

ANGLICA

An International Journal of English Studies

Special Issue: Scotland

29/3 2020

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 <https://orcid.org/0000-0002-0654-6464>

Pedagogical University of Cracow

A Polish Physicist Visits Glasgow: Marian Smoluchowski's Depictions of Scotland

Abstract

The paper discusses selected essays by Marian Smoluchowski (1872–1917), a 19th-century Polish physicist. Smoluchowski's scientific output was outstanding (he was a pioneer of stochastic physics); apart from science, however, he was a passionate mountaineer. Smoluchowski enjoyed travelling, one of the places he visited being Scotland. He described it in his essays, e.g. “Wycieczki górskie w Szkocji” (1896), which will be discussed here. Smoluchowski's visions and impressions of Scotland are also placed against the backdrop of selected other 19th-century Polish travellers who visited and wrote about Scotland.

Keywords: mountains, Poland, science, Scotland, travelogue

1. Polish Physicists in Scotland

For Polish-Scottish relations, Smoluchowski's stay in Scotland is only an episode, therefore starting research on this issue needs to be justified: on 28th June 2017 the Senate of Poland passed a formal resolution which listed Smoluchowski's scientific achievements and announced the need for further research (“Uchwała Senatu...” 2) while the Polish Physics Society officially proclaimed the year 2017 a time to commemorate the centenary of Smoluchowski's death. He is still remembered and respected as a great scientist but so far little has been written on his fascination with Scottish landscapes and mountains.

Two outstanding Polish physicists who greatly contributed to world science, August Witkowski (1854–1913) and Marian Smoluchowski, had fellowships at the University of Glasgow and worked with Professor William Thomson (Lord Kelvin). Witkowski spent a year in Glasgow (1881), and was awarded an *honoris causa* degree by the Jagiellonian University (1892), the University of Glasgow (1901) and the University of Technology in Lvov (1912) (Rafalska-Łasocka 50–52). Smoluchowski followed him and was in charge of the Department of Physics; he also gave a speech during Witkowski's funeral (“Pogrzeb śp. A. Witkowskiego”).

He worked with Kelvin in Glasgow during the winter term of 1896, and in 1901, together with Witkowski, was awarded an *honoris causa* degree by the University of Glasgow. Lord Kelvin gave a speech during the ceremony; two Polish scientists were then distinguished (*Record of the ninth jubilee of the University of Glasgow* 81). Kelvin was their patron and teacher, but perhaps the word “guide” would be a more apposite description of his role (cf. Natanson 1913, 200; “Kronika” 1896, 3; “Wiadomości bieżące” 1896, 336; “Jubileusz Lorda Kelvina” 4). From 6th December 1890 Lord Kelvin was an active member of the Academy of Science in Cracow, of the Department of Maths and Biology (“Skład Akademii Umiejętności” 19).

2. Smoluchowski and Kelvin

Marian Ritter Smoluchowski was born on 28th May 1872 in Vorderbrühl near Vienna. His father used the name Ritter von Smolan. His mother, Stefania, was a sister of Stanisław Szczepanowski, an entrepreneur and a politician who was closely connected with British culture. He attended the famous and well-respected Collegium Theresianum. Between 1890–1894 he studied physics in Vienna, and as early as in 1895 he received his PhD for the work *Acoustical Studies of the Elasticity of Soft Materials*. He was also distinguished with a diamond ring, *sub auspiciis imperatoris*.¹ From November 1895 to June 1896 he worked in Paris at the Sorbonne, in the laboratory of Gabriel Lippman. This is also the time when his love for nature and hiking started. Smoluchowski spent his summer holidays abroad, climbing in the Alps with his brother Tadeusz. In 1885 he went to Zakopane for the first time, and was deeply impressed by the Tatra mountains, and when he studied in Italy, he used this opportunity to get to know the Alps better.

