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Rudolf Hoernes and Artur Winkler-Hermaden: two important geologists of Graz and their scientific research work in Lower Carinthia and Lower Styria

Rudolf Hoernes in Artur Winkler-Hermaden, dva graška znanstvenika pomembna pri geoloških raziskavah Spodnje Koroške in Spodnje Štajerske

Rudolf Hoernes und Artur Winkler-Hermaden, zwei für die geologische Erforschung Unterkärntens und der Untersteiermark bedeutende Grazer Erdwissenschaftler

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Abstract

During the Austro-Hungarian Monarchy Graz was a university and technical college site located in the southeast part of the empire. From here also geological "field research" took place in those areas which at that time belonged to the duchies of Styria and Carinthia, but today belong to Slovenia. In connection with the collapse of the monarchy and the establishment of today's state borders, the research activities in Lower Styria and Lower Carinthia subsided. This development is illustrated by two researchers: Rudolf Hoernes, a member of the University of Graz, who was at the beginning of this research history, and Artur Winkler-Hermaden, who spanned the period from the disintegration of the monarchy to the decade after World War II.

Povzetek

Geologa Rudolf Hoernes (1850-1912) in Artur Winkler-Hermaden (1890-1963), oba iz Gradca, sta se med svojimi zelo raznovrstnimi geološkimi raziskavami ukvarjala tudi z območji južno od današnjih avstrijskih provinc Štajerske in Koroške, ki se imenujejo Spodnja Štajerska in Spodnja Koroška. Od leta 1918 te regije sodijo v Jugoslavijo oziroma Slovenijo. V Hoernesovo in Winklerjevo-Hermadenovo delo so bile vključene podrobne lokalne raziskave, regionalni pregledi in sinteze pa tudi obsežne pripombe. Na podlagi intenzivnega proučevanja njunih biografij in znanstvenih bibliografij lahko na kratko povzamemo.

Zusammenfassung

Graz war während der Österreichisch-Ungarischen Monarchie ein im Südosten gelegener universitärer Standort. Von hier aus fanden auch geologische *„Feldforschungen“* in jenen Gebieten statt, die damals den Herzogtümern Steiermark und Kärnten zugehörig waren, aber heute zum slowenischen Staatsgebiet zählen Slowenien. Mit dem Zerfall der Monarchie und der Etablierung der heutigen Staatsgrenzen verebbten die Forschungsaktivitäten in der Untersteiermark und in Unterkärnten. Diese Entwicklung wird an Hand von zwei Forscher-persönlichkeiten aufgezeigt: Rudolf Hoernes, der der Grazer Universität zugehörig war und der zu Beginn dieser Erforschungsgeschichte von Graz aus stand, und Artur Winkler-

Hermaden, der die Zeitspanne vom Zerfall der Monarchie bis in das Dezennium nach dem zweiten Weltkrieg überspannt.

Rudolf Hoernes (7. 10. 1850 – 20. 8. 1912)

Rudolf Hoernes se je rodil 7. oktobra 1850 na Dunaju kot sin Moriza Hoernesa (1815–1868), ki je bil od leta 1856 direktor in kustos dunajskega Visokega kabineta za minerale, in njegove žene Alojzije, roj. Strauss (zet Eduarda Suessa). Rudolf Hoernes je po končani srednji šoli v svojem domačem kraju obiskoval predavanja, ki so jih izvajali profesorji, denimo na Paleontološkem inštitutu Melchior Neumayr (1845–1890) in na Geološkem inštitutu Eduard Suess (1831–1914) na Dunaju. Leta 1875 je Hoernes pridobil doktorat z dvodelno disertacijo Terciarne študije in Geološka struktura otoka Samotrake. Leta 1873 je delal kot geografski geolog na južnem Tirolskem in v severni Italiji. Leta 1876 je v Gradcu postal izredni profesor, ki je že imel objavljenih precejšnje število publikacij, ni pa imel še habilitacije. Leto kasneje se je poročil z Johanno Reuss (1859–1943), hčerko zdravnika in mikropaleontologa Avgusta Emanuela Reussa (1811–1873). Leta 1883 je bil imenovan za rednega profesorja geologije in paleontologije. Leta 1895 je bil Hoernes imenovan za člana Antropološkega društva na Dunaju, od leta 1899 pa je bil odgovoren za cesarsko akademijo znanosti na Dunaju. V študijskem letu 1905/06 je bil dekan Filozofske fakultete Univerze v Gradcu.

