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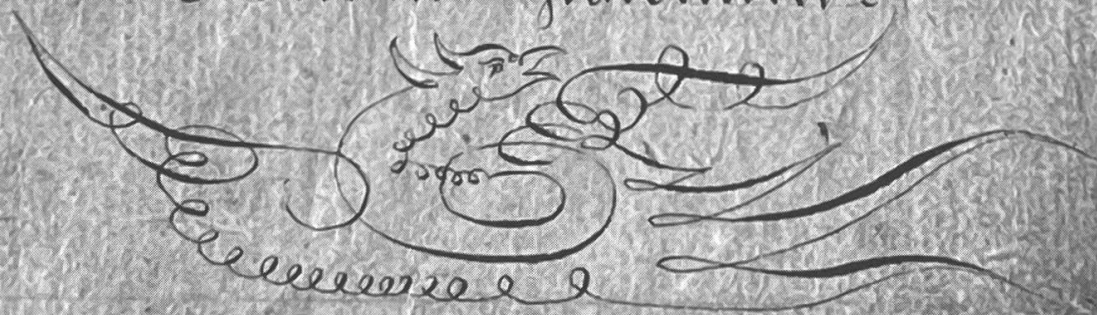
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*Degli insigni filosofi viaggiatori  
che nei loro letterarj viaggi  
per geognostiche osservazioni  
onorano Predazzo  
e l'albergo di  
Michele Giacomelli.*



# Geological Riddles

## The Origins of Geotourism in the Dolomite Mountains

William Bainbridge

### Zusammenfassung – Geologische Rätsel. Der Geotourismus in den Dolomiten

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In diesem Beitrag werden der Geotourismus in den Dolomiten sowie die Debatte über die Entstehung der Erde im 19. Jahrhundert beleuchtet. Die Forschungen des Grafen G. M. Pencati im Fassatal haben dieses zu einem international attraktiven Ort gemacht. Das Gästebuch des Hotels Nave d'Oro bietet eine wertvolle Quelle, die es ermöglicht, die Begegnungen von Wissenschaftlern und Touristen in der Region zu erkunden. Darin enthalten sind Einträge berühmter Wissenschaftler (Humboldt, Fuchs, Richthofen, Murchison usw.) und einer Schar weniger bekannter Besucher. Zudem wird über einen fleissigen Gastwirt berichtet, der es mit Geologen zu tun hatte, welche die Ursprünge der Erde erkundeten.

In the introduction to the first edition of her national bestseller, *Untrodden Peaks and Unfrequented Valleys: A Midsummer Ramble in the Dolomites* (1873), Amelia B. Edwards observed that the district she was about to promote as a new fashionable “playground” for British travellers had once attracted the curiosity of only a few scientists: *Till the last six or eight years – that is to say, till the publication of Ball’s Guide to the Eastern Alps in 1868, and the appearance of Messrs. Gilbert and Churchill’s joint volume in 1864, – the Dolomite district was scarcely known even by name to any but scientific travellers. A few geologists found their way now and then to Predazzo; a few artists, attracted in the first instance to Cadore, as the birthplace of Titian, carried their sketch-books up the Ampezzo Thal; but there it ended.*<sup>1</sup> In acknowledging the contribution of scientists and artists to such a promotion, Edwards drew a distinction between two epochs of travel: the one of scientific discovery, in the wake of the identification of the dolomite rock by Dolomieu and Saussure, and the one of touristic ex-

plotation, following the publication of Josiah Gilbert's and George Cheetham Churchill's *The Dolomite Mountains* (1864) and John Ball's *Guide to the Eastern Alps* (1868).

If the reference to artists remains mostly associated with Cadore, the “few geologists” who found their way to the Dolomites are mentioned in the section Edwards devoted to the Hotel Nave d'Oro (‘Golden Ship’) in Predazzo: “Their visitors’ book is quite a venerable volume, and contains, among the usual irrelevant rubbish of such collections, the handwriting of Humboldt, Fuchs, Richthofen, Sir Roderick Murchison, the Elie de Beaumonts, and other European celebrities”.<sup>2</sup> Edwards’ attitude towards these “celebrities” is detached. Predazzo embodied for her a Mecca only “attractive to geologists and mineralogists” with “no excursions to repay the unscientific visitor”.<sup>3</sup> For the scientific visitor, instead, the lure of Predazzo coincided with the glittering aura of illustrious geologists who left their signature in the visitors’ book of the Nave d'Oro, whose owner, Michele Giacomelli, quickly transformed into a relic charged with international prestige.

The hotel is now gone, but we have its guestbook.<sup>4</sup> This paper introduces this remarkable document as a precious incunabulum to explore the emergence of geotourism in the Dolomites in the period between the epoch of scientific discovery and the epoch of tourist exploitation. Defined relatively recently as a form of “special interest” tourism, geotourism has been historically studied with reference to the English Peak and Lake Districts and the southern coastline of England, where the first commodification of geological wonders was accompanied by the development of dedicated itineraries, guided tours and travel books specifically designed for visitors interested in picturesque scenery, mineralogy and geomorphology.<sup>5</sup> The case of Predazzo, then only an isolated village off the Alpine beaten path, shows the entrepreneurship of an industrious inn-keeper able to gain profit from an exchange with the most prominent geologists of the time, who visited his abode in search of the origins of the Earth.<sup>6</sup>

## Preposterous Formations

The guestbook of the Nave d'Oro was not started as a guestbook. The original intention may have been closer to a chronicle, as the title *Memoriale* would suggest.<sup>7</sup> The first entry reads in fact like a short report on the discoveries made in the region by Count Giuseppe Marzari Pencati, an inspector of mines (“consigliere montanistico”) for the Kingdom of Lombardy-Venetia, who between 1818 and 1821 conducted a series of geological investigations in the mountains around the Fassa Valley.<sup>8</sup> The studies conducted by Luca Ciancio



and Ezio Vaccari have managed to shed new light on Marzari Pencati's contributions to the geology of the Dolomites as well as on the controversy that his sensational discoveries spurred in the scientific circles of the time.<sup>9</sup> To understand the tenor of Marzari Pencati's findings we need to recall the hegemony exerted by Abraham von Werner on the European geological disputes of the first two decades of the nineteenth century.<sup>10</sup>

Based upon the concept of rock formation as the result of a slow process of sedimentation in water, Werner's neptunist theory provided scientists with an orderly method for classifying all major rocks of the Earth's surface, independently of their mineral composition or geographical distribution. According to his view, the Earth was made up of distinct sequences of rock formations, chronologically organised in primitive (*Urgebirge*), transitional (*Übergangsgebirge*), secondary or stratified (*Flötz*), alluvial or tertiary (*Aufgeschwemmte*) and volcanic classes. Granite, for instance, belonged to the primitive class and was located in deeper strata; limestone, instead, was linked to the secondary class and was found above the former. Areas in which the sequences showed different distributions were simply dismissed as anomalies. Werner's followers, including Alexander von Humboldt and Leopold von Buch, surveyed vast territories in Europe and the Americas guided by these principles.