Smoluchowski studied in both Paris and Great Britain. When in London and Glasgow he made the most of the opportunity to visit the Scottish Highlands. He also studied in Berlin and became a professor in 1898 in Vienna. He travelled widely through Italy, France and Spain, and went back to England and Scotland. He stayed in Glasgow during the academic year of 1896/1897 and was awarded the title of *Research Fellow* of the university (*Kronika Uniwersytetu Lwowskiego* 523). Some parts of the diary he kept at the time have survived.² On its basis we can partially reconstitute when he did research work at the most prestigious European universities. He was fluent in several languages, and wrote his notes in the languages of the country he was currently living in. From August 1896 they became more precise and detailed, as he included more information of the places he visited. During his stay in London, for example, we learn more about the city’s most popular tourist attractions, such as Kew Gardens, the National Gallery, Westminster Abbey, Tower Bridge, the Natural History Museum, Regents Park, the British Museum (Smoluchowski 1896, 6–7). Under the date 11.09, he wrote in pencil

“Euston St – Crew – Carlisle – Glasgow” (1896, 7). Later on, he went on trips from Glasgow. On 16th September, for example, he wrote “Ben Lomond,” on 21st September “Fort William” and “Ben Nevis” (1896, 8). This is important, as Smoluchowski described his trips around Scotland and climbing its mountains.³

The names of the places he used in his essay “Wycieczki górskie w Szkocji” are in accordance with the notes in his diary (Loch Cornish, Glen Sligachen). From October 1896 the word “University” often appears in his diary, together with the names of its colleges and cultural places of Glasgow. On 21st December Smoluchowski wrote that Lord Kelvin had read some preliminary results of his research before they were submitted to the *Edinburgh Review* (1896, 10). Later on, he used the name of Carruthers Beattie, a scholar he co-operated with under Kelvin’s guidance (they co-wrote several articles).⁴ He used the following address: M. Smoluchowski de Smolan, PhD, Glasgow, 38 Park Road (Smoluchowski 1890–1900, 34), and this was also the version of his name used by the laboratory at the University of Glasgow when referring to him in the academic year 1896/97.⁵ In a note devoted to Kelvin, Smoluchowski emphasised the Scottish scientist’s “greatness of mind” and the fact that his interests included as diverse subjects as the study of atoms and the structure of the Earth: “Any other scientist, even a great expert in his field, pales in comparison to Kelvin” (1908b, 4). Like Kelvin, Smoluchowski was also interested in various areas of physics; to him, it was the type of science which is relatively easy to learn as “it can be limited to a number of main rules which facilitate the comprehension of the whole content” (1917, 7). Like Kelvin, Smoluchowski used simple research tools in order to carry out innovative ideas.

This is how he recalled his cooperation with Kelvin:

While co-working with others, it was Kelvin who would offer ideas and guide the work. I believe he was too restless, or impatient, perhaps. I do enjoy recalling this amazingly interesting time I spent in Glasgow 11 years ago when Thomson (Lord Kelvin then already!), Beattie and I would work on certain new phenomena of the electrical conductivity of gases. I vividly remember that each morning Kelvin would enter the laboratory, and, while opening the door, would ask: “Have you discovered anything new, gentlemen?” It did not happen every day in our type of research but you can imagine the enthusiasm when we could tell him about “something new”! (1908b, 15; trans. A.B.)

In 1897 Smoluchowski returned to Vienna, where he received his post-doctoral degree. He then moved to Lvov, where he gave a series of lectures on theoretical physics, and on 3rd March 1900 he was nominated a professor. As much as Smoluchowski respected Kelvin, he did not hesitate to criticise some of his ideas. On the basis of Smoluchowski’s hand-written notes and references to Kelvin in his articles, we can assume that it was Clerk Maxwell who particularly influenced the Polish scientist’s research. It may also be a natural consequence of

parallel research interests which they shared. After their joint work in Glasgow (1896–1897), the scholars met several times.

Smoluchowski became a professor of theoretical physics at the University of Lvov in 1903. He attended the 9th jubilee of the University of Glasgow (12–15 June 1901) as a formal emissary of the University of Lvov (“Kronika” *Gazeta Lwowska* 1901, 3; “Kronika” *Słowo Polskie* 1901, 2).⁶ Two months later, in Paris, he took part in an international congress of physicists (6–12 August 1901) under Kelvin’s auspices. He wrote a long report on that conference (Smoluchowski 1901). He was a member of several British scientific societies of which Kelvin was the honorary member. We do not know, however, whether Smoluchowski and Kelvin met when the Polish physicist was in Cavendish Laboratory in Cambridge between August 1905 and April 1906 (Rovenchak 2).⁷ After Kelvin’s death (17 December 1907) Smoluchowski gave a lecture on 21st January 1908 at a meeting of The Society of Biologists; it was entitled “On Lord Kelvin (Sir William Thomson)” (*Kronika* 1908, 3). In a Lvov magazine *Ateneum Polskie* Smoluchowski published an article entitled “Lord Kelvin” (1908a), which was probably a longer version of this lecture.

