

by Marianne Klemun

## Science and prestige: the 9th International Geological Congress, Vienna (1903)

Department of History, University of Vienna, Universitätsring 1, 1010 Vienna, Austria; E-mail: [Marianne.klemun@univie.ac.at](mailto:Marianne.klemun@univie.ac.at)

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The “International Geological Congress” (IGC) took place in Vienna in 1903, during a period when the city became a metropolis and experienced its greatest population growth. Hosting the congress was important for the self-assurance of the Habsburg earth scientists. As a sign of continuity, the IGC was part of the institutionalization process and took place every three years with the first conference being held in Paris in 1878, the following in Bologna (1881), Berlin (1885, delayed by one year due to an outbreak of Cholera), London (1888), Washington D.C. (1891), Zurich (1894), St. Petersburg (1897) and Paris (1900).

Both the scientists and the government of the Habsburg Monarchy considered geology as an unifying force of progress within the multi-ethnic state. The first geological map of the entire Monarchy, prepared by the Imperial Geological Survey (“Geologische Reichsanstalt”, GRA founded in 1849) and published in 1867, can be seen as an expression of this unifying goal. From today’s historical perspective, the political structure of the Habsburg Monarchy is referred to as a “composite state”, and we may argue that the geological map of the entire Monarchy created an expressive, unifying sign. During the 19th century, geological research within the empire reached its peak with substantial and highly diverse output being achieved in Vienna and other cities of the Monarchy. These efforts had long been determined by the attempt to clarify the alpine structure, for which the future “Deckenlehre” (nappism, theory of overthrust faulting) would represent a “magic key” (Tollmann, 1973, 31). The standing of the high level of Habsburg earth science expertise amongst the leading European powers had to be defended, and the IGC provided the ideal opportunity to assert this claim of excellence.

On August 19, 1,903,664 members from 29 countries were registered, 393 joined the congress in person. 23 women were registered, all being spouses of the participants. Although the number of participants did not represent an increase compared to the previous event in Paris in 1900, which had been attended by 461 geologists, it should be borne in mind that in Paris the World Exhibition, which was taking place at the same time, was an added major attraction. The next geologists’ congress in Mexico in 1906 only attracted 321 attendees. The spatial distance was decisive for the decline in numbers, since the participants from Europe traditionally formed the majority.

Formally, the organization in Vienna followed the given structure of previous congresses. A preliminary Executive Committee and a broader Committee for Organization was established in Vienna in 1900. In

terms of content, three groups of topics were favoured, (1) the question of crystalline shales, (2) that of nappe outlier (klippen) and (3) research on “Balkan and Orient”. With the realization by scientists of a greater extent of the over-thrust phenomenon (“Überschiebung”), the congress had brought about a turning point in the recognition of the schist cover theory “Deckenlehre” (Alpine nappism, theory of overthrust faulting).

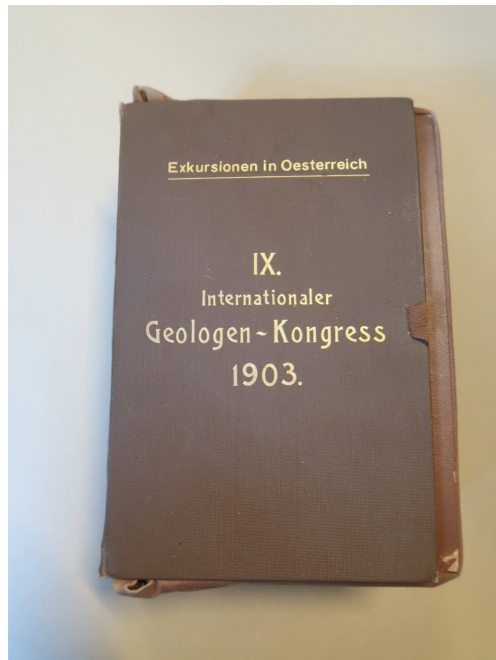
A total of 41 scientific papers was presented. Through 48 articles as guides prepared for 21 excursions the Habsburg Monarchy presented itself to the geological community in its territorial entirety, as a great power of considerable geographical size and range. On the occasion of the congress the monumental work “Bau und Bild Österreichs” was published, based on the cooperation between the leading Austrian geologists Carl Diener, Rudolf Hoernes, Franz E. Suess and Viktor Uhlig. Eight maps and 250 images were included to illustrate this masterpiece (Diener et al., 1903) with a very important preface by Eduard Suess.

The focus of the congress on the Balkans was indicative of the geopolitical component and underlined the scientific strength of the Habsburg Monarchy in this space. If there was one thing that surpassed all previous IGC congresses, it was the high number of 21 excursions offered, which concerned the most interesting and geologically diverse areas of the monarchy.

The venue of the IGC was the University of Vienna with events and sessions held in both its large and small festivity halls (Festsäle) while some presentations were also given in lecture halls at the Department of Geology.

For each individual excursion, 48 accompanying texts were drafted and combined in a guidebook with 1,190 pages in total (Führer, 1903). All results, papers about debates and excursion programmes were published in a handsome volume, which clearly stood out from previous IGC publications thanks to its comprehensive coverage of the congress (Compte rendu, 1904). In addition to the stimulating discussions following the presentations, the excursions also contributed to the success as they underpinned the high standard of Habsburg earth sciences within the European and international context.

The steadily growing internationalization over the course of the 19th century had several faces. In the geosciences, it was the IGC from 1878 onwards, which, alongside other forms of communication, consolidated already existing international networks. In addition, international visibility, national public reputation and honour were



**Figure 1.** Guidebook for the Excursions, 1903 (*Führer für die Exkursionen in Österreich. Organisationskomitee des IX. Internationalen Geologen-Kongresses (Ed.), by Teller F., Brüder Hollinek, Vienna 1903. 1190 pp, with 202 illustrations and 28 tables.*)

essential drivers. Industrialization and urbanization formed the background to this specific internationalization process.

## Introduction: Research Questions

Each congress venue gave the event a unique character. A certain distinctiveness was the result of the urban environment, its unique history and the congress themes. Even the research preferences of the host organizers left their mark on the event. This paper will discuss in what way the 9<sup>th</sup> IGC (1903) held in Vienna was distinctive from other congresses, both in terms of proceedings and content.

Which local, national and international hierarchies manifested themselves in this event? Which relations between the state and the city of Vienna were visible? These are the most important questions that will be discussed in this article. Internalisation and communications are the aspects that determine the dimension of every congress of this scale. But what does “internalisation” mean in this context? How can it be conceptualized as a historical entity against the background of the emerging tendency of nationalization during the 19th century? I will discuss these essential issues from a historical perspective.

## The Long Way to the 1903 IGC in Vienna

While there was great enthusiasm in Vienna about hosting the IGC, the realisation of the event itself was a long time coming. The representatives of the Imperial Geological Survey (“Anstalt” GRA) – Edmund Mojsisovics von Mojsvár (1839–1907) as its chief geologist

and Dionýs Stur (1827–1893) as its director (1885–1892) – emphasized at the 4<sup>th</sup> IGC in London in 1888 their wish to hold the next congress in Vienna (Nelson, 2006, 279). As was stated in the journal *Science*, this had already been agreed on at the congress in London in 1888:

“Austria-Hungary had previously had [!] a quasi promise that the 5<sup>th</sup> session should be held in Vienna, but their representatives at the London session [1888], Mojsisovics and Stur, gracefully and generously yielded to the invitation to America. [...] M. Stur said that the Austrian-Hungarian geologists very much desired the congress to be held in Vienna, but after having heard the invitation to meet in the United States, he would also support this invitation, in the hope that three years later, or in 1894, the congress would come to Vienna, when he promised them a warm reception.” (Frazer, 1891, 258f.).

Since the scientists from Austria-Hungary did not repropose their invitation *expressis verbis* at the IGC in Washington DC in 1891, the IGC in 1894 was held in Zurich instead. Furthermore, the meeting of “German Natural Scientists and Physicians” was already on the agenda of other congresses to be held in Vienna for 1894, which may explain why Vienna did not confirm the original invitation during the 5<sup>th</sup> IGC in Washington (1891). Additional reasons for not having insisted on the invitation to Vienna were a lack of support from the state and generational changes within the main geological figures involved as Professor Melchior Neumayr died in 1890 and Director Stur in 1893.