In the district of Trentino, or Italian Tyrol, such anomalies were especially puzzling. Buch's explorations of the area around Pergine in 1798 provides an excellent example of the feeling of bewilderment produced in the observer by the encounter between theory and reality: *Here I don't understand people anymore – and hardly nature. Rocks appear here chaotically thrown into disarray, and the beautiful order one could find north of the Brenner seems totally gone [...] Are not here obviously overturned the beautiful systems, which once governed the rock formations? Is porphyry here not bedded above secondary limestone (Flözkalk), mica-schist (Glimmerschiefer) above porphyry?*<sup>11</sup> At this point, Buch tried – as he would do again later on, when confronted with similar findings in Norway – to stubbornly defend Werner's theory.<sup>12</sup> Such bewildering anomalies threatened to undermine the chronological order of rock formations, which the admired teacher of the Freiberg Mining Academy had so beautifully laid out. Buch's consternation was expressed, as in the passage above, in terms of apprehension, both epistemological and aesthetic, without nonetheless compromising his loyalty to Werner.

During his training in Paris, between 1801 and 1805, Marzari Pencati had the occasion to meet, among many other illustrious scientists, Humboldt and Buch, and to study with the palaeontologist George Cuvier, another fervent follower of Werner's theory. Despite his acquaintance with neptunist circles, he established closer links with Barthélemy Faujas de Saint-Fond, who was regarded

as one of the few adversaries of Werner's theory. Marzari Pencati found in Faujas a fervent supporter of the vulcanist theory formulated in Italy by Anton Lazzaro Moro, embraced by Giovanni Arduino and Alberto Fortis, and revived by James Hutton in his *Theory of Earth, with Proofs and Illustrations* (1795).<sup>13</sup>

Marzari Pencati's adherence to Faujas' vulcanism, a theory in which magmatic activities played a major role in the Earth's formation, yielded to his marginalisation from the mainstream neptunist community.<sup>14</sup> Firmly persuaded of the igneous origin of crystalline rocks, Marzari Pencati conducted a series of fieldworks in Trentino, around the area that had puzzled Buch back in 1798. During three long excursions in 1818–1819, Marzari Pencati noticed in Canzocoli, near Predazzo, the anomalous presence of granite lying above the allegedly much younger Alpine and Jura limestones. He also observed that the chalk underneath such “tertiary granite” presented clear evidence of contact metamorphism, giving the rock the appearance of marble. This modification could only be due to the action of a hot and fluid granite, proving the igneous origin of that rock.<sup>15</sup> Marzari Pencati's observations challenged not only Werner's sequence of strata but also his theory of rock crystallisation in water, and thus threatened to subvert the then most credited model for explaining the origin of the Earth.

### Geognostic Skirmishes

Well aware of its unsettling potential, Marzari Pencati shared his discovery only with friends and colleagues. One of them, Giambattista Brocchi, a geologist inclined to accept the neptunist theory, had already divulged some of his preliminary findings in 1811 and 1817.<sup>16</sup> The fear of seeing the merit of his discoveries compromised spurred Marzari Pencati to publish the results of his investigations in 1819 and 1820.<sup>17</sup> The convoluted language of these reports, their fragmentary style, and the generic remit of the publishers and journals in which they appeared reveal all the anxiety that a provincial inspector of mines must have felt in going against a such a monumental theory like Werner's neptunist one.

The discovery that was to demolish that monument could have remained unnoticed if Claro Giuseppe Malacarne had not published a summary in the *Biblioteca italiana*.<sup>18</sup> The most vigorous endorsement, however, came from the vulcanist geologist Scipione Breislak, who refashioned Marzari Pencati's argument as a direct attack against the Wernerian orthodoxy.<sup>19</sup> The French and German versions of Breislak's endorsement gave international resonance to Marzari Pencati's discovery.<sup>20</sup> The first neptunist reaction came from Buch himself. In a letter dated 29 September 1821 and addressed to the local inspec-

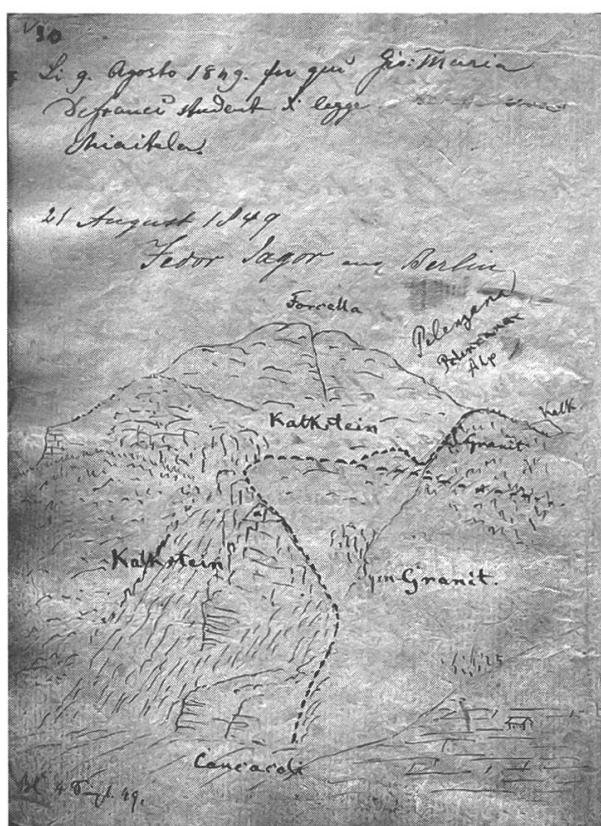


Fig. 1. Sketches of the site of Canzoccoli, near Predazzo: a) Fedor Jagor, 21 August 1849 (*Memoriale*, p. 30); b) Julius Payer, 28 September 1863 (*Memoriale*, p. 70).

tor Alois Pfaundler, Buch mobilised his international authority to dismiss that discovery as an optical illusion: “I believe therefore that such apparent superposition of granite is in fact only a *juxtaposition* and that the limestone is certainly not traceable under the granite”.<sup>21</sup> Shortly after, the mineralogist Paul Maria Partsch informed Ludwig von Welden of Buch’s rejection and illustrated his comment with a drawing.<sup>22</sup>

Marzari Pencati’s reply highlighted Buch’s inaccuracies and dubbed Partsch’s summary a “novel” (“il romanzo del signor Partsch”).<sup>23</sup> His rancorous tone, rambling style and windy prose, printed on large cumbersome folios (“forma incomoda di grandi fogli impressi soltanto da una parte”) and distributed in leaflets or broken up brochures (“fogli volanti o frantumi di opuscoli”), scarcely made his argument effective.<sup>24</sup> Despite his unfashionable communication style, Marzari Pencati’s observations were correct, and the subsequent writings by Humboldt and Buch failed to disprove their validity.<sup>25</sup> In 1824, Breislak wrote a further account on the topic, in which he added the then still unpublished report by Pietro Maraschini, Domenico Trettenero and Charles Bertrand-Geslin, who conducted a conclusive survey on site, confirming Marzari

