

by E.E. Milanovsky

Three sessions of the International Geological Congress held in Russia and the USSR (1897, 1937, 1984)

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Editorial note—*The International Commission on the History of Geological Sciences has undertaken to organize a series of short articles for Episodes on the history of the different Sessions of the International Geological Congress. These were held as follows: France (1878), Italy (1881), Germany (1885), UK (1888), USA (1891), Switzerland (1894), Russia (1897), France (1900), Austria (1903), Mexico (1906), Sweden (1910), Canada (1913), Belgium (1922), Spain (1926), South Africa (1929), USA (1933), USSR (1937), UK (1948), Algeria (1952), Mexico (1956), Denmark/Finland/Norway/Sweden/Iceland (1960), India (1964), Czechoslovakia (1968), Canada (1972), Australia (1976), France (1980), USSR (1984), USA (1989), Japan (1992), China (1996), Brazil (2000). Any authors wishing to offer contributions on the meetings in Mexico (1906), Canada (1913), Belgium, Denmark, India, Canada (1972), and Brazil are invited to contact the INHIGEO Secretary-General at: doldroyd@optushome.com.au. The papers will not appear in chronological order.*

The first session of the International Geological Congress (IGC) held in Paris in 1878 (Ellenberger, 1978), brought together geologists from many countries. The number of countries represented gradually increased from 20 to 27 during the seven congresses held before the end of the nineteenth century; from 30 to 50 between Sessions 8 to 17, held during first forty years of the twentieth century before the Second World War; and from 80 to over 100 countries between Sessions 18 and 31, held after the War. Correspondingly, the number of delegates increased from 200 to 700 between Sessions 1 and 7; from 300 to 950 between Sessions 8 and 17; and from 1100 to 5000 between Sessions 18 and 31.

Sessions have been held in 22 countries and on all continents. In three countries—England, Canada, and Mexico—meetings have been conducted twice; and in three other countries—France, USA and Russia (later USSR)—three times. The preference for these countries was related to their relatively high level of development of geological science, their active participation in the work of all IGC sessions, the complexity and interest of the geological structure of their territories, suitable for the organization of interesting and thematically diverse excursions; and, for France, as the country where the first IGC was held. The present comparative description, within the framework of a single paper, of the three IGC sessions conducted in Russia, with intervals of 40 and 47 years, gives a good opportunity to show the changes in the activity of the IGC in the development of geological science through a period of about a hundred years.

At the 6th IGC Session in Zurich in 1894, the offer by the leader of the Russian delegation, A. P. Karpinsky, to hold the next meeting in Russia was accepted (Milanovsky, 1984). This 7th Session was held in the country's capital, St. Petersburg, from 17 to 24 August, 1897, under the guidance of its President—Academician Karpinsky, and with Academician F.N. Tchernychev and Dr. K.B. Focht as Secretaries-General¹. The session attracted an unprecedented number of participants—1037 geologists, from 27 countries. (For comparison,

the numbers at the previous sessions increased from 310 to 830). There were personally present 704 geologists (for comparison, the numbers at the proceeding sessions increased from 224 to 422). The number of foreign participants from many countries of Europe, Asia, North and South Americas, Australia, and New Zealand reached 629 (though only 461 actually attended in person). There were 338 Russian participants (with 243 personally present).

The meetings were held in the Great Hall of the Zoological Museum of the St Petersburg Academy of Sciences. At the opening ceremony, delegates were welcomed by the President of the 2nd IGC Session in Bologna, the Italian geologist G. Capellini, Academician Karpinsky, the President of the Russian Geographical Society, P.P. Semenov-Tianshansky, and by the Professor of Geology at Moscow University, A.P. Pavlov.

At the general (plenary) sittings of the Congress there was discussion of the principles and rules of stratigraphic nomenclature and classification, and principles for eruptive rocks. Prominent geologists of the day such as K. Zittel, E. Renevier, C. Depéret, M. Bertrand, A. de Grossouvre, F. Sacco, D. Diener, A.P. Karpinsky, F.N. Tchernychev, A.P. Pavlov, F.Yu. Löwinson-Lessing, and A. Lagorio were involved in the discussions. Reports were heard from the commission on the geological map of Europe (E. Renevier, F. Beischlag, M. Bertrand); on geological bibliography (F.N. Tchernychev); and also from the International Commission on the study of glaciers (F. Forel, M. Fichter). As at the previous Zurich IGC, four thematic sections were held, devoted to discussion of problems of general geology (orogeny, evolution of climates, etc.); petrography and mineralogy; stratigraphy and palaeontology; and applied geology and geophysics. The issues were treated in 22 papers by foreign and Russian scientists in the Congress's *Proceedings*. These were published in 1899, partly in French. Included in the volume was the important monograph by F.Yu. Löwinson-Lessing: *Researches on Magmatic Rocks* (in Russian).

At the closing session, at the suggestion of the French palaeontologist A.G. Godri, it was decided that an appeal should be made to the governments of all countries that had participated in the Congress to introduce the teaching of geology in the senior classes of middle schools. Soon after, geology was introduced to the curriculums in France and Romania, and later in some other countries. But geology and mineralogy were taught in the Year 10 classes of schools in the Soviet Union only in the second half of the 1930s and the early 1940s.

