One Century of the Croatian Geological Survey

***Abstract**: Croatian Geological Survey is the successor of the Geological Commission for the Kingdoms of Croatia and Slavonia founded in 1909. The Commission was established thanks to efforts and merits of Dragutin Gorjanović-Kramberger, world-famous scientist. During its hundred-year existence, the Commission/Survey played an crucial role in the development of geology in Croatia, primarily in the production of geological maps in different scales and for different purposes, but also in applying the geological science in practice, e.g., in water resource exploration, landslide prevention and mitigation, exploitation of mineral resources, environmental protection, and construction of infrastructural objects.*

***Key words**: Croatian Geological Survey, Geological Commission, Dragutin Gorjanović-Kramberger, geological map.*

1. Overview of the Development of Croatian Geology and the Establishment of the Geological Commission

The development and rise of Croatian geology began in the middle of the 19th century (Babić, 1954), building onto earlier investigation of foreign, primarily Austrian, geologists. The founder of the Croatian geology as an independent science (and profession) was Ljudevit Farkaš Vukotinović (1813–1893), a versatile. Although a lawyer by education, he published numerous papers on geology and was among the first scientists who wrote in Croatian (Herak, 2002). In 1852, Vukotinović published one of the oldest geological maps of Croatian regions (Fig. 1).

Well-known zoologist Spiridion Brusina (1845–1908) also contributed to geology considerably. He determined over 500 new species of molluscs, organized the collection in the Natural History Museum and was instrumental in the foundation of the Croatian Society of Natural History in 1885 (Kochansky-Devidé, 1975).

Furthermore, three people contributed the most to the definitive rise of Croatian geology. They were: Gjuro Pilar (1846–1893), who was the first formally trained Croatian geologist (Pilar obtained his PhD in Brussels in 1868) and the first professor of geology and mineralogy of the former Faculty of Philosophy in Zagreb (Kochansky-Devidé, 1976); Mijo Kišpatić (1851–1926), the founder of Croatian mineralogy and petrography (Kochansky-Devidé, 1976); and Dragutin Gorjanović-Kramberger (1856–1936), versatile geologist and world-famous palaeontologist (palaeoanthropologist) and the founder of the Geological Commission (Herak, 1957; Kochansky-Devidé, 1978; Šuklje, 1937).

With Gorjanović-Kramberger back in Zagreb after having finished his studies abroad, a new era in the development of Croatian geology began. He and Pilar realized the necessity of producing a geological map of Croatia and Slavonia at the scale of 1:75 000 which was quite usual at the time. Thus they decided the first printed sheet to be of Zagreb. Together they produced a manuscript version of the geological map of Mt. Medvednica which was displayed at the Zagreb Economic Exhibition in 1891.

After Pilar's premature death (1893), Gorjanović-Kramberger continued with geological mapping (Šimunić, 2007) and in 1902 he produced a geological map of the Ptuj–Vinica sheet together with a legend, and the map was published by the Department of Internal Affairs of the Royal Territorial Administration. This was followed by following maps (with legends): Zlatar–Krapina in 1904, Rogatec–Kozje in 1904, and Zagreb in 1908. Some maps (and legends) were produced by Gorjanović's collaborator Ferdo Koch (1874–1935), who published the sheets of Ivanić Grad–Moslavina (1906), Daruvar (1908), and Medak–Sv. Rok in 1909, when the Commission was established (Fig. 2). Regarding the publication of geological maps, Gorjanović-Kramberger subsequently (1910) noted, among other things: "*After our brave and meritorious Pilar had died, I tried, after becoming the head of the Chair of Geology and Palaeontology at our Francis Joseph I University, to expose to the public the existing information on geological mapping of our homeland, which had already been collected. The former Croatian ban (governor) and the present Hungarian prime minister, a highly distinguished gentleman, Count Drag. Khuen-Hedervary was also convinced of the indispensability of having a general geological map and thus ordered the publishing of such a map, together with a bilingual, Croatian-German explanatory commentary.*

Following the decree issued by the High Royal Croatian Administration on December 17, 1900, number 35 302, printing of 250 copies of the first sheet of the geological map was approved, and following the order of the High Administration Presidency from March 20, 1904, number 6783 ex 1903, publication of the entire geological map was ensured with the expense of 3000 crowns per year".

Simultaneously with the publication of geological maps, Gorjanović-Kramberger also put great effort into the process of establishing an independent geological survey (Benček, 1995), which was opposed by the Hungarian government in Budapest. Pressure was exerted on him, even threats, but Gorjanović-Kramberger remained steadfast regardless. His resolution can be seen in his August 25, 1908 response to a letter from Budapest, in which he had been

Stoljeće Hrvatskoga geološkog instituta

Sažetak: *Hrvatski geološki institut sljednik je Geologijskog povjerenstva za Kraljevine Hrvatsku i Slavoniju, koje je osnovano 1909. godine. Povjerenstvo je osnovano nastojanjem i zaslugom Dragutina Gorjanović-Krambergera, našeg svjetski poznatog znanstvenika. Stoljeće djelovanja Povjerenstva – Instituta ima nezaobilaznu ulogu u razvoju geološke struke u Republici Hrvatskoj, ponajprije izradom geoloških karata različitih mjerila i namjena, ali i primjenom geološke znanosti u praksi, kao npr. istraživanja za vodoopskrbu, sanaciju klizišta, mineralne sirovine, zaštitu okoliša i infrastrukturne objekte.*

Ključne riječi: *Hrvatski geološki institut, Geologijsko povjerenstvo, Dragutin Gorjanović-Kramberger, geološka karta*

1. Osvrt na razvoj hrvatske geologije i osnivanje Geologijskog povjerenstva

Razvoj i uspon hrvatske geologije započet je sredinom 19. st. (Babić, 1954), a temelj njezina razvoja bila su ranija istraživanja stranih, ponajprije austrijskih geologa. Utemeljitelj hrvatske geologije kao struke je Ljudevit Vukotinović (Farkaš) (1813–1893), svestrani prirodoslovac. Iako školovani pravnik, objavio je mnoge radove s geološkom tematikom i bio je jedan od prvih istraživača koji je pisao na hrvatskom jeziku (Herak, 2002). Godine 1852. Vukotinović je objavio jednu od najstarijih geoloških karata s područja hrvatskih krajeva (sl. 1).

Razvoju geologije znatno je pridonio hrvatski poznati zoolog Spiridon Brusina (1845–1908). Odredio je više od 500 novih vrsta mekušaca, sređivao zbirku u Prirodoslovnome muzeju, a nepobitne su njegove zasluge za osnivanje Hrvatskog naravoslovnog (danas prirodoslovnog) društva 1885. godine(Kochansky-Devidé, 1975).

Za definitivni uspon hrvatske geologije zaslužna su trojica naših prvih školovanih geologa: Gjuro Pilar (1846–1893) prvi profesor mineralogije i geologije na tadašnjem Mudroslovnom (danas Filozofskom) fakultetu u Zagrebu (Kochansky-Devidé, 1974); Mijo Kišpatić (1851–1926), utemeljitelj hrvatske petrologije i mineralogije (Kochansky-Devidé, 1976), te Dragutin Gorjanović-Kramberger (1856–1936) svestrani geolog i paleontolog svjetskoga glasa te utemeljitelj Geologijskog povjerenstva (Herak, 1957; Kochansky-Devidé, 1978; Šuklje, 1937).

Povratkom D. Gorjanović-Krambergera u Zagreb nakon studija u inozemstvu započela je nova etapa u razvoju hrvatske geologije. Naime, on i G. Pilar uočili su potrebu izradbe geološke karte područja Hrvatske i Slavonije u tada uobičajenome mjerilu 1:75 000, te odlučili da prvi tiskani list bude Zagreb. Zajedno su izradili rukopisnu geološku kartu Zagrebačke gore, koja je bila izložena na zagrebačkoj izložbi 1891. godine.

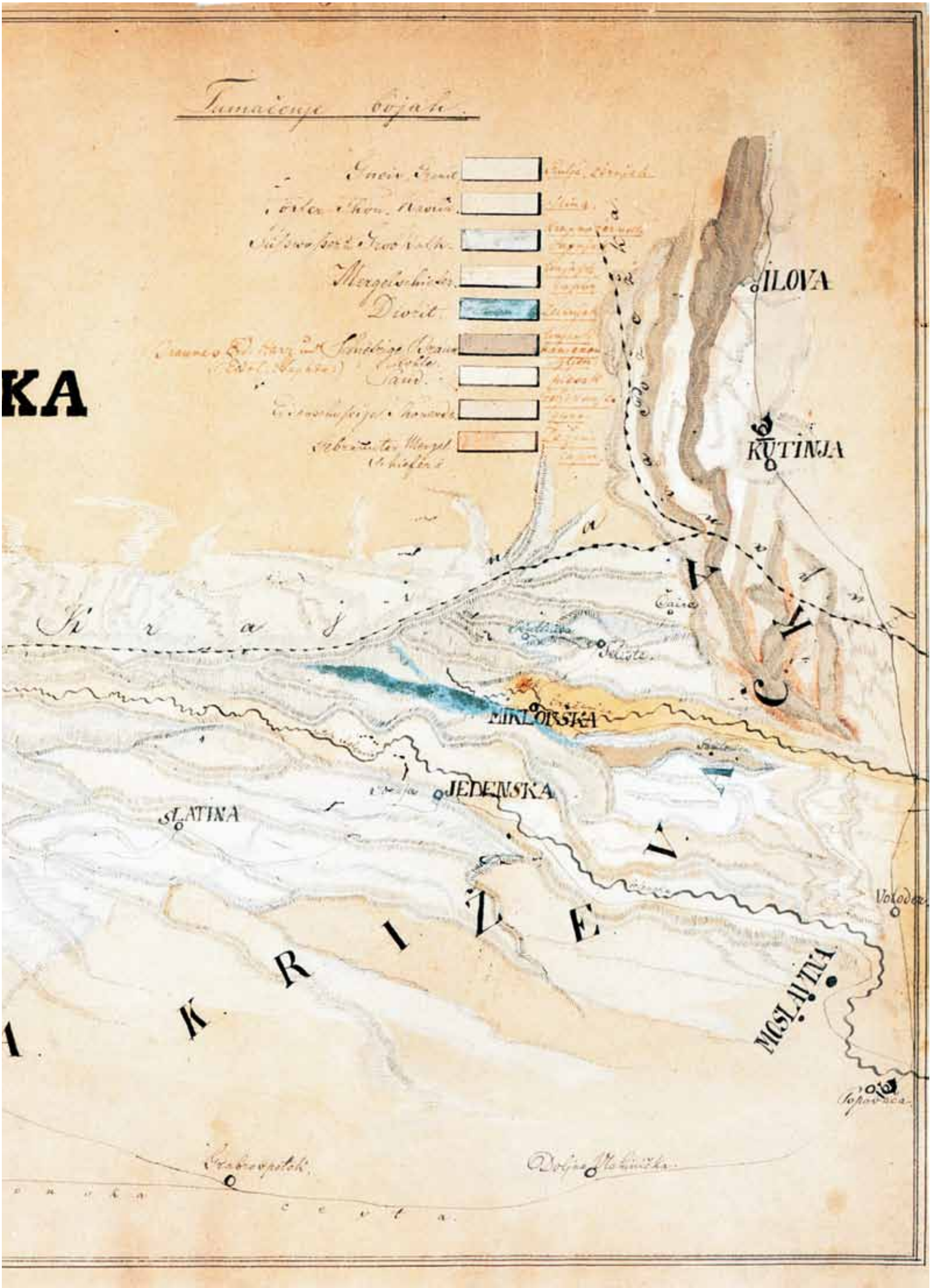
Nakon prerane Pilarove smrti (1893) D. Gorjanović-Kramberger nastavio je geološka kartiranja (Šimunić, 2007) i 1902. godine objavio geološku kartu lista Ptuj–Vinica s tumačem, u izdanju Odjela za unutarnje poslove Kraljevske zemaljske vlade. Slijede karte s tumačima Zlatar–Krapina (1904), Rogatec–Kozje (1904) te Zagreb (1908). Autor pojedinih karata i tumača bio je Gorjanovićev suradnik Ferdo Koch (1874–1935), koji je objavio listove Ivanić Grad–Moslavina (1906), Daruvar (1908) te u godini osnivanja Povjerenstva (1909) list Medak–Sv. Rok (sl. 2). Vezano na izdavanje karata D. Gorjanović-Kramberger je poslije (1910) među ostalim napisao: "*Nakon smrti našeg vrlog i zaslužnog Pilara nastojao sam, pošto sam preuzeo stolicu za geologiju i paleontologiju na našem sveučilištu Franje Josipa I., da privedem javnosti one podatke o geologijskom kartiranju naše domovine, koji su do tada već bili sabrani. O neophodnoj potrebi geologijske prijegledne karte bio je uvjeren i tadanji hrvatski ban, a sadašnji ugarski ministar-predsjednik preuzvišeni gospodin grof Drag. Khuen-Hedervary, pa je odredio, da se izda ovakova karta s njemačko-hrvatskim popratnim tekstom.*