Rudolf Hoernes je umrl 20. avgusta 1912 v Judendorfu severno od Gradca.

Temeljna znanstvena področja, s katerimi se je Hoernes ukvarjal v svojih 250 publikacijah, so bila stratigrafska struktura neogena, sistematična paleontologija in znanost o potresih.

Publikacije Rudolfa Hoernesa, povezane s Slovenijo, glej prilogo za nemškim besedilom, bodo objavljene v knjigi.

Artur Winkler-Hermaden (8. 5. 1890 – 9. 5. 1963)

Artur Winkler-Hermaden se je rodil 8. maja 1890 na Dunaju kot sin poljskega maršala Arthurja Winklerja (von Hermaden) (1858–1934) in njegove žene Emme, roj. Hofmann von Wellenhof (1864–1940). Študiral je naravoslovje na Dunaju in v Gradcu. Izlet po Alpah pod vodstvom Victorja Uhligoma (1857–1911) je poleti leta 1910 navdihnil Arturja Winklerja in ga pripeljal do poklica geologa. Po končani vojaški službi je začel študirati geologijo s Franzem Eduardom Suessom (1867–1941). Leta 1914 je Winkler končal disertacijo z naslovom Preiskave o geologiji in paleontologiji štajerskega terciarja. Končni ustni izpit iz geologije in paleontologije iz predmeta mineralogija-petrografija je 15. maja opravil z odliko. Dne 14. junija 1914 je doktoriral iz filozofije. Nekaj dni po diplomi je bil pozvan k vojaškemu služenju in je bil do konca vojne kot frontni častnik različnih sil na skoraj vseh vojnih prizoriščih; bil je večkrat odlikovan. Leta 1918 se je Artur Winkler poročil z Magdaleno Heleno Kobulo (1892–1965).

Njegova odsotnost med vojno je bilo obdobje »neplačanega prostovoljstva«, na Geološkem zavodu je delal od 2. aprila 1915. Od 23. marca 1920 je bil pripravnik, od 15. oktobra 1923 asistent, od 26. januarja 1929 geolog in od 28. marca 1931 glavni geolog.

Leta 1921 je bil Winkler-Hermaden habilitiran na Dunajski univerzi na celotnem področju geologije ter je poleg predavateljskega dela vodil izlete in pripravljal geološke karte. Od leta 1939 do 1941 je vodil Tehnično in geološko znanstvenoraziskovalno službo za upravljanje gozdov. Dne 1. avgusta 1941 je bil imenovan za izrednega profesorja, 1. septembra 1941 je postal redni profesor geologije in mineralogije na nemški tehniški univerzi v Pragi. Leta 1945

je bil odpuščen in se je vrnil na Štajersko brez službe. Zaradi političnega delovanja je bil interniran.

Leta 1954 je Winkler-Hermaden opravljal gostujočo profesuro na Free University of Berlin. V letih 1955 in 1956 je poučeval na univerzi v Erlangenu. Leta 1957 je bil imenovan za izrednega profesorja, kmalu zatem pa za rednega profesorja za mineralogijo in tehnično geologijo na tehniški univerzi v Gradcu. Leta 1960/61 je bil dekan.

Leta 1957 je bil izvoljen za dopisnega člana, 1962 pa je postal polnopravni član avstrijske akademije znanosti in član akademije znanosti v Bologni, od leta 1961 je bil častni član Geološkega društva na Dunaju.

Dne 9. maja 1963, dan po praznovanju 73. rojstnega dne, je Artur Winkler-Hermaden preminil v štajerskem mestu Kapfenstein.

Winkler-Hermaden ima zelo širok opus znanstvenih publikacij. Njegovo najbolj cenjeno delo – tudi danes – je knjiga Geologisches Kräftespiel und Landformung (Geološke sile in obdelovanje tal).