A certain lack of interest by the government already became obvious in 1891. The applications for financing the attendance of the imperial geologists at the 5<sup>th</sup> IGC (Washington, 1891) were met with little enthusiasm on the part of the Ministry of Culture. The trip was eventually financed by the Schlönbach Foundation (Stur, 1892, 13). Since Stur, as the director of the Imperial Geological Survey (GRA), obviously did not intend to undertake such a long journey, Tietze was appointed in his place as representative of the Imperial Geological Survey (GRA). Emil Tietze and his colleague Carl Diener were impressed by the excursions organized by the IGC in Washington, which included the territories of Ohio, Chicago and Yellowstone Park. It was the first time that the IGC had offered three field trips to its participants (Nelson, 2006, 284). In the following congresses excursions were increasingly given more weight, especially in Vienna in 1903. Moreover, Emil Tietze and Carl Diener had their first experience as participants at an IGC that would prove important for the task that they would be assigned a few years later in preparing the 9<sup>th</sup> IGC in Vienna in 1903.

In 1894, the director of the Imperial Geological Survey (GRA) Guido Stache appointed Emil Tietze as his representative for the 6<sup>th</sup> IGC in Zurich at the last minute, because the former had fallen ill (Stache, 1897, 19). As in 1891, Tietze was elected vice director of the “Conseil”, the highest governing body of the IGC (Compte rendu, 1897, 34).

## Initiatives: Emil Tietze as Driving Force

As hardly any other figure, Emil Tietze (1845–1931) can be seen as the main driving force that set the course for the 9<sup>th</sup> IGC in Vienna in 1903 as a result of his long-standing experiences as a participant in multiple congresses. Born in Breslau, he had studied in Tübingen and received his doctorate in Breslau in 1869. His entry into the Imperial

Geological Survey (GRA) as a trainee was the beginning of a successful 48-year career at that institution that led him to be appointed chief geologist in 1877, vice director in 1901 and director in 1902 (Hammer, 1931, 405). He directed Geological survey campaigns of territories in Galicia, Austria-Silesia, Montenegro and Bosnia. Extensive research trips took him to Persia, the Caucasus, Asia Minor, Palestine and Syria, and, as a result of his participation in IGC congresses worldwide, also to North America (1891), Russia (1897), Mexico (1906) and Canada (1913). He had an impressive record of international experience compared with other researchers of the empire as a result of his extensive geological mapping activities in the Balkans and the "Orient", and also due to his repeated participation in official functions at geological congresses in his role within the "Counseil". Actually, it should have been the task of the vice-director of the Imperial Geological Survey (GRA) Mojsisovics to represent his institution in St. Petersburg 1897, since he attended almost all the IGC's and had even on this occasion registered his wife for the 7<sup>th</sup> IGC in Russia. Unfortunately, he was prevented by bereavement and his own illness from attending in person. As happened for the previous IGC in Zurich the director of the Imperial Geological Survey (GRA) Stache decided at the last moment not to attend, so that Tietze had to take on the task of representing the Imperial Geological Survey (GRA) and at the same time be part of the Austrian delegation (Stache, 1898, 6ff). Thus, it fell to Emil Tietze, during the 7<sup>th</sup> IGC in St. Petersburg in 1897, to officially deliver the invitation to host the IGC in Vienna in 1903, which was joyfully acclaimed by the assembly (Compte rendu, 1897, CX and XX). Therefore Tietze together with Johann Böckh (director of the Royal Hungarian Institution in Budapest) as vice-president, was already acting as a representative of the Austro-Hungarian delegation. The experiences in St. Petersburg formed a decisive starting point for further steps to be taken and on his return to Vienna Tietze began to promote the forthcoming IGC in a public lecture (Tietze, 1897, 307).

## Preparing the 1903 International Geological Congress in Vienna

As a result of the devoted commitment on the part of the Imperial Geological Survey (GRA) up to that point, the Ministry for Culture and Education ("Cultus und Unterricht") entrusted the task of organization to the director of the Imperial Geological Survey (GRA) in late 1899 "in the interest of carrying out the preparatory work for the IX. IGC to be held in Vienna in 1903" (GBA, Decree, 13 December 1899, Z. 16.100). The Ministry wanted to know what the Imperial Geological Survey (GRA) had planned in this regard. A deadline of 30 March 1900 for the submission of a detailed report on the organization of the personnel was set (GBA, archive, protocol, Nr. 67, 1900, 3269). In December 1899, the Ministry had already held out the prospect of a financial loan of 20,000 guilders (=40,000 crowns) to be given in instalments, depending on requirements, but made this loan conditional to provision by the Imperial Geological Survey (GRA) of detailed budgeting for the planned congress (GBA, archive, Ministry decree 492, 189). Director Stache was called upon to take the first steps towards establishing the organization. He considered:

*"It is permissible to believe that this goal will be attainable without violating any justified claims or ambitions, if the Direction would suc-*

*ceed in first reaching agreement with the entirety of the Viennese professional comrades on the programmatic treatment of the Congress question and on the scope and construction of the Preliminary Organizing Committee to be called into being... [which] could do justice to the establishment of interrupted relationships between the individual special groups of the professional comrades"* (Stache to Ministry, 13 March 1900, Ministry decree 492, GBA, archive).

Inclusion should guide the preliminary work for the congress. Gaps between all institutions, different ethnic nations, hierarchies and personalities (the University of Vienna, the Technical University, the Academy of Sciences and the Imperial Geological Survey (GRA) in Vienna and also between the subfields of earth sciences) were to be bridged. Thus, the congress gained in significance, by uniting all the Viennese earth scientists on the same level leaving aside hierarchical differences.

Director Stache's invitation to professional colleagues for an initial meeting in Vienna met with great approval. "26 representatives of the geological sciences" met in the "scientific club" (Stache, 1901, 2) in Vienna. It was agreed at the meeting to nominate a Preliminary Committee (Executive Committee) consisting of nine members for organizing the congress. The following geologists were elected to this Committee: August Böhm von Böhmersheim (1858–1930, habilitated at the Technical University in Vienna), Karl Diener (1862–1928, geographer and geologist, and from 1897 associate Professor at the University of Vienna), Guido Stache (1833–1921, from 1892 director of the Imperial Geological Survey (GRA), Eduard Suess (1831–1914, university professor and from 1898 President of the Austrian Academy of Sciences in Vienna), Friedrich Teller (1852–1913, palaeontologist with a doctorate from University of Vienna and chief geologist of the Imperial Geological Survey (GRA), from 1902 vice director), Emil Tietze (1845–1931, chief geologist of the Imperial Geological Survey GRA, from 1901 vice director, from 1902 director), Franz Edler von Toula (1845–1920, from 1884 professor of geology and mineralogy at the Technical University Vienna) and Gustav Tschermak (1836–1927, from 1873 professor of mineralogy and petrography at the University of Vienna). One of the further steps to be taken by the committee was to decide on the general features of the programme of the congress.

This list of names supplemented with Friedrich Becke (1855–1931, from 1898 professor of mineralogy) was announced at the 8<sup>th</sup> congress in Paris on 27 August 1900 as the 9<sup>th</sup> IGC Executive Committee under the presidency of Eduard Suess and Guido Stache. Subsequently, the organizing committee was enlarged with representatives from the crownlands of the monarchy, professors from the universities of Innsbruck, Graz, Lviv, Krakow, Brno and Prague and other scholars. Tietze had travelled to Budapest specifically to involve colleagues from Hungary (Stache, 1902, 23). However, the inclusion of Hungarian geologists was not as successful as Tietze has hoped (Dudich, 1999, 65). The fragile harmony that existed between Austria and Hungary became apparent in this failed cooperation.

Since Eduard Suess, the "nestor" of geology as he was often called by his contemporaries, became emeritus at the university after celebrating his 70th birthday in 1902, he also resigned his role as president of the 9<sup>th</sup> IGC in June 1902, as he wanted to devote himself exclusively to his task as president of the Academy of Sciences in Vienna, in order to continue his scientific work undisturbed. Tietze – in the meantime elected president of the Geographical Society in Vienna, also newly

appointed director of the Imperial Geological Survey (GRA) – now became president of the Executive Committee instead of Suess.

