

DR. JOSIP POLJAK THREE ANNIVERSARIES: 1882-1922-1962

SANJA JAPUNDŽIĆ

Croatian Natural History Museum, Demetrova 1, HR-10000 Zagreb, Croatia

Three important anniversaries celebrated in the year 2022 are related to Dr Josip Poljak, the long-term director of the Geological and Palaeontological Museum in Zagreb: the 140th anniversary of his birth, the 60th anniversary of his death and also the important 100th anniversary of the submission of the first speleological dissertation in Croatia, successfully defended by Josip Poljak.

He was born on November 15, 1882 in Orahovica, one of the four children in the family of housewife Adela and municipal registrar Antun. He completed "Volkschule" in Orahovica and Sisak. In Zagreb, he attended the "Realschule", which he completed in 1903 (Fig. 1). After that he served one year in the military in 1904/1905 and went back home to Orahovica. At home, he wrote, he was waiting for any kind of job and decided to enrol in the Philosophical Faculty (Mudroslovni fakultet) at the University in Zagreb.

During his studies, he attended the summer semester of 1907/1908 at the University of Prague, and in 1909 received his diploma. In his "osobnik" (personal file of the employee) it is written that Poljak, still a student, from November 1906 until May 1908, worked in the Archaeological Department of the National Museum ("Narodni muzej") drawing archaeological items. At the end of 1908, he was employed at the Geological -Paleontological Museum, first as a temporary assistant, later as high school teacher (namjesni učitelj srednjih škola, ispitan i srednjoškolski učitelj, pravi srednjoškolski učitelj, profesor srednjih škola) and from 1918 as a curator. By decree of the Autono-



Fig. 1. Josip Poljak while young

mous Banovina of Croatia authorities in 1940 he was appointed to the position of Director of the Geological - Paleontological Museum, where he remained until his retirement in 1959 (Fig. 2).



Fig. 2. Retirement of Josip Poljak (in the middle) in 1959

He died in August 20, 1962 in Zagreb.

Josip Poljak was a man of many interest and successful in many fields. First of all, he was dedicated to his profession – geology. He was engaged in geological research from the very beginning of his work in the Museum, when its director was the famous Croatian geologist and palaeontologist Dragutin Gorjanović-Kramberger. Poljak was above all a field geologist (Fig. 3), as Academician Vanda Kochansky-Devidé wrote in



Fig. 3. Identification document which enabled Poljak to do field work without disturbance (1931)



Fig. 4. Field work, Putišići, April 1953 (Poljak second from the right)

her memory of him: "It can be said that, on the territory of Croatia and former Yugoslavia, there is almost no square kilometre where he did not pass in his long, working life; there wasn't a hill, a well, and almost not even a path, that he didn't know about." (KOCHANSKY-DEVIDÉ, 1963) (Fig. 4). For example, in his report for 1942, Poljak himself carried out field research, all of it just in the second half of the year (he was then 60 years old), writing that his curator trainee Ivan Crnolatac was in military service and, in August and October he got a little help from Donata Devidé, curator trainee at Mineralogical and Petrographic Museum, as follows:

June 20 – July 1: geological mapping and research of the southern slopes of Kalnička gora and the northern part of Bilogora

August 16 – August 31: geological mapping and research in the area from Novi Marof, Koprivnica, Križevci to Zagreb

September 12 – September 16: the Director of the Museum collected fossils in Oligocene layers from the coal mines of Stari and Novi Golubovec

October 16 – October 30: the Director of the Museum continued his work from August 1942 in the area east of Ključ-Oštrica-Presečno route (POLJAK, 1942)

Almost all the field research was carried out for the purpose of the geological mapping of Croatia. Josip Poljak is the author of three sheets of geological maps: Orahovica-Beničanci (1934), Ledenice-Brinje-Oštarije (1935) and a manuscript map, Našice-Kutjevo (1940) (Fig. 5).

In addition to geological mapping, Poljak, in his more than 60 scientific papers/articles/works, discusses other geological and palaeontological topics, such as the glaciation of Mt Velebit, Miocene sea urchin fauna, the geomorphology of Dugi otok island, the Upper Jurassic sediments of Velika Kapela etc., but most of his papers deal with the geology and geomorphology of the karst.

