones of Terra; the monograph of the Peştera lui Adam (peştera = cave) from Băile Herculane – a unique cave with a thermophile biocoenosis in a temperate climate

(V. DECU, A. NEGREA and ŞT. NEGREA, 1974); a new topoclimatic classification of the caves used in the study of the cavernicolous biocoenosis (GH. RACOVIȚĂ, 1975); the ample study on the cavernicolous populations of coleopters from the Apuseni Mountains (GH. RACOVIȚĂ, 1980); the first papers about a the fauna of the superficial mesovoid environment from Romania (C. JUBERTHIE *et al*., 1981, GH. RACOVITZA and M. ŞERBAN, 1982); the book "Initiation à la biologie et l'écologie souterraines" with my original data, as a complimentary to the treaty of Biospeleogy of A. Vandel (R. GINET and V. DECU, 1977); the volume "Groundwater Ecology" (editors J. GIBERT, D. DANIELOPOL and J. STANFORD, 1994) contains also the Romanian contributions to the study of the subterranean waters; the book "Coleopterele din peşteri" by OANA MOLDOVAN (2002) a welcome synthesis; the studies on the adaptive modifications of the sensorial apparatus at the soil and subterranean Carabidae carried out by E. NITZU (1996); in the book "Groundwater Ecology" edited by C. GRIEBER *et al.* (2001), three authors from Cluj – O. MOLDOVAN, S. IEPURE and A. FEKETE wrote the chapter "Recent ecological research on groundwater in Transylvania"; the book "Chiropterele – relații cu omul şi mediul înconjurător" (authors: DANIELA and CRISTIN BORDA, 2005).

3. Biogeographic studies: the paper "Observații zoogeografice asupra faunei cavernicole din Oltenia şi Banat" (D. DANCĂU and I. TABACARU, 1964) – which emphasizes for the first time the importance of the Timiş-Cerna Corridor as a paleobiogeographic barrier; the remarkable paper concerning the origin and repartition of the European cavernicolous diplopods (I. TABACARU, 1970); the original synthesis "Aperçu zoogéographique sur la faune cavernicole terrestre de Roumanie" – the first parting of Romania into biospeleogical provinces and zones based on all troglobitic bio-indicator species with an emphasis on the paleobiogeographic barriers (V. DECU and ŞT. NEGREA, 1969); the book "Formes primitives vivantes", published in Paris by CL. DELAMARE-DEBOUTEVILLE and L. BOTOŞĂNEANU (1970), NIȚU, E. (2001): "Edaphic and subterranean Coleoptera from the Dobrogean karstic areas. A zoogeographic approach".

4. Biospeleological expeditions with published results: the international speleological expedition from 1983 in Bulgaria (L. BOTOŞĂNEANU, V. DECU and T. RUSU, 1964); the first great biospeleogical expedition (4 months) in the Cuban archipelago (and also the first expedition abroad organized by Romanian naturalists) made by L. BOTOŞĂNEANU, V. DECU, ŞT. NEGREA and GH. RACOVIȚĂ (1969), followed by a second one of four months, made by T. ORGHIDAN, L. BOTOŞĂNEANU, D. COMAN, V. DECU and ŞT. NEGREA (1973); the papers of the Romanian and foreign specialist based on the materials from the two expeditions were published by the Romanian Academy Publishing House under the title "Résultats des expeditions biospeleologiques cubano-roumaines à Cuba", the real

editors of the four volumes being L. BOTOŞĂNEANU, V. DECU and ŞT. NEGREA (1973, 1977, 1981 and 1983); in 1980, Şt. Negrea published the diary of the expeditions to Cuba under the title "Expediţionari români la tropice" after he had published in 1979 a volume of travel memories entitled "Prin peşterile lumii"; in 1987 was published the volume "Fauna hipogea y hemiedafica de Venezuela y de otros paises de America del Sur", partly elaborated with the material brought by the expedition of T. Orghidan and V. Decu in Venezuela (1983); in May-June 1990, there was the expedition organized by Şt. Negrea in Israel to collect material from the caves and the soil (participants: Şt. and Alexandrina Negrea, V. Decu and I. Căpuşe), the results were published by the Romanian Academy Publishing House (d.t.p. editor E. NITZU, 1995); in 1987, C. Lascu and S. Şerban published, at the Romanian Academy Publishing House, a book about the underwater caves and their exploration, a chapter of the book being dedicated to the biospeleogical discoveries; in 1995, V. Decu, together with E. Nitzu, V. Iavorschi and V. Gheorghiu made a second expedition in Israel, the results being published in only a few papers in the Travaux de l'Institut de Spéleologie "Emile Racovitza".