In 1902 2000 copies of the second circular were swiftly sent out to colleagues at home and abroad. It contained information about the exact period when the event would be held (20-27 August 1903), the amount of fees and the name of the gentleman who was responsible for the finances; mining councillor, industrialist and president of the Federation of Industrialists, Max Gutmann. The attendance fee was 20 crowns (=21 francs = 20 marks = 18 shillings).

Furthermore, the main topics of the congress were announced. It was emphasized that the selection was related to current discussions and main questions of geology. In fact, the selected topics emerged from the priorities of the leading scholars in Vienna.

“L'état actuel de notre connaissance des schistes cristallines (MM. F. Becke, C. van Hise, P. Termier, F. E. Sues, A. Sauer, J. Sederholm, L. Mrazek).” The question of the nature of crystalline shale had been discussed in London as early as 1887, but, as was argued, required revision because of new developments.

“Le problème des ‘lambeaux de recouvrement’, des ‘nappes de charriage’ et des ‘Klippen’, [...] V. Uhlig, M. Lugeon, F. Torneboen, Bailey Willis, P. Kossmat” (Compte rendu, 1904, 13). The problem of over-thrusting and the origin of the so-called cliffs.

Geology of the Balkan Peninsula and the Orient (F. Toula, V. Hilber, J. Cvijić, G. Bukowski, F. Katzer, A. Philippson).

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## Ceremonial Opening: Representation, State and Science

The official ceremonial opening of the congress took place at noon on August 20 in the Great Festival Hall of the University of Vienna (Franzensring, today Universitätsring), the venue of the 9<sup>th</sup> IGC. It was under the protectorate of Archduke Rainer (1827–1913), patron of art and science, president of the Vienna World Exhibition in 1873 and curator of the Austrian Academy of Sciences. It was chaired by Minister of Culture and Education, Wilhelm Ritter von Hartel, professor of philology in Vienna, and from 1899 vice president of the Academy of Sciences. Other high state dignitaries also paid their respects at the congress: the Prime Minister Dr. von Koerber, the Minister of Railways von Wittek, the Minister of Agriculture M. Giovanelli, the Obersthofmeister Count Orsini-Rosenberg, Field Marshal and Commander of Vienna Engel, Section Head of the Ministry of Railways Wurmb, Vice Mayor of the City of Vienna Strobach, Frank as a representative of the Military Geographical Institute, the Rector of the University of Vienna and philologist Professor Jakob Schipper, Professor Krafft, prorector of the Technical University of Vienna, Dean of the Faculty M. Bormann and Professor Eduard Suess as President of the Austrian Academy of Sciences in Vienna. Not only diplomacy but also the political sphere found its striking expression in this chorus of representatives of the state.

Openings like this are a stage of self-expression and self-representation of the host country and its government. The minister Hartel used it to emphasize the theoretical and practical importance of geology for society. It was important for Hartel to emphasize that “*Austria is one of the first countries to have established an independent institution for geological surveys,*” by which he referred to the Imperial Geological

Survey (GRA), founded in 1849. He continued regarding the universities, stating “*that not long afterwards geological doctrines were separated from the mineralogical lectures [from 1862] and independent university chairs were created; that later palaeontology was given an independent representation [since 1873] at many of our universities and special institutes were dedicated to it; and that, on the other hand, through the establishment of extraordinary professorships for petrography [from 1868] and of a second independent chair for geography [1885].*” Hartel saw the unanimous cooperation of all states and nations as a means to “reach higher goals” (Compte rendu, 1904, 97-99).

Rector Schipper of the University of Vienna welcomed the guests on behalf of the Academic Senate. Vice Mayor Strobach on behalf of the Imperial City of Vienna, and Giovanni Capellini, director of the Geological Survey of Italy and former president of the IGC thanked the hosts for the friendly reception and reminded the audience of the fact that Tietze had initiated the joint project of a European map at the 2<sup>nd</sup> IGC in Bologna in 1881 (Compte rendu, 1904, 101). Albert Gaudry, President of the former 8<sup>th</sup> Congress in Paris, represented by Charles Barrois, called to mind the important geologists of Vienna, the founders of the Imperial Geological Survey (GRA), Wilhelm von Haidinger and Franz Hauer, and expressed his regrets on the resignation of Suess as president of the congress (Compte rendu, 1904, 102).

Tietze as newly confirmed “président du congrès” (Compte rendu, 1904, VIII) and of the Bureau gave his thanks for the high honour and emphasized the importance of the different areas of Austria, the Alps, Carpathians and Sudetes, as classical landscapes of geology (“als klassische Landschaften der Geologie”, “les pays quasi classiques de la géologique”) and their role as type models for other regions of the earth (“types modèles pour de vastes régions du globe”). Not least for this reason, he stated that geologists like Adam Sedgwick and Roderick Murchison from Britain or Leopold von Buch and Heinrich Ernst Beyrich from Germany had already found their research interests in Austria decades ago (Compte rendu, 1904, 103-107). The welcome address of Carl Diener as secretary general of the IGC Bureau concluded the festive speeches.

Let us summarize the speeches. They generally did not refer to current political concerns while simultaneously acknowledging that geology was closely connected with the state. Embedded in civilizational goals, they drew on historical progress as a fundamental factor of the congress. The interpretative claims of geology were absorbed by the pacifist rhetoric of community. Individualization was transformed into a collective framework. All the speeches referred to the power of unity of participants and nations.

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## Research Themes and Results

The session (“Séances Générales”, General Meetings) on the theme on the nature of crystalline slates was opened by Professor Friedrich Becke from Vienna. His explanations were based on the latest results of physical chemistry, which he used for the analysis of mineral composition and structure. Becke’s new methodological approach and its interdisciplinary perspective were most promising. Pierre-Marie Termier, professor of mineralogy at the École des Mines Supérieure in Paris, then described the slates in the Western Alps, Adolf Sauer, professor at the Technical University Stuttgart, those in the Central German mountains,

while Charles R. van Hise (Wisconsin) characterised those in the United States. A comparison of the slates in the central zone of the Alps and those in Bohemia was presented by Dr. Franz E. Suess jun. (son of Eduard Suess), Jakob Johannes Sederholm focused on crystalline slates in Finland, and Professor Ludovic Mrazec from Bucharest compared those of the Romanian Southern Carpathians with those in the Eastern Alps. The whole meeting was devoted to evidence from different parts of the world in order to compare the phenomenon globally.

The second theme on over-thrusts touched on an old unresolved open research question. The session was chaired by Archibald Geikie, director of the Geological Survey of the United Kingdom. A fierce controversy had arisen decades before over the Glarus Main Thrust fault in Switzerland, which was interpreted as a folding phenomenon by Escher von der Linth and later by Albert Heim in the mid-19th century. However, Roderick Murchison had already suggested a shift in thought in 1848, based on the comparison with observations in Scotland. Heim stuck to his approach and got involved in a heated debate with the representative of the cover theory or nappes concept (“Deckentheorie”), which was supported by the Munich professor August Rothpletz and Marcel Alexandre Bertrand, professor at the École des Mines in Paris and also by Archibald Geikie (Trümpy, 1999). The “big five” of this debate, Archibald Geikie, Marcel Bertrand, Albert Heim, August Rothpletz and Eduard Suess, were present at the IGC in Vienna, so a lively debate was to be expected at this meeting.

Professor Victor Uhlig, Eduard Suess’s successor as professor of geology at the University of Vienna, discussed in his lecture the difference between the Carpathians and the Swiss Alps concerning the over-thrust phenomenon. He did not like the overthrust interpretation at all as he had just presented the geology of the Carpathians as a golded chain. Professor Maurice Lugeon from Lausanne devoted his presentation to the problem of the dislocation of the Swiss Alps. Forty years prior, Lugeon argued, geologists had already recognized that large elevations had shifted by several kilometres. The great front, he determined, was formed from masses that were pushed from the inside of the mountains. Thus, he assumed that the Alps of Chablis were important for his explanation, because they had moved from the south side of the Alps from Piedmont over the Mont Blanc chain. The lecture was met with great approval by the majority of those present, even the doyen of Swiss geology, Albert Heim, was convinced by the new approach, while Professor Armin Richard Baltzer from Bern vehemently rejected Lugeon’s hypothesis. Heim said appreciatively: “I had no intention of taking part in the discussion. Now that I have been invited, I can only say that I am deeply moved by the splendid exposition we have just heard. ...” (Compte rendu, 1904, 124). Rothpletz expressed his opinion to leave the Eastern Alps out of the discussion, since, as Rothpletz emphasized, Lugeon had not seen them and had not been there.