Poljak produced almost 170 expert geological reports, especially after World War II, mostly for economic purposes – the construction of various hydro-electric power



Fig. 5. Manuscript geological map Našice-Kutjevo

plants, for example: Geological expert opinion on the supply of drinking water to the town of Brod; Geological survey of the area of Istarske Toplice spa for the purpose of spa renovation; Geological survey of the Čurilovac area for the purpose of building a steam turbine factory. One of the more interesting titles is: Geological research of the Zagreb terrace and the geological profile through the terrace for the purpose of building an underground railway, from 1948.

In 1918, when Josip Poljak became a curator of geological and paleontological collections, he spent two weeks in museums in Vienna, Budapest, Linz and Graz in order, as he wrote himself, to study the organization of museums and museum collections. Apparently, after that he devoted himself fully to museum work, as he himself wrote: *I was involved in putting in order the museum collection and organising palaeontological material (identifying the huge amount of undetermined specimens), I created the files for the museum, for the library, as well for the entire furnishing, instruments and the equipment of the museum.* And indeed, his handwriting is visible in all the inventory books, on labels in the collections (Fig. 6), on library cards (at that time the Museum kept more than 25000 specimens in the collections and more than 2000 volumes of magazines and books in the library).

Poljak also finalized the permanent exhibition of the museum collection, which was however changed and refreshed after his retirement, in 1960. Some parts of the collections "Fauna of Jurassic deposits of Velebit, Lička, Velika and Mala Kapela, Pleševica and Vinica near Duga Risa", "Tithonian" fauna of Velika Kapela, "Miocene urchins of Croatia and Slavonia" and the "Stratigraphic collection" were gathered and determined



Fig. 6. Poljak's handwriting on a label in the geological-paleontological collection

by Josip Poljak himself and published in his scientific papers. He also photographed almost all of the fossils from the collection on glass plates which, today, are stored in the Museum (Fig. 7).

Poljak was an active participant, as a special officer, in the Commission for nature protection and preservation of natural monuments at the Royal Ban Administration of Sava Banovina. As early as then, he recognized the importance of preserving important natural objects. In the Gazette/Herald of the Commission for nature protection and the



Fig. 7. Glass plates with fossils from the collections

preservation of natural monuments in 1938 he wrote about significance of geological and paleontological sites: *If it is therefore necessary to protect the plants and animals, which constantly multipli, renew and spread, the need to protect these objects, which nature took millennia to create is indeed important. These are the objects that are not created overnight, objects that, if we destroy them today, neither we nor our descendant will ever have again. These are geological and palaeontological objects, some of which are important for human survival and others for science and its achievements.* (POLJAK, 1938). He points out the importance of the protection all kinds of forms in Croatian karst areas, especially springs, wells, caves and other underground objects. He recognized the importance, but also the fragility of tufa (sedra), without which the Plitvice Lakes would not be what they are (Fig. 8), stood up for the protection of the Krapina Neanderthal site at Hušnjakovo. Poljak also emphasized how important it is to pay attention to fossil remains that are found during mining or building activities: *As an example, I mention that one company has been working near Zagreb for more than two decades and during that time they exploited big areas of Zagrebačka gora. It is impossible than no faunal or floristic material was found in this large excavation, because this area is well known for fossil remains. The museum has not received a single piece of fossil material during all that time, and was not even invited to possibly explore excavated sites.* (POLJAK, 1938).

The third important anniversary in this year is related to the speleological work of Josip Poljak. On April 1, 1922, Poljak defended his doctoral dissertation entitled "Caves of the Croatian karst", under the mentorship of Professor Milan Šenoa, who was at that time Head of the Geographic Department at the Philosophical Faculty of Zagreb University (Milan Šenoa was a son of famous Croatian writer August Šenoa, and he himself wrote novels, essays, plays and biographies).



Fig. 8. East part of the Sastavci waterfalls, Plitvice Lakes, 1939

Investigating mostly the Croatian karst, Josip Poljak was one of the first who went underground, joining the Cave Research Committee (Odbor za istraživanje špilja) at the very beginning, in 1910 (Figs. 9, 10). As early as 1912, he published his first speleological paper named: "New cave in Gorski Kotar" about the Lipa cave near Lokve (today known as Lokvarka cave). The article contained a cave profile as well as the photograph *Chapel in the Lipa cave*, taken deep inside the cave' it is considered to be the oldest speleological photograph in Croatia. A year later, the first part of the trilogy *Caves of Croatian karst (Caves of Lokve and Karlovac surroundings)* was published (Fig. 11). The second part, *Caves of Plitvice Lakes, Drežnik and Rakovica surroundings* was published in 1914, and the third one, *Caves of the Croatian coast from Rijeka to Senj*, in 1924.

