

The historical analysis of the original manuscript *Geologische Spezialkarte* maps on the Austro-Italian war front

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ABSTRACT

In the Archive of the Geological Survey of Italy - ISPRA Library, 24 hand-colored and unpublished geological maps of the *KKGR Geologische Spezialkarte* were recently discovered. These maps cover the NE sector of Italy and concern the territories annexed by Italy at the end of the First World War.

The comparative analysis carried out with the Austrian original cartographic maps, confirms that the handwritten maps were compiled using the surveys made between 1854 and 1900.

The acquisition of cartographic material in the years immediately following the conflict, arising from the obligations of the peace treaty, demonstrates a long-term cooperation between the Geological Survey of Austria and the Geological Survey of Italy, going deeply beyond the political divisions.

KEY WORDS: geological map, *Geologische Spezialkarte der Österreichisch-Ungarischen Monarchies*, First World War, Geological Survey of Italy, Geological Survey of Austria.

INTRODUCTION

The historic core of the bibliographic and cartographic heritage of the Geological Survey of Italy - ISPRA has originated with the foundation of the Royal Geological Committee and its library, strongly pursued by Quintino Sella since 1861, immediately after the unification of Italy (Ercolani, 2013; Pantaloni, 2014). Since the foundation of the Royal Geological Survey was possible to organize a network of publications exchanges with similar institutions from other countries. The current geological, topographic and geo thematic cartographic heritage consists of over 50,000 maps, 15,000 of these covering the whole Italian territory.

Part of this heritage includes handwritten geological maps dating back to the late 1800s; they consist of more than 1,000 specimens kept in the historical archives of the Library, 700 of these are available online in digital format. These maps represent an invaluable source of historical, cultural and scientific information (Severino et al., 2014).

Another important document collection is represented by the historical archive (1863-1960) of the Geological Survey of Italy: a collection of correspondence, unpublished official and unofficial writings, crucial for a correct historical reconstruction of those years. Biblio-cartographical exchanges between European and non-European Geological Surveys were

very frequent in those years (Pellati, 1895). Countries such as France, Belgium, Switzerland, Germany and Austria-Hungary sent to the Geological Survey of Italy, and received in mutual exchange, their official geological maps. Among all other countries, Austria represented for the Geological Survey of Italy one of the main trading partners, due to its geographical proximity and to the many “shared” geographical areas. The stock of the periodical literature of the Austro-Hungarian area represent one of the fundamental heritage of the library in the years between the late XIX and early XX century, consisting of over a thousand publications represented by Yearbook (*Jahrbuch*), Reports (*Verhandlungen*) and Memories (*Abhandlungen*).

The *Kaiserlich Königlichen Geologischen Reichsanstalt (KKGR)* was founded on November 15, 1849, one of the first Geological Survey in the world; the first Director was Wilhelm Karl Ritter von Haidinger, followed by several scientists who had in common a past experience as field survey geologists: among these Franz von Hauer, Dyonis Stur, Guido Stache and Emil Tietze (Geologische Bundesanstalt, 1999).

THE MEANING OF THE DISCOVERY

For obvious reasons, Austria has always shown an interest in the geology of Northern Italy since the establishment of *KKGR*, as testified by several publications of that period. An early example is the *Karte der nördlichen Lombardie* published by Hauer in 1858, used by Omboni (1861) and Curioni (1876) as a guide for their geological maps of the Lombardy region.

The oldest *KKGR* geological map preserved in the ISPRA library is the *Generalkarte des Lombardisch-Venetianischen königreiches* (Hauer, 1858-1860), composed of 5 sheets at 1:288,000 scale, hand-colored on a 1838 Austrian Military Topography (Pellati, 1904). Quintino Sella bought the map in 1861 during his famous educational trip to the main European Geological Surveys (Sella, 1862). The Director Haidinger sent the maps to the R. Geological Survey, manually reproduced by Austrian cartographers, on May 12, 1862, as reported on a marginal note.

The *KKGR* began the systematic geological survey of the Austrian territory in 1869, producing the *Geologische Spezialkarte der Österreichisch-Ungarischen Monarchies* cartographic series at 1:75,000 scale, completed around 1920.

In early 1900 some areas had not yet been completed; the *KKGR* had entrusted two emerging young geologists, Wilhelm Hammer and Bruno Sander, to the geologic survey of the sheets *Bormio und Passo del Tonale*, *Glurns und Ortler*, *Nauders und Sterzing*, between 1901 and 1921.