At the time, Smoluchowski had already been recognised as an excellent scientist. He was successful in his personal affairs as well, as he was happily married to Zofia Baraniecka. The Alps fascinated him all the time. His foreign trips included Hungary, Croatia, Bosnia, the islands of Jersey and Wight, Cambridge and London as well as the Sussex countryside. He came to Cracow in 1915, and then the University of Vienna wanted to invite him to become the head of the Department of Experimental Physics. In 1916 Smoluchowski became the rector of the Jagiellonian University. In preparation for his office as rector, he went to Ojców, where he took numerous refreshing walks and rested. He took part in the Great War for a couple of months (working for the military censorship). He died at the age of just 45, on 5th September 1917 in Cracow, due to an outbreak of dysentery in the city.

3. In the Mountains of Scotland

Smoluchowski was a scholar, polyglot, musician, painter and sportsman. He loved tourism, skiing, swimming, and horse riding (Szpecht 59). He was said to be an excellent hiker, and there are several articles which explore this aspect of his biography (Goetel 1953; Goetel 1917–1918; Goetel 1917; Klemensiewicz; Roszkowska). When compared to his important contributions to science, his essay on hiking in Scotland may seem insignificant, but I believe it is worth some attention because of its tone of excited amazement at the pristine nature of Scottish landscapes as well as its unabashed romanticism⁸; moreover, it offers the possibility of comparing the reports of various Polish trips to the Scottish

Highlands in the 19th century. The research on literary travel at that time emphasised climbers' involvement with nature (Buckton-Tucker 259); in his study on traveling through the Highlands Peter Womack notes that "the strength of the land [...] speaks directly to the powers of imagination" (77), while Walery Goetel observed that the Highlands attracted Smoluchowski as they were mysterious and impossible to reach (1917, 222). Zygmunt Klemensiewicz, a fellow mountaineer, in turn claimed: "His yearning for the mountains never diminishes; when he is far from great mountain ranges, he visits the small ones – like Scotland during his studies in Glasgow" (4).

Smoluchowski's essay "Wycieczki górskie w Szkocji" [Excursions in the Highlands of Scotland] (1915–1921) was originally a lecture he gave in German in Vienna, during a meeting of the Academic Section of the Alps Society. Later on, the text was published, but the form of a lecture determined its final shape: the author addressed an audience of professionals who were particularly interested in the technical issues of the expedition (its logistics as well as dealing with numerous difficulties). The Vienna audience were mainly students, which – again – determined the language and the scope of erudition in the text. Most of the students knew the Alps, but only some of them were familiar with the Scottish mountains, therefore Smoluchowski used the following strategies in order to show Scotland as an attractive place:

- 1) He increased the interest of the audience by emphasising hydrobiological "mysteries" of the exotic place: first he talked about his own surprise at the unusual colours of the mountains, then he highlighted the notion of "mystery" (something which cognitively disturbs). Finally, he explained the given phenomena and strengthened the cognitive effect by contrasting his "knowledge" with "lack of knowledge," for example when he spoke about the marshes in the mountains: "I always thought that marshland and swamp could be found in the lowlands; today I learned the hard way and I know how false my idea was" (1915–1921, 6).
- 2) He emphasised the cognitive values of the excursion: thanks to a British man he met by accident Smoluchowski learnt about "a new tourism method" (1915–1921, 6): it concerned rainy weather in the mountains and the advice was to wear a rubber coat, to hide under a ledge, and to walk briskly when the rain stopped.
- 3) He informed the listeners/readers about potential dangers in the Highlands: "a rocky ridge you could fall from" (1915–1921, 6; trans. A.B.); "caution – a swampy valley in Sligachen [...] it must be awful to get lost in this region!" (1915–1921, 7; trans. A.B.); "a couple of years ago a tourist fell from the peak of Sgurr-na-Gillean and died, which obviously made me respect these mountains even more" (1915–1921, 8; trans. A.B.).
- 4) He added some humour to his narration of Scotland, in which he sometimes made funny remarks on the Scottish Highlands; however, it was