In his speleological papers, Poljak describes in detail the underground features he explored – the geological structure, orientation and measurements of corridors, hall, passages, cave decorations, accompanied by profiles, with drawings and photographs he made himself. He focused on the geological structure and hydrography of underground structures. In determining the stratigraphic sequences of the deposits, their petrographic composition and type of tectonic movement, he interpreted the origin of caves and pits throughout Croatia.

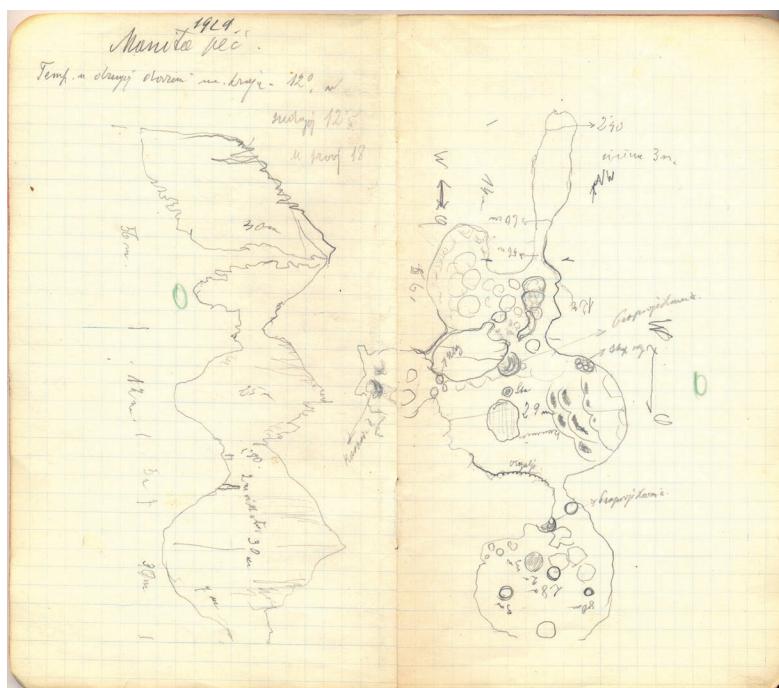
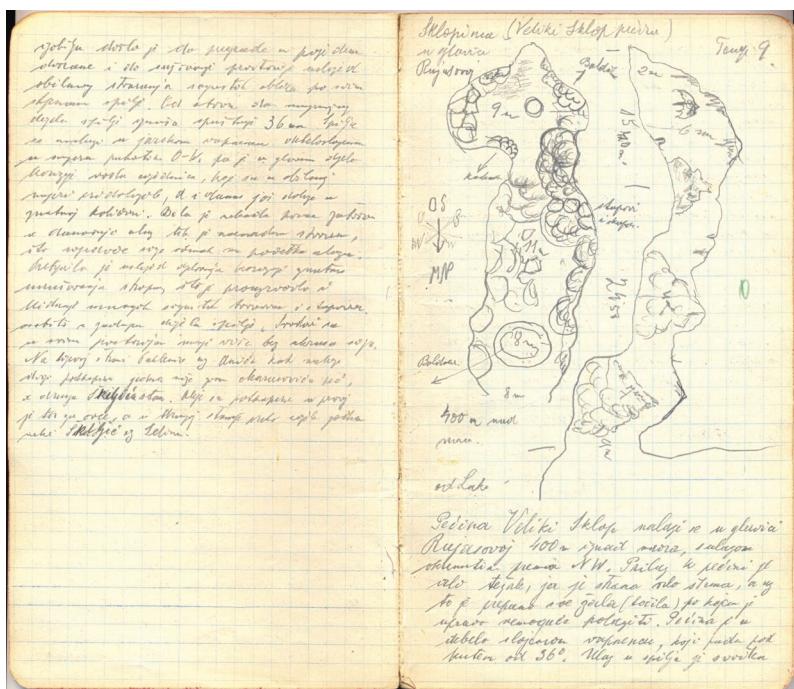
The research underground, as he said, is extremely difficult and demanding: *because it requires great financial and physical sacrifice; that's why such research is progressing quite slowly.....Since these are the first practical data of our activities in the field of speleology, it is quite clear that we have to fight against various problems, which otherwise a skilled speleologist does not have to cope with* (POLJAK, 1914).