Pencati's observations.<sup>26</sup> Traces of this survey are found also in the *Memoriale*, with the addition of a drawing by the ethnologist Fedor Jagor, explaining the relation between granite and chalk (Fig. 1a).<sup>27</sup>

### Bread upon Butter

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The list of illustrious names scattered throughout the *Memoriale* is conspicuous for the absence of Leopold von Buch. Given the antagonism that opposed the two geologists, it would be surprising to find Buch's signature in a collection praising Marzari Pencati so emphatically. It is remarkable, however, to see, right after the first entry, the signature of Humboldt.<sup>32</sup> The great naturalist stayed at the Nave d'Oro only for few hours on the 30<sup>th</sup> of September 1822. He had arrived at Verona on the 7<sup>th</sup> of that month, as part of the Prussian delegation to the Congress of Verona, and made a quick excursion to Predazzo





Fig. 2. a) Portrait of Giuseppe Marzari Pencati;  
b) Portrait of Alexander von Humboldt, Predazzo,  
Museo Geologico delle Dolomiti (MUSE).

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to take a closer look at the site around Canzoccoli.<sup>33</sup> Ciancio is right in distinguishing between the moderate position of Humboldt, more disposed to accept as valid Marzari Pencati's observation, and Buch's more critical opinion. One may wonder how Werner's pupil might have accepted to add his signature next to a comment qualifying that observation as a "fight against the neptunist system endorsed by Werner's followers". It is more plausible, therefore, that at the time of Humboldt's visit those comments still had to be included.

Humboldt's signature turned out to be a treasure for the Nave d'Oro. Giacomelli entrusted a local artist with producing a portrait of the famous scientist ("as if he were a comfortable Bauer") and proudly hung it in the dining room of his hotel, close to Marzari Pencati's one (Fig. 2).<sup>34</sup> Humboldt's portrait continued to act as a brand for the Nave d'Oro until later in the century, when Giacomelli's son, Francesco, printed a leaflet addressed to geologists ("ai cultori della geonosia e mineralogia") with the effigy of the scientist prominently featured at the top of the page.<sup>35</sup> According to Walter White, who visited the Dolomite district in 1870, Francesco Giacomelli continued to praise Marzari Pencati's discovery by showing his guests "an album containing the portraits of some who have visited Predazzo for scientific objects" and, of course, the venerated

“visitors’ book”, with signatures of “the most famous geologists and mineralogists of Europe [who] have journeyed to Predazzo to see the singular phenomenon with their own eyes”.<sup>36</sup>

Among them, White chose to transcribe a short poem by an “Irish Doctor”, who in humorous lines captured quite vividly the gist of the matter:

*Bread upon butter spread is rare,  
Rare heels up and head down,  
Grass growing toward the centre’s rare,  
Rare under foot a crown.*

*But all the rarest, granite here  
Lying on chalk is seen;  
And by some blunder chalk below,  
Where granite should have been.*<sup>37</sup>

The poem renders well and in plain terms the topsy-turvy effect that the inverted position of granite above limestone could still produce, twenty-five years from its first formulation, in visitors still acquainted with Werner’s theory. In the *Memoriale* the poem is dated “July 27. 1854” and signed “J<sup>s</sup>. Henry”, which helps us identify White’s “Irish Doctor” with the Irish poet James Henry.<sup>38</sup> The *Memoriale* offers, therefore, the autographed version of such a witty composition.<sup>39</sup>

The poem soon found its way on the printed paper. In Henry’s 1856 collection of poems, the quatrains are prefaced as follows: “Written in the Album at Predazzo in Val Fiemme [sic] (Italian Tyrol) where geologists find chalk underlying granite”.<sup>40</sup> The eclectic author, a reputed Virgilian scholar until lately ignored, would figure perfectly in any history of walking. One of his biographers describes him as a “physician, pamphleteer, wanderer, and classical scholar”, who paid special attention to Trentino in his two long peripatetic satires, written in the manner of Horace: *Thalia Petasata, or a foot-journey from Carlsruhe to Bassano, described on the way in verse* (Dresden 1859) and its sequel *Thalia Petasata iterum, or A foot journey from Dresden to Venice, described on the way in verse* (Leipzig 1877).<sup>41</sup>

According to Amelia Edwards, there was another autograph which lent special prestige to the guestbook: “some nefarious autograph-hunter has abstracted one of the greatest treasures the book contained – the signature of the discoverer of the Georgium Sidus”.<sup>42</sup> This information came most probably from Giacomelli himself, who must have mentioned only the surname Herschel, leading Edwards to believe that William Herschel, the discoverer of Ura-