Graz and its importance as a university and technical college site in the Austro-Hungarian Monarchy

Even in the last decades of its existence, the Austro-Hungarian Empire („Dual Monarchy"), in spite of its large size, had only seven universities: Praha (Charles University, founded 1348, German University, 1882), Vienna (Rudolph University, 1365), Graz (Karl-Franzens University, 1585), Lviv (Ivan-Franko University, 1661), Innsbruck (Leopold-Franzens University, 1669), and Chernivtsi (Jurij-Fedkovych University, 1875). Actually, the University of Krakow founded in 1364 by the Polish King Casimir the Great should also be included: When, at the end of the 18th century, the Polish kingdom lost its political independence and was divided among Prussia, Russia and the Austrian Monarchy, the southern part of the Polish territory (Galicia) fell to Austria. In 1846 the city of Krakow - and thus its university - was also integrated to the Austro-Hungarian Empire.

In addition to the Austrian universities, four „German" Technical Colleges existed in Praha (established 1806, closed 1945), Vienna (1815), Graz (1811), and Brno (established 1849, closed 1945). During the 1870s, the colleges were transferred to state institutions, and a little later their struggle to achieve equality with the universities began.

Both, the universities and the technical colleges were institutions where geological subjects were taught. Concerning research work, the universities were engaged in basic scientific research, whereas the technical colleges were committed to the technical-applied fields of their science. Considering geology as an academic science, it should be noted that earth sciences did not enter the universities until the 1860s in the Austrian monarchy (Angetter et al., 2013).

Looking at the locations of the above-mentioned universities and technical colleges, it is noticeable that Graz occupied the most southeastern sector in the territory of the monarchy. Thus, the field of view of geological research directed at the southeastern European area appears to be almost predetermined (Fig. 1).

To give an insight on the geologic research of the Graz University and the Technical College (since 1976 Technical University) in today's Slovenia, two researcher personalities are selected: Rudolf Hoernes (1850-1912) from the Institute of Geology and Paleontology of the Karl-Franzens-University of Graz, who started with geologic and paleontologic studies in areas south of the present-day Austrian-Slovenian border at the end of the 19th century, and Artur Winkler-Hermaden (1890-1963) from the Technical College, who carried out very extensive and large-scale geologic mapping work.

Lower Styria/Spodnja Štajerska and Lower Carinthia/Spodnja Koroška.

The period under consideration of Hoernes and Hermaden in present-day Slovenia roughly covers the last decade of the 19th century and extends beyond the collapse of the Austro-Hungarian Monarchy after World War I to the annexation of Austria into Nazi Germany in 1938. However, during this period the border that exists today between Austria and Slovenia has changed.

Fig. 1: Sketch of the Austro-Hungarian monarchy. 1, Bohemia; 2, Moravia; 3, Silesia; 4, Galicia; 5, Upper Austria; 6, Lower Austria; 7, Hungary; 8, Bukovina; 9, Vorarlberg; 10, Tyrol; 11, Salzburg; 12, Styria; 13, Carinthia; 14, Austrian Littoral; 15, Carniola; 16, Croatia-Slavonia; 17, Dalmatia; 18, Bosnia and Herzegovina. Black dots indicate cities with universities.

The visitor to the border region of the Styrian part of Austria and Slovenia notices that the natural and cultural landscape on both sides of the state border has little or no difference. Nevertheless, the outline seems surprising, since the state border rarely adheres to superordinate topographical guidelines. It crosses several valleys (including the Feistritzbach) to reach the watershed between Mur and Drava shortly before the Radlpaß/Radelj. The border thus follows a different scheme, it represents the attempt of an ethnic demarcation on the base of language differences made a century ago (Cede & Fleck, 2002). Until 1918 the area on both sides of the present border belonged administratively to Lower Styria/Spodnja Štajerska.

Fig. 2: Austria and the bordering Slovene areas of Lower Styria Lower Carinthia.

The Carinthian part of the Austrian border to Slovenia has a longer identification process. Already governed by the Treaty of Saint-Germain after the collapse of the Austro-Hungarian Empire at the end of World War I, the part of the former Duchy of Carinthia known as „Spodnja Koroška“ remained with the former Kingdom of Serbs, Croats and Slovenes (later Yugoslavia). Complexities and difficulties in defining the final southern border of Carinthia resulted in the Carinthian plebiscite on October 10, 1920 in the area predominantly settled by Carinthian Slovenes. This plebiscite ultimately determined the borderline as it exists today.

