

**Hermann Hunger \***

## **Smoluchowski and Vienna**

IT MAY SEEM PRETENTIOUS to tell an audience of scientists in Poland something about Marian von Smoluchowski. Even worse, I am not qualified to say anything about his achievements in physics which have made him world-famous. I shall have to restrict my talk to some details of his life related to Vienna in the most general sense.<sup>1</sup>

Smoluchowski was born in 1872 near Vienna, in the village of Vorderbrühl; the house in which the family lived is still standing today. He spent his childhood and adolescence in Vienna, and then studied at Vienna university, receiving a Ph. D. with highest honours „sub auspiciis imperatoris“ in 1894. It was only in 1895, at the age of 23, that he received a grant which enabled him to travel abroad to extend his knowledge and apply it to new tasks. He spent this time mostly in Paris, Glasgow and Berlin. When he returned to the university of Vienna in 1897, he applied for a *venia legendi* in physics from the philosophical faculty; it was granted in 1898.

For high school, Smoluchowski had attended the famous Theresianische Akademie which was intended for highly gifted pupils who were likely to become later public servants of outstanding quality. Also a pupil there was Friedrich Hasenöhr, a close friend of Smoluchowski, who shared with him the love for physics and for mountain climbing. Another pupil, a few years older, was Kasimierz Twardowski, who became professor of philosophy in Lwow. In 1899 he persuaded Smoluchowski to have his *venia legendi* transferred from Vienna to Lwow and to move to that university. In spite of some doubts, Smoluchowski agreed. One of his motives was to provide Polish students with the most modern physics teaching. From this time on he came to Vienna only for visits. After a few years already he was made professor in Lwow; in 1913 he accepted an invitation to the chair of experimental physics at the university of Cracow.

Already while at school, Smoluchowski became expert in mountain climbing. Frequently his brother Thaddäus accompanied him. In the mountaineering literature of the time he is mentioned several times for having been the first to find a particularly daring route to some peak. He reported about such exploits in an almost military style to the German & Austrian Alpenverein. I am not going to read from his reports because much of their lively style would be lost in translation (at least in mine). Suffice it to say that in 1916 he received a gratulation from the Alpenverein on the occasion of 25 years of membership. In his answer, Smoluchowski stated that there were three things which he owed to the mountains:

The habit to undertake difficult tasks

The joy to overcome difficulties

The ability to brighten everyday life by the beauty of the mountains.

Smoluchowski almost came back to Vienna, and this is the main topic of this paper.

Friedrich Hasenöhr, professor of physics at Vienna university and a friend of Smoluchowski since their school days, died on Oct. 8, 1915, in battle in Italy. The philosophical faculty of the university formed a committee to deliberate how the vacancy could be filled. The members were Lecher, Stefan Meyer, Escherich, Oppenheim, Höfler, von Hepperger, Dopsch and Exner.

They met on Nov. 11, 1915, with the dean, Prof. Wirtinger, presiding. After some discussion, Lecher moved to nominate Smoluchowski *unico loco*; the committee agreed unanimously. Lecher and Exner wrote a resumee containing the following sentences:

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<sup>1</sup> The material for this paper was given to me by Prof. Othmar Preining who would have been far more qualified to speak about Smoluchowski.

Among the citizens of Austria the committee can nominate only a single candidate who entirely fulfills the requirements of a physics chair in Vienna and who can be expected to successfully continue the tradition of Boltzmann's school. This is the current professor of physics at Cracow university, Marian von Smoluchowski. The other professors of theoretical physics at Austrian universities are hardly worth mentioning; in part they have different areas of research.

In addition, the committee came to the conclusion that none of the foreign colleagues mentioned earlier in the minutes could rival Smoluchowski with regard to the requirements of the Vienna chair; much less could they be preferred over him.

The committee therefore voted unanimously to nominate Smoluchowski *unico loco*, „convinced that the vacant position would be filled by him in the most excellent way”.<sup>2</sup>

The report concludes with a curriculum vitae of Smoluchowski.