probably his identifying with the Alps which linked the lecturer to his audience: "I cannot think of my reaching the summit of Ben Nevis as a great climbing achievement, and the whole route can be summarised as follows: a convenient paved horse route leads to the summit. The difficulty is none, as you are obliged to pay one shilling for using the route!" (1915–1921, 7; trans. A.B.)

It needs to be said that the very fact of preparing a lecture for his alpinist companions was more important for Smoluchowski than any fascination with natural phenomena we would expect from a doctor of physics who worked at the Sorbonne. Ben Nevis is not just the highest peak in Scotland; it is the highest mountain in the British Isles. In the mid-1880s a meteorological station was established there, and it was one of the first of this kind in the world. The Polish press mentioned this fact and explained that measurements were done once an hour (T.R. 559), and that the sun shone there only two hours per day (K.S. 229). Ben Nevis was an attraction for all astronomers, and Smoluchowski was particularly interested in astronomy from a very early age. The astronomical congress in Upsalla in 1896 announced a year, (1.05.1896–1.05.1897), of "international measurements above the clouds" (K.W. 1896, 269; trans. A.B.). This means that Smoluchowski reached Ben Nevis when these important measurements were being taken. For all experimental physicists (Smoluchowski was one of them) this was an enormous attraction. Smoluchowski, however, wrote about Ben Nevis as if he deliberately chose to ignore the scientific significance of the mountain:

At the very summit there is a well-managed hostel effusively called "The Ben Nevis Hotel," connected with a small meteorological observatory. I resisted the temptation to enter the 'hotel' and I limited myself to the platonic delight of watching the magnificent scenery from a snow-covered terrace. (1915–1921, 8; trans. A.B.)

This passage shows Smoluchowski's attitude as a tourist or alpinist: he enjoyed the mountain landscape the most when he was alone. On the basis of the essay in question we can distinguish between two kinds of emotions which accompanied him on his hiking tours.

First of all, we need to highlight the fact that he was always well prepared for his expeditions: he had proper clothes, a compass and a map, he would always read a guidebook as well and would use some of its suggestions while hiking. He would have it with him during the excursion and make use of its descriptions and photos so that he could prepare his own route (Smoluchowski 1915–1921, 8–9). He mentions other people he saw or met, but he clearly wanted to be alone during the ascent. He reached Ben Lomond with an Englishman he had met by accident, but he emphasised that the man insisted that they walk together. He descended alone, though, choosing a more difficult and dangerous route. When the rest of the passengers of the tourist ferry went to see Cornish Loch, Smoluchowski decided to observe the hills nearby (1915–1921, 8). He was alone in unknown territory,

and he tried to find a way back home using his instinct. The Polish scientist was also proud that he had chosen a more difficult route, whereas others took “a different, easier way” (Smoluchowski 1915–1921, 8; trans. A.B.). He then proceeded on his own. The word “alone” is used very often, as if Smoluchowski created a programme for “tourists being independent and not relying on their guide” (Świerz 1928, 28; trans. A.B.). When he affirmed his physical stamina, he felt satisfaction as an experienced mountaineer (he uses the term “real ecstasy”).

The other feelings felt were triggered by the landscapes. Small islands on Loch Lomond and their vegetation inspired him to use the phrase “the ferociously romantic character of the pristine forests” (Smoluchowski 1915–1921, 6), Katrin is called “bucolic” (1915–1921, 6), the castle in Dunrobin is a set of beautiful ruins (1915–1921, 7), whereas from the peak of Ben Nevis one can see “a strange, melancholic but incredible landscape” (1915–1921, 8). The language Smoluchowski uses to describe his memories of the Scottish Highlands demonstrates a deep-seated romanticism (on the seventh page he also mentions Fingal and Ossian). Despite his ignorance concerning the wild and dangerous nature, and despite his emphasis on treating some aspects of the excursion as a sporting achievement, the essay is a Romantic model of experiencing direct contact with nature.