During his life span and his scientific activity, Rudolf Hoernes remained unaffected by changes in the borderline. Only changes in the administrative boundaries within the Duchy of Styria (i.e., Graz district and Marburg/Maribor district) and the changes to smaller regional councils („Bezirkshauptmannschaften“) took place in his time. In contrast to Hoernes Hermaden experienced the disintegration of the Austro-Hungarian Empire and the establishment of the (first) Republic of Austria. The resulting territorial „shrinking process“ from an original area of over 670,000 km2 to almost 84,000 km2 was accompanied by serious changes in the external borders. Similarly, suddenly geological work areas were outside the state territory.

Rudolf Hoernes (1850 – 1912)

Rudolf Hoernes (Fig. 3) was born on October 7th, 1850 in Vienna as the son of Moriz Hörnes (1815–1868), who was the director and curator of the Vienna Hof-Mineraliencabinet from 1856 on, and his wife Aloisia, b. Strauss (sister-in-law of Eduard Suess). After completing high school in his hometown, Rudolf Hoernes attended lectures by renowed professors, e.g. at the Paleontological Institute by Melchior Neumayr (1845–1890) and at the Geological Institute by Eduard Suess (1831–1914) in Vienna. In 1875 Hoernes earned a doctorate with a two-part dissertation „1. Tertiary Studies, 2. Geological Structure of Samotrake Island“. In 1873 he joined the Geological Survey and worked as a mapping geologist in South Tyrol and northern Italy. In 1876 Rudolf Hoernes, who already had a considerable number of publications but no habilitation, was appointed associate professor in Graz. A year later, he married Johanna („Jenny“) Reuss (1859–1943), the daughter of the physician and micro-paleontologist August Emanuel Reuss (1811–1873).

Fig. 3: Rudolf Hoernes. Photo by Leopold Bude, Graz about 1895.

In 1883 he was appointed full professor of geology and paleontology. In 1895 Hoernes was appointed Corresponding Member of the Anthropological Society in Vienna. In the academic year 1905/06 he was Dean of the philosophical faculty of the Graz University.

One year after his appointment Hoernes began to deal with earthquakes. In a lecture on the well-known earthquake of June 1873 in Belluno (Veneto, Northern Italy) about which he had carried out field research in 1876, he gave a report in the “Naturwissenschaftlichen Verein für Steiermark”. In this lecture he presented for the first time “the irrefutable coincidence of tremor lines with real (tectonic) transverse fractures” and introduced the term “tectonic earthquakes”.

In addition, he proposed a still valid classification of earthquakes into collapse earthquakes, volcanic earthquakes and tectonic earthquakes.

From the year 1878 Hoernes extended his studies of earthquake phenomena to the whole area of Styria and built up a dense network of observation points (Fig. 4). Few years later this observation network had almost 140 sites where earthquakes were registered and reports sent to the Institute in Graz (Hubmann & Wagmeier 2017).