The beginning of the 7th Session was overshadowed by a distressing event. During his journey through the Caucasus region in connection with the preparation of a post-Congress excursion, a young and talented Russian geologist of Armenian origin, Leonid A. Spendiarov (1869–1897), fell from his horse and received severe head injuries. In spite of his condition, he returned to St Petersburg and found sufficient strength to be present at the Congress's opening ceremony, but on the evening of the same day he suddenly died. The father of the deceased scientist suggested to Karpinsky that his son's

¹ Congrès géologique international. Compte rendu de la VII session. St Petersburg, 1887, 1899. St Petersburg.

memory should be preserved by the establishment of a fund named the 'Spendiarov Prize' (Tigranyan, 1970)¹. It was decided to award it at each congress to a scientist of any nationality judged to have performed the best work in the field of geology. The sum would be the interest accumulated during the period between two congresses on the 4000 roubles deposited by Spendiarov's relatives in the State Bank of Russia (permanent deposit No. 33318).

This proposal was accepted with gratitude at the closing sitting of the Congress and from the following 8th Session the Spendiarov Prize was awarded to outstanding geologists of different countries according to the decision of the Congress, which, according to an adopted regulation, should include a representative from Russia (or the USSR in the 1920s–1980s). The prize has been awarded to scientists from Russia or the USSR four times².

As with the preceding meeting, the 7th Session of the IGC was accompanied by pre- and post-congress excursions, in which almost three hundred people participated (Figure 1). A detailed and very good illustrated guidebook of 700 pages was prepared in French, with a coloured geological map of the European part of Russia on a scale of 1:6,300,000, specially published for the participants. For many years, this became foreign scientists' main source of information on the geology of European Russia, Urals and Caucasus³. Before the congress, there was a 30-day excursion to the Ural Mountains, along a route that set out from Moscow and its environs to: R'azan (on the Oka River)–Penza–Syzran and Samara (on the Volga River)–Miass–Zlatoust–Tcheljabinsk–Ekaterinburg–Nizhny Tagil (in the Urals)–Perm (on the Kama River to the west of the Urals)–Kazan–Nizhny Novgorod (on the Volga). Additionally, there was a

two-week excursion through Estonia and a one-week one through Finland; and during the session there were short excursions in the environs of St Petersburg and to the Imatra waterfall in Finland.

After the meeting, there was first a joint three-day excursion in the environs of Moscow. Then the excursionists were divided into three groups. One group went south through Kursk to the Donetz coal basin. The second went by steamer along the rivers Moskva, Oka, and Volga down to its mouth at Astrakhan, along the Caspian Sea to Petrovsk (now Machačkala), and then along the northern slope of the Great Caucasus to Vladicaukaz city. The third group travelled to Kiev and then along the right side of the Dnieper River in the Ukraine. The participants of the different groups linked up in the region of Caucasus mineral waters and visited the region close to the extinct volcano, Elbrus, crossed the Great Caucasus ridge along the Military-Georgian road, visited many places of Transcaucasia (Azerbaijan, including Baku city; Armenia—up to Ararat volcano; and Georgia, including Tiflis, Borjom, Kutais, and Batum). They then crossed the Black Sea by steamship to the Crimea Peninsula, and visited its southern coast from Sudak, on the eastern side, to Yalta and Sevastopol, on the western side. The excursion finished in Odessa. All together, the scientific activities connected with the 7th Session of the IGC lasted for two and a half months.

According to the report of the Russian *Geolcom*, the 7th Session was an outstanding success, which surpassed the hopes and expectations of its organizers. In comparison with previous sessions, the scope of the geological excursions and their duration and organization were striking, as was the quality and size of the published

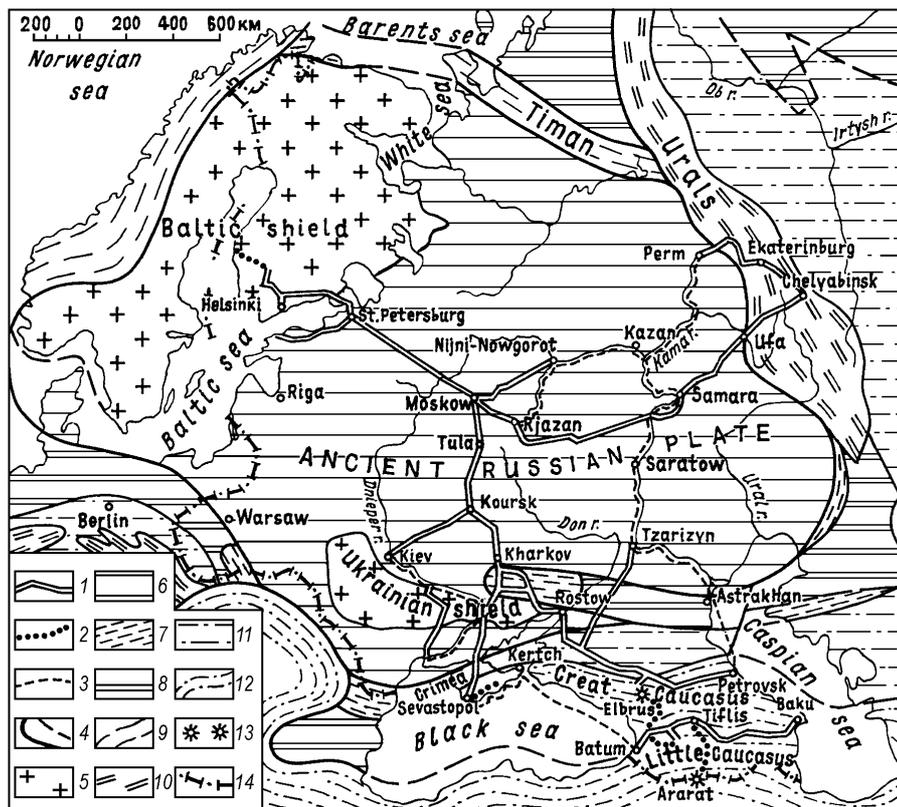


Figure 1 Geological excursions for the 7th IGC (1897).