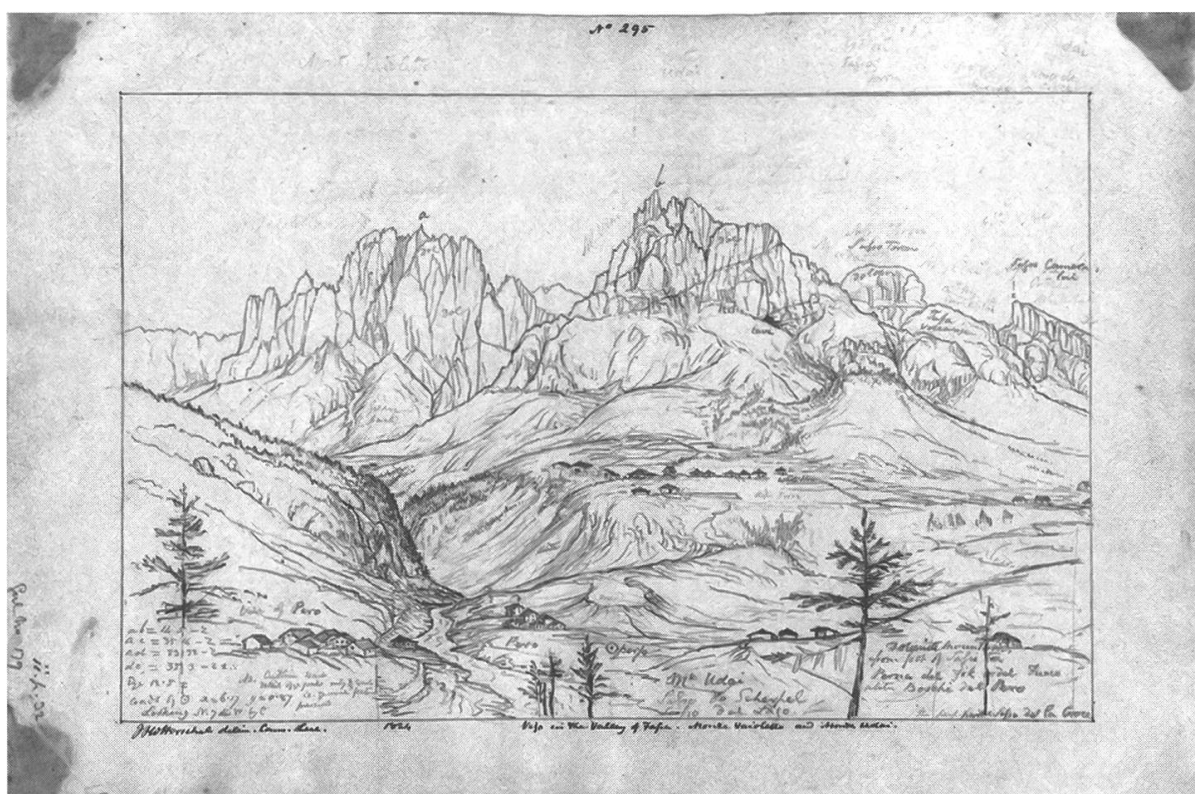


Fig. 3. Sir John Frederick William Herschel, *Vigo in the Valley of Fassa. Monte Violetto and Monte Udai*, 1824, Los Angeles, The J. Paul Getty Museum, Gift of the Graham and Susan Nash Collection, 91.GG.98.29.

nus, stayed at the Nave d'Oro.<sup>43</sup> It is unlikely, however, that the great astronomer, who died in 1822, ever went to Predazzo. Who did go there was his equally famous son, John Frederick William, the English polymath who counts as one of the inventors of experimental photography.<sup>44</sup> Herschel passed through the village on the way back from his second Italian tour in 1824, a tour marked by a strong attraction for geological phenomena.<sup>45</sup>

It was his mentor, William Hyde Wollaston, the inventor of the *camera lucida*, who introduced Herschel to the fields of geology and mineralogy. His excellent drawings in the Fassa Valley bear witness to this interest. The eight drawings that document his presence in the Fassa Valley, now at the Getty Museum in Los Angeles, are less interesting for the picturesque scenery they depict than for the geological gaze they reveal.<sup>46</sup> In the course of his "mineralogical ramble through Tyrol in the months of August and September" of 1824, Herschel visited the site of Canzoccoli, "a spot already remarkable among geologists from the asserted superposition of *granite* on *chalk*", but which attracted

his interest for “the most remarkable fact attending this junction”, namely “the occurrence of a thin lamina of serpentine between the sienite and the dolomite”.<sup>47</sup> The exposure of serpentine was then a hot topic in Britain, observed in Scotland by John Macculloch and Charles Lyell.<sup>48</sup> This way Predazzo became a site of comparison for understanding the geology of Britain; the rocks Herschel extracted from the site became part of the mineralogical collection of the Geological Society in London.<sup>49</sup>

## Geological Fandom

Herschel modestly describes himself as an amateur geologist: “I content myself with submitting the specimens, with this very imperfect account, to the judgement of better geologists than myself”, although his mineralogical observations reveal an interest in the discipline which goes well beyond that of a dilettante.<sup>50</sup> He found out about Canzoccoli from a company of three “travellers who had visited it the day before”, whose names are included in a footnote: “Il Marchese Petrucci, di Pezaro [sic], Mons. Bernard Islin, and Signior Perolini [sic], di Bassano”.<sup>51</sup> These names are clearly traceable in the *Memoriale*: “In September 1824 were here to explore the rocks of Predazzo – not only rocks but also botanical objects – Mr Parolini from Bassano, Mr Carlo Betrant from Nantes and the Marquis Petrucci from Peszero”, identifiable as the famous botanist Alberto Parolini, the geologist Charles Bertrand-Geslin, who stayed at the Nave d’Oro the year before, and the naturalist Pietro Petrucci from Pesaro.<sup>52</sup> The next page, on which Herschel would presumably have added his signature, has indeed been removed, leaving the stub of paper still visible.

The loss of information, however, was probably not only due to “nefarious autograph-hunter[s]”, but also to Giacomelli’s unsystematic process of gathering data for his *Memoriale*. In an entry of 1826 he stated: “In the year 1826 five students from Norway came here to conduct geological observations, whose names I cannot mention for I have lost the piece of paper on which they wrote them”.<sup>53</sup> Right below this note, a different hand added later: “three of these men were Keilhau, Professor of Mineralogy, Boeck, Professor of veterinary, Abel, Professor of Geometry”.<sup>54</sup> It was Buch himself who mentioned a site in Norway as a possible comparison to the geological phenomenon observable at Canzoccoli.<sup>55</sup> It is not surprising, therefore, to find students from Norway in Predazzo already in the 1820s. Albeit not professors at the time of their visit, the three young students – the mineralogist Baltazar Mathias Keilhau, palaeontologist Christian Peter Bianco Boeck, and mathematician Niels Henrik Abel – were accompanied by Nicolaj Benjamin Møller, who became mining superintendent



at Kongsberg's silverworks, and Nils Otto Tank, an adventure-seeker and later missionary for the Hutterite Brethren in the Americas.<sup>56</sup>

In his work on the volcanic rocks in the region around Oslo, then named Christiania, the Norwegian geologist Waldemar Christopher Brøgger devoted an entire volume to Predazzo, whose introduction reads like a nostalgic celebration of the guestbook of the Nave d'Oro: *We read the old, often difficult to decipher traces of names, and a deep nostalgia takes hold of our soul; – how they all sought the truth with such honest effort! And yet, how slow and arduous was the way to the truth, how many strenuous steps went unheard in the steep cracks of these mountains! We read with reverence the names of the first pioneers.*<sup>57</sup> Brøgger confirmed the presence of the three Norwegian colleagues who had travelled to Predazzo before him, adding, as reported by Elling Holst, a transcription of the entry found in the guestbook.<sup>58</sup> What is noticeable here is the celebratory link Brøgger established between Predazzo and his homeland: "The area around Christiania and the one around Predazzo! The correct identification of granite and therefore deep rocks as the products of magmatic solidification, as eruptive rocks, is linked to these two names".<sup>59</sup>

In the extensive list of over forty names belonging to prominent scientists that Brøgger extracted in the *Memoriale* – from Marzari Pencati to Richthofen, Mojsisovics, Bertrand and beyond – the name of Buch was noticeably absent ("We could not find the name of Leopold von Buch").<sup>60</sup> This name was important to him because, as already noted, it was Buch who credited Christiania with being the geologically "most important area of northern Europe", and Buch again who promoted Predazzo, via Marzari Pencati's discovery, as a place of global interest.<sup>61</sup> Despite the skirmishes that saw the Italian and the German geologists polemically opposed, Buch admitted that Tyrol offered nothing less than "the key to the theory of the Alps, without which the real constitution of these mountains could be conceived only imperfectly".<sup>62</sup> Brøgger found in Buch the authority that allowed him to harness the prestige of Predazzo to promote Christiania.