5. Other works: the album "Peşteri din România" by M. ŞERBAN, I. VIEHMANN and D. COMAN (1961); the first map of the karstic regions of Romania made by T. ORGHIDAN *et al.* (1965); the paper "Bibliographia Biospeleogica Romanica (1937 – 1963)" by V. DECU and ŞT. NEGREA (1965) as continuation of the well-known catalog of B. Wolf but only for our country; the volume "Emil Racoviţă: Opere alese" (edited by C. MOTAŞ, 1964); the massive volumes dedicated to the centenary of Racovitza's birth and the semi-centenary of the "Emile Racovitza" Institute of Speleology (both published by the Romanian Academy Publishing House, edited by T. ORGHIDAN, 1970 and 1973); the volume "Peşteri din România" – the first Romanian tourist's guide of this kind (coordinator: ŞT. NEGREA, authors: T. ORGHIDAN, ŞT. NEGREA, GH. RACOVŢĂ, C. LASCU, 1984); in 1985, Pleşa published a "small glossary of Stygobiology"; in 1989 was published the first volume from the series "Miscellanea Speleogica Romanica" (chief editor I. CĂPUŞE, secretary editor ŞT. NEGREA), this volume contains, among others, the paper "Chronologie du developpment des recherches biospéologiques" signed by D. DANCĂU and ŞT. NEGREA; the book, mostly with original data, "Chiropterele din România" by V. DECU, D. MURARIU and V. GHEORGHIU (2004); the great "Encyclopaedia Biospeleogica" in three volumes and 2294 richly illustrated pages (editors: CHRISTIAN JUBERTHIE and VASILE DECU, 1994, 1998 and 2001) with chapters written by researchers from the "Emile Racovitza" Institute of Speleology: V. DECU, L. BOTOŞĂNEANU, ŞTEFAN NEGREA, DAN DANIELOPOL, MARIA GEORGESCU and GH. RACOVITZA; the chapter "Beetles" by OANA MOLDOVAN in "Encyclopaedia of Caves" (D. CULVER & W.B. WHITE editors, 2004).

FINAL REMARKS

The Biospeleology – this biological science founded by the young Romanian scientist Emile Racovitza in 1907 while he was working at the Arago Laboratory from Banyuls-sur-Mer from France – had known in Romania, after his death (1947), a second period of great development lasting, in my opinion, for half a century. It started in 1956 with the reorganization of the Institute of Speleology – named in 1957 after its founder – and ended in 2005 with the retirement of the last biospeleogists of this period, all of them more or less renowned, and recognized as such abroad.

As an eyewitness of the events of the entire post-Racovitza period and based on documents, partially reproduced here as facsimiles, I try to explain in this paper how nine years after the death of the founder, the Institute of Speleology – the first one in the world, founded by Racovitza in 1920 within the framework of the Science Faculty of the Cluj University – was reorganized as an Institute of Speleology at a national level with two head-quarters: a "Central" in Bucharest and a "Subsidiary" in Cluj – both led by a single director.

Taking into account the historical conjecture from Romania in the "fifties" of the last century, I reached the conclusion that the starting factor was the "migration" of two disciples and collaborators of Emile Racovitza – Radu Codreanu and Val. Puşcariu – from the Science Faculty from Cluj to the Faculty of Biology from Bucharest.