During cartographic researches in the archive of the ISPRA

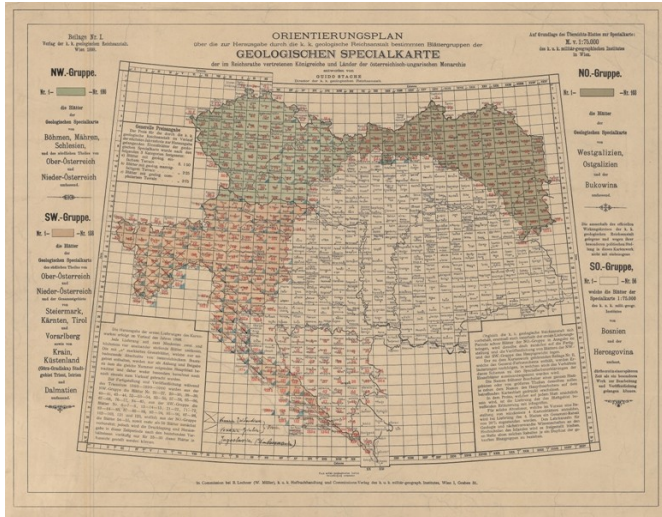


Fig. 1 - Sheet chart of the *Geologische Spezialkarte der Österreichisch-Ungarischen Monarchien* cartographic series at 1:75,000 scale.

library, were discovered 24 hand-colored *KKGR Geologische Spezialkarte* maps belonging to the “redeemed territories” (passed from Austria to Italy after World War I) and still showing geological information only relating to territories annexed by Italy at the end of the war (Fig. 1).

Therefore, it was undertaken a task aimed to understand the reasons that justify the possession of this maps, through an analysis of historical documents collected in the ISPRA library archive.

This historical documents analysis allowed to understand the relationships between the Geological Survey of Italy and the *KKGR* during that period, showing a continuity in the technical-scientific cooperation regardless of the heavy hurdle of the First World War.

During the recovery plan of the cartographic fund of the Geological Survey of Italy (Carusone et al., 1996), these maps were placed, in numerical code order, among those produced in modern times by the *Geologische Bundesanstalt* (GBA). A careful analysis showed that these sheets exactly represents 24 maps of the area annexed to Italy at the end of the war and never printed by the *KKGR*, opening the field to different possible interpretations on the acquisition by the Geological Survey of Italy of this valuable and original cartographic material.

Thus it was started an historical and scientific research in the documental and cartographic archives both of GBA and Geological Survey of Italy, examining and studying in detail only 11 maps relating to the Dolomites area.

The unpublished field maps, 1:75,000 scale, of the *Geologische Spezialkarte* are preserved at the historical archives of the GBA in Wien under the name of the geologist in charge of the survey. A detailed comparison of the maps

owned by the GBA and those preserved in the archives of the Geological Survey of Italy was necessary to detect potential discrepancies among them. The analysis of the GBA manuscripts revealed a first major difference regarding the year of publication of the topographic maps used for surveys. The date shown on the maps preserved in Italy, is between 1913 and 1918 and occasionally symbols of fortifications and other military items occur in the legend.

The comparative analysis carried out with the GBA original cartographic maps, in particular with the sheet *Tarvis*, showed that the maps stored in Italy were redrawn between 1919 and 1925 (Fig. 2). The analysis of all the others original cartographic further confirms that the handwritten maps acquired by the Geological Survey of Italy were compiled using the surveys of *Geologische Spezialkarte der Österreichisch-Ungarischen Monarchien* made between 1854 and 1900.

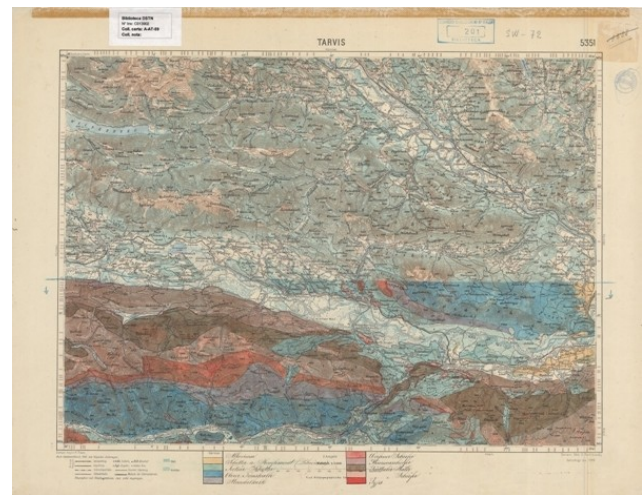


Fig. 2 - Sheet SW72 *Tarvis* of the *Geologische Spezialkarte der Österreichisch-Ungarischen Monarchien*; 1:75,000 scale.

The cartographers, who were also in charge of the realization of the topographic maps immediately after 1919, have probably reproduced manually these maps, when the current GBA used to be called *Geologische Staatsanstalt* (1920-1921; Albert Schedl pers. com.).