Glasom naredbe vis. kr. hrv. vlade od 17. prosinca 1900. broj 35.302 dozvoljeno bi izdanje prvog lista geologijske karte u 250 primjeraka, a uslijed naredbe visokog vladinog predsjedništva od 20. ožujka 1904. broj 6783 ex 1903. osiguranо je izdavanje ciele geološke karte sa 3000 kruna godišnjeg izdatka".

Usporedno s izdavanjem karata Gorjanović-Kramberger je vodio postupak za osnivanje samostalne geološke službe u Hrvatskoj (Benček, 1995), što su osporavale vlasti iz Budimpešte. Bilo je pritisaka, pa i prijetnji, ali o Gorjanovićevoj odlučnosti svjedoči njegov odgovor od 25. listopada 1908. na pismo iz Budimpešte u kojem se prijeti sankcijama: "*Kako je Kraljevina Hrvatska-Slavonija na polju javne prosvjete samostalna, to je njoj na volju publicirati što hoće o hrvatskim prilikama. Napose je pako geol. pregledna karta izljev rada kr. hrv. sveučilišta, dotično profesora geologije i odnosnoga zavoda sveučilišnoga te u tom redigiram i publiciram tu kartu. Vjerujem da može Kr. ugarski geološki zavod snimati geološki i Hrvatsku, ali bi preporučio da se to zbude u sporazumu sa nama, jer nije dobro raditi – osobito u nas – po principu jačega*" (Krizmanić i Radovčić, 1994).

Izdane karte te ugled D. Gorjanović-Krambergera i napose njegova upornost i rodoljublje bili su odlučujući čimbenici da Kr. hrv.-slav.-dalm. zemaljska vlada 3. srpnja 1909. donese Naredbu br. III. A. 2275 o ustroju Geologijskog povjerenstva (sl. 3). Naredbu je potpisao tadašnji ban Pavao RAUCH. Sjedište

Fig. 1. Geological map of Moslavačka gora (Vukotinović 1852)



Sl. 1. Geološka karta Moslavačke gore (Vukotinović 1852)

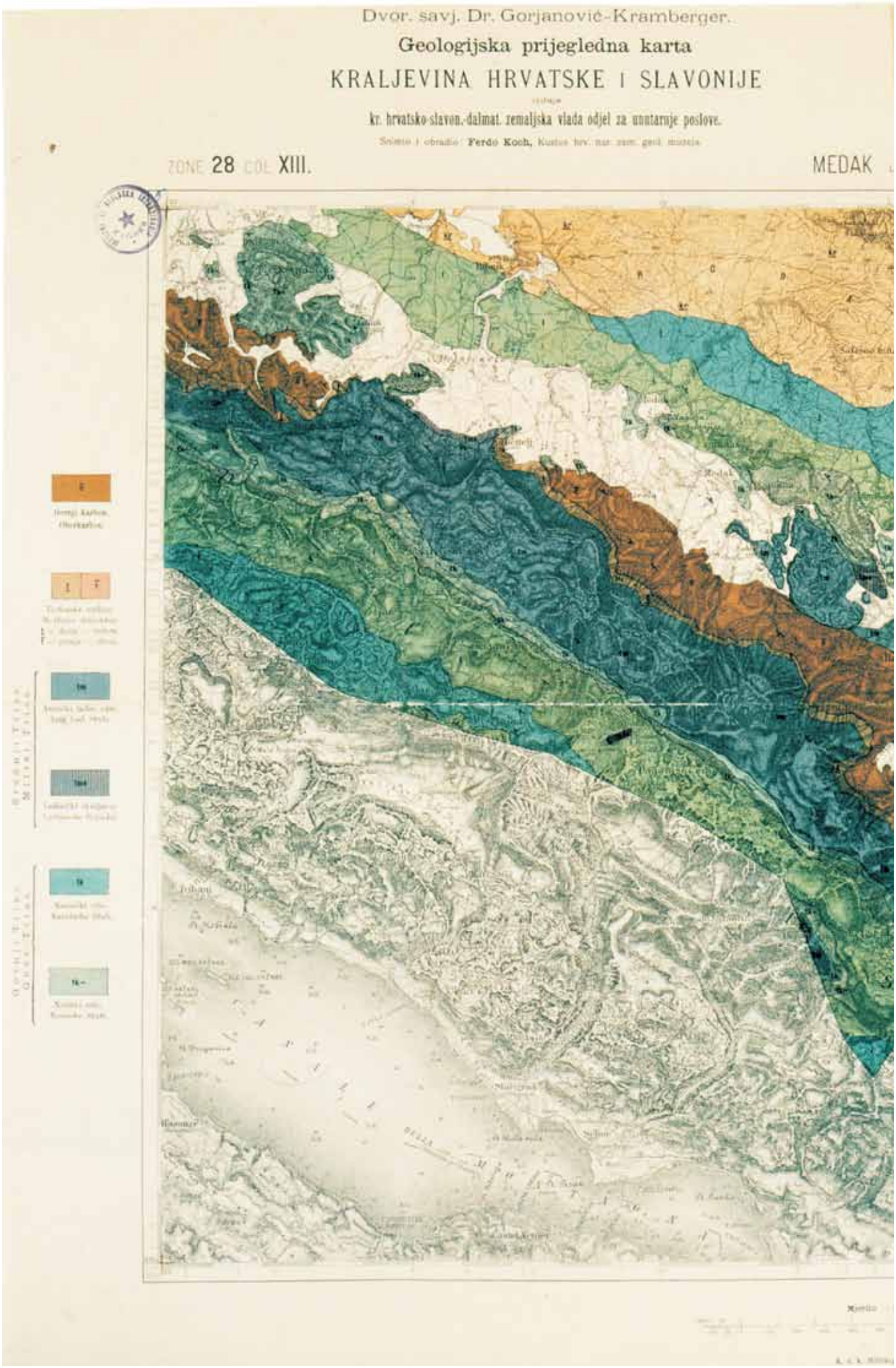


Fig. 2. Geological map Medak-Sv. Rok (Koch 1909)

Sl. 2. Geološka karta Medak-Sv. Rok (Koch 1909)

threatened: "*As the Kingdom of Croatia and Slavonia is independent regarding public education, thus it is allowed to publish whatever it wants on its conditions. Especially, the general geological map is the product of activities of the royal Croatian university, i.e. its professors of geology and its geological department, and therefore I insist on editing and publishing this map. I accept the Royal Hungarian Geological Institute can also geologically map Croatia, but I would recommend to do that in agreement with us, as it is not good to work – particularly here – by threat of force*" (Krizmanić, Radovčić, 1994).

Fig. 4. Dragutin Gorjanović Kramberger, the founder of the Geological Commision

Sl. 4. Dragutin Gorjanović Kramberger, osnivač Geologijskog povjerenstva

The already published maps, as well as Gorjanović-Kramberger's reputation, backed by his persistence, stubbornness even, and his patriotism, were the decisive factors which made the Royal Croatian-Slavonian-Dalmatian Land Administration to issue Order No. III. A. 2275 about the organization of the Geological Commission on June 3, 1909 (Fig. 3). The order was signed by the ban (governor) Pavao Rauch. The residence of the Commission was placed in the building of the National Museum, Demetrova Street No. 1; and in accordance with paragraph No. 2 of the Order, Gorjanović-Kramberger was appointed the director of the Commission (Fig. 4).

2. Overview of the Activities of the Commission/Institute

During the past century, the institution developed its activities almost without interruption, with the motto: *study and publish*, as defined in paragraph no. 3 of the Order. However, continuous as they might have been, the activities didn't proceed smoothly: there were numerous negative factors influencing the activities. Let us only mention the fact that, during the past century, five different regimes ruled the country and the people, two world wars raged over the country, and, most recently, the Homeland War, which the Institute also considerably contributed to, both materially and personally, defending the country.