Another aspect of Smoluchowski's reports is his visual aesthetics. His key words are “landscape” and “wonderful.” A certain analogy with impressionistic painting can be observed in the way he noticed and described sights, in particular light:

In the south, east and north – it is a distant and broad country, a confusion of large ridges, cone-like steep rocks and delicate, green and brown peaks which are covered with delicate mist; in between there are numerous mountain lakes which are long and dark blue. [...] From above its [the lake's] blue-black, quiet and smooth depth, there gloomily appear mountain massifs, covered with snow and almost one with the clouds. (1915–1921, 7–8; trans. A.B.)

His vivid descriptions remind us that Smoluchowski was also a painter.⁹ This very impressionistic aspect of looking at nature can be seen in his other texts: “nightfall was just turning into a pinkish daylight which was slowly embracing the snowy peaks of the mountains” (1913, 104); “above there were huge ledges with their long blue shadows which could be seen on the snowy slopes” (1913, 105).

Smoluchowski's descriptions can be compared with some of the earlier Polish excursions in these places, written by Krystyn Lach-Szyrma (1828), Tomasz Wilhelm Kochański (1828),¹⁰ Teodor Tripplin (1851) and Stanisław Bełza (1900, 1911).¹¹ We do not know whether Smoluchowski was familiar with any of them; he probably had not read Lach-Szyrma's essay on Ben Lomond before he undertook his own excursion. The former concentrated on the heathlands (Lach-Szyrma 57) which intrigued Smoluchowski so much that he used the word “mystery” while describing them. These texts represent the 19th-century culture of travelling and

describing the journey. They are of different length, which determines the scope of facts and details in the descriptions. What all these texts written in Polish have in common is the city of Glasgow and the hills in the not-too-far distance (Loch Lomond, Loch Katrin, Ben Lomond). Polish writers created a literary stereotype of Scotland. To them, it was a mountainous and romantic land combining nature and cultural memory.

Smoluchowski's predecessors had visited the places in Scotland which had been mentioned in Walter Scott's *Rob Roy* (vol. 4). They were aware of that; they either quoted Scott or referred to his work through various allusions (usually to *The Lady of the Lake* and *Rob Roy*). They all referred to Ossian's songs and to Fingal,¹² Ossian being mentioned more often than Scott.¹³ The landscapes they saw and described were not autonomous environmental places but rather cultural and biological hybrids which linked individual geographical locations with certain literary descriptions. In other words, people went to see Loch Lomond and Ben Lomond hoping to relive the experience of Ossian or Rob Roy. Polish travellers followed in Polish footsteps (Triplin verified Lach-Szyrma's descriptions, whereas Belza acknowledged his predecessors), Walter Scott and Macpherson. Literary archetypes and their imitations in the form of memoirs/travelogues merged and consolidated a stereotype of Scotland as a mountainous region in which man meets primordial nature. Glasgow, with its smoking chimneys, was just a theatrical curtain behind which a primal Romantic wildness and a beauty untouched by civilization were to be found. This cultural code appealed to Smoluchowski as well. At the same time, all the travellers were deluded: they went to see a wilderness but they were constantly coming across memorabilia left by their predecessors.¹⁴

A chronological list of the above-mentioned Polish travellers' texts on Scotland shows that the depictions of the habitants were less popular, but the number of quotations from poetry and historiographical sources gradually increased. The spiritual excitement and the idea of the 'sublime' slowly gave way to the notion of consumerism. An accidental person whom Smoluchowski met during his walk is not anymore an example of 'living memory' or a great source of knowledge of Scotland's past, but an opportunity to receive some practical advice (for example, how one should protect oneself from sudden rain in the mountains, etc.).