Poljak entered numerous caves and underground spaces, the first trained researcher to do so, and he also named some of them. Investigating Jama Vodarica on Mt. Velebit (Fig. 12), he wrote in his field diary in 1929: *Speleothems as well as travertine are coated with a black crust, probably manganese, between dolomite layers, so the whole hall produces an especially mystical appearance when lit. That is why I name it the Black Hall.*

His outstanding work in the scientific research of the underground were recognized as an exceptional contribution to speleology, so the Speleological Society of Croatia elected him its first president in 1954. Due to his work obligations and also in view of his age he could not perform this duty long and was elected president for life. The same society, in memory of Josip Poljak established, in 1984, the Dr Josip Poljak Diploma and Plaque, the highest speleological award in Croatia.

Josip Poljak made a great contribution to Croatian mountaineering activity, acting as a vice-president of the Croatian Mountaineering Association for many years, and as editor-in-chief of the magazine Croatian Mountaineer on two occasions, in 1914 and 1922-1929. (It is interesting to mention that the first assembly of Croatian Mountaineering Association was held on April 29, 1875, in today's building of the Croatian Natural History Museum, at the initiative of another famous geologist, Gjuro Pilar, also a Slavonian. That Slavonians made great contributions to the activity of hiking in Croatia is evidenced by another fact – the well known Premužić trail on Velebit Mountain was built by Ante Premužić, born in Slavonski Kobaš.)

Poljak established the Photographic Section within the association, which published the magazine Fotografski vjesnik, of which Poljak was the editor. As a very active member he exhibited his photographs at numerous exhibitions and regularly gave lectures on popular topics related to the mountains: *"As the first lecturer Dr Josip Poljak*



Figs. 9. & 10. Pages from Poljak's speleological diary (1929)

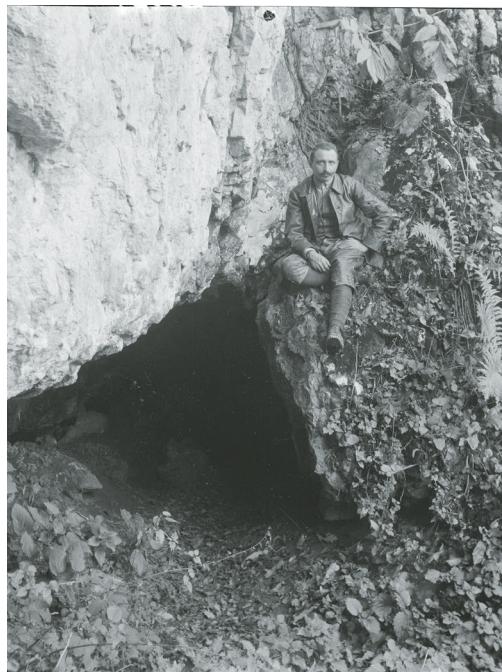


Fig. 11. Entrance to Ozaljska cave

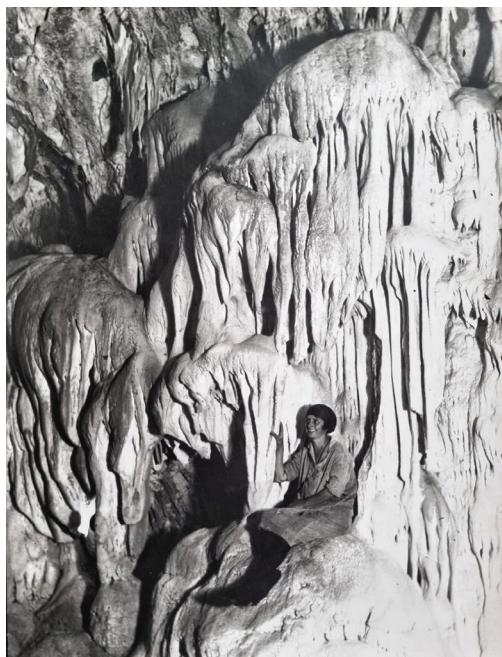


Fig. 12. Veli Sklop cave (V. Paklenica): A group of speleothems shaped as a large helmet (1929)

explained the characteristic phenomena and most significant forms of the Croatian karst, in a popular-science way using the numerous great photographs, which the lecturer himself took on his scientific and hiking trips to Velebit, Senjsko bilo... Before the eyes of the young who filled up the spacious gymnasium (about 700 in number!) came pictures, one after another, each one more beautiful, splendid and more interesting than the other" (Lecture in Bjelovar in 1925, ANON., 1925).