Armin Teske in his biography quotes from a letter which Smoluchowski wrote to professor Höfler in Vienna in November of 1915. I like to translate the beginning sentences because they are so much in contrast with the opinions of some professors at Vienna university, about which I shall have to report presently. Smoluchowski writes:

You know that I am a Pole and will remain a Pole. But of course I am not blinded by chauvinism such that I would have to feel unhappy if I had to leave the core area where my native language is spoken. Actually I feel at home in Vienna just as well as in Cracow or Lwow.<sup>3</sup>

Smoluchowski continues in this letter that he would accept an invitation to Vienna, although he felt very obliged to Cracow university; on the other hand he expected to have far more possibilities in Vienna so that he would be able to do more to further science. These words give the impression that an invitation had in fact been sent to him. At this time however he can only have reacted to preliminary information sent to him by Höfler; the philosophical faculty in Vienna first had to vote on the report of its committee.

Stefan Meyer too wrote to Smoluchowski about the possibility of an invitation to Vienna. The answer reads:

Your telegramme forced me to make a decision on a problem which until now I had considered only a remote possibility. Although the idea of being invited to a chair in Vienna is both enticing and an honour, I had to fight with heavy doubts whether it is right to accept it. I know that many of my colleagues here will be very offended if I leave Cracow and my true homeland. I don't even know whether I would do it. The decisive circumstance is that working here in experimental physics is the wrong post for me; in addition the administration of the institute, the quarrels with the officials, with servants, assistants, etc. etc. heavily obstruct my principal work. Only now do I realize that I am much more suited for a chair in theoretical physics, where one has to deal with experts and not with physicians, biologists and other non-mathematical people. I am completely

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<sup>2</sup> “Aus der Reihe der Inländer vermag die Kommission nur einen einzigen Kandidaten zu nominieren, der den Anforderungen einer Wiener Professur voll entspricht und von dem mit sehr großer Wahrscheinlichkeit zu erhoffen ist, dass er die Tradition der Boltzmann-Schule in glücklicher Weise wird weiterführen können. Es ist dies der derzeitige Professor der Physik in Krakau Marian Smoluchowski Ritter v. Smolan; die übrigen Vertreter der theoretischen Physik an den österreichischen Hochschulen können kaum in Betracht kommen. Sie gehören zum Teil anderen Forschungsrichtungen an ...

Die Kommission war aber auch der Ansicht, dass keiner der früher genannten jüngeren Theoretiker des Auslandes in Bezug auf die Erfordernisse unserer Professur Smoluchowski gleichkäme, geschweige denn ihm vorzuziehen wäre ... Die Kommission hat darum einstimmig beschlossen, Smoluchowski *unico loco* zu nennen in der Überzeugung, dass durch dessen Berufung die erledigte Stelle in ausgezeichnete Weise besetzt sein würde.”

<sup>3</sup> “Wie Du weißt, bin ich Pole und werde ein Pole bleiben. Aber ich bin natürlich nicht so chauvinistisch verblendet, daß ich mich beim Verlassen meines engeren Sprachgebietes unglücklich fühlen müßte. Eigentlich fühle ich mich in Wien ebenso zu Hause wie in Krakau oder Lemberg.”

certain that I would produce much more in the new position compared to here. Not only would I have more possibilities for my own work, I would also be very conscious of the obligation implied by being a successor to Stefan, Boltzmann and Hasenöhr. As far as I am concerned, scientific work is the ultimate purpose of my life, and all other obligations have to be subordinated to it. That is my final decision, from which resulted the text of my telegraphic answer to you.

I was extremely pleased that the committee made its decision unanimously and „unico loco“. I am curious, though, how the complete faculty will act, whether they will invoke national interests against me. At least some time ago, when I received the *venia legendi*, this was not the case. In any event this will be one of the most important points in my life, and the direction of my future work will depend on it.<sup>4</sup>

From this letter it is obvious that an official invitation had not yet been sent to Smoluchowski, and that his friends only had told him of the committee's vote. The remark by Stanislaw Ulam (*Am. Journal of Physics* 25 (1957) 478) that „he (Smoluchowski) received an invitation to a chair of theoretical physics in Vienna“ must be based on a misunderstanding.