With the only exception of Marzari Pencati, Brøgger's list of prominent personalities is conspicuous for the systematic removal of all Italian scientists, who more than once pop up in the *Memoriale* next to those foreign names. Italian naturalists played for him the same supporting role of local guides accompanying prominent mountaineers in their dolomitic ascents.<sup>63</sup> For Brøgger the *Memoriale* is not a guestbook but a "Fremdenbuch" ('foreign book') – the venerable document of a geological fandom whose heroes belong to the credited community of northern scientists. Equally unmentioned is the crowd of simple tourists flocking to Predazzo to admire the remarkable geological phenomenon at Canzoccoli – the guestbook's numerous entries, forming the bulk of

what Edwards dismissed as “the usual irrelevant rubbish of such collections”.<sup>64</sup> That rubbish, however, comprises the drawing by the mountaineer artist Julius Payer, included in the *Memoriale* on the 28<sup>th</sup> of September 1863, a few days after he climbed the Grossglockner.<sup>65</sup> The sketch depicts the site of Canzoccoli with very little geological information, however, to glean from the image, in striking contrast to Jagor’s earlier drawing (Fig. 1b).

It is possible that, in looking at the site, Payer experienced the same baffling feeling that Walter White would so eloquently express about ten years later, when a young member of the Giacomelli family escorted him to take a closer look at the location venerated by so many illustrious scientists: “*Ecco!*” said the lad, “we have arrived,” as we stepped upon a small rough shelf strewn with bits of stone, and backed by a patch of grey cliff. I looked at that patch curiously; but could discern no differences, and felt disappointed. To my perception the surface was grey rock of uniform colour, and nothing more. Among the fragments under foot it was easy to see which was granite and which kalk; but in the rock itself one looked like the other: that is, to my eyes. It was not the first time that I had taken trouble to see a geological phenomenon, and had been disappointed; and my conviction that geologists have a special gift of vision was confirmed. I afterwards discovered that the difference which masked itself from near eyes could be seen at a distance, for, on looking up to the patch from the edge of the village on our return, I distinctly saw in the darker colour of the top of the cliff the granite superimposed on the white calcareous base.”<sup>66</sup> White’s passage, as the one by Brøgger before, discloses the hypertextual dimension of a historical guestbook. In the case of the Nave d’Oro, travelogues and scientific reports act as complementary historical sources, revealing the cosmopolitan dimension of geotourism in the Dolomites. Regardless of the “irrelevant rubbish” it might contain, the *Memoriale* became an object of prestige – “a precious manuscript, preserved with special care”, in which even amateur explorers visiting the area *en touriste* could add, “with a sort of respect”, their names, and cultivate the fantasy of becoming part of history in a holiday mood.<sup>67</sup>

- 1 A. B. Edwards, *Untrodden Peaks and Unfrequented Valleys: A Midsummer Ramble in the Dolomites*, London 1973, p. vii; the identification of the Dolomites as a «new playground [...] far more attractive than the Alps» (*ibid.*, p. ix) alludes to L. Stephen, *The Playground of Europe*, London 1871. For British travellers in the Dolomite region, see W. Bainbridge, *Topographic Memory and Victorian Travellers in the Dolomite Mountains: Peaks of Venice*, Amsterdam 2020.
- 2 Edwards (see note 1), p. 283; see also W. Bainbridge, «Titian Country: Josiah Gilbert (1814–1893) and the Dolomite Mountains», *Journal of Historical Geography*, 56, 2017, pp. 22–42.
- 3 Edwards (see note 1), p. 285.
- 4 *Memoriale degli insigni filosofi viaggiatori che nei loro letterarj viaggi per geognostiche osservazioni onorano Predazzo e l'albergo di Michele Giacomelli*, 2 vols., Predazzo, Museo Geologico delle Dolomiti (MUSE), henceforth abridged as *Memoriale*; see F. Luzzini, «Scalare il Sublime. Scienza e storia nel primo volume del Memoriale dell'Hotel Nave d'Oro di Predazzo (1820–1875)», *Natura Alpina: Rivista della Società di Scienze Naturali del Trentino*, 69, 2018, pp. 95–100; S. Trotter, N. Zanotti (eds.), *Il Memoriale dell'albergo Nave d'Oro di Predazzo*, Predazzo 2015; S. Vardabasso, «Das Fremdenbuch des Gasthofs 'Nave d'Oro' in Predazzo», *Geologische Rundschau*, 38, 1950, pp. 68–71.
- 5 T. A. Hose, «Towards a History of Geotourism: Definitions, Antecedents and the Future», *Geological Society, London, Special Publications*, 300.1, 2008, pp. 37–60, see also, for earlier accounts, N. Heringman, *Romantic Rocks: Aesthetic Geology*, Ithaca 2004; *Id.*, *Sciences of Antiquity: Romantic Antiquarianism, Natural History, and Knowledge Work*, Oxford 2013; B. M. Stafford, *Voyage into Substance: Art, Science, Nature, and the Illustrated Travel Account, 1760–1840*, Cambridge, MA, 1984.
- 6 On Michele Giacomelli (1772–1836) and his son Francesco Benedetto (1799–1873), who ran the hotel after the death of his father, see S. Trotter, «L'albergo Nave d'Oro», in: Trotter/Zanotti (see note 4), pp. 17–25.
- 7 *Memoriale* (see note 4), vol. 1, p. 1.
- 8 L. Ciancio, «Marzari Pencati, Giuseppe», in: *Dizionario Biografico degli Italiani*, Rome 2008, pp. 454–459.
- 9 *Id.*, «La chiave della teoria delle Alpi: località, collezioni e reperti dell'area trentina e dolomitica nella storia delle teorie geologiche (1760–1830)», *Archivio Trentino*, 48, 1999, pp. 205–274; E. Vaccari, «Il contributo di Giuseppe Marzari Pencati (1779–1836) alla geologia veneta dell'Ottocento», in: C. Lazzari (ed.), *Le scienze della terra nel Veneto dalla caduta della Serenissima all'Unità d'Italia*, Venice 1999, pp. 25–41.
- 10 A. M. Ospovat, «The importance of regional geology in the geological theories of Abraham Gottlob Werner: a contrary opinion», *Annals of Science*, 37.4, 1980, pp. 433–440; R. Laudan, *From Mineralogy to Geology: The Foundations of a Science, 1650–1830*, Chicago 1987, pp. 87–112.
- 11 L. von Buch, «Pergine», in: *Id.*, *Geognostische Beobachtungen auf Reisen durch Deutschland und Italien*, 2 vols., Berlin 1802, vol. 1, pp. 301–318, here p. 301: «Hier verstehe ich die Menschen nicht mehr, – und kaum die Natur. Chaotisch scheinen hier die Gebirgsarten durcheinandergeworfen, und die schöne Ordnung vom Brenner herab, scheint ganz dahin [...] Sind nicht hier offenbar die schönen Systeme über Haufen geworfen, welche die Formationszeit der Gebirgsarten bestimmten? Ist hier nicht Porphyr auf Flözalk, Glimmerschiefer auf Porphyr gelagert?».
- 12 Ciancio (see note 8), pp. 227–228. On the explo-