At the initiative of Ivan Krajač, then Minister of Trade and Industry and a honorary member of Croatian Mountaineering Association, 25000 forints were ensured for publishing a Mountain-guide of Mt. Velebit. It was Poljak, as an excellent connoisseur of this mountain, who was given a task of producing that guide, which was published in 1929 (Fig. 13). This comprehensive and, for that time, richly illustrated manual, is full of detailed information about the origins of Mt. Velebit, its fauna, flora, climate, water sources, history, as well as the life of the people in this area of dramatic topography. On nearly 300 pages North, Central and South Velebit are presented in detail – with all the hiking trails, mountain shelters and lodges and springs. The glossary of less-known words, the detailed bibliography, a list of illustrations, an alphabetical list of localities and four schematic maps (Map of North and Central Velebit, Map of South Velebit, Draft of way of marking of hiking trails of northern and central Velebit and Auto-map of south western Croatia) are included. Dr Poljak's numerous photographs enriched this Guide presenting the most beautiful landscapes of Velebit.

In the part entitled „Hiking equipment“ he gave some interesting practical advice: *As for the supply, it depends on the stomach and wallet of each individual, as well as on their physical strength, how much and what kind of food they will take. Carry only as much alcohol as is needed for medicine: some cognac, a little wine so you freshen up water in a case of need...*

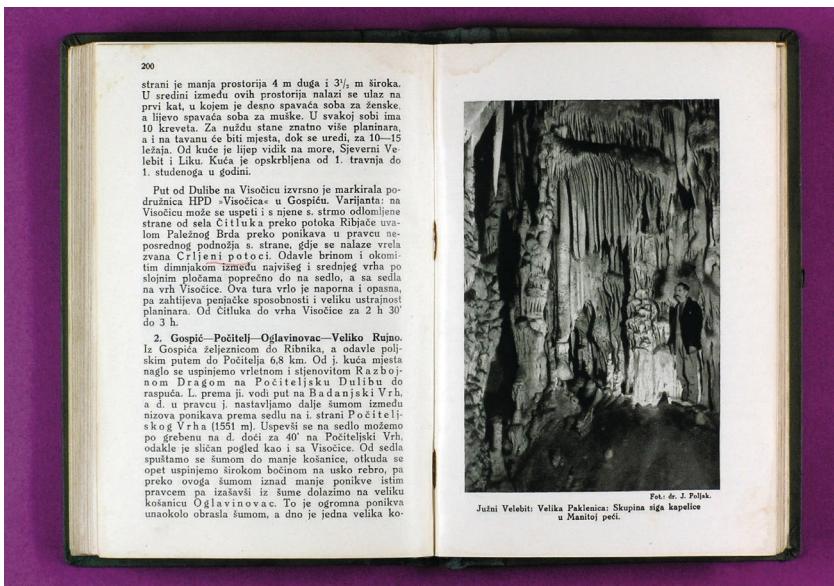


Fig. 13. Pages from "Mountain-guide of Velebit"

Many will ask: do I need a weapon? I would say not, because the highlanders are calm and obliging/attentive. (POLJAK, 1929).

According to the writings of other mountaineers, Poljak was very patient and adaptable on the mountain.: *He was always natural and willing to give an explanation from his professional knowledge, to explain us from which period which some rock originates, what is it composed of, and to explain us the origin of the layers that we were looking at...Professor Poljak was a real artist in choosing a place to stay and pitch a tent. In addition he was unusually skilled at cooking.*

Poljak's photographs depicting mountain places most often adorned the magazine Croatian Mountaineer, where they illustrated the text of Poljak or his travel companion, Miroslav Hirtz (Figs 14, 15), also a hiker and travel writer, a zoologist by profession. In his article "Through Velika Kapela and Velebit to the Sea" vividly express how alive Poljak's photographs were: *At this point in my story, I would like to put down my pen and put in front of you a series of photographs taken by Dr Poljak along the way, a series of pictures, the pictures that no one has taken before him, which, with respect to their taste, are unique photographic landscapes in our hiking literature*". (HIRTZ, 1923).