The presentation of the Swedish Professor Alfred Elis Törnebohm regarding the great shift in the Scandinavian fold mountains was read by August Böhm von Böhmersheim as Törnebohm was unable to attend. His study was based on a revision of the Trondheim Silurian area, which, he argued, was fundamentally different to the Aare shales, where at its western edge he had found another feature that was similar but older than the Trondheim Silurian area. It was, according to Törnebohm, not an overburden but an over-thrust. Another session on this topic extended the perspective with a presentation on the over-

thrusts in the United States, which were discussed by a member of the American Survey, Bailey Willis. Evidence on the Plain of Ljubljana was presented by Franz Kossmat, a geologist of the Imperial Geological Survey (GRA).

The shift from geognosy to tectonics included the difficulty, as Westermann pointed out, “in accepting the fact that generalizing from the local site in tectonics meant abandoning the idea of territorial uniqueness in favour of synthesis” (Westermann, 2009, 443). This was the case with Albert Heim. With the realization of a further spreading of the over-thrust phenomenon, the Congress had brought about a pivotal change in the recognition of the contested cover-theory (“Deckenlehre”) (Bachl-Hofmann et al., 1999, 74) and tectonics. Therein probably lay its most significant result.

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## Focus: Bosnia-Herzegovina, the “Orient” and “Colonial” Framing

The focus on Bosnia-Herzegovina and the “Orient” at the congress touched on the heart of a longstanding Habsburg activity. It constituted the climax of the representation of Austrian science at the Congress and formed the showpiece of the efforts by the Austrian hosts.

Based on this large scale of detailed findings and experiences by many predecessors, Franz Toula from Vienna presented the results of geological mapping seamlessly, integrated in his publication a bibliography with 1300 titles and made reference to the most important chapter stressed at the congress, tectonics: “We are in the last years in a new phase of our science, in that of intensive efforts to bring tectonic relations renewed into the foreground.” (Toula, 1904, 5). Both his knowledge of the written sources and his empiricism found expression in the thematic maps where he gave an overview of different scientific perspectives on tectonics developed by different travelers in this area. He referred to the map as an “attempt of a comparative representation of the different views about the tectonic construction of the Balkan peninsula, with Morea, the archipelago with Crete and Cyprus, the peninsula of Anatolia, Syria and Palestine” (Toula, 1904, 330).

Toula’s report was corroborated by the presentations of Jovan Cvijić, professor at a Grammar School in Belgrade and student of Eduard Suess, on the tectonics of the Balkan Peninsula with emphasis on Serbia and Friedrich Katzer’s new overview on Bosnia and Herzegovina. Richter expressed his highest appreciation for Katzer, who had established the Geological Survey in Sarajevo:

*“As an Austrian, however, I am particularly pleased that we are able to show the congress participants the pleasing picture of a great scientific progress, which has only been achieved with the personal and moral means of old Austria.”* (Compte-rendu, 1904, 137 f.)

Thus, focusing on geology in the Balkans and the Orient was indicative of the congress’s role as an arena for the manifestation of the monarchy in its entirety but also of its claim to control the internal colonization of Bosnia-Herzegovina by scientific means. With regard to the scientific-political south-eastern orientation of Austria-Hungary, the Viennese ethnologist Franz Heger had already emphasized the colonial visions, although in connection with his excursion to Bosnia-Herzegovina: *“And when there is talk of the great colonizing effort of other empires in distant parts of the world, every Austrian*

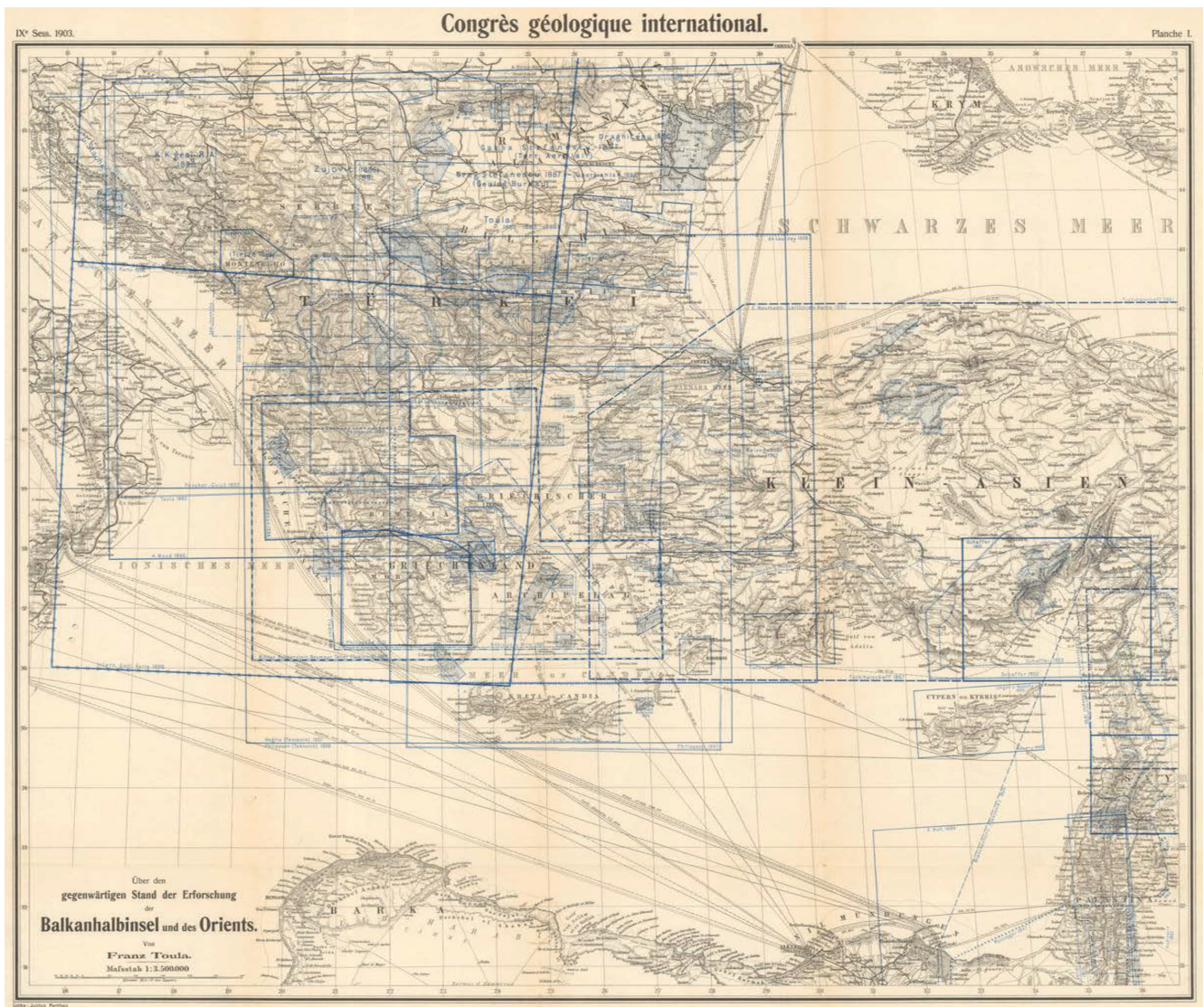


Figure 2. Map about the exploration of the Balkan Peninsula, provided by Franz Toula, published in *Compte rendu*, 1904.

can smile with quiet satisfaction; he, too, has a colony and they lie at his gate." (Heger 1895, 88).

## Topics within the Sessions ("Seances") of the "Sections"

Albert Heim's mountain relief plaster model of the Säntis in Switzerland was on display in the university aula from the beginning of the congress. In his presentation he described this cultural technique of three-dimensional design and its development in Switzerland. He emphasized the procedure he had developed: 400 drawings "based on nature" and 600 photographs formed the fundament for this relief. He justified his decision for choosing the Säntis as follows: "because I consider it to be one of the most beautiful mountain ranges on earth, where the connection between form and construction is most clearly expressed" (Compte rendu, 1904, 135).