The analysis of the documental archive of the Geological Survey of Italy led to the finding of a folder on the "Agreements between Italy and Austria for restitution of scientific material to Italy (Faldone 1920-1921, fascicolo 10, carte 1-14). The folder contains 14 papers relating to the activities undertaken by Italy for the recovery of cartographic material of the redeemed territories, still in possession of Austria.

According to the Saint Germain Treaty of September 10, 1919 (CNR-ISGI, 1919-1925), which established the breakdown of the Austro-Hungarian Empire, Austria was required, among other charges of war, to provide the technical documents stored in his archives to the Italian Administration. The Austrian government did not follow this provision immediately, and has opposed to the yield of documents and materials relating to studies and research carried out in the interest of the “lost regions”.

The first official request of the Austrian cartographic material of the Trentino territory dates back to July 4, 1921, when Giorgio Dal Piaz, professor at the Padua University, writes a letter to Mario Cermenati, President of the Italian Geological Committee. In the letter, Dal Piaz mentions a report about the Trentino area maps and informs Cermenati that Giovanni Battista Trener was charged to complete them and to write a monograph accompanied by an appropriate geological map of the whole sector. This map would have been used during the excursion of the XXXIII Congress of the Italian Geological Society, held in Padua in the summer of 1920. The field trip took place in the Dolomites across the sites of some of the bloodiest battles of the WW1 (Dal Piaz et al., 1920; Novarese, 1920). In the letter Dal Piaz claims to have already asked the Geological Survey of Italy for the delivery of the Austrian maps in its possession and so he urges Cermenati to send the precious cartographic material owned by the office.

In November 1920, Dal Piaz once again writes to Cermenati enclosing two reports: one written by Trener and the other one by Vardabasso. The latter is a report on the attempts to recover the cartographic material from the *Geologische Bundesanstalt*, where Vardabasso had the opportunity to examine the geological maps at 1:75,000 scale of the Trentino area. He claims that only 25 of these are original field survey maps 1:25,000 scale, but that the authors have kept them. He goes on remarking that some areas have not yet been completed and that the Austrian geologists (Sander, Teller, etc.) have offered to complete the work if paid. From the Trener report, undated but attached to the same letter of Dal Piaz, it can be deduced that half of the Triveneto sheets at 1:75,000 scale have been published and that for others hand-colored editions exist. Trener also writes: "From the conversation with Cermenati, in the presence of the Director of the Geological Survey of Italy [Aichino], I had hoped of being able to obtain immediately copies of the maps that the library of the Geological Survey had just received from Wien", highlighting how these maps had already been delivered in Rome.

Then Trener gives some suggestions, aimed to the realization of the Triveneto geological map. First of all, he recognizes the need to revise the *Geologische Spezialkarte* maps already printed, including those that belong to the Mojsisovics monograph (*Bozen, Klausen*, and part of the maps *Sterzing, Toblach* and *Pieve di Livinallongo*) of which there are field geological maps 1:25.000 scale. Trener points out that there was a manuscript version of the other 10 sheets, and their hand-written copies were sold at 20 Lira per sheet by the KKGR. He asserts, however, that for the South Tyrol would not be possible to compile a geological map or notes because the geological data are exclusively available from the 1:75,000 scale maps. Trener concludes proposing to resume relationships with the Geological Survey of Italy for the temporary transfer of handwritten Austrian geological maps and, if that fails, he suggests to request the needed copies through the *Geologische Bundesanstalt*.

During a meeting of the Italian Geological Committee in 1921, it stood out that the issue was still unsolved and that the argument had aroused some disagreements. The Committee members were still struggling in the pursuit of the cartographic material from Wien. They had nominated Vittorio Novarese as

official responsible for the acquisition procedures in August 1921, and they had even considered to purchase the maps.

The analysis performed in the historical archives, however, allows to state that the Austrian maps arrived at the library of the Geological Survey of Italy before the debating, thus confirming the claims of Trener in 1920.

The above mentioned maps, as stated by Dal Piaz in the report concerning the geological field survey of South Tyrol (Fondo Dal Piaz, pers. com.), were compiled using the unpublished surveys carried out between 1854 and 1900 by the Austrian geologists.

Otherwise the maps requested in 1920 by Dal Piaz, Trener and Vardabasso are indeed those surveyed at the beginning of 1900 by geologists Sander, Hammer, Trener (sheets Merano, Bressanone, Trento, Passo di Resia).