1. Excursions by special trains; 2. By carriages; 3. By rivers and sea; 4. The borders of the ancient East European platform; 5. Its shields; 6. Its Russian plate; 7–8. Metaplateau regions, transitional between ancient platforms and mobile belts: (7) fold zones of Baikalian (Timan, etc.), Caledonian and Hercynian (Middle Polish zone, Dobrudja), Hercynian (Donetz Basin) etc.; (8) areas with plate cover (Middle European, Moesian, Donetz–North Ustjurt, Pechora–Barents Sea areas); 9. Scandinavian Caledonian fold system of the North Atlantic mobile belt; 10. Hercynian fold systems of the Ural–Mongolian (Urals) and Mediterranean (in Western Europe) mobile belts; 11. Young (Epihercynian) plates (West Siberian, etc.); 12. Alpine fold systems of the Mediterranean mobile belts (Crimean, Caucasus, etc.); 13. The major volcanic mountains of the Caucasus and Armenian highlands; 14. State boundaries of Russia in 1897.

1 Leonid Spendiarov's younger brother Alexander (1871–1928) became a famous Armenian composer. Leonid also possessed musical abilities. Simultaneously with the study of geology at Moscow and Dorpat Universities he studied the cello and singing at the conservatoire and sang at the musical soirées in the home of A. P. Karpinsky.

2 At the 8th Session of IGC (Paris, 1900), when this prize was to be presented for the first time, it was intended to be awarded to A. P. Karpinsky. But he, while receiving the honours, declined the money, so the Committee of the IGC awarded it to the Portuguese geologist P. Choffa. For the 9th, 10th, 11th, and 12th Sessions, the Prize was awarded to W. Brøgger (Norway), F. N. Tshernyshev (Russia), J. Clark (USA), and E. Argand (Switzerland) respectively. The Prize was not awarded at Sessions 13 and 14, post-War. At the 14th Session in Spain, the Soviet delegation informed the IGC of its decision to leave the capital of the prize to be at the disposal of IGC. The award was renewed and a tradition was established of awarding the prize to a geologist of the country where the previous Session was held.

3 International Geological Congress, 1897, Guide des excursions du VII Congrès Géologique International, avec 39 planches, nombreuses figures, cartes locales et une carte de la Russie d'Europe à l'échelle de 1:6,300,000. St Petersburg.

guide-book. The President A.P. Karpinsky received hundreds of enthusiastic and grateful letters from foreign participants.

After the 7th IGC session, there were five more meetings before the beginning of the First World War. After the War the activities of the IGC were renewed and the next four sessions were held in Belgium (1922), Spain (1926), South Africa (1929), and the United States (1933). At the 16th session, in Washington, the head of the Soviet delegation, Academician I. M. Goubkin, on behalf of the Government of the USSR, proposed that the next session should be held in the USSR in 1937; and this invitation was accepted. The Organizing Committee, formed in the Soviet Union, was headed by Academician A.P. Karpinsky and its President, Academician Goubkin. Together with the Vice-Presidents, Academician A.A. Borissyak and Academician V.A. Obrutchev, and the Secretary-General, Academician A.E. Fersman, they began the preparation of the meeting. A geological map for all territories of the USSR on the scale 1:5,000,000 (with several 'white spots' for some not yet studied territories in northeast Siberia) was compiled and published for the first time, ready for the opening of the 17th Session. Copies were distributed to all participants at the Congress, which was held in Moscow from 21 to 29 June, 1937. It was one of the first such large-scale, crowded international scientific forums conducted in the Soviet Union.¹

Gathered in Moscow were 949 geologists from 50 countries (711 from USSR and 238 from abroad), and the overall number of participants reached 2963—twice as many as were present at the previous largest meetings of the IGC in St Petersburg (1037), Madrid (1123) and Washington (1182). Among the foreign colleagues were present such outstanding scientists as E. Bailey, G. Tyrrell (England), P. Fourmarier (Belgium), S. Czarnocki (Poland), I. Högbom, E. Norin, and N. Magnusson (Sweden), P. Escola (Finland), K. Zapletal (Czechoslovakia), O. Dalinkevicius (Lithuania), W. Waterschoot van der Gracht (the Netherlands), F. Blondel, H. Termier, J. Goguel, S. Jakob (France), A. Heim (Switzerland), L. Picard (Palestine), J. Fromaget (Indochina), W. Bucher, G.M. Kay, C. Dunbar, H. Hess and B. Willis (USA), A. Du Toit and S.H. Haughton (South Africa), and many others. Two hundred foreign scientists and scientific organizations participated, in addition to the Congress members.

Academician I.M. Goubkin, a specialist in petroleum geology and Head of the Geological Survey of the USSR, was elected Congress President, while the famous mineralogist and geochemist Academician A.E. Fersman was elected Secretary-General.