Activities of the Commission were regulated according to the Order. In order to publish research results, the periodical *Vijesti Geologijskog povjerenstva* (News of the Geological Commission), the precursor of the current *Geologia Croatica*, started to be published. The first meeting of the Commission took place on February 10, 1910; the previous period was analyzed and the decision of how to organize the program of further activities was made. In the same year, the scope of Commission's work was expanded by the establishment of the Geographical Section and the Committee for Cave Research. In addition, according to the governmental order from July 31, 1910, the Commission became gradually better equipped for field work, which was primarily carried out in the areas of the Velebit Mountain and Gorski Kotar district. The most engaged mapping geologist was Ferdo Koch, who alone produced three 1:75 000 sheets of the geological map: Knin–Ervenik (1914?), Pag (1914), and Gračac–Ermain (Rmanj) (1914), in addition to being active in mapping the "Croatian sections" of the Hungarian Geological Institute on the Senj–Otočac and Karlobag–Jablanac sheets. During the First World War (1914–1918), geological mapping nearly stopped because most of personnel were engaged in military activities. After the war, the Austro-Hungarian Empire dissolved and Croatia soon joined the newly formed Yugoslavian state (Pikija, Halamić, 2009).

The Commission was rescinded in 1922 and its activities were transferred to the newly formed *Kraljevski geološki zavod* (Royal Geological Institute). Gorjanović-Kramberger was appointed the director, but only until 1923, when Ferdo Koch became the director. The following period was characterized by a reduced scope of geological research, in cooperation with Belgrade geologists and with activities paving the way to centralization. Still, during the period between 1926 and 1930, the Institute managed to continue publishing its own periodical, *Vijesti.*

By passing a special law at the end of 1930, the new Geological Institute of the Kingdom of Yugoslavia was formed, and by the decree of the former Ministry of Education from December 16, 1931, the complete inventory, documentation (archives, etc.), and personnel of the Zagreb Institute were moved to Belgrade. F. Koch (1931–1933) and Fran Šuklje (1933–1935) were appointed directors of the new Institute; during this period, ten sheets of geological map at the scale of 1:75 000 covering the territory of Croatia were published.

In 1939, the Kingdom of Yugoslavia was partly decentralized and the *Banovina* of Croatia (a largely independent regional unit ruled by a *ban*) was established. Thus, a part of Croatian sovereignty was regained and soon afterwards, the Geološki zavod Banovine Hrvatske (*Geological Institute of the Banovina of Croatia*) was established. However, the inventory and documentation (archives, etc.) moved to Belgrade in 1931 were not returned to Zagreb. In addition, a large part is still claimed. The location of the Institute was Kulina Bana Square 15 (present Trg žrtava fašizma) and Fr. Šuklje was appointed the director.

The Banovina of Croatia existed until April 1941, when the Yugoslavian state collapsed and the pro-fascist Independent State of Croatia was proclaimed in Zagreb (Šišić, 1975). The Institute changed its name to Hrvatski državni geološki zavod (*Croatian State Geological Institute,* or *Survey*) (Šuklje, 1942), and continued to function with this name until the end of the war in 1945. Soon after it was established, the Institute acquired more personnel, but due to war geological mapping and solving of practical problems were soon gradually reduced. During its existence, the Institute managed to publish three volumes of Vjestnik Hrvatskog državnog geološkog zavoda i Hrvatskog državnog geološkog muzeja (*News of Croatian State Geological Survey and Croatian State Geological Museum*) until 1944.

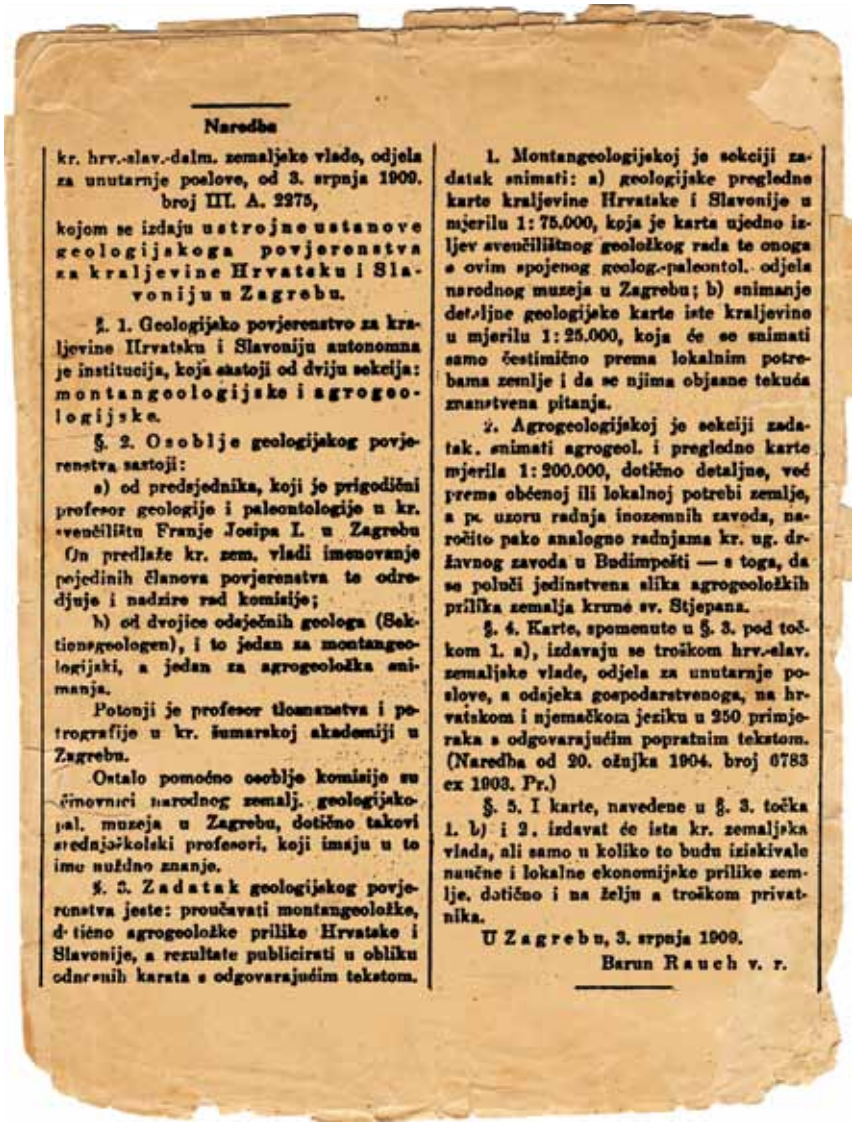
Povjerenstva bilo je u zgradi Narodnog muzeja u Demetrovoj ul. br. 1., a sukladno paragrafu 2. Naredbe predsjednikom Povjerenstva imenovan je D. Gorjanović-Kramberger (sl. 4).

2. Pregled djelovanja Povjerenstva – Instituta

Tijekom proteklog stoljeća djelovanje Ustanove odvijalo se praktično u kontinuitetu i pod geslom *proučavati i publicirati*, definiranim u paragrafu 3. Naredbe. Spomenimo i niz nepovoljnih utjecaja, jer se u tom razdoblju na našem prostoru promijenilo pet državnih uređenja, prohujala su dva svjetska rata i konačno Domovinski rat, tijekom kojega je Institut dao znatan doprinos obrani domovine.

Djelatnost Povjerenstva organizirana je sukladno Naredbi o ustroju. Radi objavljivanja rezultata istraživanja pokretnuto je glasilo *Vijesti Geologijskog povjerenstva*, preteča današnjeg časopisa *Geologia Croatica*. Prva skupština Povjerenstva održana je 10. veljače 1910. i na njoj je analizirano proteklo razdoblje te donesen program organizacije daljeg rada. Iste godine proširena je djelatnost Povjerenstva ustrojem Geografijske sekcije i Odbora za istraživanje špilja, a na temelju Naredbe vlade od 31. srpnja 1910. Povjerenstvo se postupno dobro ekipiralo, a glavnina terenskih istraživanja odvijala se na području Velebita, Like i Gorskoga kotara. Najangažiraniji geolog bio je F. Koch, koji je autor karata M 1:75 000 listova Knin–Ervenik (1914?), Pag (1914) i Gračac–Ermain (Rmanj) (1914), a u okviru "hrvatske sekcije" Mađarskoga geološkog zavoda kartirao je na listovima Senj–Otočac i Karlobag–Jablanac. Tijekom 1. svjetskog rata (1914–1918) istraživanja su praktično zamrla jer je veći dio zaposlenika bio angažiran u vojsci. Završetkom rata došlo je do raspada Austro-Ugarske, a Hrvatska je ubrzo ušla u novostvorenu jugoslavensku državu (Pikija i Halamić, 2009).

Povjerenstvo je ukinuto 1922. godine, a njegove je poslove preuzeo novoosnovani *Kraljevski geološki zavod*. Direktorom Zavoda imenovan je D. Gorjanović-KrambergeR, a već 1923. godine dužnost direktora preuzima F. Koch. Slijedi razdoblje smanjenog opsega geoloških istraživanja, sudjelovanja beogradskih geologa te aktivnosti na pripremi centralizacije. Zavod je



Naredba

kr. hrv.-slav.-dalm. zemaljske vlade, odjela za unutarnje poslove, od 3. srpnja 1909. broj III. A. 2275,

kojom se izdaju ustrojne ustanove geologijskoga povjerenstva za kraljevine Hrvatsku i Slavoniju u Zagrebu.

§. 1. Geologijsko povjerenstvo za kraljevine Hrvatsku i Slavoniju autonomna je institucija, koja sastoji od dviju sekcija: montangeologijske i agrogeologijske.

§. 2. Osoblje geologijskog povjerenstva sastoji:

a) od predsjednika, koji je prigodični profesor geologije i paleontologije u kr. sveučilištu Franje Josipa I. u Zagrebu (On predlaže kr. zem. vladi imenovanje pojedinih članova povjerenstva te određuje i nadzire rad komisije;

b) od dvojice odsječnih geologa (Sektionsgeologen), i to jedan za montangeologijski, a jedan za agrogeološka snimanja.

Potonji je profesor tlosmanstva i petrografije u kr. šumarskoj akademiji u Zagrebu.

Ostalo pomoćno osoblje komisije su činovnici narodnog zemalj. geologijsko-pal. muzeja u Zagrebu, dotično takovi srednjoškolski profesori, koji imaju u to ime nuždno znanje.

§. 3. Zadatak geologijskog povjerenstva jeste: proučavati montangeološke, dotično agrogeološke prilike Hrvatske i Slavonije, a rezultate publicirati u obliku odnosnih karata s odgovarajućim tekstom.

1. Montangeologijskoj je sekciji zadatak snimati: a) geologijske pregledne karte kraljevine Hrvatske i Slavonije u mjerilu 1:75.000, koja je karta ujedno izljev sveučilištnog geološkog rada te onoga s ovim spojenog geolog.-paleontol. odjela narodnog muzeja u Zagrebu; b) snimanje detaljne geologijske karte iste kraljevine u mjerilu 1:25.000, koja će se snimati samo čestimično prema lokalnim potrebama zemlje i da se njima objasne tekuća znanstvena pitanja.