In section A, which was dedicated to geology in broader terms, Karl Ludolf Griesbach, director of the Geological Survey of India lec-

tured on erratic blocks in the Himalayas, Georg Böhm, professor in Freiburg, on the Moluccas, M. P. Hubrecht of Utrecht was congratulated on behalf of the Dutch government for this contribution (Compte rendu, 1904, 48), M. Rudolph Hauthal, director of the Museum La Plata, spoke on the state of exploration in Argentina, Michel E. Ficheur presented a new map on western Algeria, and Gustav-Émile Haug gave an overview of his research results on Tunisia. This was the only section that was concerned with a global perspective on geology rooted in colonialism.

In section B, devoted to palaeontology, William Johnson Sollas, Othenio Abel and Charles Jean Julien Depéret contributed to latest assessments on urgent paleontological questions. Abel's lecture on the extinction of species caused a sensation.

In section C, the topic about glaciers attracted three speakers. Emmanuel Louis-Eugène Martonne informed the audience about glaciers in the Carpathian Mountains, the Swedish explorer Axel Hamberg about the technical aspects of exploration, Harry Fielding Reid, professor at John Hopkins University, about the stratigraphy of glaciers.

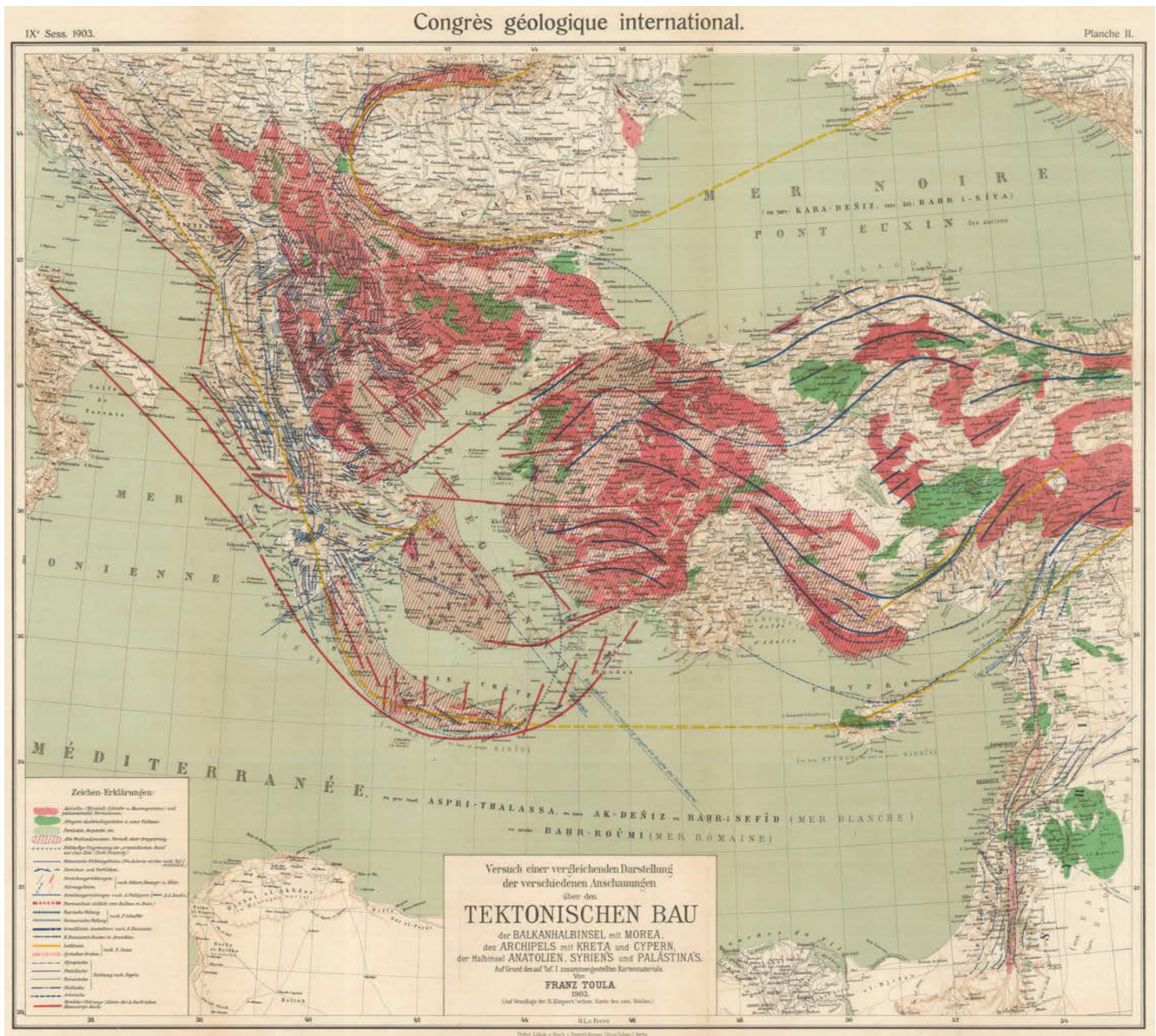


Figure 3. Map provided by Franz Toula about different descriptions of tectonics in the Balkan Peninsula, in: *Guide to the Excursions 1904*, published in *Compte rendu 1904*.

In section D, Kladiusz Angerman, urban planner of Jasło (Habsburg Monarchy, today Poland), described the petrol deposits of Boryslaw (Austro-Hungarian Monarchy, today Ukraine) in relation to tectonics. In the time between 1878 and 1914 Habsburg Monarchy became the third biggest petroleum producing economy after Russia and the United States. It was Paul and Tietze who have described the petroleum reserves in a profile already in 1877 (Paul and Tietze 1877) and afterward it became the richest place in Eastgalicia (Austro-Hungarian Monarchy, today Ukraine) with 480.000 barrels amount in 1903.

## The Congress as a Social Event in the Metropolis of Vienna and Exhibitions

On the eve of the congress opening (August 19), a reception for participants took place in the restaurant “Volksgarten” on Burgring,

close to the Emperor’s castle. While the participants had been introduced to individual state dignitaries of Vienna at the opening ceremony (August 20), the dinner on the second evening served as an opportunity for all scholars to exchange ideas in a convivial and intimate ambience.

The purpose of dividing the invitees to the care of several hosts was to bring the participants closer together in smaller groups on the second evening. In this way, it was possible to better take into account already existing acquaintances or friendships, as well as scholarly preferences. Eduard Suess received his friends at the Hotel Continental, Tietze at the Hotel Meißl and Schadn, and Mojsisovics at the Hotel Sacher and Gutmann at the Waldsteingarten (Prater). Tschermak “will host an intimate evening”, as the “Neues Wiener Tagblatt” (Tages-Ausgabe, 23 August 1903, 7) reported. All the establishments had the typical Viennese flair and were among the city’s premier restaurants. They also showed different facets of the city, from venues



**Figure 4.** Attendees of the International Geological Congress in Vienna 1903, in the court of the University of Vienna. The building was the headquarters of the 9<sup>th</sup> IGC, and most of the meetings and discussions took place within the two festivity halls of the building or within the lecture rooms of the Geological Department. The image was donated from G. Götzinger in 1951 to the Geologische Bundesanstalt Vienna, G 27-II. President Emil Tietze in the middle (second row) with a hat in his left hand.

favoured by the court, to the well-known hotels, to bourgeoisie restaurants.

In the middle of the congress week, the Vienna City Hall and the Municipal Council hosted a banquet for the geologists. 500 participants of the congress and accompanying persons were present and listened to the speeches of the mayor during the opulent meal. Tietze affirmed the close relationship of the city to geology and the importance of Vienna for geologists: “Geology, however, is a science, more international than any other, while in no other natural science local investigations played such an important role as in geology.” (Der Geologenkongress, Neue Freie Presse, 25 August 1903, 6). Tietze thanked the city for calling in expert opinions from geologists and for erecting honorary graves for geologists and issuing honorary citizenships such as that of the Viennese Eduard Suess. From among the guests, Professor Charles Depéret from Lyon and Professor Franz Loewinson-Lessing from St. Petersburg pledged a toast to the city of Vienna.

The director of the Imperial Library Joseph von Karabacek, professor of “history of the orient” at the University of Vienna, organized an exhibition at the Imperial Library that documented Vienna’s and the court’s elaborate collections and included papyri, an early map of Africa, literature from all regions of the world. The displays documented a global mixture of knowledge and politics, but also contained the Book of Genesis and unique early editions of the Bible, with all objects referring to geology (Compte rendu, 1914, 113). Other exhibitions were organised at the Natural History Museum and from the Mineralogical Society.