Abstracts of about 390 presented papers were published (in English and Russian) in time for the opening of Congress.² For the plenary sittings in the Great Hall of the Moscow Conservatorium a series of papers by leading Soviet and foreign scientists was delivered. Academician Goubkin presented generalized data on global oil resources. M.M. Prigorowsky characterized the coal-bearing provinces and basins of the USSR. G.W. Tyrrell considered the problem of the relations between magmatic geology and radiogeology and its importance for the contemporary geology. Academician A.D. Arkhangelsky spoke on the geological results of magnetometric and gravimetric work in the USSR. M.M. Tetjaev addressed the geotectonics of the Soviet part of Asia, while the Belgian, P. Fourmarier, analyzed the problem of the origin and development of schistosity in folded complexes.

Most of the papers were presented and discussed at sittings of the ten Congress Sections (on oil; coal; the Precambrian; the Permian System; the connections between tectonics, magmatism and ore deposits; the tectonic problems of Asia; problems of geochemistry; the use of geophysical methods in geology; the geology of the Arctic regions; and some miscellaneous topics), and also at a symposium on palaeoclimates. Altogether about 230 papers were heard and discussed. There were also the sittings of the different commis-

sions of the Congress and other international geological organizations. The Congress Council discussed the proposal of the Soviet delegation for the recognition of Russian as one of the official Congress languages, like French, English, and German, as well as Spanish and Italian, which were recognized as official at the 14th Session in Madrid. It was decided to recognize Russian as an official language at the next IGC, and the question of the inclusion of Russian among the permanent official languages of Congress was put on the agenda for the 18th Session. It was decided to hold that meeting in England in 1940 (though in fact, because of the War, it was only held in 1948). The Spendiarov Prize for the Moscow Session was awarded to the Soviet geologist Dr V.P. Baturin for his work on the lithology of the oil-bearing Middle Pliocene deposits in the Eastern Caucasus and the palaeogeography of that time in the Caspian basins.

A series of exhibitions on the geology and mineral deposits of the Soviet Union was also organized during the 17th Congress. The most important ones were held in the halls of the Moscow Conservatorium; the others in the geological and mineralogical museums of the Moscow Geological Prospecting Institute and in the basement of the mineralogical and palaeontological museums of the Academy of Science of the USSR, which were constructed at that time. The Head of the Soviet Government, V.M. Molotov, hosted a formal reception for the Congress participants in the Moscow Kremlin.

More than 10 pre- and post-congress excursions were organized in different regions of the Soviet Union. Unlike the 7th Session, they embraced not only the East-European platform, Crimea, Caucasus and Urals, but also several regions of Siberia and the Soviet Arctic and Subarctic (see Figure 2). More than 25 guidebooks in Russian and English were prepared and issued to the participants³. These excursions, with the exceptions of the 3-day excursions in the environs of Moscow and Leningrad, lasted from 20 to 30 days. In all, the excursions attracted 470 foreign and Soviet geologists. Before the Congress there were the Northern excursion (Leningrad–Karelia–Kola Peninsula); the Southern excursion (Donetz coal basin–Crimea–Nikopol manganese deposits–the Ukrainian shield and feriferous Krivoj Rog Basin–Kiev); the Caucasus excursion (the region of Caucasus mineral waters–the Military-Georgian road–Armenia–Georgia–the Black Sea coast of Caucasus, and a traverse through the western part of the Greater Caucasus); and the Permian excursion (Kuibyshev, for the Uralian depression–the western slopes of Urals in the Bashkirian and Permian regions–Kazan). The intended Volga excursion (along the rivers Moskva–Oka and Volga) had to be cancelled, but the guidebook for this excursion was published (Figure 2)

After the congress, there was the *Oil excursion* (Permian and Bashkirian for the Uralian depressions–Kuibyshev [= Samara] on the Volga–Caucasus mineral waters–Grozny–Dagestan–Baku–Tbilisi–Kakhetia–Suchumi–Tuapse–Maikop–Taman); the *Siberian excursion* (Central Urals–Novosibirsk– the Kusnetski coal basin–Krasnojarsk–Minusinsk–Bashkirian Urals); the *Novaja Zemlya excursion* (by steamship) (Arkhangelsk–the coasts of the southern and northern islands of Novaya Zemlya–Murmansk); and the *Moscow excursion* (Moscow and its environs–Tula–Alexin–Jasnaya Polyana–Serpukhov–Podolsk). In addition, there were short excursions to *Leningrad and its environs* and along the *Moscow–Volga channel*.

After the 17th Session, during 1939–1941, six volumes of the *Proceedings* were prepared and issued in English and Russian.⁴ With its numerous well prepared and organized excursions, and associated books and maps, the 17th Session demonstrated to the international scientific community the considerable success achieved by Soviet geologists following the October Revolution in the regional study of the territories of the USSR, in the discovery of its mineral resources,

1 International Geological Congress, 1939–1941, Report of XVII Session. USSR, 1937. 6 vols, Moscow (in Russian and English).

2 International Geological Congress, 1937, XVII Session, USSR, 1937. Abstracts of Papers. Moscow & Leningrad (in Russian and English).

3 International Geological Congress, 1937, XVII Session, USSR, 1937. Excursion guide-books, Moscow.

4 See Note 8. Volume 3, in Russian, was not published because of aggression of Nazi Germany against Soviet Union in June 1941, which was followed by the four terrible years of the Great Patriotic War, as it is called in Russia..