ration of the region before Buch, see *Id.*, «Le forme del discorso geologico nell'Italia del Settecento: tradizioni scientifiche metropolitane e interessi locali nelle indagini sulla geomorfologia del Tirolo meridionale», in: J. Mathieu, S. Boscani Leoni (eds.), *Die Alpen! Les Alpes! Zur europäischen Wahrnehmungsgeschichte seit der Renaissance. Pour une histoire de la perception européenne depuis la Renaissance*, Bern 2005, pp. 237–252.

**13** Ciancio (see note 8); *Id.*, *Autopsie della terra: Illuminismo e geologia in Alberto Fortis (1741–1803)*, Florence 1995, p. 153; Laudan (see note 10), pp. 113–237; E. Vaccari, *Giovanni Arduino (1714–1795): Il contributo di uno scienziato veneto al dibattito settecentesco sulle scienze della terra*, Firenze 1993; *Id.*, «Wernerian Geognosy and Italian Vulcanists», in: H. Albrecht, R. Ladwig (eds.), *Abraham Gottlob Werner and the Foundation of the Geological Sciences*, Selected Papers of the International Werner-Symposium in Freiberg, 19<sup>th</sup> to 24<sup>th</sup> September 1999, Freiberg (Freiburger Forschungshefte, Reihe D, 207 Montan und Technikgeschichte) 2003, pp. 26–35; M. T. Greene, *Geology in the Nineteenth Century: Changing Views of a Changing World*, Ithaca 1982, pp. 19–45.

**14** This unfair marginalisation is aptly acknowledged in L. Pasini, *Notizia sulla vita e sugli studj del conte Giuseppe Marzari Pencati, vicentino, I. R. consigliere delle miniere*, Milano 1836.

**15** Ciancio (see note 8), pp. 239–240.

**16** G. Marzari Pencati, «Squarcio di lettera del sig. conte Marzari al sig. Brocchi, intorno ad alcune osservazioni mineralogiche fatte ne' colli Vicentini», *Biblioteca italiana, o sia Giornale di letteratura, scienze ed arti*, 8, 1817, p. 522; G. B. Brocchi, *Memoria mineralogica sulla valle di Fassa in Tirolo*, Milano 1811, p. 17; on Brocchi's neptunism, see L. Ciancio, «La difesa dell'ipotesi nettunistica», in: p. Marini (ed.), *L'opera scientifica di Giambattista Brocchi (1772–1826)*, Vicenza 1987, pp. 55–65, and *Id.*, «Giambattista Brocchi e la teoria dei vulcani sottomarini: conversione o ristrutturazione teorica?», in: E. Vaccari (ed.), *Le scienze della terra nel Veneto dell'Ottocento*, Venice 1998, pp. 23–50.

**17** G. Marzari-Pencati, *Cenni geologici e litologici sulle provincie Venete, e sul Tirolo*, Vicenza 1819; *Id.*, «Notizia sopra un granito in massa sovrapposto sul fiume Avisio, in giacimento discordante, al calcare secondario; cioè adagiato in sovrapposizione immediata entro le grandi valli dall'erosion lenta in esso calcare scavate; ed intorno i passaggi mediati od immediati, di questo granito all'amigaloide agatiferi, al basalto, alla dolerite, al porfido euritico, al serpentino, e ad un neurite porfiroide supposto affine alla trachite nera», *Nuovo Osservatore Veneziano. Supplemento*, 118 and 127, 1820, pp. 1–6.

**18** G. Malacarne, «Lettera del dottor Claro Giuseppe Malacarne, segretario per gli affari delle

miniére, al sig. barone Isimbardi, I.R. consigliere, direttore della Zecca di Milano, intorno alle scoperte fatte ultimamente nella valle del Lavis in Tirolo dal sig. conte Giuseppe Marzari-Pencati di Vicenza, I.R. consigliere montanistico ed ispettore generale delle miniére», *Biblioteca italiana, o sia Giornale di letteratura, scienze ed arti*, 21, 1821, pp. 370–400; see Ciancio (see note 8), pp. 240–241.

**19** S. Breislak, «Sulla giacitura di alcune rocce porfiriche e granitose osservate nel Tirolo da Sig. Conte Marzari-Pencati, I.R. Consigliere delle Miniére. Memoria geognostica letta all'Imp. R. Istituto di Lombardia», *Giornale di fisica, chimica, storia naturale, medicina ed arti*, 4, 1821, pp. 171–202, also printed separately.

**20** *Id.*, «Mémoire géologique sur le gissement de quelques roches porphyritiques et granitiques observées dans le Tyrol par M. le comte Marzari Pencati», *Journal de Physique, de chimie, d'histoire naturelle et des arts*, 93, 1821, pp. 181–193, 247–271; *Id.*, «Ueber die Lagerung einiger Porphy- und Granitfelsen in Tyrol vom Bergrathe Grafen Marzari-Pencati. Eine Vorlesung gehalten im kaiserlich-königlichen Institut der Lombardei», *Deutschland geognostisch-geologisch dargestellt und mit Charten und Durchschnittszeichnungen erläutert*, 2, 1821, pp. 236–252; on Breislak, see L. Gennari, «Breislak, Scipione», in: *Dizionario biografico degli italiani*, Roma 1973, vol. 14, pp. 118–220.

**21** L. von Buch, «Schreiben des Leopold Freiherrn von Buch, königl. preuß. Kammerherrn, des rothen Adler-Ordens Ritter, Mitgliedes der Akademien der Wissenschaften von Berlin, Paris, München und Edinburgh etc., an den k.k. provisorischen Domainen-Inspektor herrn Alois von Pfaundler», *Kaiserlich-Königlich privilegirter Bothe von und für Tirol und Vorarlberg*, 86, 1821, p. 344: «Ich glaube daher, dass diese scheinbare Auflagerung des Granits doch nur ein Nebeneinanderstehen, und der Kalkstein durchaus nicht unter dem Granit hinein zu verfolgen sey». The letter was also included in *Deutschland geognostisch-geologisch dargestellt und mit Charten und Durchschnittszeichnungen erläutert*, 2, 1821, pp. 253–258, immediately after the German translation of Breislak's lecture (see note 19).