Working as an assistant of the Professor Radu Codreanu, Valeriu Puşcariu – an untiring explorer of the caves and protector of nature – associated the young lecturer in Hydrobiology, Traian Orghidan, to the speleological campaigns organized by him in the country. At his turn, T. Orghidan associated himself with the Professor of Vertebrate Zoology Margareta Dumitrescu, a specialist in bats. Also Val. Puşcariu was the one who, in order to obtain funds, made the Romanian Geological Committee to create two collectives of biologists for the study of the guano caves from our country. The first collective, formed in 1951 in Bucharest, was made up by Val. Puşcariu, Traian Orghidan, Margareta Dumitrescu and Jana Tanasache. The second one, formed in 1952 in Cluj, contained Mihai Şerban, Dan Coman, Iosif Viehmann, Petru Bănărescu and Corneliu Pleşa (the last two only temporarily). Beginning from 1954, Val. Puşcariu was officially appointed the responsible for both collectives – thus uniting under the authority of the Geological Committee the most active biospeleologists of the time. Therefore, Val. Puşcariu is the main author who brought and ignited the sacred fire of the Biospeleology in Bucharest.

The contract with the Geological Committee was on a determined period, linked to the results, respectively on the finding and exploitation of the chiropterite as a fertilizer. Thus, in order to avoid the extinction of the flame of the Biospeleology with the disbandment of the two collectives, T. Orghidan and

M. Dumitrescu, sustained by Val. Puşcariu, who was an employee of the Geological Committee, by R. Codreanu and others from the Faculty of Biology, thought to organize an "Institute of Speleology of the Popular Republic of Romania" which would include the one founded by Emile Racovitza (then in trouble), under the authority of the Academy of the Popular Republic of Romania or the Education Minister. In other words, he had, on the one side, to reorganize the Institute founded by Racovitza at a republican level, based on the "seniors" (the biospeleologists from the two collectives of the Geological Committee) and, on the other side, to form new biospeleogists among the students of the first "scientific debating societies" founded in 1952, respectively the Debating Society of Hydrobiology (president Ştefan Negrea and under the scientific guidance of T. Orghidan) and the Debating Society of Vertebrates and Paleontology under the scientific guidance of M. Dumitrescu.

In the following, based on documents and my personal notes from that time, I show in my paper how T. Orghidan and M. Dumitrescu struggled to reach their goal, namely to unite the biospeleologists from Bucharest (more and more numerous due to the specialization of the "juniors" educated by them) with the biospeleologists from Cluj (strongly diminished numerically after the death of Racovitza). With the release of the scientist Constantin Motaş from the communist prisons, after seven years of political detention, and his acceptance to be the director of the reorganized Institute of Speleology, the Council of Ministers of the Popular Republic of Romania published the "*Decision no. 1189 from the 21st of June 1956 regarding the organization of the Institute of Speleology of the Popular Republic of Romania with the head-quarter in Bucharest*".

The united efforts of the biospeleologists from Bucharest and Cluj, now under the aegis of the "Emile Racovitza" Institute of Speleology, led to remarkable results which are shortly enumerated in the chapter "*Main achievements of the biospeleological collectives from Bucharest and Cluj between 1956 and 2005*". This period of great achievements ended in 2005 with the retirement of the last biospeleologists from this top-generation at the 1st of July 2005: Vasile Decu, Magdalena Gruia, Ştefan Negrea and Ionel Tabacaru in Bucharest and Corneliu Pleşa and Gheorghe Racoviţă in Cluj-Napoca. Although, officially, the biospeleologists from the post-Racovitza generation had retired from the Institute, three of them (V. Decu, Şt. Negrea and I. Tabacaru) in Bucharest and one in Cluj (Gh. Racoviţă) continue to work in their laboratories – due to the goodwill of the present-day director Ioan Povară and Cristian Goran, adjunct director.