2. Agrogeologijskoj je sekciji zadatak, snimati agrogeol. i pregledne karte mjerila 1:200.000, dotično detaljne, već prema općenoj ili lokalnoj potrebi zemlje, a po uzoru radnja inozemnih zavoda, naročito pako analogne radnjama kr. ug. državnog zavoda u Budimpešti — s toga, da se polučí jedinstvena slika agrogeoloških prilika zemalja krune sv. Stjepana.

§. 4. Karte, spomenute u §. 3. pod točkom 1. a), izdavaju se troškom hrv.-slav. zemaljske vlade, odjela za unutarnje poslove, s odsjeka gospodarstvenoga, na hrvatskom i njemačkom jeziku u 250 primjeraka s odgovarajućim popratnim tekstom. (Naredba od 20. ožujka 1904. broj 6783 ex 1903. Pr.)

§. 5. I karte, navedene u §. 3. točka 1. b) i 2. izdavat će ista kr. zemaljska vlada, ali samo u koliko to budu iziskivale naučne i lokalne ekonomijske prilike zemlje, dotično i na želju a troškom privatnika.

U Zagrebu, 3. srpnja 1909.

Barun Rauch v. r.

Fig. 3. Copy of the order about the organization of the Geological Commision
Sl. 3. Kopija naredbe o ustroju Geološkog povjerenstva

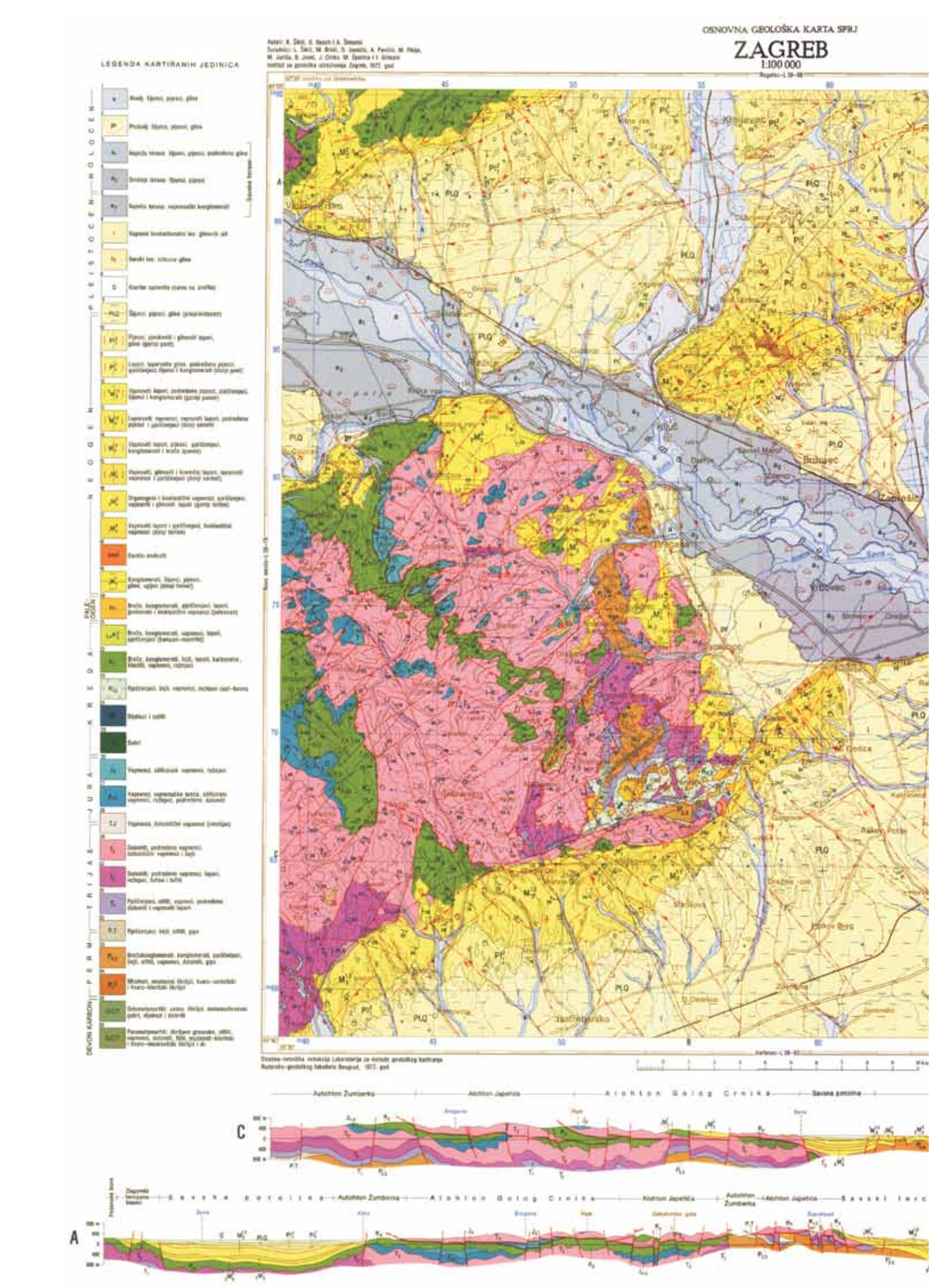
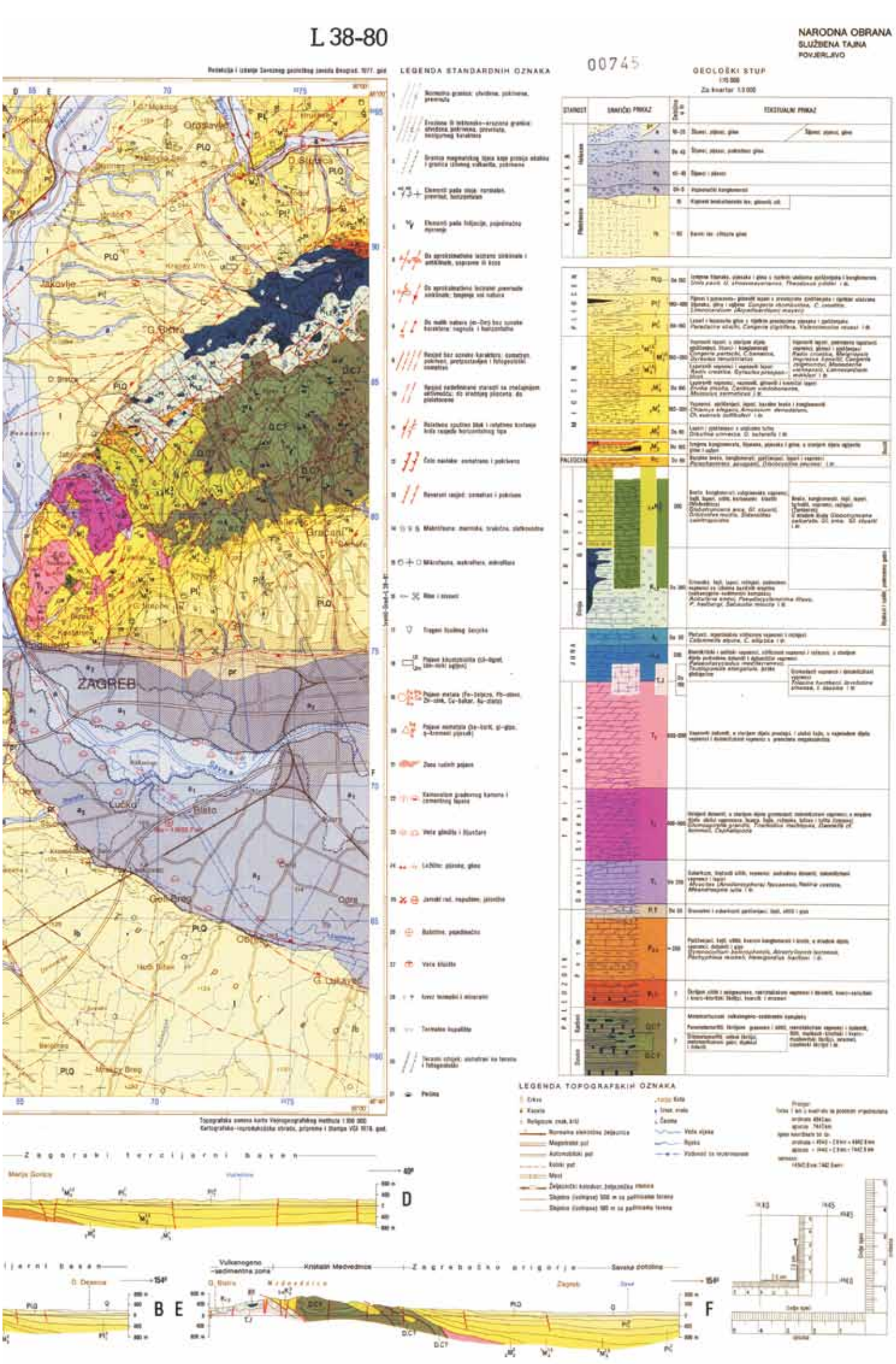


Fig. 5. Basic Geologic Map 1:100 000, sheet Zagreb



Sl. 5. Osnovna geološka karta 1:100 000, list Zagreb

After the war, the Institute changed its name again to Državni geološki zavod (*State Geological Institute,* or *Survey*). Šuklje remained the director. In order to satisfy the needs of post-war restoration and industrialization, some Croatian geologists were sent, by decrees, to Bosnia and Herzegovina, and Macedonia.

Soon after, a new threat appeared to Croatian geology: the idea of state centralization was resurrected. This is what M. Herak (1994) wrote about that: "*Well-known geologist Vasilije Simić* (*who was active in the Geological-Palaeontological Museum in Zagreb from 1927 to 1929*) *came from Belgrade in 1946 with a proposal that all geological structures be transferred to Belgrade in order to form a new, strong centre for complex geological research and education of highly qualified geologists. I participated in his conversation with the director of the Geological-Palaeontological Museum, Josip Poljak, and witnessed his stubborn decision to reject all our contrary arguments. Fortunately, the dean of the Faculty* (*the newly established Faculty of Science and Mathematics, eds. remark*) *was well-known geographer Josip Roglić, who, thanks to his extraordinary persistence, succeeded what we failed: to refuse the proposal, with the explanation that by the liquidation of geology in Zagreb, the Zagreb University would remain a torso, and the complementary natural sciences would be deprived of their all-important geological basis.*" The same year, in the middle of July, the government of the People's Republic of Croatia issued a decree, by which the *Geological and Mining Institute of Croatia* was founded. Actually, the Institute was organized in the middle of 1947, by the end of which Ivan Jurković was appointed as the director. Jurković was a B.Sc. in both geology and chemistry, had good organization skills, and – also important – he was supported by existing political structures. Very soon, the Institute strengthened and, in addition to the geological and chemical divisions, the geophysical and drilling divisions functioned. The same year, the Institute started to publish its annual periodical, *Geološki vjesnik* (Geological Bulletin). The bulk of the Institute's professional activities at the time were directed to mineral resources research.