Unfortunately, Smoluchowski's misgivings about national interests turned out to be correct. When the philosophical faculty met on December 11, 1915, some members spoke against nominating Smoluchowski *unico loco*, not because of his scientific qualification, but from the point of view of nationality. Therefore, while the committee's motion received 22 positive and only 19 negative votes, it nevertheless did not reach the required absolute majority because of 11 abstentions. As a consequence the committee was expanded and ordered to deliberate anew.

When the committee met again on Jan. 15, 1916, the newly added members Doelter and Wegscheider opposed a nomination of Smoluchowski alone. After an extended discussion it was decided to send inquiries to Einstein, von Laue and Sommerfeld, in this sequence. Einstein answered that he would very seriously consider accepting such an invitation. Von Laue wrote that he would feel obliged to take up negotiations with the Prussian administration about the matter, and that the result would depend on these. Sommerfeld too promised to seriously consider a potential invitation but declined to say anything about the probability of accepting it, as long as the detailed conditions of the post were not known to him.

None of the persons asked had clearly declined to accept an offer. The committee held another meeting on Feb. 3, 1916. They could not agree on a common report so that two separate reports were produced: one by the majority (6 of 11) proposed to nominate Einstein in first place, and in second place *aequo loco* von Laue, Smoluchowski and Sommerfeld. The minority (5 of 11) did not want to mention Smoluchowski at all, but only the German candidates. They produced lengthy comparisons between these and Smoluchowski in order to show that he was not clearly superior. But the main

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<sup>4</sup> „Dein Telegramm hat mich genötigt, betreffs eines Problems, das ich bisher als eine ferne Möglichkeit betrachtet hatte, zu einem raschen Entschlusse zu kommen. So verlockend und ehrenvoll der Gedanke an eine Berufung nach Wien war, habe ich doch schwere Zweifel niederzukämpfen gehabt, ob ich Recht tue, eine solche anzunehmen. Ich weiß, dass viele meiner jetzigen Kollegen mir das sehr übel nehmen werden, dass ich die Krakauer Universität und mein rechtmäßiges Heimatland verlasse, und ich weiß auch nicht, ob ich es tun würde, wenn nicht der Umstand den Ausschlag geben würde, dass ich hier als Experimentalphysiker eigentlich einen unrechten Posten inne habe und durch die Administration des Instituts, die Scherereien mit den Behörden, mit Dienern, Assistenten, Praktikanten usw. usw. in meiner eigentlichen Tätigkeit schwer behindert werde. Erst jetzt ... sehe ich es ordentlich ein, dass ich doch weit besser für eine theoretische Lehrkanzel taue, wo man es mit Spezialisten und nicht mit Medizinern, Naturhistorikern und anderen unmathematischen Leuten zu tun hat. Ganz sicher bin ich, dass ich in der neuen Stellung weit mehr leisten würde als hier, nicht nur weil ich mehr Gelegenheit zu eigener Arbeit haben würde, sondern weil ich mir der hohen Verpflichtungen bewusst bin, welche die Nachfolgerschaft Stefans, Boltzmanns, Hasenöhrs mit sich bringt. Für mich ist die wissenschaftliche Tätigkeit doch das eigentliche Lebensziel und da müssen alle anderen Verpflichtungen zurückstehen – das ist mein endgiltiger Entschluss, aus dem der Wortlaut meines Antwort-Telegrammes resultierte.“