At the end, some thoughts regarding the future of the biospeleologists from our Institute in the context of the world-wide development of the Biospeleology. The Subterranean Biology is in full world-wide development but without centers as in the past (France, then Romania then again France plus Romania) – in other words it has a global level. The Romanian biospeleogists will resist with difficulty

to this tendency as their forces are diminished at under ten researchers in Bucharest and just as much in Cluj (let us remember there were, in 1963, 22 in Bucharest and 7 in Cluj). While abroad the emphasize is laid upon the study of the deep terrestrial and aquatic subterranean environments (biodiversity, ecology, zoogeography, experimental studies), the Romanian biospeleologists, numerically diminished, the majority very young, still in training, work mostly on more accessible environments, respectively the edaphicolous and hypogeicolous superficial fauna (MSS). While in Bucharest, the majority of the biospeleologists tends to specialize in the study of the terrestrial biodiversity, in Cluj there is a clear tendency toward the study of the aquatic subterranean organisms.

On the young generation of Romanian biospeleologists, some still under training, will depend if the research of the subterranean and edaphic environments will keep to the tradition of Emile Racovitza, C. Motaş and T. Orghidan or will open new paths that will or will not lead to the third golden period of the Romanian Biospeleology. I hope with all my heart that "*Encyclopaedia Biospeleogica*" and "*Fauna subterană a României*" of the post-Racovitza will not be the "swan song" of the Romanian Subterranean Biology.

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The photographs accompanying the paper come from the author's archive.

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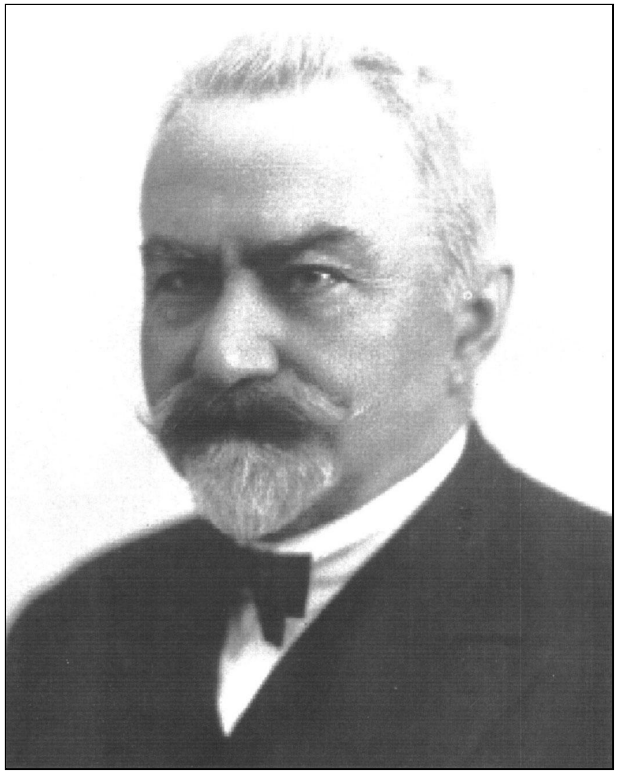

Photo 1. – Emil Racoviţă, founder of Biospeleology and of the first Institute of Speleology in the world.

Photo 2. – René Jeannel and Pierre-Alfred Chappuis, the main collaborators of Emile Racovitza during their activity in Cluj.

Photo 3. – Constantin Motaş, the first director of the Institute of Speleology, reorganized after the death of Emile Racovitza.

Photo 4. – Traian Orghidan, the first of the deputy director of the Institute of Speleology, reorganized after the death of Emile Racovitza.

Photo 5. – Margareta Dumitrescu,the first chief of the Biospeleology Department of the Institute of Speleology, reorganized after the death of Emile Racovitza.

Photo 6. – Emile Racovitza in his laboratory from the Institute of Speleology in Cluj.

Photo 7. – Prof. C. Motaş at the Zoological Station from Agigea between Prof. Radu Codreanu (left) and Valeriu Puşcariu, former assistant of Emile Racovitza (right).

Photo 8. – Prof. Radu Codreanu (in the middle) and Prof. Traian Orghidan

Photo 9. – Members of the second Cuban-Romanian biospeological expedition in Cuba (1973). From left to right: Ştefan Negrea, Lazăr Botoşăneanu, Angel Graña, Vasile Decu, Vicasio Viña Baés, Carlos Fundora Martinez, Dan Coman, Antonio Núnez Jiménez and Traian Orghidan.