Fig. 6. Building of the Institute is Sachsova street 2
Sl. 6. Zgrada Instituta u Sachsovoj ulici 2

According to the decree from October 21, 1950, the government of the People's Republic of Croatia made a decision to organize the geological survey and simultaneously changed the name of the Institute to *Zavod za geološka istraživanja N.R. Hrvatske* (Institute for Geological Research of People's Republic of Croatia). The fifties were characterized by considerable increase in professional personnel and the beginnings of systematic exploration for oil economy (the company Naftaplin was founded in 1952; today, INA-Naftaplin) and activities on the organization of production of a new geologic map. The name was shortened to *Zavod za geološka istraživanja* (Institute for Geological Research).

Let us take a glance at the development of geological map. It is a well-known fact that geological mapping represents a permanent research process in every country, it stimulates the development of the profession, and the geologic map makes the basis for all kinds of applied and specialist research. At the conference of geologists from all republics of the former Yugoslavia held in Zagreb in 1952, activities for the production of a new geologic map officially started, and at the first Geologists' Congress in 1954 the decision was made that the official name of the new map would be Complex Geologic Map and its production methodology based on lithostratigraphic principles at the scale of 1:50 000. At the Second Geologists' Congress in 1957, the official name was changed to Basic Geologic Map and practical activities on its production started the following year. Following the instructions of the Federal Geologic Institute in Belgrade in 1962, mapping should have been carried out according to chronostratigraphic units on topographic maps at 1:25 000 and published sheets would have been at the scale of 1:100 000. The territory of the Republic of Croatia included 74 sheets, of which the Institute was charged to produce 66, of which, in turn, 61 were published and thus made available. Of the remaining 5 sheets, which cover about 10% of the Croatian territory, some were printed, some prepared for printing, but distribution was stopped due to the former federal country dissolving. Basic Geologic Map 1:100 000 is a major project for the Croatian geology; through its production process, an entire generation of geologists came of age (in professional sense) and became expertly acquainted with geology of Croatia. On the other hand, a number of specialists (and specialist disciplines) also evolved. Field work (geologic mapping in the strict sense) for this map was completed in 1989. A sheet example is represented in Fig. 5.

By the end of 1960, the Institute changed its name again to *Institut za geološka istraživanja* (Institute of geological research) and officially acquired scientific status. New personnel, stable financial situation and diversification of projects enhanced the continuation of

izdavao časopis *Vijesti Geološkog zavoda* u razdoblju 1926–1930.

Donošenjem posebnog zakona potkraj 1930. godine formiran je *Geološki institut Kraljevine Jugoslavije*, a uredbom tadašnjeg ministra prosvjete od 16. prosinca 1931. cjelokupni inventar, arhiva i osoblje Zavoda u Zagrebu preseljeni su u Beograd. Dužnost direktora tog Instituta obavljali su F. Koch (1931–1933) i Fran Šuklje (1933–1935), a u tom razdoblju tiskano je deset listova geoloških karata M 1:75 000 s područja Hrvatske.

U okviru decentralizacije Kraljevine Jugoslavije godine 1939. uspostavljena je Banovina Hrvatska. Time je vraćen dio hrvatskog suvereniteta, a ubrzo je u Zagrebu osnovan *Geološki zavod Banovine Hrvatske*, no inventar i dokumentacija preneseni 1931. godine u Beograd nisu vraćeni u Zagreb, a znatan dio potražuje se još i danas. Sjedište Zavoda bilo je na Trgu Kulina bana 15 (danas Trg žrtava fašizma), a direktorom je bio imenovan F. Šuklje.

Banovina se održala do travnja 1941. godine, kada se raspala jugoslavenska država, a u Zagrebu je proglašena Nezavisna Država Hrvatska (Šišić, 1975). Zavod je preimenovan u *Hrvatski državni geološki zavod* (Šuklje, 1942) i pod tim imenom djelovao cijelo vrijeme rata, odnosno do 1945. godine. Direktor je bio F. Šuklje. Ubrzo nakon osnivanja Zavod je kadrovski ojačan te su započeta geološka kartiranja i rad na praktičnim zadacima, no zbog ratnih djelovanja istraživanja su postupno smanjivana. Zavod je pokrenuo glasilo *Vjestnik Hrvatskog državnog geološkog zavoda* i *Hrvatskog državnog geološkog muzeja* i do 1944. godine izašla su tri broja.

Nakon završetka rata Zavod je preimenovan u *Državni geološki zavod*. Direktor je i dalje bio F. Šuklje. Za potrebe obnove i industrijalizacije dio hrvatskih geologa je dekretima upućen na istraživanja po Bosni i Makedoniji.

Ubrzo nakon rata zaprijetio je novi udar hrvatskoj geologiji, jer je revitalizirana ideja o centralizaciji, a Milan Herak (1994) o tome je napisao: "*Naime, godine 1946. iz Beograda je došao tada poznati geolog Vasilije Simić* (*koji je od 1927. do 1929. djelovao i u Geološko-paleontološkom muzeju u Zagrebu*)*, s prijedlogom da se sve geološke strukture presele u Beograd kako bi se stvorio snažan centar za kompleksno geološko istraživanje i izobrazbu geoloških stručnjaka. Bio sam sudioni-kom njegova razgovora s ravnateljem Geološko-paleontološkog muzeja Josipom Poljakom i svjedokom njegove upornosti da odbije sve naše proturazloge. Ali na sreću, tada je dekanom Fakulteta* (*riječ je o novoosnovanom Prirodoslovno-matematičkom fakultetu, op. ur.*) *bio poznati geograf Josip Roglić, koji je izuzetnom upornošću i uvjerljivošću uspio ono što mi nismo – odbiti prijedlog, s obrazloženjem da bi likvidacijom geologije u Zagrebu Sveučilište postalo torzo, a komplementarne prirodoslovne struke ostale bez važne geološke osnove*". Iste godine sredinom srpnja Vlada Narodne Republike Hrvatske donosi Uredbu kojom se osniva *Geološko-rudarski institut Hrvatske*. Institut je praktično ustrojen tek sredinom 1947, a pred kraj godine direktorom je imenovan Ivan Jurković, diplomirani geolog i kemičar s dobrim organizacijskim sposobnostima, a svakako treba spomenuti da je imao i potporu tadašnjih političkih struktura. Institut je ubrzo kadrovski ojačan, tako da su uz geološki i kemijski odjel postojali još odjeli za geofiziku i bušenje. Iste godine počelo je izlaziti i institutsko glasilo *Geološki vjesnik*. Glavnina stručne djelatnosti Instituta u to vrijeme odnosila se na istraživanje mineralnih sirovina.

Uredbom od 21. listopada 1950. Vlada NR Hrvatske donosi odluku o organizaciji geološke službe, a Institutu je ujedno promijenjeno ime u *Zavod za geološka istraživanja NR Hrvatske*. Pedesete godine karakterizira znatno povećanje stručnoga kadra, početak sustavnih istraživanja za potrebe naftnoga gospodarstva (1952. godine osnovan je Naftaplin, danas INA-Naftaplin) te aktivnosti za organizaciju izrade geološke karte. Spomenimo i promjenu imena u *Zavod za geološka istraživanja* 1955. godine.

Kratko ćemo se osvrnuti na geološku kartu. Poznato je da je geološko kartiranje trajni istraživački proces u svakoj državi, potiče razvoj struke, a geološka karta čini podlogu svih specijalističkih i primijenjenih istraživanja. Na savjetovanju geologa tadašnje države u Zagrebu 1952. godine započete su aktivnosti za izradbu karte, na I. kongresu geologa 1954. godine donesena je odluka da naziv bude Kompleksna geološka karta, a izradba po listostratigrafskim principima u mjerilu 1:50 000. Na 2. geološkom kongresu 1957. godine naziv karte je promijenjen u Osnovna geološka karta, a praktični radovi započeti su 1958. godine. Prema Uputstvu Saveznog geološkog zavoda iz 1962. godine kartiranje se izvodi po kronostratigrafskim jedinicama na topografskim osnovama M 1:25 000, a karta se tiska u mjerilu 1:100 000. Teritorij Republike Hrvatske obuhvaćaju 74 lista. Institut je izradio 66 listova od kojih je 61 tiskan i dostupan, a od ostalih pet listova koji obuhvaćaju oko 10% teritorija RH neki su tiskani, a neki pripremljeni za tisak, ali distribucija nije obavljena zbog raspada bivše države. Osnovna geološka karta 1:100 000 kapitalni je projekt za hrvatsku geologiju, kroz koji je stasala generacija geologa koja izvrsno poznaje geološku građu Hrvatske, a s druge strane razvio se niz specijalista. Geološko kartiranje za tu kartu završeno je 1989. godine. Izgled i sadržaj jednog lista karte ilustrira sl. 5.

Pri samom kraju 1960. godine Zavod mijenja ime u *Institut za geološka istraživanja* i službeno stječe znanstveni status. Kadrovske prinove, stabilno financiranje i raznolikost projekata ubrzali su nastavak specijalizacije, pa je 1966. godine Institut reorganiziran i osnovana su tri stručna odjela: geološki, inženjerskogeološko-hidrogeološki i mineraloško-petrografski, a prateće djelatnosti obavljao je odjel zajedničkih službi. Godine 1970., pod djelomice nerazjašnjenim okolnostima, Institut gubi svoj dio zgrade u Kupskoj ulici. Sjedište je premješteno u Koturašku ulicu, a zaposlenici u vlastiti montažni objekt u Sutlanskoj ulici i na nekoliko lokacija u iznajmljene prostore. Istovremeno je započeto traženje lokacije za izgradnju vlastite zgrade. Angažmanom uprave te uz pomoć lobista i ministarstva uskoro je počela izgradnja zgrade na današnjoj lokaciji. Zgrada je dovršena 1972. godine, a dogradnjom 1978. godine dobila današnji izgled (sl. 6).