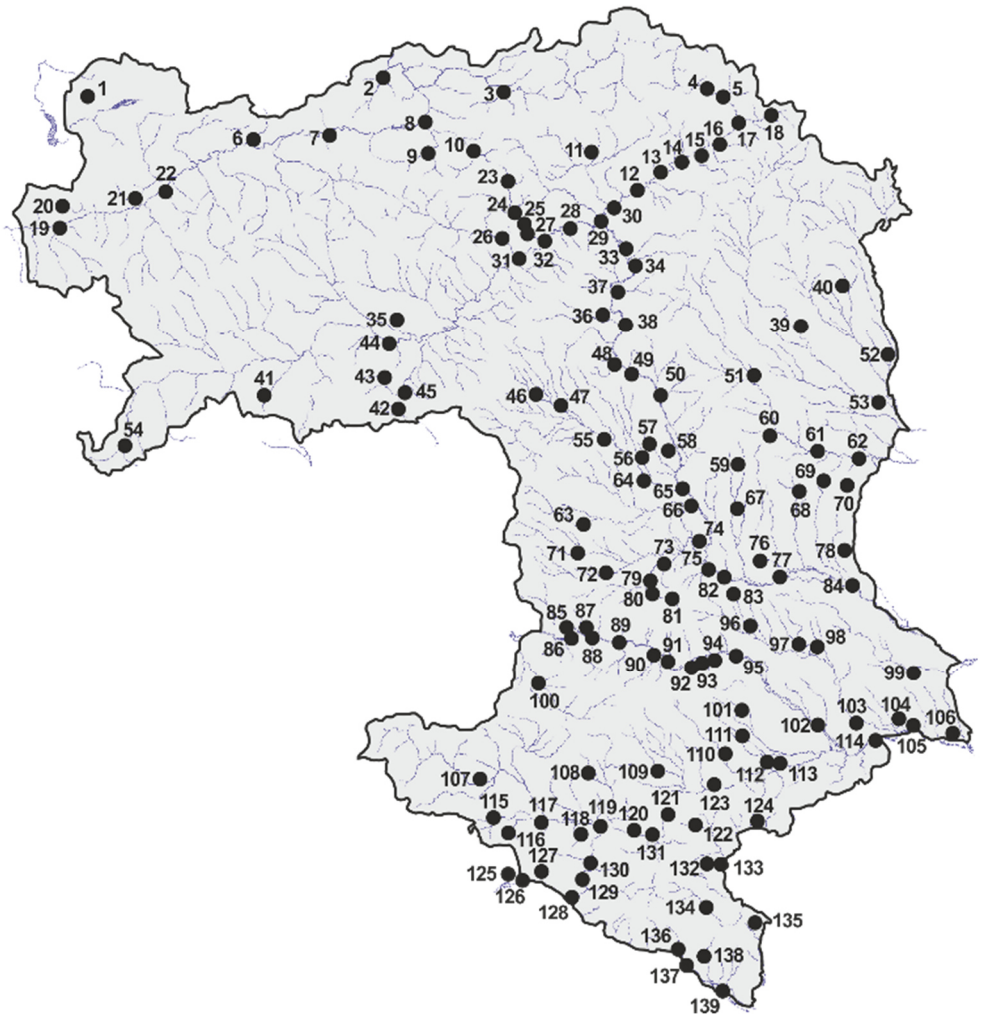

Fig. 4

Subsequently, Hoernes correlated the location and orientation of the earthquake zones of individual earthquakes in the Southern and Eastern Alps with geologically mapped faults and demonstrated a causal relationship between orogeny and tectonic earthquakes.

Later, in 1893 he published a detailed textbook on earthquake theory ("Erdbebenkunde") from a geological point of view.

Towards the end of the first decade of the 20th century, Rudolf Hoernes was involved in various disputes that were carried out in public - transported via the daily press. These conflicts included the influence of the Catholic Church on university affairs and Christian (Protestant) circles that rejected evolution in the spirit of Charles Darwin.

For his clear and unbending attitude in discussions, especially in cases of endangering the independence of the university by political or ideological influence, Hoernes earned great respect from his students. He was therefore called „fighter for the freedom of science".

Another facet of Rudolf Hoernes was his commitment to free education, regardless of social status and ideology. From 1905 onwards, he also offered education programs for the interested working class, whose primary interest was in solving the daily life struggle rather than in educating their children.

Rudolf Hoernes died on August 20th, 1912 in Judendorf north of Graz.

Fig. 4:

Places in Styria where earthquakes were recorded from 1880 onwards. Note the density of observation points in Alpine longitudinal valleys (for example Mur-Mürz-Fault) and in Lower Styria. Slovenian place of Lower Styria with German terms in square brackets.