On one evening, the Scientific Society “Wissenschaftliche Club” (Eschenbachgasse 9) invited the participants of the congress to their rooms where maps were presented for accurate viewing. On the last day of the congress, the participants were able to admire the famous

meteorite collection, at the time one of the richest in the world, in the Imperial Natural History Museum (Neues Wiener Tagblatt, Tages-Ausgabe, 27 August 1903, 7). At the final banquet it was traditional to thank the monarch, and Professor Kyoto from Japan also pledged a toast in the German language to Eduard Suess. A commemorative plaque, designed by the medallist Josef Tautenhajn with the words “Mente e mallo” (through reason [“Geist”] and hammer) was given as a gift to the participants.

## Internationalization Versus/and Nationalization

The exchange of supra-regional knowledge in the modern era took place by means of various forms of communication, the culture of letters, networking, the sharing of writings, scholars' journeys, the exchange of publications and joint field research as well as specialized journals. From the mid-19th century, the academies and national scholarly societies in the Habsburg Monarchy facilitated and intensified cooperation. They articulated and pooled scientific interests in the respective fields of knowledge, although cross-border cooperation usually only took place between states. A generally new dimension of internationalization can be assumed for the 19th century, which encompassed both the political-economic and the cultural-scientific spheres. The need for general coordination and standardization in the face of acceleration, a growing intensity of contacts and differentiation of all fields of knowledge caused the formation of a new supranational “locus of discursive communities” (Fuchs, 1996, 156), international associations and international congresses.

A more important role on the way towards a new quality of institutionalized internationalization was played by the world exhibitions held in the metropolises after the middle of the century. Local achievements



**Figure 5.** Commemorative Plaque, designed by the medallist Josef Tautenhajn, as a gift for the participants (image from: *Illustriertes Wochenblatt*, August 22, 1903, Nr. 229, p. 8).



became supra-nationally visible alongside one another and were awarded prizes. The world exhibitions offered the individual nations a comparably international performance evaluation, which articulated economic and scientific-cultural interests as a competition. On the side-lines, they also provided an occasion for scientists to meet. Opposites, such as patriotism and cosmopolitanism, inscribed themselves in nationalization tendencies. In the same period, the first international congresses were established, often in interaction with world exhibitions. The first IGC in Paris in 1878 and the 7<sup>th</sup> in 1900 in Paris took advantage of these synergies, in general Paris was leading in the organization of congresses in the 19<sup>th</sup> century, followed by Brussels and London.

When the IGC was held in Berlin in 1885, the fact that the first congress in Paris in 1878, (a few years after the Franco-German War) “called itself ‘international’, although German scholars had not been invited, was criticized” (Gellhorn, 1885/1886, 97). This example shows to what extent current politics, far away from acting in a neutral manner, influenced the design of the congresses. Unilateral claims to hegemony came to light even more clearly against the background of political conflicts. In his opening speech, the Prussian Minister of Culture raised the question of whether the international scientific congresses could be included in the organization of scientific work. He answered the question in the affirmative in regard of other congresses, as Gellhorn states (Gellhorn, 1885/1886, 98). In his eyes, unity could ensure internationality if questions posed in each country were to be solved according to “the same point of view or according to a great plan” (Gellhorn, 1885/1886, 98).

From a current perspective, personal encounters and exchanges during lectures do not seem to be sufficient to categorize them as internationalization, rather the actual implementation of joint multi-lateral projects is decisive.

The international congresses reacted to the tension between the fragmentation of the knowledge landscape and the urge for new synthesis with the effort of standardization. The congress in Bologna in 1881 had as its goal “the achievement of a uniform designation of geological maps (unification des figurées géologiques) bringing about a uniform geological terminology.” (Hauer, 1882, 17). The joint project to produce a geological map of Europe was launched by the Austrians in Bologna in 1881, furthermore a theoretical debate about standardization should be immediately put into practice (Hauer, 1882, 17). Indeed, much energy was invested in this project up until 1903.

Commissions as specific organizational bodies of the IGC were created to pool communication in a multilateral way. Thus, the commissions of the IGC were a prime example of implementing internationalism. Samuel Franklin Emmons (Washington) suggested in Vienna to add a geo-physical laboratory in addition to the already existing four working commissions: the international cooperation in the field of geology, the Palaeontologia universalis, the Glacier Commission and the Commission for the production of a geological map of Europe. This motion, warmly endorsed by Eduard Suess, was adopted. A second major proposal touched internationalisation in organizational terms:

“Sir A. Geikie, on behalf of the International Geological Congress, moved the following resolution: ‘The International Association having received and considered a reference made by the International Geological Congress held at Vienna, 1903, resolves to ask the Inter-

*national Geodetic Association to take into consideration whether and (or) in what way it can undertake or promote international cooperation in the investigation of the following subjects: ‘Precise determination of levels in mountain chains subject to earthquakes, with the view of ascertaining whether such chains are stable or are undergoing movements of elevation or depression.’ ‘Measurements of the value of gravity with the object so far as questions are concerned of shedding light on the international distribution of masses in the earth, and on the rigidity or isostasy of the terrestrial crust. The president proposed Vienna as the location of the next assembly in 1907. The proposal was adopted unanimously.’” (Science, 17 June 1904, 931).*

Cooperation with other international associations was a new dimension of internationalisation and the vision for the future.

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## Fieldtrips and Excursions

According to the tradition of geological fieldwork, international congresses from 1891 also gave attention to excursions in general. They were organized and structured along the lines of geological practice.

While fieldwork was controversial among contemporaries, it was a constituent element for the establishment of geology as a discipline in the late 18<sup>th</sup> century. Especially over the course of the 19<sup>th</sup> century, during the first heyday of stratigraphy, famous geologists visited one another and shared their insights about geological sites that were significant for them and where they had achieved scientific results. These visits were more important than conferences. There were two reasons why excursions became an integral part of the IGCs. Geologists wanted to stick to their values and traditions and they took the opportunity of a meeting to become familiar with sites they had never seen before. For many geologists observing phenomena they only knew from books was crucial, leading them to reconsider their views and form new approaches. For the host, excursions were an opportunity to present their home country and expertise in a favourable light. But the detailed planning of excursions was a time-consuming and expensive task.

A total of 13 larger and 9 smaller excursions were carried out at the 1903 9<sup>th</sup> IGC in Vienna. The number of excursions was already decided in winter 1900/01, itineraries planned in detail and carried out on a trial basis in the summer of 1901. The manuscripts describing these trips were already available in 1902 and printed in 1903. There were 48 independent contributions intended as accompanying material. Attention was placed on outstanding outcrops, instructive sites and beautiful landscapes.

The excursions covered the whole monarchy except Hungary. Five major excursions took place prior to the congress. (I) 100 People attended Jaroslav Jahn’s and Prof. Adolf Hofmann’s nine-day tour to the Palaeozoic in the centre of Bohemia, which was known in particular through the famous palaeontological works of Joachim Barrande (1799–1883), an advocate of the theory of catastrophes. The trip started in Prague on a steamer on the Vltava River towards Zlichov and back. One day was devoted to visiting the collections in Prague, by train to Beraun (Beroun, Silurian terrain), then to Königshof (Králuv Dvur) and to Karlstein (Karlštejn). After that the group travelled to Jince by the Rakonice railroad. The second part of this Bohemian excursion was led by Adolf Hofmann, professor for deposits at the mining academy in Příbram, which was also visited. The group was limited to 50 peo-



Figure 6. Map of the itineraries of all excursions of the Congress in 1903. Published in: *Compte rendu 1904*.

ple. Prof. František Slavík and Johann Nepomuk Woldřich, professor for geology and palaeontology at the Prague University led the participants to the outcrops of the Bohemian Cretaceous. This excursion was the most popular one among all.

(II) A second excursion was prepared by August Rosiwal, honorary lecturer at the Technical University in Vienna, Josef Emanuel Hibsč, professor at the agricultural academy at Tetschen-Liebwerd, Alexander Makowsky, professor at the Technical University of Brno and Suess junior. They led its 50 participants to the Bohemian thermal baths, the famous volcano Kammerbühl, very much appreciated by Goethe, to the low mountains of Bohemia and – accompanied by Hibsč and Suess junior – to Segengottes near Brno.