Sedamdesetih godina započeta su praktična istraživanja za izradu specijaliziranih karata – hidrogeološke (sl. 7) i inženjerskogeološke (sl. 8) u mjerilu 1:100 000. Glavnina istraživanja mineralnih sirovina u to vrijeme odnosi se na boksit, ugljen i gline. Spomenimo da sredinom sedamdesetih godina počinje sustavni razvoj geokemije nabavkom odgovarajućeg instrumentarija. Godine 1977. Institut mijenja ime u *Geološki zavod – Zagreb*, ali bez promjene unutarnje organizacije.

Osamdesete godine obilježava početak informatizacije s posebnim naglaskom na pripremu grafike i kartografije, zatim završetak radova na izradi Osnovne geološke karte 1:100 000, ali i početak programiranja i praktičnog izvođenja nove geološke karte na litostratigrafskom principu koja se izvodi i danas pod nazivom Osnovna geološka karta Republike Hrvatske 1:50 000. Potkraj osamdesetih godina definirani su kriteriji i metodologija izradbe geotermalne karte. Godine 1988. Zavod mijenja ime u *Institut za geološka istraživanja*.

Devedesete godine obilježava prije svega Domovinski rat, koji je unio niz promjena u organizaciju radnog

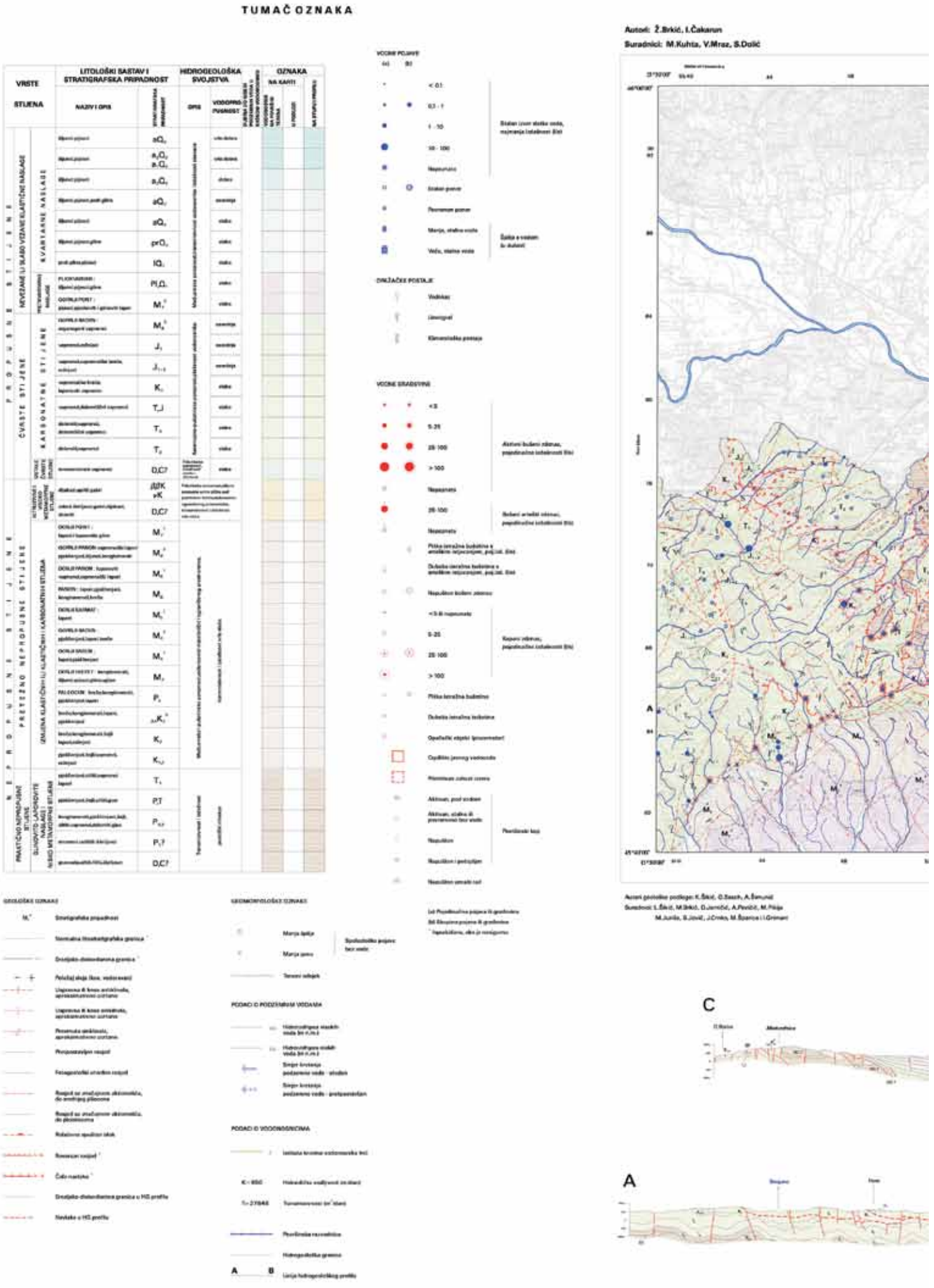
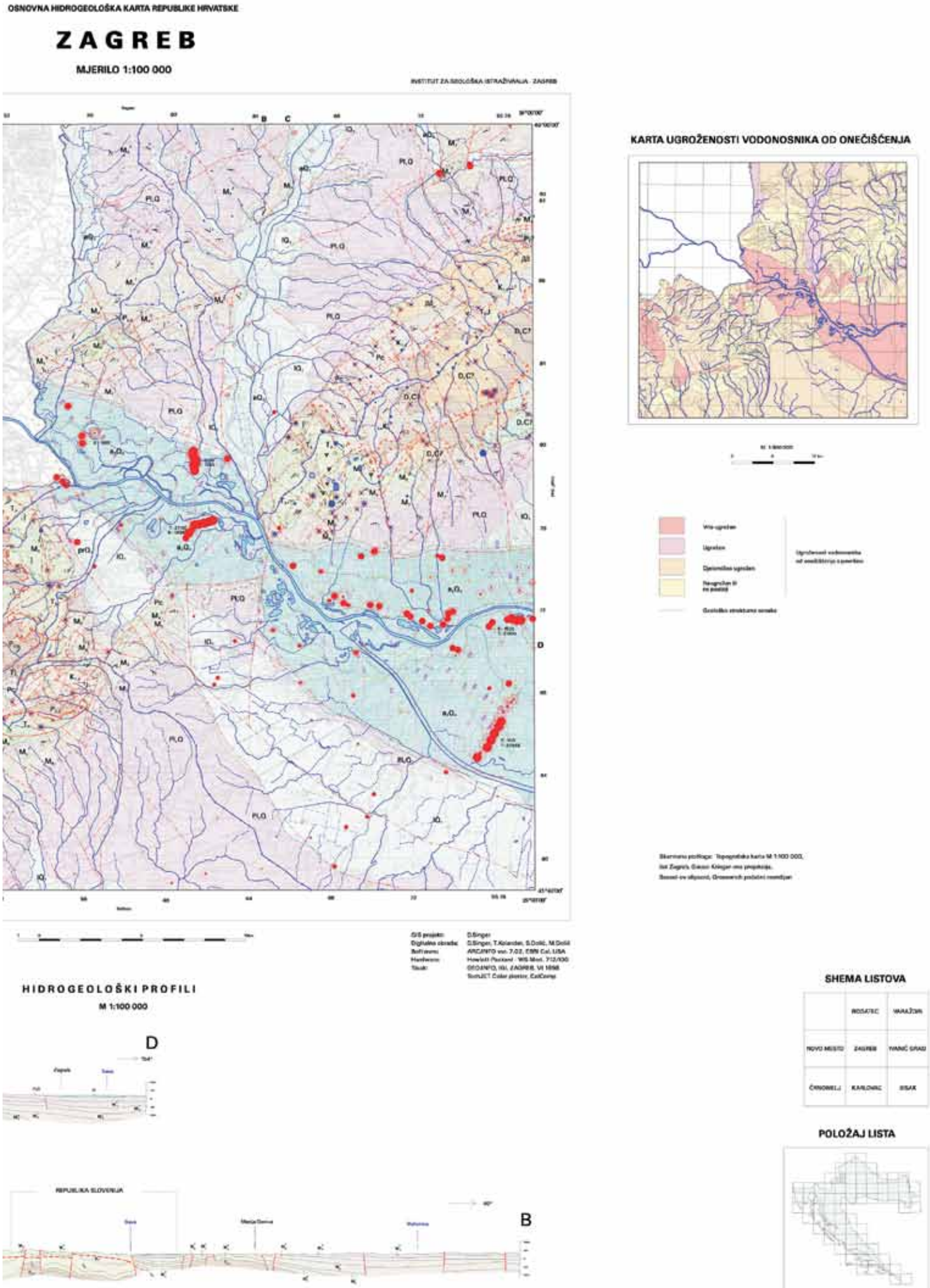