All 19th-century Polish depictions of Scotland, apart from Smoluchowski's, demonstrate a fascination with water. This is relatively easy to explain: such was the way of travelling, tourist ships were popular on the Scottish lochs. The depictions of the lochs are picturesque and, despite Scott's influence, it is possible to read them as interesting documents of one's fascination with the movement of the waves, the sounds, the phenomena of the mist and of the changes of the contours of objects in different forms of water. Smoluchowski's reflections upon the changes of colours are less interesting and quite unoriginal. The interest of Polish travellers (Lach-Szyrma's and Belza's in particular) focuses on waterfalls and cascades. The water is falling down as if it was trying to rebel against the currents

of rivers and streams. They perceived them as a symbol of freedom, independence, surprise, a sudden departure from reality which one knows and anticipates. In their essays, Scotland becomes a land of lakes, streams and cascades, instead of mountains, hills and rocks. Their gaze is always turned upwards, either being on a ship or on a road below the mountains. Some decided to climb certain hills. Lach-Szyrma, for example, wrote about “a marvellous view” from Ben Lomond (114). The common perspective was either horizontal or vertical. Smoluchowski introduced a change: he climbed the mountains, looked downwards and observed a given place, although he also wrote about the mountains which he saw from the perspective of a lake. He walked alone with no guide, which is another difference as his predecessors would always make sure they were following in someone else's footsteps in the hope of collecting some historical memorabilia, or to listen to some local rural stories. The generation living at the end of the 19th century needed the mountains to acknowledge their readiness to undertake the tasks which required high competences and a great amount of effort.

Notes

- 1 A student of Smoluchowski's, Kazimierz Gostkowski, explained that such an award was given to students who had received excellent grades from the beginning of their secondary-school education. The ring could also be used when a person wished to officially complain if he/she was unfairly treated (Gostkowski 23).
- 2 Smoluchowski's manuscripts were collected and arranged by Małgorzata Dziekan and Paweł Polak and in their article “Rękopisy Mariana Smoluchowskiego – ważne źródło do badań nad filozofią w Polsce.” The authors discuss philosophical issues only.
- 3 On the basis of these notes it is possible to confirm that “in September 1896 the late Marian Smoluchowski went for a trip to the Scottish mountains and islands” (Smoluchowski 1915–1921, 5, editors' footnote; trans. A.B.).
- 4 For example Kelvin, Beattie and Smolan (1897, 393–428; 1898, 277–278).
- 5 Cf. *Marian Ritter von Smolan Smoluchowski*, www.universitystory.gla.ac.uk/biography/?id=WH24566&type=P
- 6 The Jagiellonian University was represented by Jerzy Mycielski, Bolesław Wicherkiewicz and August Witkowski (“Ruch artystyczny i literacki”).
- 7 Rovenchak's article is based on the materials from the archive of the University of Lvov and offers valuable biographical information on Smoluchowski, for example the addresses of the places where he lived.
- 8 Cf. Smoluchowski (1913, 103): “We were excited about the mysteriousness of the places which were difficult to reach and had not been visited by skiers. These peaks, which were among the highest Carpathian mountains of Galicia and

- Hungary, seduced us. [...] We enjoyed the combination of what we had expected and what was also the modest romantic adventure of our expedition” (trans. A.B.).
- 9 Goetel (1953, 93–94) noticed “an artistic element” in Smoluchowski’s descriptions of Scotland.
 - 10 Kochański was the author of *Obrazy Londynu, Paryża, Wiednia, Petersburga, Berlina i Rzymu czyli opisanie osobliwości, zwyczajów i obyczajów mieszkańców sześciu głównych stolic Europy* (1829) (only three issues were published, the ones devoted to London and Paris).
 - 11 The version of Bełza’s text I quote in this article dates from 1900 – chronologically, it is the closest to the time of Smoluchowski’s essay, therefore it records Scotland as seen by the scientist.
 - 12 Cf. Kochański (1828, 200): “Before I begin to describe Fingal’s cave I need to inform my readers about Fingal. The whole of Scotland and the Hebrides are filled with keepsakes related to Fingal; there are numerous ruins which are proudly named after him” (trans. A.B.).
 - 13 Józef Ignacy Kraszewski commented on Trippin’s descriptions in the following way: “beautiful landscapes of the mountain land affect the traveller’s eyes and the spirit of Ossian can be seen there as well” (3; trans. A.B.).
 - 14 Trippin offered a personal confession: “I just love this religion of memorabilia. It proves that there is a spiritual life somewhere there and it elevates people above the level of infinitesimal material objects” (127).

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