Nun hat es mich außerordentlich gefreut, dass der Kommissionsbeschluss einstimmig und „unico loco“ gefasst wurde ... Neugierig bin ich, wie sich dazu das Plenum der Fakultät verhalten wird, und ob man nicht nationale Sonderinteressen gegen mich ins Treffen führen wird – was allerdings seinerzeit, bei meiner Habilitierung, nicht der Fall war. Jedenfalls wird das einer der wichtigsten Momente in meinem Leben sein, von dem die Richtung meiner weiteren Tätigkeit abhängt.“

argument of the minority was again nationalistic: Vienna being a German university ought to look for professors within the German nation, whether they come from Austria or other countries. Other nations within Austria were only to consider if there was no candidate within the own nation. Similar considerations, they declared, were the rule at universities of other nationalities within Austria: there too candidates of the own nation would be given preference, even if there were suitable candidates of other nationality within Austria. Remarkably, the dean gave his opinion that the German component of the university was to be preserved. Another argument brought forward against mentioning Smoluchowski was the following: the ministry was expected to prefer to invite Austrian citizens as professors, regardless of their nation; therefore Smoluchowski would be invited first by the minister, even when he was placed last by the faculty. For these reasons, the minority did not want to include Smoluchowski at all, and proposed the following list: first, Einstein; second, *aequo loco* Sommerfeld and von Laue.

When the faculty next met on March 11, 1916, it voted separately on each of the persons mentioned. The results were: Einstein 46 yes, 5 no, 2 abstentions; Sommerfeld 48 yes, 3 no; von Laue 47 yes, 2 no; Smoluchowski 16 yes, 35 no, 4 abstentions. So Smoluchowski was rejected by the faculty. After this vote, professor Exner insisted that the original majority vote of the committee, which had included Smoluchowski, be added to the faculty's decision as a *votum separatum* and forwarded to the ministry as well.

In the course of time, von Laue declined an invitation to Vienna. For reasons not specified, the ministry considered it impossible to invite Einstein; instead, it asked the philosophical faculty on January 11, 1917 for a new proposal. Again a committee was formed which consisted of more or less the same people as before. On Feb. 10, 1917, the committee again could not agree on a proposal. One group led by Exner favored a sequence Sommerfeld, Smoluchowski, Debye; another wanted to nominate Sommerfeld alone. This group again invoked national interests: Vienna as a German university should not invite non-Germans as professors. Both proposals were presented to the faculty on March 13, 1917; it accepted the second one with 33 yes, 21 no, with 5 abstentions, and rejected the first with 26 yes, 25 no, with 10 abstentions. Again, professor Exner gave a *votum separatum* for the proposal containing Smoluchowski's name.

In a letter from Smoluchowski to Stefan Meyer from this time there may be an allusion to these protracted negotiations in the words: "I have not heard anything new in the well-known affair".

As you know, Marian Smoluchowski died on September 5, 1917 in Cracow.

Zofia Smoluchowska wrote shortly after the death of her husband to Stefan Meyer, asking him to contact professor Höfler with the request for a detailed obituary. Höfler had been Smoluchowski's teacher at the gymnasium and had introduced him to physics. She had already written to Höfler first, but received no answer; therefore she now wrote to Meyer:

I have asked for such an obituary because my husband was a Viennese, he spent a happy youth in Vienna, and his heart was always attached to Vienna — therefore I wished that Vienna should say farewell to him.<sup>5</sup>

In the end, this obituary was never written. Another one, however, by professor Lecher, appeared in the "Neue Freie Presse" of September 15, 1917. Among other things he says,

our university, or rather, the physicists of our university, had hoped to attract this great scientist and wonderful teacher to Vienna.<sup>6</sup>

Since Lecher had been involved in all the procedures to hire a professor of theoretical physics after the death of Hasenöhr, he must have written this sentence deliberately.

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<sup>5</sup> "Ich habe es deswegen getan," (i.e., I have asked for such an obituary) „weil mein Mann doch ein Wiener war, in Wien seine beste und schönste Jugendzeit verlebt hat, an Wien immer mit seinem Herzen hing – und ich wollte, Wien solle ihm doch ein Abschiedswort sagen".

<sup>6</sup> "Unsere Universität oder – genauer gesagt – die Physiker unserer Universität hofften, diesen großen Forscher und wunderbaren Lehrer für Wien zu gewinnen."