Fig. 7. Basic Hydrogeologic Map 1:100 000, sheet Zagreb



Sl. 7. Osnovna hidrogeološka karta 1:100 000, list Zagreb

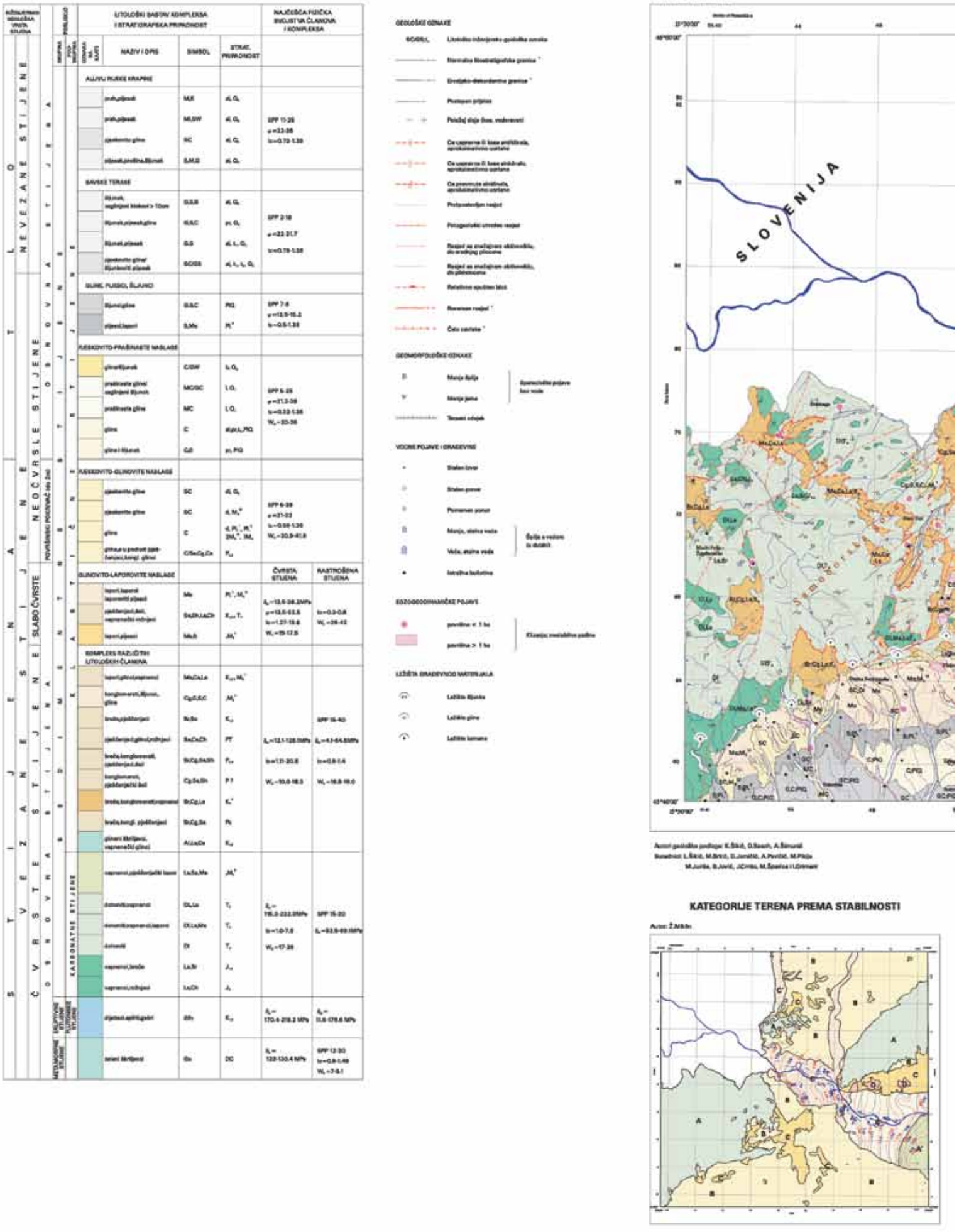
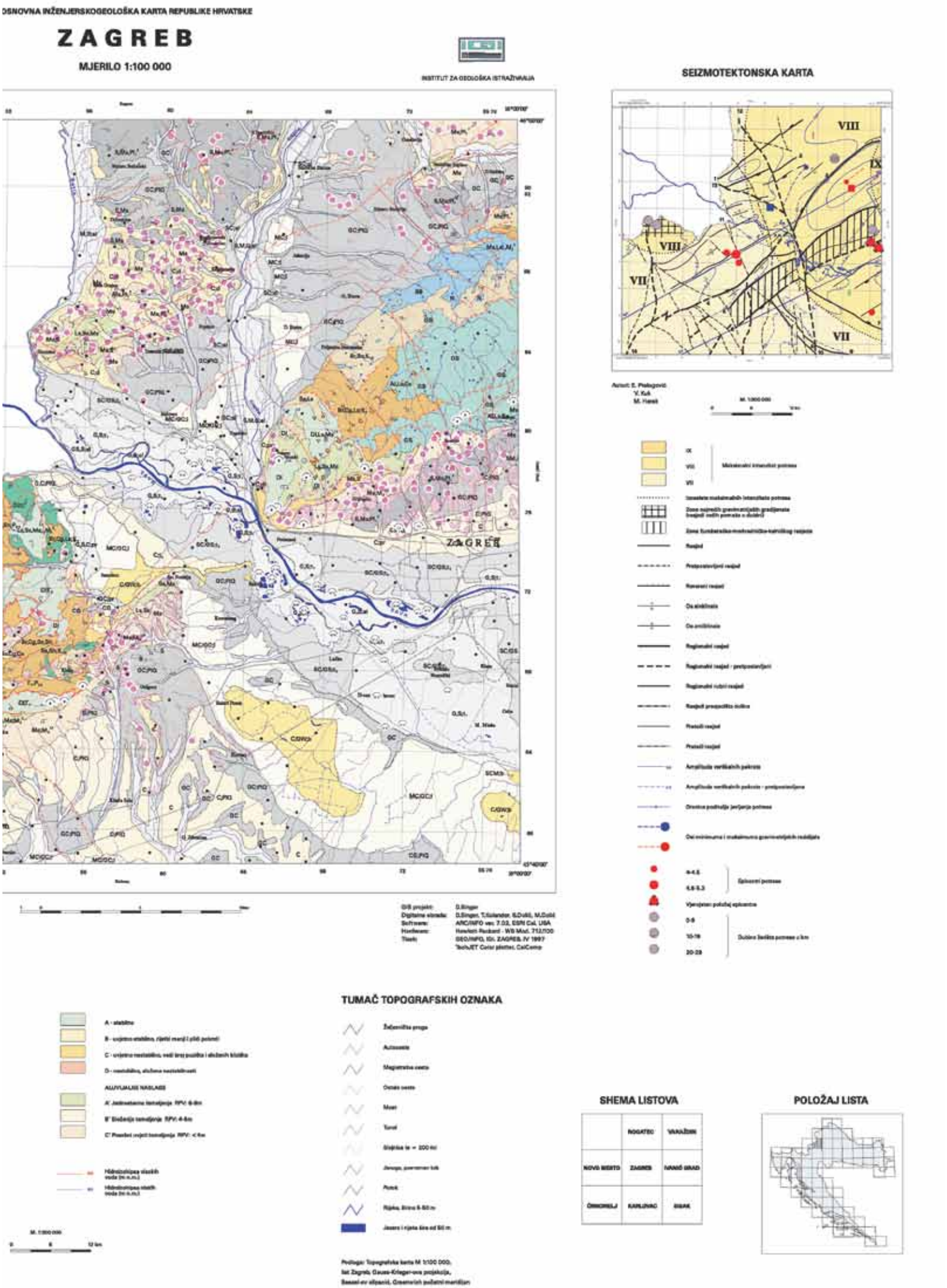


Fig. 8. Basic Engineering-Geologic Map 1:100 000, sheet Zagreb



Sl. 8. Osnovna inženjerskogeološka karta 1:100 000, list Zagreb

specialization, and thus, in 1966, the Institute was reorganized, with the establishing of three professional departments: geology, engineering and hydrogeology, mineralogy-petrography; the department of joint activities was charged with accounting and other services. In 1970, under still unexplained circumstances, the Institute lost its office space in the building in Kupska Street 2. Thus, the headquarters moved to Koturaška Street, while the professional personnel were situated in a prefabricated building in Sutlanska Street which became the property of the Institute, and in several rented flats. Simultaneously, the search for a new location began, where a new building owned by the Institute would be built. Thanks to active engagement of the Institute's management, help of the Ministry, and some lobbying, construction of the present building soon began. The building at the present location was completed in 1972 and in 1978 another floor was added and the building acquired its present-day appearance (Fig. 6).

In the seventies, practical investigations began for the production of specialized maps – hydrogeological (Fig. 7) and engineering-geological (Fig. 8) – at the scale 1:100 000. Regarding mineral resources, a major part of research was directed toward bauxite, coal, and clay. In addition, in the middle of the seventies, systematic geochemical investigations began, supported by acquisition of necessary instruments. In 1977, the Institute changed its name again to *Geološki zavod – Zagreb* (Geologic Institute – Zagreb), but the internal organization remained the same.

The 80-ies were characterized by the beginning of informatization, with special emphasis on graphic and cartographic tools, the final phases of production of the Basic Geological Map 1:100 000, but also the beginning of programming and practical activities concerning a new map, based on lithostratigraphical (formational) principles, which is still being produced with the title Basic Geological Map of the Republic of Croatia at the Scale of 1:50 000. Furthermore, by the end of the 1980s, the principles of methodology and criteria for a geothermal map were defined. In 1988, the Institute changed its name again to *Institut za geološka istraživanja* (Institute for Geological Research). The nineties were primarily characterized by the Homeland War, which introduced several changes into the organization of the working process. Field work was not possible in the occupied part of the territory. A number of employees participated, in different ways, in the defence of the sovereignty of the Republic of Croatia, either as volunteers or mobilized, or members of the Civil Defence, or within the framework of the organization *Croatian Rear Front* by delivering food, medical supplies, etc. to the front line. The Institute helped a lot. Unfortunately, one of the employees, young geologist Ozren Lukić (1965–1992) was killed as a volunteer on Mount Velebit (Kuhta, 1992). However, the nineties will also be remembered for positive events. A leap was made in informatization, supported by the acquisition of up-to-date equipment, and a database began to be established. Cooperation with oil management was expanded, which had a positive effect on the financial situation of the Institute. Hydrogeological research was successful in providing new water resources for waterpower engineering and in preparation for construction of hydroelectric power plants. In engineering geology, the most important projects were related to construction of highways, solving the problem of landslides, and the Danube–Sava canal. Geochemical research was also intensified, by systematic (net-like) sampling of rocks, water course sediments, and soils. *Geološki vjesnik* was printed regularly (yearly) and in 1992 changed its name to *Geologia Croatica* and organized an international editorial board. Perhaps the most important event that took place during that period was the 1st Croatian Geological Congress with international participation which was held in Opatija in 1995, and the bulk of the preparatory and organization work was carried out by employees of the Institute.

During the last period of the century, activities of the Institute was determined by several basic projects of geological mapping defined as being a permanent scientific-investigatory Institute's activity, in addition to programmed scientific thematic projects, international collaboration was intensified, a functioning model of the Geological Survey (as a part of the Institute) was defined, and by the decree of the administrative committee from February 2nd, 2005, the present name became *Hrvatski geološki institut* (in English: Croatian Geological Survey).

On January 1, 2009, the Institute's personnel consisted of 106 employees, including 27 with a PhD degree. The Institute consists of the Department of Geology, Department of Hydrogeology and Engineering Geology, Department of Mineral Resources, Geologic Service with the library and archives of professional documentation, and the Professional services.

The basic projects, included within the program *Geologic Maps of the Republic of Croatia*, are financed by the Ministry of Science, Education, and Sport, consist of the following maps:

- Basic Geologic Map of the Republic of Croatia 1:50 000;
- Basic Hydrogeologic Map of the Republic of Croatia 1:100 000;
- Basic Engineering-Geologic Map of the Republic of Croatia 1:100 000,
- Map of Mineral Resources of the Republic of Croatia;
- Basic Geochemical Map of the Republic of Croatia;
- Geothermal Map of the Republic of Croatia;
- Structural-Geomorphologic Map of the Republic of Croatia 1:100 000;
- Tectonic Map of the Republic of Croatia 1:300 000.