**22** P. M. Partsch, «Estratto di lettera del sig. Partsch di Vienna, in data 22 gennaio 1822, al sig. colonnello barone di Welden (traduzione dal tedesco)», *Biblioteca italiana, o sia Giornale di letteratura, scienze ed arti*, 25, 1822, p. 104; the drawing is reproduced in Ciancio (see note 8), p. 242.

**23** G. Marzari-Pencati, *Avviso [comunicato ad Alberto Parolini]. Squarcio d'una lettera inedita nel quale parlasi della giacitura del Monte Cimadasta, e degli altri terreni cristallizzati terziarij posti fra il Grigno ed il Cimon*, Vicenza 1822; on Parolini, see A. Brotto Pastega, *Le case ed il giardino del naturalista bassanese Alberto Parolini (1788–1867)*, Bassano del Grappa 1996.



- 24 «Prospetto delle lettere, arti e scienze nell'Italia dall'anno 1821 a tutto il 1825, premesso in forma di Proemio all'anno XI. Geologia, geognosia e mineralogia», *Biblioteca italiana, o sia Giornale di letteratura, scienze ed arti*, 46, 1826, pp. 251–261, here p. 256; the long title of his notice (see note 18) offers an eloquent example of his rhetoric.
- 25 Ciancio (see note 8), pp. 243–245; A. von Humboldt, L. von Buch, «Sur le Gisement du granite dans la vallée de Fiemme», *Annales de chimie et de physique*, 23, 1823, pp. 261–266, which contain two letters addressed to André Jean François Marie Brochant de Villiers.
- 26 S. Breislak, *Sulle osservazioni fatte da alcuni celebre geologi posteriormente a quelle del sig. conte Marzari intorno alla giacitura de' graniti nel Tirolo meridionale: memoria geognostica letta all' I.R. Istituto di Lombardia*, Milano 1824; P. Maraschini, «Osservazioni sulle rocce pirigene della Valle di Fiemme dei signori Bertrand-Geslin, Trettenner e Maraschini; espote in una lettera di P. Maraschini al signor S. Breislak, I.R. Ispettore dei nitri e delle polveri», *Biblioteca italiana, o sia Giornale di letteratura, scienze ed arti*, 32, 1823, pp. 351–366.
- 27 *Memoriale* (see note 4), vol. 1, p. 6, entry dated 25 September 1823.
- 28 *Ibid.*, p. 3: «Il sig. Conte Giuseppe Marzari Pencati Vicentino Consigliere Montanistico del Regno Lombardo Veneto per sua M.I.R. fu qui l'anno 1820 e 1821 e scopse tra le altre cose il rinomato fenomeno ai Canzoccoli, ove si trova il granito sovrapposto al calcareo».
- 29 *Ibid.*, p. 3: «Marzari fu qui anche gli anni 1818 e 1819 per le solite osservazioni geologiche, che cotanto contribuirono per combattere il sistema netuniano calcato dai werneristi, osservò che il granito si è sovrapposto al calcare e che i porfidi al pari del granito si trovavano espansi in regolari colate laviche».
- 30 *Ibid.*, p. 5: «[Marzari] segnò una nuova epoca nella Geologia così poco riconosciutagli dai suoi seguaci ed antagonisti, ingrati al di lui merito, ed alle sue fatiche».
- 31 *Ibid.*, p. 7: «Li 30 settembre 1823 fino il 2 ottobre fu qui ancora il Sig. Conte Marzari Pencati»; an autograph entry by Marzari Pencati is most probably the one dated 6 September 1828, see *ibid.*, p. 13.
- 32 The page with Humboldt's signature is reproduced in M. Gabrielli, «Predazzo, un richiamo per geologi ed alpinisti», in: Trotter, Zanotti (see note 4), pp. 47–63, here p. 52, fig. 32.
- 33 A. von Humboldt, «Lettre de M. de Humboldt à M. Brochant de Villiers, member de l'Institut, datée de Verone le 8 octobre 1822», in: *Id.*/Buch (see note 25), pp. 261–265, here p. 262; on Humboldt's presence at the Congress of Verona, see I. C. Nichols, *The European Pentarchy and the Congress of Verona, 1822*, Dordrecht 1972, p. 40.
- 34 W. White, *Holidays in Tyrol. Kufstein, Klobenstein, and Paneveggio*, London 1876, p. 253; see *Memoriale* (see note 4), vol. 1, pp. 102, 110, 118, 140, vol. 2, p. 11.
- 35 Reproduced in Gabrielli (see note 32), p. 54, fig. 34.
- 36 W. White, «From the Tyrol to Lombardy», *The Athenaeum*, no 2237, 1870, pp. 340–341, here p. 340.
- 37 White (see note 36), p. 340, also included in *Id.* (see note 34), p. 254, mentioning that his name also appeared in the guest book at Schluderbach.
- 38 *Memoriale* (see note 4), vol. 1, p. 41.
- 39 Another much longer poem in German by mineralogist Theodor Scheerer, who stayed at the Nave d'Oro from the 14<sup>th</sup> to the 24<sup>th</sup> of August 1862, is transcribed in Vardabasso (see note 4), pp. 69–70; see *Memoriale* (see note 4), vol. 1, pp. 63–65.
- 40 J. Henry, *Poems, Chiefly Philosophical*, Dresden 1856, p. 64.
- 41 J. Richmond, *James Henry of Dublin: Physician, Versifier, Pamphleteer, Wanderer and Classical Scholar*, Dublin 1976; J. B. Lyons, *Scholar and Sceptic: The Career of James Henry M.D., 1798–1876*, Dublin 1985; J. Henry, *Selected Poems*, ed. C. Ricks, Dublin 2002; J. Talbot, «James Henry's Poems and the 'Aeneidea'», *International Journal of the Classical Tradition*, 17.3, 2010, pp. 366–388.
- 42 Edwards (see note 1), pp. 283–284.
- 43 W. Herschel, «On the Georgian Planet and Its Satellites», *Philosophical Transactions of the Royal Society of London*, 78, 1788, pp. 364–378; J. B. Sidgwick, *William Herschel: Explorer of the Heavens*, London 1953, pp. 90–91; M. D. Lemonick, *The Georgian Star: How William and Caroline Herschel Revolutionized Our Understanding of the Cosmos*, New York 2009.
- 44 L. J. Schaaf, *Out of the Shadows: Herschel, Talbot & the Invention of Photography*, New Haven 1992.
- 45 *Id.*, *Tracings of Light: Sir John Herschel & the Camera Lucida: Drawings from the Graham Nash Collection*, San Francisco 1989, pp. 16–21.
- 46 S. Cracolici, «Il mistero del Georgium Sidus: Amelia B. Edwards e i fasti della Nave d'Oro di Predazzo», unpublished lecture presented on the 30<sup>th</sup> of December 2014 in Predazzo; I thank Cracolici for letting me read the typescript of his paper and for sharing with me his insights on the *Memoriale*.
- 47 J. F. W. Herschel, «Notice of a Remarkable Occurrence of Serpentine at the Junction of Sienite with the Dolomite of the Tyrol», *The Edinburgh Journal of Science*, 3, 1825, pp. 126–129, here pp. 127–128; see also Breislak (see note 19), p. 25.
- 48 C. Lyell, «On a Dike of Serpentine, cutting through Sandstone, in the County of Forfar», *The Edinburgh Journal of Science*, 3, 1825, pp. 112–126; see D. R. Oldroyd, B. M. Hamilton, «Themes in the Early History of Scottish Geology», in: N. H. Trewin (ed.), *The Geology of Scotland*, London 2008, pp. 27–43.