(III) A third party went to Galicia, Krakow and the Sals mountains of Wieliczka and to Lviv. Johann Fillunger, mining councillor at Mährisch-Ostrau Władysław Szajnocha and professor at the University of Krakow, and Julian Niedźwiedzki, professor at the University of Lviv, organized the excursion. Viktor Uhlig attracted 85 participants for his several day-long trip to the High Tatras presenting the Carpathian cliffs (Klippen).

(IV) A three-day tour was led by Prof. Eberhard Friedrich Fugger from the Salzburg *Gymnasium* and Franz Wähner, professor at the German University of Prague, to Adnet (“terrain liastique”) and the Schafberg (Austria). Afterwards, Ernst Kittl, custodian of the geological-palaeontological collection of the Imperial Natural Museum in

Vienna, invited the congress participants to an eight-day tour to the Salzkammergut and Hallstatt, Gosau, Aussee and Hierlatz and the Simony-hut at the plateau of Dachstein mountain (Austria).

(V) The fifth excursion to Styria was offered by Conrad Clar, Vinzenz Hilber, Hans Hofer, Rudolf Hoernes, Anton Holler, Karl Penecke, Karl August Redlich, Max Sedlacek, Ferdinand Siegmund and Michael Vacek. Points of interest were the lignite mining site in Voitsberg, the eruptive area of Gleichenberg, the Graz basin, the area of Rein, the hill country of Leibnitz, the peridot area of Krabat and the mining academy of Leoben (Austria).

Short excursions were offered during the congress. Session days and excursions alternated. The short trips led to the immediate surroundings of Vienna, to the Semmering (Franz Toula), Schneeberg (Georg Geyer), or the Waldviertel (Friedrich. Becke), the Kahlenberg (Othenio Abel and Julius Dreger), Atzgersdorf, Baden and Vöslau, the terrain miocen (Theodor Fuchs and Franz Schaffer), Eggenburg (Theodor Fuchs and Othenio Abel) and the “breakthrough valley of the Wachau and the loess landscape of Krems” (Albrecht Penck). This landscape, characterized by viticulture, reminded Penck of Ferdinand Richthofen’s descriptions of the terraced landscape in China (*Compte rendu*, 1914, 17). References to the issues discussed in the sections were included in the field trips and multi-day ventures. The Schneeberg, for instance, seemed so important to Geyer because it “presents a characteristic picture of the tectonic conditions of the Alpine sec-



**Figure 7.** Visit during the excursion to Bohemia to the most modern known “Richard Schacht of the Baldauf-Rudolphischen Braunkohlenschächte”, south of Brüx, 44 m underneath. Richard Baldauf (in the middle) as host of his guests. The excursion was led by J. E. Hibsich on August 8, 1903, Foto by courtesy of the Geologische Bundesanstalt, Vienna. Two ladies were registered for this excursion: “Madame G. F. Becker Washington” and “Elisabeth Revoutzky Moskau” (*Compte rendu*, 1914, 815f.).

tions”.

Nine field trips, each lasting a week, were offered after the congress. Destinations were (VI) the Dolomites in South Tyrol (Carl Diener and Gustav von Arthaber), with the still ongoing controversy between the facies theory and the reef theory of the Schlern Dolomites, (VII) the Etsch basin close to Bolzano, Trento and Rovereto (Michael Vacek), where tectonics and Mesozoic sediments could be observed. (VIII) The Hohe Tauern region, especially the Zillertal (Friedrich Becke and Ferdinand Löwl) was a destination restricted to 10 mountaineers, with accommodation high up in the mountains in the “Berliner Hütte” and other alpine cottages. (IX) The trips to Predazzo and Monzoni (Cornelio August Doelter), (X) to the Carnic Alps (Georg Geyer) and the surroundings of Raibl (Franz Kossmat), and (XI) to Feistritztal near Neumarktl in Upper Carniola (Friedrich Teller) were also exclusive for only ten participants who were experienced mountaineers.

(XII) The “Glacial Excursion to the Eastern Alps”, led by Albrecht Penck and Eduard Richter, was planned for a duration of 18 days and was very popular with 80 fellow travellers. The trip was led to Steyr and Melk, Bad Hall, Kremsmünster, Ischl, Mondsee, to the Salzach, Salzburg and the Inn Valley, Innsbruck, Telfes and Stubaital.

Dalmatia was also on the programme. A boat trip (XIII) was led to southern Dalmatia (Gejza of Bukowski), Ragusa (today Dubrovnik), Budua, the mountain San Stefano and to the islands Lissa and Lesina. In southern Dalmatia, the under-thrust seemed to be very pronounced. From there the trip went to northern Dalmatia (Friedrich Kerner), to Spalato, Sebenico and Trieste.

The excursion through Bosnia and Herzegovina (Friedrich Katzer) started in Bréka at the north-eastern border of the country, led across the Sava plain and the Majevica mountain to the coal-rich region of Donja Tuzla, to Doboje and up the Bosna via Zenica to Sarajevo, Jajce, to Mostar and Popovo polje.

202 illustrations and 28 plate supplements were added to the guide-

book, which included descriptions of the routes for all destinations. Instructive maps, profiles, sketches and photographs were provided. A map showed the routes of all excursions and their destinations.

The excursions had lasting effects on the participants, illustrated for example by Pierre-Marie Termier, for whom Becke’s trip to the Zillertal was a great inspiration for the explanation of the Tauern window and the most spectacular development of the cover theory for the whole Eastern Alps (Exner, 2005, 12).

Except for the Hungarian half of the empire, all areas of the Monarchy were represented. The Hungarian Survey supported Friedrich Katzer’s publication of his extensive travel book on Bosnia in preparation of the congress (Katzer, 1903).

The plan of all geologists from Vienna and other parts of the Monarchy working together, in sum 43 experts and guides, made it necessary to select and cooperate with many geologists from the periphery areas. The book provided was more than a simple travel guide, it comprised detailed analysis and summaries of the respective research areas and landscapes.

## Outcomes of the 9<sup>th</sup> IGC - Conclusions

This paper has highlighted the distinctive importance of the 9<sup>th</sup> IGC (Vienna, 1903): particularly the topic of tectonics reached a broad audience and achieved a breakthrough. The congress was a major success with its lectures, speeches, debates, meetings on controversies, festivities and especially its fieldtrips and excursions. References to tectonics ran like a common thread through all lectures and even excursions.

Stache’s careful and diplomatic planning in forming the organizing committee in advance was successful. Indeed, looking at the excursions and their organizers, it seems that almost all geological experts of the entire monarchy except for Hungary were involved. Particularly in the Austrian part of the Monarchy, the rhetoric of unity persuaded competent geologists to participate in the organization of the IGC and its excursions. Stache and Tietze and the group of the Imperial Survey (GRA) were eager to piece together their research results in as complete a way as possible regarding the research about the Balkans.

From a current perspective, personal encounters and exchanges during the scientific sessions do not seem to be sufficient to categorize them as internationalization, rather the actual implementation of joint multilateral projects is decisive. However, since an important purpose of the congresses was the self-presentation of the respective national science, this could impede the sense of community.

During the excursions, the geologists got to know each other more closely and were able to discuss and reconcile different views. For the 43 tour guides, all of them leading geologists of the Monarchy except Hungary, it was a great opportunity to demonstrate their in-depth knowledge.

The Viennese public and its daily newspapers greeted the event of the IGC effusively, covering every day of the congress and its excursions: “Scholars of world renown in their science”, wrote the *Neue Wiener Journal*, “will take home new impressions from this realm, which is almost as rich in the most interesting geological forms as in the most interesting ethnic tribes.” (Mutter Erde, Neues Wiener Journal, 21 Aug. 1903, 1.). From this point of view, the congress indeed

embodied the pride of the empire and the relations between science, internalisation and nationalism.

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### Archive Sources

GBA (Geologische Bundesanstalt), Archiv (Bibliothek und Archiv), Protokoll, Nr. 67 (1900), Zahl 3269 and Letter of Stache to the minister, February 2, 1900.

GBA, Bibliothek und Archiv, "Ministerial-Erlässe", 492, 1899. Ausgestellt vom Ministerium am 13. Dezember, erhalten am 17. December and letter from Stache to the minister, March 13, 1900.