Thematic scientific projects are financed and carried out through scientific programs, and the Institute's employees are engaged, as project leaders, in eight scientific projects.

International cooperation has a long and fruitful tradition in the Institute, and nowadays all departments and the Geologic Service are engaged in a number of international projects. A particularly important fact which should be adequately emphasized is that, since March 26, 2006, the Institute (Survey) has been a full member of the EGS (EuroGeoSurveys), the association of European geological surveys.

During 2009, the Institute celebrated its hundredth anniversary, which was marked by several important events. With financial support of the Ministry of Science, Education and Sport, the *Geologic Map of Croatia 1:300 000* was published, together with explanatory text. It should be emphasized that the map will be distributed to all schools in Croatia and will be used in teaching. In order to solemnly celebrate the founding day of the Geological Commission, July 3, a formal meeting was held in the building of INA-Naftaplin. Also, in connection with the anniversary, a book (monograph) was published under the title *Croatian Geological Survey 1909–2009 – Hundred Years in the Service of the Homeland* (Fig. 9). The book was presented on September 11 at a symposium on the Institute's cooperation with related institutions. During September, a permanent exhibition was arranged in the Institute's

procesa. Na okupiranom dijelu teritorija nije bilo moguće obavljanje terenskih istraživanja. Niz zaposlenika sudjelovao je na različite načine u obrani suvereniteta Republike Hrvatske, i to kao mobilizirani ili dragovoljci, kao članovi Civilne zaštite, a specifičan način je bio u okviru organizacije *Hrvatska pozadinska fronta*, i to dostavljanjem pomoći braniteljima na prvoj liniji fronte. Znatan dio te pomoći donirao je Institut. Nažalost jedan od zaposlenika, geolog Ozren Lukić (1965–1992) poginuo je kao dragovoljac na Velebitu (Kuhta, 1992). Devedesete godine pamtimo i po pozitivnim događajima. Načinjen je odlučan iskorak u informatizaciji nabavkom suvremene opreme, te započeta izrada baza podataka. Proširena je suradnja s naftnim gospodarstvom, što je izravno pogodovalo stabilnom financijskom poslovanju. Uspješno su se odvijala hidrogeološka istraživanja za potrebe vodoopskrbe i pripremu izgradnje hidroenergetskih objekata, a najvažniji projekti inženjerske geologije bili su vezani uz ceste, klizišta i kanal Dunav–Sava. Intenzivirana su i geokemijska istraživanja sustavnim mrežnim uzorkovanjem stijena, vodotočnih sedimenata i tala. Redovito je izlazio *Geološki vjesnik*, koji 1992. godine mijenja naziv u *Geologia Croatica*. Poseban događaj iz tog razdoblja zbio se 1995. godine, kada je u Opatiji održan 1. hrvatski geološki kongres s međunarodnim sudjelovanjem, a glavninu poslova organizacije obavili su zaposlenici Instituta.

Tijekom posljednjeg razdoblja stoljeća djelovanja Instituta definirani su temeljni projekti kao trajna znanstveno-istraživačka djelatnost, programirani znanstveni projekti, intenzivirana međunarodna suradnja, definiran model funkcioniranja geološke službe, a odlukom Upravnog vijeća od 2. veljače 2005. naziv je *Hrvatski geološki institut*.

S danom 1. siječnja 2009. u Institutu je bilo 106 zaposlenika, od toga 27 doktora znanosti. Ustrojbene su jednice Instituta: Zavod za geologiju, Zavod za hidrogeologiju i inženjersku geologiju, Zavod za mineralne sirovine, Geološka služba s knjižnicom i arhivom stručne dokumentacije i Stručne službe.

Temeljne projekte, odnosno Program *Geološke karte Republike Hrvatske* financira Ministarstvo znanosti, obrazovanja i športa, a čine ga sljedeće karte:

- Osnovna geološka karta Republike Hrvatske 1:50 000
- Osnovna hidrogeološka karta Republike Hrvatske 1:100 000
- Osnovna inženjerskogeološka karta Republike Hrvatske 1:100 000

Fig. 9. Cover of the book published on the occasion of 100 years of the Institute

Sl. 9. Naslovnica knjige izdane prigodom 100-te obljetnice Instituta

- Karta mineralnih sirovina Republike Hrvatske
- Osnovna geokemijska karta Republike Hrvatske
- Geotermalna karta Republike Hrvatske
- Strukturno-geomorfološka karta Republike Hrvatske 1:100 000
- Tektonska karta Republike Hrvatske 1:300 000

Znanstveni projekti financiraju se i izvode kroz znanstvene programe, a zaposlenici Instituta trenutačno vode osam znanstvenih projekata.

Međunarodna suradnja ima dugu tradiciju u Institutu, a danas svi zavodi i Geološka služba sudjeluju u nizu međunarodnih projekata. Posebno treba istaknuti da je Institut 26. ožujka 2006. postao punopravni član EGS (EuroGeoSurveys), udruge europskih geoloških službi.

Tijekom 2009. obilježavala se stota obljetnica Instituta, a spomenut ćemo značajnija događanja. Potporom Ministarstva znanosti, obrazovanja i športa publicirana je *Geološka karta Republike Hrvatske 1:300 000* s tumačem. Posebno treba naglasiti da će karta biti distribuirana svim školama u Hrvatskoj i koristiti se u nastavi. Na dan osnutka Geološkog povjerenstva 3. srpnja održana je Svečana akademija u dvorani INA-Naftaplina. Prigodom jubileja izdana je knjiga *Hrvatski geološki institut 1909.–2009. – Sto godina u službi domovine* (sl. 9). Promocija knjige održana je 11. rujna u sklopu Skupa o suradnji Instituta sa srodnim organizacijama. Tijekom rujna završeno je postavljanje trajne izložbe u ulaznom prostoru Instituta, koja sadrži karakteristične stijene, fosile i mineralne sirovine s područja Hrvatske. Posebno treba spomenuti da je Institutu povjerena organizacija Generalne skupštine EGS-a, koja je održana u Zagrebu od 13. do 17. listopada 2009.

3. Zaključak

Stoljeće djelovanja Hrvatskoga geološkog instituta važan je događaj za naše prirodoslovlje, a posebno za geološku struku. Institut je sljednik Geologijskog povjerenstva za Kraljevine Hrvatsku i Slavoniju ustrojenog 1909. godine. Posebnu ulogu i zasluge za osnivanje Povjerenstva imao je Dragutin Gorjanović-Kramberger, svjetski poznati geolog i paleoantropolog.

Djelovanje Povjerenstva – Instituta u proteklih sto godina odvijalo se zapravo u kontinuitetu, unatoč čestim nepovoljnim utjecajima kao što su ratovi, promjene državnih uređenja te pritisci s političkom pozadinom. S druge strane konstanta djelovanja bila je *proučavati i publicirati*, što je navedeno u Naredbi o ustroju iz 1909. godine.

Tijekom stoljeća djelovanja nepobitan je utjecaj Instituta na razvoj geološke znanosti u Hrvatskoj, ponajprije kroz suradnju sa srodnim organizacijama u domovini i inozemstvu te poticaj za razvoj specijalističkih disciplina. Posebno treba istaknuti tri oblika djelovanja Instituta, a to su *geološko kartiranje*, *primjena geologije u praktičnim istraživanjima* i *izdavaštvo*. Geološko kartiranje je i danas temeljna djelatnost Instituta, a čini ju Program *Geološke karte Republike Hrvatske*, koji uz Osnovnu geološku kartu 1:50 000 čini još sedam tematskih karata. Primjena geološke znanosti nezaobilazna je u geotehničkim zahvatima, rješavanju vodoopskrbe, istraživanju i pridobivanju svih korisnih sirovina te zaštiti okoliša. Izdavačka djelatnost pratila je djelovanje Povjerenstva – Instituta, a glavninu izdanja čine periodične publikacije, knjige i kongresna izdanja.

Obilježavanje stote obljetnice Instituta odvijala se tijekom cijele 2009. godine nizom događanja. Izdana je Geološka karta Republike Hrvatske 1:300 000 s tumačem, održana Svečana akademija, izdana prigodna knjiga, postavljena stalna izložba u zgradi Instituta, održan je prigodni skup o suradnji Instituta sa srodnim organizacijama i fakultetima u zemlji i inozemstvu, a sredinom listopada održana je u Zagrebu Generalna skupština Europskih geoloških službi (EGS).

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entrance hall, displaying characteristic samples of rocks, fossils, and minerals of Croatia. Finally, it should also be emphasized that the organization of the General Annual Assembly of the EGS (EuroGeoSurveys), the association of European geological surveys, was entrusted to the Institute and was held in Zagreb from October 13 to 17, 2009.

3. Conclusion

The hundredth anniversary of the Croatian Geological Institute (Croatian Geological Survey) is an important event for Croatian natural science, particularly for the geological profession. The Institute is the successor of the Geological Commission for the Kingdoms of Croatia and Slavonia founded in 1909. The most important role and the greatest merit for the establishing the Commission goes to Dragutin Gorjanović-Kramberger, eminent geologist and world-famous palaeontologist.

The activity of the Commission – Institute (Survey) during the past hundred years was practically continuous, in spite of rather frequent negative circumstances, such as wars, changes in governmental structure, and pressures with political background. On the other hand, the Institute was constantly active in studying and publishing, according to the founding Decree from 1909.

During a hundred years of activities, the Institute had an indisputable influence on the development of geology in Croatia, primarily through cooperation with related organizations in Croatia and abroad, and stimulated the development of specialist disciplines. Three aspects of the Institute's activity should be particularly emphasized: geological mapping, application of geology in practical research, and publishing activity. Geological mapping is still the Institute's basic activity, within the program *Geologic Maps of the Republic of Croatia*, which, in addition to Basic Geologic Map of Croatia 1:50 000, includes seven more thematic maps. Application of geology is indispensable in all geotechnical actions, in solving problems of water supply, in exploring and exploiting all useful resources, and in environmental protection. Publishing activity has continuously accompanied Institute's other activities, a major part of publications including periodicals, books, congress (symposium) proceedings, and geological guides.

The hundredth anniversary of the Institute was marked by different events during the entire 2009. The most important among them were: publication of the Geological Map of Croatia 1:300 000 with explanatory text; a formal meeting was held, a book (monograph) was published, a permanent exhibition was opened in the Institute's building, a symposium on cooperation between the Institute and related institutions and faculties at home and abroad was organized, and, finally, in mid-October, the General Assembly of the Association of the European Geological Surveys was held in Zagreb.

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