Poljak's love of and dedication to photography can still be felt and seen today in almost 4000 negatives, glass plates, slides, positives and photo albums kept in the Croatian Natural History Museum. More than a half of this collection consists of negatives, taken in the period from 1912 to 1957. The motifs on his photographs primarily represent the geology and geomorphology of all parts of Croatia, as well as other areas of the former state and mostly can be reduced to one common denominator – the



Fig. 14. Excursion of Swiss professors and industrialists to Sljeme in 1925 under the guidance of Josip Poljak (first from left, bottom row) and Miroslav Hirtz (middle, second row). The consul of Switzerland, Julius Schmidlin sits in the middle, bottom row. (Photo from the collection of Samobor Museum)



Fig. 15. Famous “Velebitians” in Divoselo, 1925, during the trip in South Velebit. From left to right: Josip Poljak, Ilija Šarinić (teacher from Švica), Miroslav Hirtz (zoologist), Radivoj Simonović (doctor from Sombor), Ivan Gojtan (sitting, writer from Gospic)

Dinaric karst (Figs 16, 17, 18). Slightly less than 200 negatives were taken in the time of World War I. Josip Poljak was mobilized in mid-1914 as a member of the 16th Infantry Regiment, and demobilized at the end of 1918. All that time he spent on battlefields of Serbia, Galicia and Italy, first as a sergeant and captain and later as a military supply officer. These photographs show the soldiers during their work and rest, the domiciliary population as well as the landscapes of the places they stayed or passed through (Figs. 19, 20). Some of the glass plates are specimens from the collections of the Geological-Palaeontological Museum, which were probably taken at the time when Poljak was engaged in organizing and inventorying the museum material.

In addition to photo material, about twenty of Poljak's field diaries are also stored in the Museum. These handwritten diaries, dating from 1913 to 1954 are full of detailed information on the geology of the regions he explored, and rich in drawings of caves and geological profiles. Inside, we can find notes on travel expenses, costs of meals and drinks, a list of clothes prepared for the trip. An important part of the diaries is the index of all photographs, which was very useful and greatly facilitated the identification on negatives and glass plates.

Poljak also left behind numerous handwritten or typewritten manuscripts of articles, geological opinions on different matters and some official and private correspondence.

After his death, the Geological-Palaeontological Museum organized the *Exhibition about the life and work of the prominent geologist Dr Josip Poljak*, which was on display in Zagreb, Orahovica, Rijeka and Senj in the period from 1963 to 1965. On his birthday,