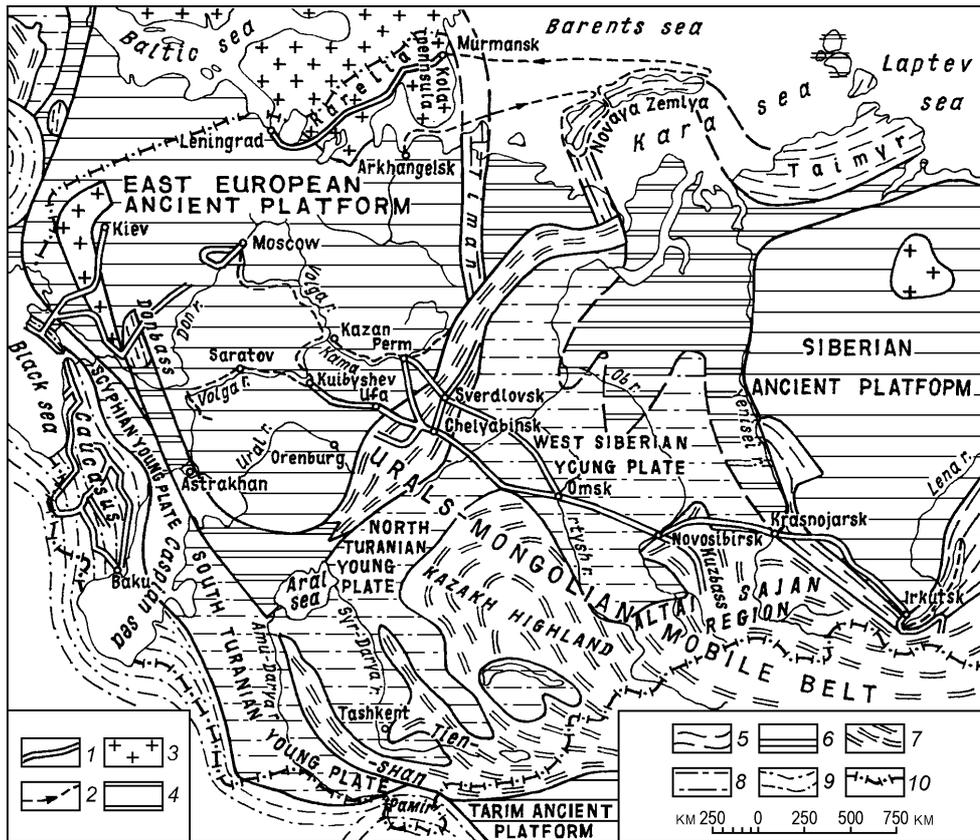


Figure 2 Geological excursions for the 17th IGC (1937)

1. Routes of excursions by special trains and buses;
2. The same by the rivers and sea;
3. Shields of ancient platforms;
4. Plates of ancient platforms;
5. Fold zones of metaplatforms;
6. Plate cover of metaplatforms;
7. Palaeozoic fold systems of the Ural–Mongolian mobile belt;
8. Young (Epihercynian) plates on the Palaeozoic folded basement of Ural–Mongolian and Mediterranean mobile belts;
9. Alpine fold system;
10. The state boundaries of the USSR in 1937.

and the elaboration of the many important theoretical problems in geoscience.

At the same time, it must be recalled that this session was held in 1937 — the year of the most cruel mass persecution of the Soviet people, motivated by ruler Stalin and carried out by the Government's repressive organs with the purpose of unmasking so-called 'enemies of the people'. This campaign of terror gave birth among the country's masses to a fear of contacts with foreigners and suspicious treatment of them, which was reflected in the atmosphere of the Congress's sittings and excursions. In this situation, a number of Soviet Congress participants were, sometimes at the last moment, refused permission to participate in the interesting excursions, and some of them, who, in connection with their work, maintained contacts with foreign colleagues, were arrested during the Congress or immediately afterwards (for instance, this happened to the outstanding Russian geologist Yu.M. Sheinmann). This situation, well remembered by the author of this paper, at that time a teenager and son and nephew of two active Soviet participants of the 17th Session—Professors E.V. Milanovsky and A.N. Mazarowitsch—was strikingly different from the atmosphere of the 7th Session in St Petersburg in 1897 as well as that of the subsequent 27th Session in Moscow in 1984, where I actively participated as a member of its Organizing Committee and was author of several papers, convener of a symposium, and scientific leader of one of the well-attended and lengthy Crimea-Caucasus excursions.

After the 17th Moscow Session, the work of the IGC was interrupted because of the Second World War and was only renewed in 1948 at the 18th Session in London. There followed the 19th Session in Algiers (1952), the 20th in Mexico (1956), the 21st in Copen-

hagen (1960), and the 22nd in New Delhi (1964). As is well known, the 23rd Session in Prague (1968) was broken off because of the introduction into Czechoslovakia of Warsaw Treaty troops (Romania excepted). More successfully, the 25th Session was held in Sydney (Australia) in 1976 and the 26th in Paris in 1980, where it was announced that the next session would, on the invitation of Soviet delegation, be held in Moscow in 1984.