(here p. 29); M. J. S. Rudwick, *Worlds Before Adam: The Reconstruction of Geohistory in the Age of Reform*, Chicago 2010, p. 141.

49 Herschel (see note 47), p. 129.

50 *Ibid.*, p. 129; Herschel became a member of the Geological Society in London in 1824, see G. A. Good, «John Herschel's Geology: The Cape of Good Hope in the 1830s», in: J. Buchwald, L. Stewart (eds.), *The Romance of Science: Essays in Honour of Trevor H. Levere*, Cham (Archimedes, New Studies in the History and Philosophy of Science and Technology, 52), 2017, pp. 135–150, here p. 138.

51 *Ibid.*, p. 128 and note.

52 *Memoriale* (see note 4), vol. 1, p. 8: «L'anno 1834 il mese di settembre furono qui a visitare le roccie di Predazzo, non solo ma anche oggetti di botanica, li Sig.<sup>ri</sup> Parolini di Bassano, Carlo Betrant di Nantes ed il Signor Marchese Petrucci di Pesaro».

53 *Ibid.*, p. 9: «L'anno 1826 furono pervenuti qui per Geologiche Osservazioni cinque signori studenti della Norvegia dei quali non posso farne il nome per avermi perduta (sic) la carta ove questi l'avevano descritti i loro nomi»

54 *Ibid.*, p. 9: «tre di questi signori sono Keilhau, Professor di Mineralogia, Boeck, Professor de l'arte veterinaria, Abel Professor della Geometria». According to E. Holst, «Niels Henrik Abel: Introduction historique à sa correspondance», in: *Id.* et al. (eds.), *Niels Henrik Abel: Mémorial publié à l'occasion du centenaire de sa naissance*, Kristiania [Oslo] 1902, pp. 3–119, here pp. 60–61.

55 Buch (see note 21), p. 344, see also Ciancio (see note 8), p. 228.

56 A. Stubhaug, *Niels Henrik Abel and his Times: Called Too Soon by Flames Afar*, Berlin 2000, pp. 352, 392; according to Holst (see note 55), the attribution of professorial titles ought to be understood as an expression of the career aspirations of the three young visitors.

57 W. C. Brögger, «Die Eruptionsfolge Der Triadischen Eruptivgesteine Bei Predazzo in Südtirol. [Einleitung]», in: *Id.*, *Die Eruptivgesteine des Kristianiagebietes*, 4 vols., Kristiania [Oslo] 1895, vol. 2, pp. 1–5, here p. 2: «Wir lesen die alten, oft schwer zu deutenden Namenszüge, und tiefe Wehmuth ergreift die Seele; – wie haben sie alle mit ehrlicher mühe die Wahrheit gesucht! Und doch, wie langsam und schwierig war der Weg zur Wahrheit, wie viele mühsame Schritte sind in den steilen Schründen dieser Gebirge vergeblich verhallt! Wir lesen mit Ehrfurcht die Namen der ersten Pioniere».

58 Holst (see note 54), p. 61; the transcription is more or less accurate, but it is not found in Brögger (see note 57).

59 *Ibid.*, p. 2.

60 *Ibid.*, p. 2: «Leopold von Buchs Namenszug konnten wir nicht finden», see F. von Richthofen, *Geognostische Beschreibung der Umgegend von Predazzo, Sanct Cassian und der Seisser Alpe in Süd-Tyrol: mit einer geognostischen Karte und vier Profiltafeln*, Gotha 1860; E. Mojsisovics von Mojsvar, *Die dolomit-Riffe von Südtirol und Venetien: Beiträge zur bildungsgeschichte der Alpen*, Wien 1879; M. Bertrand, «Sur la distribution géographique des roches éruptives en Europe», *Bulletin de la Société géologique de France*, 62, 1888, pp. 573–617.

61 *Ibid.*, p. 2, quoting from L. von Buch, «Ueber geognostische Erscheinungen im Fassathal. Ein Schreiben an den Geheimrath von Leonhard», in: *Id.*, *Gesammelte Schriften*, eds. J. W. Ewald et al., 4 vols., Berlin 1877 [1824], vol. 3, pp. 141–166, here p. 151: «Mit vollem Rechte hat der Graf Marzari-Pencati diesen Ort [*i.e.* Predazzo] in der Welt zu einer nicht geringen Berühmtheit gebracht».

62 *Id.*, «Lettre de M. Léopold de Buch à M. A. de Humboldt, renfermant le Tableau géologique de la partie méridionale du Tyrol», *Annales de chimie et de physique*, 23, 1823, pp. 276–304, with the geognostic map of Trentino, p. 291: «C'est par ces mêmes raisons que je regarde le Tyrol comme la clef de la théorie des Alpes, clef sans laquelle la constitution réelle de ces montagne ne se conçoit que très-imparfaitement», partially quoted in Brögger (see note 57), p. 2. For Buch's role in promoting the Dolomite region, see W. Bainbridge, «Debatable Peaks and Contested Valleys: Englishness and the Dolomite Landscape Scenery», *Journal of Borderland Studies*, 31, 2016, pp. 39–58.

63 Bainbridge (see note 1), pp. 104–105.

64 Edwards (see note 1), p. 285; see her entry in *Memoriale* (see note 4), vol. 1, pp. 114–115.

65 *Ibid.*, vol. 1, p. 70; see J. Payer, «Eine Besteigung des Gross-Glockner von Kals aus, im September 1863», *Mittheilungen aus Justus Perthes' Geographischer Anstalt über wichtige neue Erforschungen auf dem Gesamtgebiete der Geographie*, 16, 1864, pp. 321–331.

66 White (see note 36), pp. 259–260.

67 F. Crépin, *À travers le pays des Dolomites. Notes d'un touriste*, Gand 1882, p. 12: «Le livre des voyageurs, à feuillets de vélin comme un manuscrit précieux, est conservé avec le plus grand soin. C'est avec une sorte de respect que notre ami D\*\*\*\*\* y inscrit nos noms à la date du 17 août»; see *Memoriale* (see note 4), vol. 2, p. 79, under the date of 16 August 1882, with the name of François Crépin, Joseph Crépin, C. Crépin and the Belgian writer and diplomate Albert du Bois, the author of the entry.