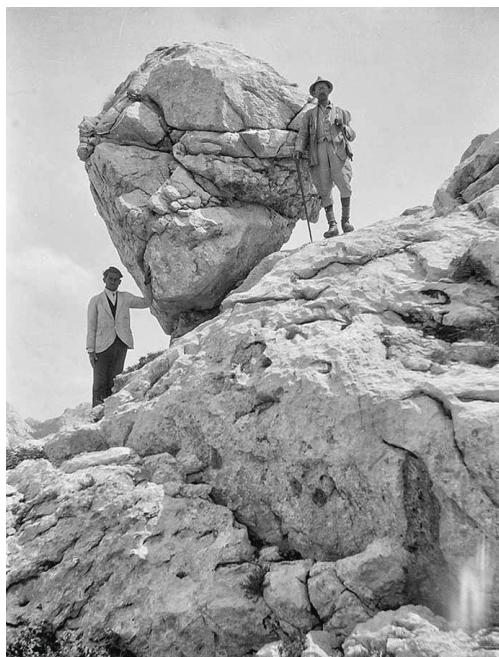


Fig. 16. Čučavac on Splovina above Stap, Velebit, 1925

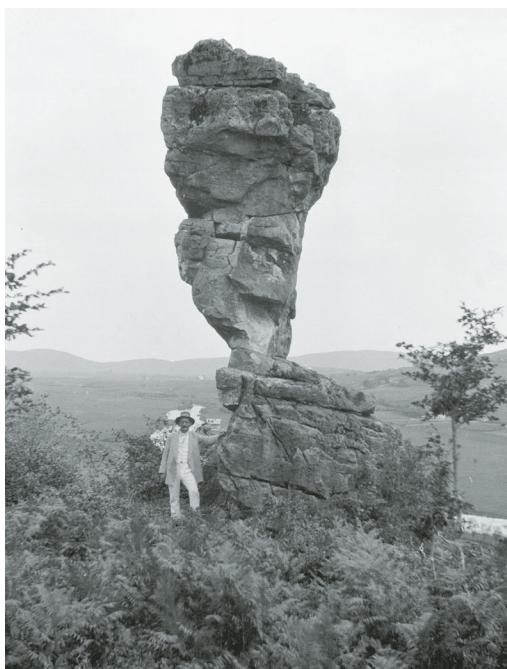


Fig. 17. Dolomite pillar at Desmerice village (Ogulin), 1930

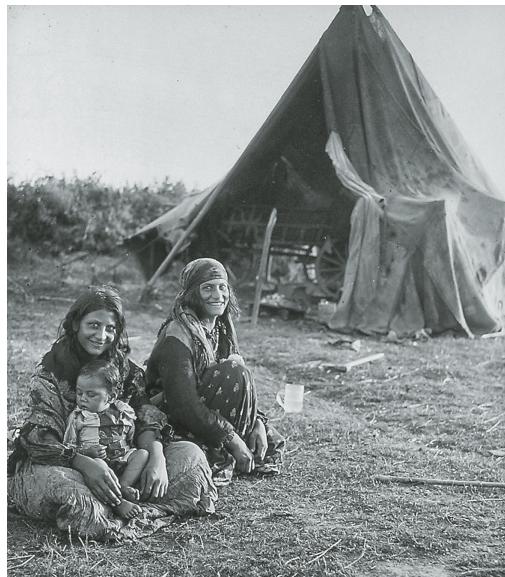


Fig. 18. Gypsies at Gračani, 1912

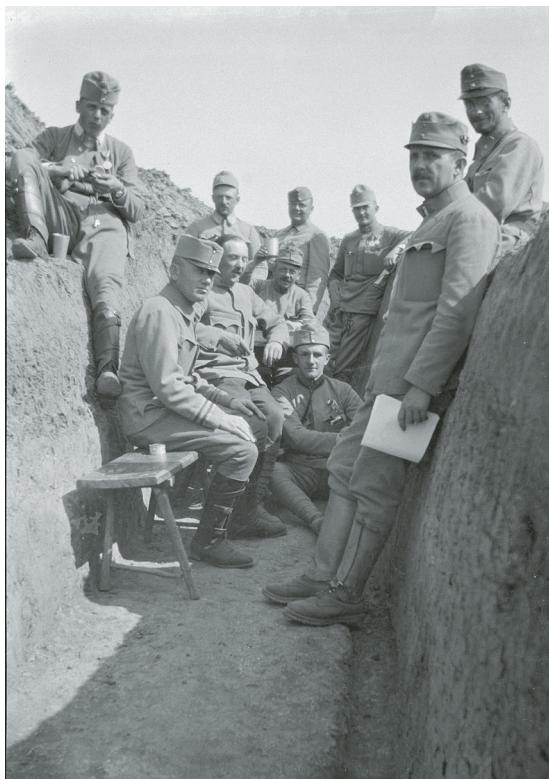


Fig. 19. Krasilowka (Ukraine): Officers, April 1915



Fig. 20. Chernivtsi (Ukraine): devastated bridge over the Pruth river, August 1917

November 15, 2005, the exhibition named *Stone forms of Velebit* opened in Croatian Natural History Museum, dedicated to Josip Poljak and his special relations to Mt Velebit. The opening of the exhibition was attended by Poljak's grandchildren, but it was a special honour to meet and listen to his daughter Vera Nevečerel (Fig. 21). Although in advanced years (she was 90 at that time), this retired teacher clearly and humorously express her memories of "daddy" as she called him. Considering how much time Josip Poljak devoted to research into the karst (Fig. 22) what is the better than to finish this memory of him with the words from his manuscript entitled "*Croatian karst and its characteristics*": *Along the Croatian coast, our people most significantly expressed the main characteristic of the karst regions with the words "bare wasteland". In these two words, not only is the morphological essence of the karst clearly expressed, but its influence on human life is also well marked, because the parts of the coastal karst are really nothing but an endless set of bare and desolate rock cliffs, under which the raging sea roars, and over which the wild bora howls its song of destruction.*

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Fig. 21. Vera Nevečerel, Poljak's daughter, at the opening of the exhibition in 2005



Fig. 22. Josip Poljak on Velebit in 1925 (photo probably by R. Simonović)

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