Soon afterwards, intensive preparations for the 27th Session started. Academician A. V. Sidorenko, Vice President of the Academy of Science of the USSR, was chosen as President of the Organizing Committee, with Professor N. A. Bogdanov as Secretary-General. But a year later Academician Sidorenko tragically perished in Algeria and the guidance of the Organizing Committee was entrusted to the Minister of Geology of the USSR, Professor E. A. Koslovsky, who organized the preparation of the 27th Session of the IGC most admirably.

Before the Congress opened, its Scientific Programme in 10 volumes, with abstracts of papers¹, 6 volumes of conference papers to be presented at colloquia in English and Russian², 22 volumes of papers to be presented for sections in Russian³, and 50 excursion guidebooks in English and Russian⁴ were prepared. A collection of selected papers in English, in 23 volumes, was published in The Netherlands⁵. These publications enabled the participants to become acquainted in good time with the problems set down for discussion at the Congress and the associated excursions.

The huge Congress programme, including more than 3000 papers, was accomplished at the sittings of the 22 sections, 47 symposia, and 6 colloquia, and also the 10 symposia of the international programme, 'Lithosphere', and many other international geological organizations⁶. Before the opening session, Professors Kozlovsky

1 27th Session of the International Geological Congress. Moscow, 1984. Abstracts of Papers, 10 volumes (in Russian and English).

2 27th Session of the International Geological Congress. Moscow, 1984. Conference Papers, 6 vols (in Russian and English).

3 27th Session of the International Geological Congress, Moscow, 1984. Papers to be Presented at Sections, 22 vols, Moscow, 1984 (in Russian).

4 27th Session of the International Geological Congress. Moscow, 1989. Guide-books for the Geological Excursions 1984, 50 vols, Moscow (all in Russian and English).

5 27th Session of the International Geological Congress. Moscow, 1984. Selected Papers, 23 vols. Printed in The Netherlands (in English). 1984.

6 27th International Geological Congress, 1984. Moscow, 4-14 August, 1984. Congress Programme, The Organizing Committee, Moscow (in Russian and English).

and Bogdanov were elected as President and Secretary-General respectively by the Council of the IGC.

The opening ceremony took place on 4 August, 1984, at the Kremlin Congress Palace. Professor Kozlovsky was greeted warmly by the delegates from 110 countries. He informed them that about 5700 scientists, including 2908 guests from abroad, were taking part in the Congress. Of these, 2248 were principal delegates and student members, 286 were accompanying persons, and 374 registered but were unable to attend. Representatives of the Soviet Government, the Moscow Council, UNESCO, and the Academy of Science of the USSR welcomed the participants and wished them success in their work.

The working part of Congress started with the General Assembly of the 27th Session, which was opened by the President of the preceding 26th Session of the IGC: Professor J. Aubouin (France). Then the President of 27th Session, Professor E.A. Kozlovsky, spoke, followed by the President of the International Union of Geological Sciences, Professor E. Seibold (FRG), who had given a survey of the modern state of geology and tendencies in its development.

The first plenary session, devoted to recent achievements in geology, was held on 5 August in the Soviet Information Centre (Sovincenter). It was chaired by Professor Seibold and Academician V.V. Menner, President of the National Committee of Soviet geologists. Professor Kozlovsky spoke on 'Geology in the national economy of the USSR'. Professor W. Hey (USA) discussed 'The past and future of Scientific Ocean Drilling'. A Corresponding Member of the USSR Academy of Sciences V.L. Barsukov and Professor H. Masursky (USA) presented a talk on 'Comparative planetology in Earth history studies'. The paper by Professor R. Price (Canada) was on the 'Dynamics and evolution of the lithosphere: The framework for earth resources and the reduction of hazards'. Academician E.M. Sergeev (USSR) spoke on 'Advances in science and technology and the environment', and M. Halbouty (USA) on 'The world's oil and gas basins and new discoveries'.

The second plenary session was also held in the Sovincenter on the final day of Congress (1 August). It opened with a paper by Professor Kozlovsky: 'Geological problems of the protection of the environment'. There followed papers by Academician A. L. Yanshin (USSR) ('Problems of the evolution of geological processes in Earth history'), J. Castani (France) ('Development of water resources and environmental problems'), G. Lüttig (FRG) ('The influence of mining activities on the environment'), L. Königsson (Sweden) ('Urban agglomerations and geological environment'), and J. Vrba and B. Moldan (Czechoslovakia) ('The Complex utilization of natural resources and the geological environment').

In his closing address, Deputy Secretary-General of the United Nations, Dr. M. Tolba, expressed the hope that all countries would support the ideas put forward at the second plenary session and take all necessary measures to protect our planet Earth.

Most of the scientific sittings of sections, symposia and colloquia of the 27th Session took place from 6 to 13 August in the new buildings of Moscow State Lomonosov University on the Lenin Hills (now the Vorobjevy Hills), in its Great Assembly Hall, which accommodated 2000 persons, in two large lecture halls (each holding 600 listeners), and in the numerous lecture rooms of the Geological and Geographical Faculties, holding from 250 to a few dozen people. Altogether, the programmes included about 4,500 papers. They were chiefly presented by scientists from the USSR (more than 1400), USA (over 300), the Peoples' Republic of China (over 200), India (over 100), and Australia, the FRG, Canada, Czechoslovakia, the United Kingdom, Bulgaria, the GDR, Poland, Hungary, and Romania (between 50 and 100).