(1) Altaussee (2) St. Gallen (3) Wildalpen (4) Neuberg (5) Kapellen (6) Liezen (7) Admont (8) Hieflau (9) Radmer (10) Eisenerz (11) Alfenz (12) St. Marein (13) Kindberg (14) Mitterdorf (15) Krieglach (16) Langenwang (17) Mürzzuschlag (18) Spital (19) Schladming (20) Ramsau (21) Gröbming (22) Öblarn (23) Vordernberg (24) Trofaiach (25) St. Peter im Freienstein (26) Traboch (27) Donawitz (28) Niklasdorf (29) Bruck (30) Kapfenberg (31) St. Michael (32) Leoben (33) Pernegg (34) Mixnitz (35) Fohnsdorf (36) Waldstein (37) Frohnleiten (38) Peggau (39) Steinbach (40) Hartberg (41) St. Lambrecht (42) St. Anna (43) St. Wolfgang (44) Judenburg (45) Obdach (46) Köflach (47) Voitsberg (48) Gratwein (49) Judendorf (50) Graz (51) Gleisdorf (52) Burgau (53) Fürstenfeld (54) Turrach (55) Mooskirchen (56) Dobl (57) Unterpremstätten (59) Kalsdorf (60) Kirchbach (61) Kirchberg (62) Feldbach (63) Fehring (64) Deutschlandsberg (65) Pöls (66) Wildon (67) Lebring (68) Wolfsberg (69) Gnas (70) Gleichenberg (71) Kapfenstein (72) Schwanberg (73) Wies (74) Großklein (75) Leibnitz (76) Ehrenhausen (77) Brunnsee (78) Mureck (79) Klöch (80) Arnfels (81) Leutschach (82) Spielfeld (83) Sveti Ilj [Egydi Tunnel] (84) Radkersburg (85) Muta [Hohenmauthen] (86) Vuzenica [Saldenhofen] (87) Radlje ob Dravi [Mahrenberg] (88) Vuhred [Station Wuchern Mahrenberg] (89) Podvelka [Reifing-Fresen] (90) Šentlovrenc [Station St. Lorenzen] (91) Fala [Faal] (92) Ruše [Maria Rast] (93) Bistrica [Feistritz] (94) Limbuš [Lembach] (95) Maribor [Marburg] (96) Pesnica [Pössnitz] (97) Sv. Lenart [St. Leonhard] (98) Sveta Trojica v Slovenskih goricah [Hl. Dreifaltigkeit] (99) Ljutomer [Luttenberg] (100) Slovenj Gradec [Windischgraz] (101) Rače-Fram [Kranichsfeld] (102) Ptuj [Pettau] (103) Moškanjich [Moschganzen] (104) Velika Nedelja [Groß Sonntag] (105) Ormož [Fridau] (106) Središče [Polsterau] (107) Rečica ob Savinji [Rietz] (108) Dobrna [Neuhau] (109) Slovenske Konjice [Gonobitz] (110) Station Windisch Feistritz] (111) Pragersko [Pragerhof] (112) Majšperk [Monsberg] (113) Ptujska Gora [Maria-Neustift] (114) Zavrč [Sauritsch] (115) Vransko [Franz] (116) Ojstrica [Osterwitz] (117) Sveti Pavel [St. Paul] (118) Liboje (119) Celje [Cilli] (120) Štore [Store] (121) Ponikvi [Ponigl] (122) Šmarje [St. Marein] (123) Poljčane [Pöltschach] (124) Rogaška Slatina [Rohitsch Sauerbrunn] (125) Zagorje ob Savi [Sagor] (126) Trbovlje [Station Trifail] (127) Hrastnik [Hrastnig] (128) Zidani Most [Steinbück] (129) Rimske Toplice [Römerbad] (130) Laško [Station Markt Tüffer] (131) Šenčur [St. Georgen] (132) Olimje [Olimie] (133) Podčetrtek [Windisch Landsberg] (134) Kozje [Drachenburg] (135) Bizeljsko [Wisell] (136) Rajhenburg [Reichenburg] (137) Krško [Videm Gurkfeld] (138) Zdole [Sdole] (139) Brežice [Rann].

Hoernes' main scientific interest in his 250 publications was the stratigraphic structure of the Neogene, systematic paleontology, the doctrine of descent and earthquake science.

Publications related to Slovenia

Zur Altersbestimmung des Miocäns von Tüffer in Südsteiermark. – Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark, 26 (1889), XCI-XCIV, Graz 1890.

Zur Geologie Untersteiermarks. IV. Die Donatibruchlinie. – Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt, 1890/3, 67-70, Wien.

Zur Geologie Untersteiermarks. V. Die Ueberschiebung der oberoligocänen und untermiocänen Schichten bei Tüffer. – Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt, 1890/4, 81-87, Wien.