These sheets, immediately after the end of World War I, have been reviewed and updated following agreements between the *Magistrato delle Acque* of Venice and the Geological Survey of Austria. Under the management of Giorgio Dal Piaz, Director of the Geological section of the *Magistrato delle Acque*, the realization of the "Tre Venezie geological map" began. The geological section, founded at the Geological Institute of Padua thanks to Giovanni Magrini, director of the Hydrographic office, had as main goal the elaboration of the "Tre Venezie geological map" at 1:100,000 scale, which would serve to the hydrographic studies of mountain basins (Dal Piaz, 1922).

For this purpose, relationships between Dal Piaz and the GBA were undertaken in order to recover the cartographic material produced in the Triveneto area (Dal Piaz & Dal Piaz, 1984). At the same time, Dal Piaz had started direct relationships with the Austrian geologists involved in field survey of those territories before the conflict.

The sheets *Bressanone* (1924), *Merano* (1924), and *Passo di Resia* (1925), complete with explanatory notes (respectively Sander, 1925; Sander & Hammer, 1926; Hammer, 1925) were published in the "Tre Venezie geological map" of the *Magistrato delle Acque* of Venice. The last sheet of the "Tre Venezie geological map", *Conegliano*, was published in 1963, a year after the death of Dal Piaz who witnessed the publication of all the 42 sheets of the series (Venzo, 1963).

The last reference to the Austrian cartographic series is done by Novarese, who wrote, in an article explaining the third edition of the Geological Map of Italy 1:1,000,000 scale, that "Beyond the eastern border were used geological information deduced from the maps of the Geological Survey of Austria, partly printed, partly unpublished, of which were sent copies to the Geological Survey of Italy many years before" (Novarese, 1932). This statement suggests that this valuable cartographic material was finally found and properly studied and valued.

The maps of *Geologische Spezialkarte* had finally reached the library of the Geological Survey of Italy in the months between 1919 and 1920. A number written in ink at the top left indicates the arrival of the exchanged material. The analysis of periodic and cartographic publications received by the library allowed to confidently date the period in which these maps arrived, between June and December 1920. The maps, have not been received then as "spoils of war" but more likely as a scientific publications exchange; in fact, an official shipment document

for surrender or sale has never been found in the records of the GBA nor in those of the Austrian State Archive.

The chronological reconstruction of the events that have allowed us to understand the reasons for which the Austrian cartography manuscript was delivered to the Geological Survey of Italy showed continuity in the technical-scientific relationship between Italy and Austria.

CONCLUSION

The acquisition of cartographic material in the years immediately following the conflict, regardless of the obligations arising from peace treaties, demonstrates a long-term cooperation between the two institutions, the *Geologische Staatsanstalt* in Wien and the Geological Survey of Italy in Rome, which goes deeply beyond the political divisions.

This relationship, already established in the years before the First World War, as demonstrated for example by the *Geologische Übersichtskarte der Alpen* (Nöe, 1890) realized by all the countries of the Alpine area, continues during the conflict and in the years immediately following the war (Fig. 3).

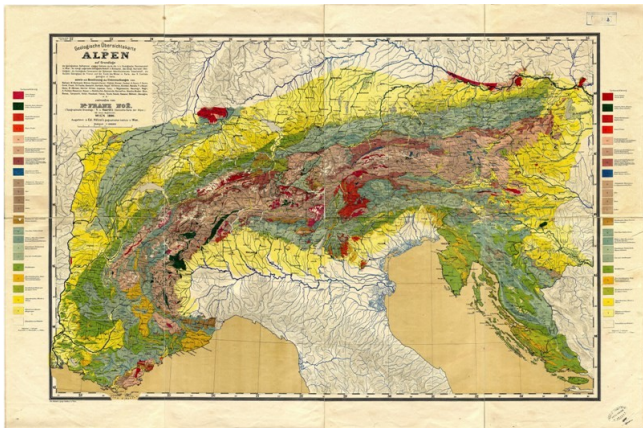


Fig. 3 - *Geologische Übersichtskarte der Alpen*, 1:1,000,000 scale, coordinated by Franz Noe, realized by the k.k. Geologische Reichsanstalt in Wien, the königl. Ungarische Geologische Anstalt in Budapest, the königl. Bairische Oberbergamt, the Geologische Commission der Schweizer Naturforschenden Gesellschaft, the Société Géologique de France and the École des Mines in Paris, the R. Comitato geologico d'Italia.

The realization of the geological map of the *Tre Venezie*, promoted by the *Magistrato delle Acque* and coordinated by Giorgio Dal Piaz, is based on geological information derived from Austrian maps and, in some cases, the same Austrian Authors (Sander, Hammer) were involved. This proves that there was the need for a fast execution of the mapping but mostly it demonstrates the recognition of their highly scientific value; they indeed could be considered among the most successful geologists of the Alps of that period.

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