The sittings of the sections, colloquia, and symposia may be grouped by their themes in thirteen main categories: (1) comparative planetology and cosmochemistry; (2) geology of continents; (3) geology of the oceans; (4) remote sensing of the Earth; (5) geophysical researches; (6) super-deep drilling of the Earth's crust; (7) petrology, mineralogy, and geochemistry; (8) mathematical geology; (9) energy resources; (10) mineral deposits and mineralogeny; (11) hydrogeology and engineering geology; (12) geological problems of

environmental protection; (13) history of geology and geological education. Overall four large groups of scientific problems were discussed: (1) the Earth's geological structure, origin, and development; (2) problems of providing mankind with sources of energy and mineral raw materials; (3) problems of engineering geology in relation to large-scale constructions; (4) geological problems of protecting the natural environment, including both conservation of the Earth's surface and underground features such as limestone caves.

Simultaneously with the scientific sittings, from 3 to 13 August, the Moscow exhibition complex Krasnaya Presnja held two international exhibitions: 'Geological and Geophysical Equipment, Devices and Instruments' and 'Maps and Geological Books' (Geokarta-84). The products of 149 firms, enterprises, and organizations from eighteen countries, the large exhibition of geological cartography from fifteen countries (in all 266 maps and atlases) and the display of the latest geological literature (800 books published in different countries in the years 1981-1984), which reflected geological research undertaken in Britain, Bulgaria, Canada, China, Cuba, Czechoslovakia, East Germany and West Germany, Finland, France, Hungary, Iran, Israel, Italy, Japan, Mozambique, Poland, The Netherlands, the Soviet Union, the United States, and some other countries, as well as the results of the activities of different international geological and other organizations. More than 25,000 people, including most of the Congress participants, distinguished guests, as well as many diplomats and journalists, visited these exhibitions.

An extensive social and cultural programme was prepared for the Congress participants, accompanying persons, distinguished guests, and accredited journalists. It included numerous excursions through Moscow and its environs, visits to many natural science, art, and historical museums and exhibitions, particularly the mineralogical and palaeontological museums of the Academy of Sciences, the geological museums of the Moscow Geological Prospecting Institute, the Earth Science Museum of Moscow University, the Tretyakov Gallery of Russian art, the Pushkin Museum of foreign art, the historical museums, etc., many Moscow scientific institutes, and the educational institutions with the highest of geological profiles (the Geological Faculty of Moscow State University, the Moscow Geological Prospecting Institute, the Moscow Mining Institute, the Moscow Institute of Oil and Gas Geology, etc.), as well as many historical, cultural, archaeological, and architectural memorials in Moscow and its suburbs, the Novodevichij (New Maiden) Monastery, and the environs of Moscow, notably the ancient towns of Zagorsk (Trinity Sergiev Monastery), Vladimir, Suzdal, Rostov the Great, the Tchaikovsky Museum in Klin, the estate and country house of Leo Tolstoy, Jasnaya Polyana, and others within a range of 200 km from Moscow. There were visits to concerts of ancient Russian music and many other activities, free of charge or at reduced prices. A special reception was arranged in honour of the women participating in the Congress.

A most important component of the scientific programme was the numerous (in all 77) geological excursions across the territories of the USSR—which took place between 18 July and 29 August, including many month-long pre-Congress excursions, 14 one- or two-day excursions during the Congress, 33 extended post-Congress excursions, and 2 short excursions for the distinguished guests, as well as visits to different objects of cultural and historical interest. There were also 2 long pre-Congress excursions in Czechoslovakia. The duration of the longer excursions was mostly from 5 to 7, or 10 to 15, days (Figure 3).

In all, the various scientific excursions had 1752 participating geologists and guests: 479 from the USSR and 1273 from 57 foreign countries (274 from USA, 104 from Czechoslovakia, 92 from China, 91 from France, 86 from Israel, 68 from Australia, 65 from Canada, 65 from the GDR, 49 from the DDR, 42 from Britain, 37 from Iran, and 304 from 46 other countries).

The geographical scope of the regions visited during the excursions was substantially enlarged compared with the excursions of the 7th and 17th Sessions, mainly through the organization of new excursions in Central Asia, the West Siberian Plain, the Altai region, and eastern Siberia (Yakutia, Verkhoyano-Kolyma region, etc.). The