Zur Geologie Untersteiermarks. VI. Eruptivgesteinsfragmente in den sedimentären Tertiärschichten von Rohitsch-Sauerbrunn. – Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt, 1890/13, 243-246, Wien.

Zur Geologie von Untersteiermark. VII: „Das angebliche Vorkommen von Uebergangsbildungen zwischen den Tüfferer Mergeln und der sarmatischen Stufe“. – Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt, 1890/13, 246-249, Wien.

Die Anlage des Füllschachtes in Rohitsch-Sauerbrunn. – Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark, 27 (1890), 281-348, Graz 1891.

Zur Geologie von Untersteiermark. VIII. Versteinerungen aus dem Mergel von St. Egydi. – Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt, 1891/2, 33-35, Wien.

Zur Geologie von Untersteiermark. IX. Zur Fossilliste der Sotzkaschichten von Wresie bei St. Marein. – Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt, 1891/2, S. 35, Wien.

Conchylien aus der Sann bei Tüffer. – Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark, 28 (1891), LXXXIX-XCL, Graz 1892.

Zur Geologie von Untersteiermark: X. Die Fischfauna der Cementmergel von Tüffer. – Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt, 1893/2, 41-45, Wien 1893.

Die Kohlenablagerungen von Radeldorf, Stranitzen und Lubnitzgraben bei Rötschach und von St. Briz bei Wöllan in Untersteiermark. – Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark, 29 (1892), 275-295, Graz.

Art(h)ur Winkler-Hermaden (1890 – 1963)

Artur Winkler(-Hermaden) (Fig. 5) was born on May 8th, 1890 in Vienna, as the son of Field Marshal Lieutenant Arthur Winkler (von Hermaden) (1858–1934) and his wife Emma, b. Hofmann von Wellenhof (1864–1940). After school he studied natural sciences in Vienna and Graz. An excursion through the Alps under Victor Uhlig (1857–1911) during summer 1910 inspired Artur Winkler and led him to become a geologist. After completing military service, he began to study geology with Franz Eduard Suess (1867–1941). In 1914, Winkler finished with his dissertation entitled *„Investigations on the geology and paleontology of the Styrian Tertiary“*. The Rigorosum (final oral exam) of geology and paleontology, with the minor subject mineralogy-petrography on May 15th, he passed with distinction. On June 14th, 1914 he received his doctorate in philosophy. A few days after graduation, he was called up for military service.

Fig. 5: Artur Winkler-Hermaden. Foto about 1960 (Archive of the University of Technology Graz).

He served until the end of the war as a front officer in various forces in almost all theaters of war and was awarded many times.

Winkler's father, a high ranking officer of the “Austrian-Hungarian Army”, fought during World War I at the Isonzo battles. Under his command, despite the superiority of the hostile Italians, succeeded in defending the strategically important Monte Ermada near Gorizia during the fighting of 1917. Due to this military achievement he was awarded the title *“Hermaden”* as a hereditary noble name (Häusler, 2013).

From 1921, also the geologist Artur Winkler used this noble name in his publications, since the use of the double name *“Winkler Hermaden”* was awarded to all members of the direct stem line.

In 1918 Artur Winkler Hermaden married Magdalena Helene Kobula (1892–1965).

Despite his war-related absence Winkler was taken on April 2nd, 1915 as an „unpaid volunteer“ at the Geological Survey in Vienna. Here his employment position changed with the years: from March 23th, 1920, he was an intern, from October 15th, 1923 assistant, from January 26th, 1929 geologist and from March 28th, 1931 chief geologist.

In 1921, Winkler-Hermaden habilitated at the University of Vienna for the entire field of geology.

On June 1st, 1933, Winkler-Hermaden joined the prohibited NSDAP (= National Socialist German Workers' Party). Already on July 30th, 1934, he was arrested for his illegal membership in a political assembly. After his

conviction, Winkler-Hermaden lost his job at the Geological Survey on February 8, 1935. Likewise, in February 1935, he was forbidden to teach at the university "for reasons of public good". After his dismissal from the federal service and the confiscation of his assets Winkler-Hermaden tried to build up an existence in Germany. Finally, in the spring of 1938, he found employment at the State Deposit Research Center Leipzig-Freiberg in Saxony (Hubmann & Seidl, 2013).