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## References

- Bachl-Hofmann, C., Cernajsek, T., and Hofmann, T., 1999, Die Geologische Reichsanstalt in Wien. 150 Jahre Geologie im Dienste Österreichs (1849-1999). Böhlau Verlag, Wien, 588 pp.
- [Comptes rendus] Anonymous, 1880, Congrès International de Géologie: Comptes Rendus Sténographiques du Comité Central des Congrès et Conférences, 21, Paris 1878, Paris Imprimerie Nationale, 313 pp.
- [Compte rendu] Anonymous, 1882, Congrès Géologique International: Compte Rendu de la 2me Session, Bologne, 1881, Bologne, Fava et Garagnani, 663 pp.
- [Compte rendu] Anonymous, 1891, The International Congress in Washington, 1891, Science. A weekly Newspaper of all the arts and Science, v. XVIII, Nr. 457, pp. 258–259.
- [Compte rendu] Congrès Géologique International: Compte-rendu de la Sixième Session, en Suisse, Août 1894, 8 v., Lausanne 1897, 710 pp.
- [Compte rendu] Anonymous, 1899, Congrès Géologique International. Compte Rendu de la VII Session. St. Petersburg, imprimerie de M. Stassulewitsch, 464 pp.
- [Compte rendu] Anonymous [Diener and Teller], Compte Rendu de la IX. Session du Congrès géologique international (Vienne 1903), Vienna 1904, 1040 pp.
- Der Geologenkongreß. 1903, Neue Freie Presse, 25. August 1903, pp. 6.
- Diener, K., Hoernes, R., and Suess, E., 1903, Bau und Bild Österreichs. F. Tempsky und G. Freytag, Wien/Leipzig, 1110 pp.
- Donia, R.J., 2015, The Proximate Colony, Bosnia-Herzegovina under Austro-Hungarian Rule. In: Ruthner, C., Reynolds Cordileone, D., Reber, U., and Detrez, R. (Eds.), Wechselwirkungen. The Political Social and Cultural Impact of the Austrian-Hungarian Occupation on Bosnia-Herzegovina, 1878–1918, Peter Lang, New York, 2015, pp. 67–82.
- Dudich, E., 1999, Die Beziehungen zwischen der k. k. Geologischen Reichsanstalt in Wien und der Ungarischen Geologie von 1867 bis 1918. Abhandlungen der Geologischen Bundesanstalt, v. 56, pp. 61–68.
- Emmons, S.F., 1893, Congrès Géologique International-Compte rendu de la 5me Session, Washington 1901, Washington, D.C., 592 pp.
- Exner, C., 2005, Friedrich Becke und die Tauerngeologie. Jahrbuch der Geologischen Bundesanstalt, v. 145, pp. 6–19.
- Frazer, P., 1891, The International Geological Congress in Washington. Science, v. ns-18, 457, pp. 258–259.
- Fuchs, E., 1996, Wissenschaft, Kongreßbewegung und Weltausstellungen: Zu den Anfängen der Wissenschaftsinternationale vor dem Ersten Weltkrieg. *Comparativ*, v. 5/6, pp. 156–177.
- Fuchs, Th., 1877, Geologische Studien in den Tertiärbildungen Süd-Italiens. Sitzungsberichte der kaiserl. Akademie der Wissenschaften, nat.-math. Kl., v. 66, pp. 7–50.
- Fuchs, Th., 1878, Die geologische Beschaffenheit der Landenge von Suez. Sitzungsberichte der kaiserl. Akademie der Wissenschaften, nat.-math. Kl., v. 38, pp. 25–42.
- Führer für die Exkursionen in Österreich. Organisationskomitee des IX. Internationalen Geologen-Kongresses (Ed.), Redaction by Teller F., Brüder Hollinek, Vienna 1903. 1190 pp.
- Hammer, W., 1931. Zur Erinnerung an Emil Tietze. Jahrbuch der Geologischen Bundesanstalt. V. 81, pp. 402–446.
- Gellhorn, O., Bericht über den dritten internationalen Geologen-Kongress in Berlin 1885. Monatliche Mitteilungen des Naturwissenschaftlichen Vereins des Regierungsbezirkes Frankfurt, v. 3, pp. 97–101.
- Geologenkongreß. 1903, Neues Wiener Tagblatt (Tages-Ausgabe), 23. August 1903, pp. 7.
- Hauer, F., 1879, Jahresbericht des Direktors. Verhandlungen der k.k. geologischen Reichsanstalt, v. 1 pp. 1–14.
- Hauer, F., 1882, Jahresbericht des Direktors. Verhandlungen der k.k. geologischen Reichsanstalt, v. 1, pp. 1–18.
- Hochstetter, F., 1872, Die geologischen Verhältnisse des östlichen Theiles der europäischen Türkei. Jahrbuch der k.k. geologischen Reichsanstalt, v. 22, pp. 331–388. With a colored map 1:420.000.
- Heger, F., 1895, Bericht über die Excursion der Anthropologischen Gesellschaft nach Bosnien und der Herzegowina. Mitteilungen der Anthropologischen Gesellschaft in Wien, v. 25, pp. 83–88.
- Illustriertes Wiener Extrablatt, August 21, 1903, pp. 5.
- Nelson, C.M., 2006, The Fifth International geological Congress, Washington, 1891, Episodes, v. 29, pp. 279–286.
- Neues Wiener Tagblatt (Tages-Ausgabe), August 27, 1903, pp. 7.
- Stache, G., 1897, Jahresbericht des Direktors. Verhandlungen der k.k. geologischen Reichsanstalt, v. 1, pp. 1–52.
- Stache, G., 1901, Jahresbericht des Directors. Verhandlungen der Geologischen Reichsanstalt, v. 1, pp. 1–32.
- Stache, G., 1902, Jahresbericht des Directors. Verhandlungen der k.k. geologischen Reichsanstalt, v. 1, pp. 1–54.
- Stur, D., 1892, Jahresbericht 1891 des Directors D. Stur. Verhandlungen der k.k. Geologischen Reichsanstalt, v. 1, pp. 1–29.
- Tietze, E., 1884, Geologische Uebersicht von Montenegro. Jahrbuch der k.k. Geologischen Reichsanstalt, v. 34, pp. 1–110.
- Tietze, E., 1897, Der VII. internationale Geologen-Congress in Petersburg. Verhandlungen der k.k. Geologischen Reichsanstalt, v. 15, pp. 286–307.
- Tietze, E., 1903, Ansprache bei der Eröffnung der ersten Sitzung im Winterhalbjahre 1903/1904. Verhandlungen der k. k. geologischen Reichsanstalt, 313–316.
- Tietze, E., 1904, Jahresbericht für 1903, Verhandlungen der k. k. geologischen Reichsanstalt, pp. 1–4.
- Tollmann, A., 1986, Geologie von Österreich, v. III, Franz Deuticke, Wien, 719 pp.
- Toula, F., 1876, Reiseskizzen aus Bulgarien und dem Balkan. Wiener Zeitung (Abendpost), January 13, 1867, pp. 5.
- Toula, F., 1904, Der gegenwärtige Stand der geologischen Erforschung der Balkanhalbinsel und des Orients. In: *Compte rendu 1904*; also published as special publication, pp. 1–330.
- Trümpy, R., 1991, The Glarus Nappes. A Controversy in Modern Geology. of a Century Ago. In: Müeller, D.W., McKenzie, Weissert, J.A.H. (Eds.), Academic Press, London 1991, pp. 385–404.
- Westermann, A., 2009, Inherited Territories: The Glarus Alps, Knowledge Validation, and the Genealogical Organization of Nineteenth-Century Swiss Alpine Geognosy. *Science in Context* v. 22, pp. 439–461.



**Marianne Klemun** since 2002 Professor at the Department of Modern History of the University of Vienna (Working group on History of Science), more than 180 publications in History of Science (Early Modern Times, 18th and 19th Century). From 2006 to 2012, she was Vice Dean of the Faculty of Historical and Cultural Studies of the University of Vienna, Secretary General (2016-2020) and currently Vice-President for Europe (2020-2024) of INHIGEO. Her research fields include Cultures, Practices and Political Contexts of the History of Natural History (Geology, Botany, Gardens, Travelling, Collecting and Documentation).