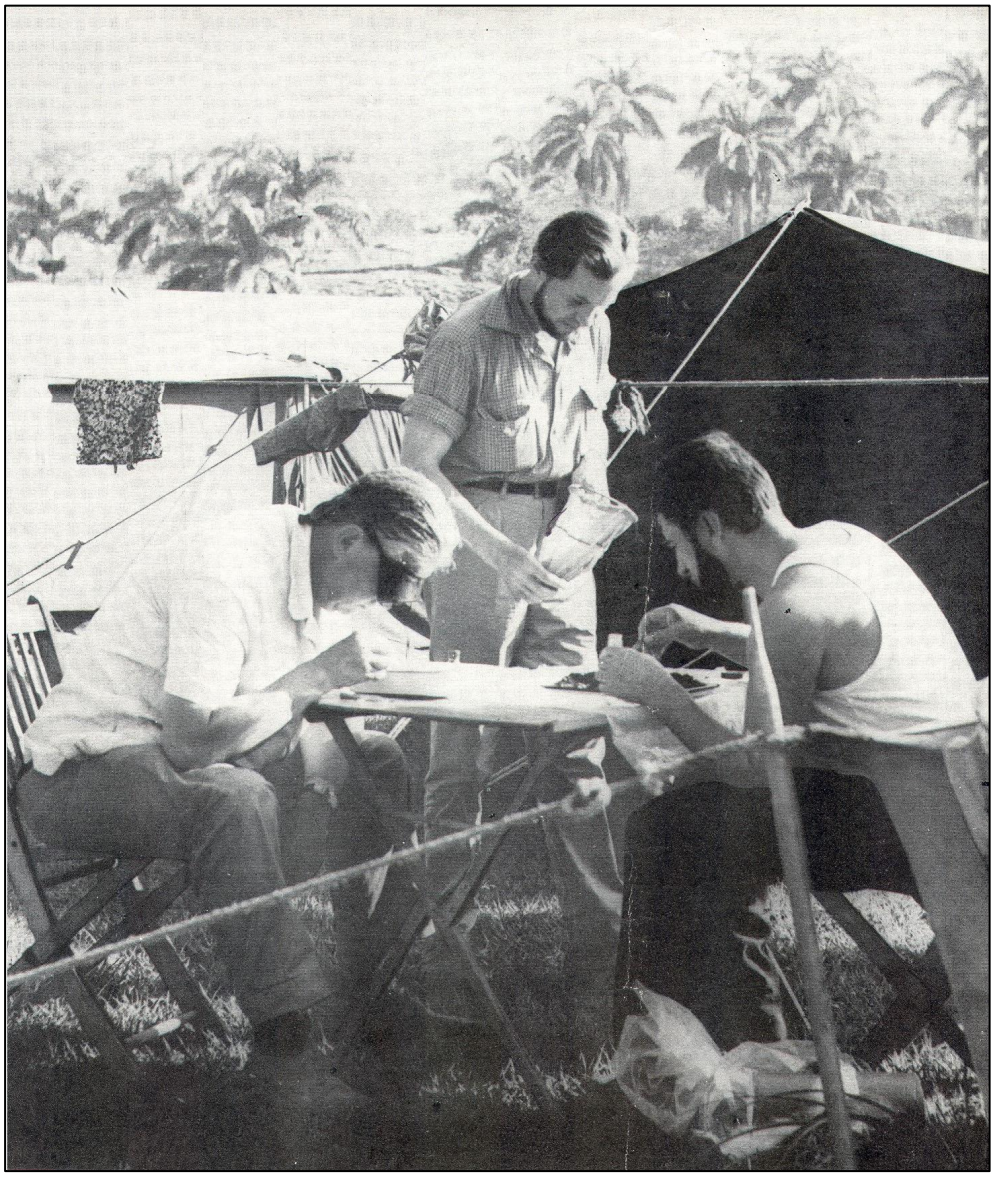

Photo 10. – The biospeleological camp from Rio Mogote Valley (Oriente, Cuba) after a day of exploring some caves. From left to right: Traian Orghidan, Ştefan Negrea and Vasile Decu.