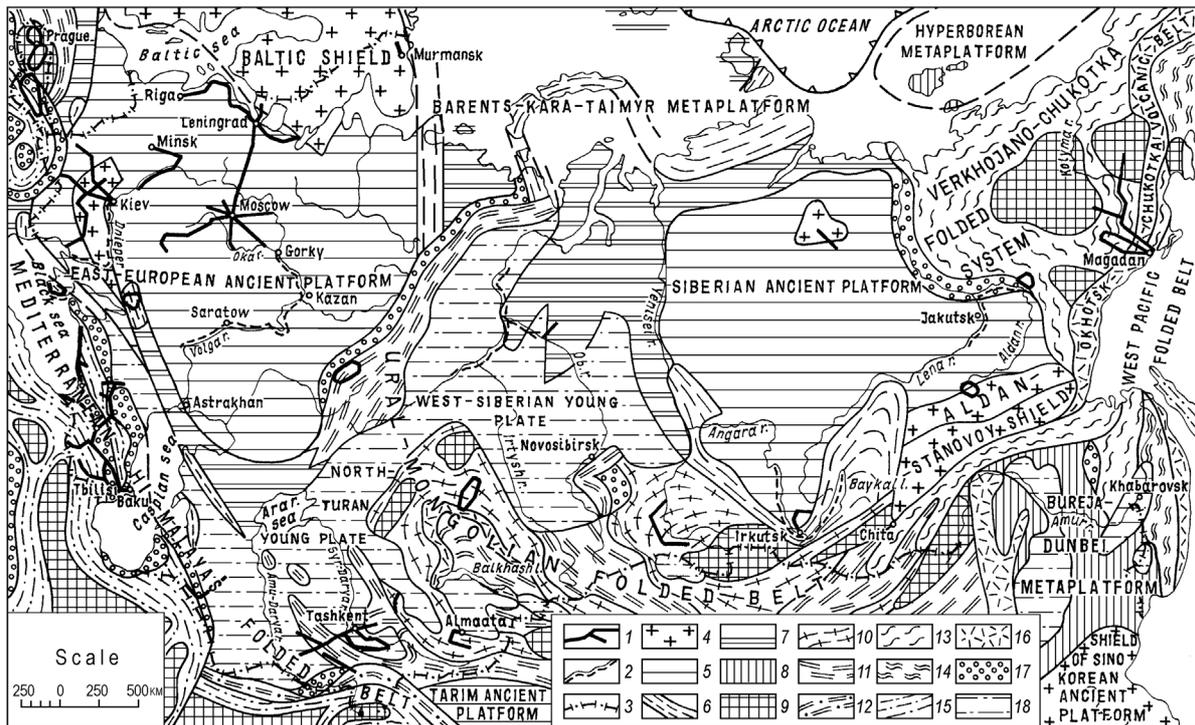


Figure 3 Geological excursions for the 27th IGC (1984). 1–2. Routes of geological excursions: (1) on roads by car; (2) on rivers, lakes and seas; 3. State boundaries of USSR and Czechoslovakia; 4–5. Ancient platforms: (4) their shields; (5) their plates; 6–8. Metaplateforms: (6) aulacogeosynclinal folded zones at surface; (7) metaplateform plate cover; (8) metaplateforms, without subdivision; 9. Pre-Phanerozoic median massifs in fold belts; 10. Sairian (a Cambrian unit occurring in southern Siberia and Mongolia) and Caledonian epigeosynclinal fold systems and zones; 11. The same: Hercynian; 12. The same: early Kimmerian or Indosinian; 13. The same: late Kimmerian or Janshanian (late Jurassic–early Cretaceous); 14. The same: Laramide (late Cretaceous); 15. The same: Alpine (Cenozoic); 16. Volcanic belts dividing fold systems of different ages; 17. Foredeeps, inner and periclinal depressions in fold systems; 18. Young (Epihercynian) plates on the Palaeozoic folded basement of Ural–Mongolian and Mediterranean mobile belts.

most popular excursions were to Crimea, Greater Caucasus and Transcaucasia (539), Central Asia (279), northwest Russia and the Baltic republics (262), Ukraine and Moldavia (151) and the Baikal region (122). The greatest number of excursions were devoted to mineral and raw material topics (29), regional geology, tectonics and magmatism (18), stratigraphy, lithology and palaeontology (23). But there were many other excursions—on Quaternary geology, neotectonics, geomorphology, engineering geology, hydrogeology and environmental protection, and history of geology and geological education, providing acquaintance with the regions used for field training for students of geological faculties and mining institutes (in particular, the Geological Faculty of Moscow University, in the Crimea area and the Caucasus region).

During the excursions, participants were also able to visit different scientific centres of the Ministry of Geology, the Academy of Science, and universities and geological museums of the USSR. Many participants expressed their satisfaction with the high scientific content and good organization of excursions, and the friendliness, good-will and hospitality of the local people.

The work of the 27th Session was completed on 14 August, 1984, with the closing ceremony at the Kremlin Congress Palace in Moscow. Opening the gathering, Professor Kozlovsky announced that Professor V. Hutchison (Canada) had been elected to the post of the President of the new International Union of Geological Sciences (IUGS) with Professor R. Sinding-Larsen (Norway) as General Secretary. They were warmly greeted by the participants. Professor Hutchison gave a speech about the role and intended tasks of the IUGS.

The Vice-President of the Academy of Science of the USSR, Professor Yanshin, announced the decision of Academy to award the Spenidiarov Prize to Professor N.A. Bogdanov and presented him with the diploma. The Deputy Secretary-General of the United Nations, the Executive Director of the environment programme, Dr.

M. Tolba, and the Head of the Programme Committee for Session 27, Academician V.V. Menner, delivered speeches. The participants unanimously adopted the appeal to geologists worldwide for 'cooperative exploration of the Earth and its resources, for international peace and friendship'. President Kozlovsky announced that the Congress Council had accepted the offer of the American delegation to host the next Session in the United States and gave the floor to Dr. R. Gould, Chairman of National Committee for Geology of the USA, who said that the scientific programme of Session 27, as well as the organization of the accompanying exhibitions and excursions, had been excellent. He thanked the Soviet geologists for their warm hospitality and for the fascinating tours arranged to enable participants to see the sights of Moscow and its suburbs. He informed people that Session 28 was to be held in Washington D. C. in 1989. Dr. Gould said that the US geologists would do their best to make it a successful meeting and looked forward to seeing all those attending the Moscow Session at their own Congress. The closing speech was delivered by the Session's President, Professor Kozlovsky.

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