From 1939 to 1941 he headed the Technical-Geological-Pedological Department of the General Water Management of Styria ("Technisch-geologisch-bodenkundliche Fachstelle beim Landesbauamt Graz"). On August 1st, 1941, he was appointed extraordinary, with September 1st of the same year full professor of geology and mineralogy at the German Technical University in Prague. In 1945 he was released and returned without a job and with loss of his entire personal possessions in Styria. Meanwhile, his son was missing, he himself was interned for two years because of his affiliation to the NSDAP.

On May 24th, 1950, the now 60-year-old Winkler-Hermaden was pardoned by resolution of the Austrian Federal President Karl Renner (1870–1950) and thus also positively fulfilled his request to practice the profession.

In 1954 Winkler-Hermaden held a visiting professorship at the Free University of Berlin. In 1955 and 1956 he taught at the University of Erlangen. In 1957 he was appointed associate professor and soon thereafter to the full professor of mineralogy and technical geology at the Technical University in Graz. In the academic year 1960/61 he served as dean.

In 1957 Artur Winkler-Hermaden was elected as the corresponding member, 1962 to the real member of the Austrian Academy of Sciences, he was also a member of the Academy of Science in Bologna and from 1961 honorary member of the Geological Society in Vienna.

On May 9th, 1963, one day after completing his 73rd birthday, Artur Winkler-Hermaden passed away in the Styrian town of Kapfenstein.

Winkler-Hermaden has a very wide-ranging œuvre on scientific publications. His most respected work today is the more than 800-page work *„Geological Force Game and Landforming".* In the field of applied geology, he wrote a large number of reports on quarries, gravel and sand pits, as well as mineral springs. From a hydrogeological point of view, his activities as publisher of a hydrogeological journal *(„Beiträge zu einer Hydrogeologie Steiermarks"* and *„Steirische Beiträge zur Hydrogeologie"* respectively) and his lectures on this subject should be emphasized (Zetinigg, 2016).

Publications related to Slovenia:

1925: Aufnahmsbericht über Blatt Gleichenberg (5256) und Unterdrauburg (5354). – Verhandlungen der Geologischen Bundesanstalt, 1925, 27-31, Wien.

1927: Aufnahmsbericht über Blatt Gleichenberg (5256), Fürstenfeld (5156) und Unterdrauburg (5354). – Verhandlungen der Geologischen Bundesanstalt, 1926, 35-38, Wien.

1928: Aufnahmsbericht über Blatt Unterdrauburg (5354), Marburg (5355) und Fürstenfeld (5156). – Verhandlungen der Geologischen Bundesanstalt, 1928, 68-72, Wien.

1929: Aufnahmsbericht über die Blätter Unterdrauburg (5354) und Marburg (5355). – Verhandlungen der Geologischen Bundesanstalt, 1929, 66-68, Wien.
(mit Heinrich Beck, Alois Kieslinger, Friedrich Teller) Geologische Spezialkarte 1 : 75.000, Blatt Unterdrauburg. – Wien (Geologische Bundesanstalt).

1930: Aufnahmsbericht über Blatt Marburg (Z. 19 G XIII). – Verhandlungen der Geologischen Bundesanstalt, 1930, 79-84, Wien.
Über tektonische Probleme in den Savefalten (mit Beiträgen von A. Moos). – Jahrbuch der Geologischen Bundesanstalt, 80, 351-380, Wien.

1931: Aufnahmsbericht über die geologische Aufnahme auf den Spezialkartenblättern Marburg (5355) und Fürstenfeld (5156). – Verhandlungen der Geologischen Bundesanstalt, 1931, 75-78, Wien 1931.
Bemerkungen zu A. Kieslingers Mitteilung „Bachern und Karawanken". – Verhandlungen der Geologischen Bundesanstalt, 1931, 165-174, Wien.
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1958: Geologisch-morphologische Studienergebnisse aus den nördlichen Karawanken, aus Nordslowenien und Nordwestkroatien. – Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen, 106, 1-44, Stuttgart.
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1959: Über weitere Beobachtungen in Nordslowenien (ehemalige Untersteiermark und Krain) und im österreichischen Anteil der Nordkarawanken. – Anzeiger der Österreichischen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Klasse, 96, 9-24, Wien.

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