

## Introduction: Four Strategies, the Prehistory of the Oslo Congress, and Sources

### 1.1. Four strategies for international mathematical communication

Oral communication, and congresses in particular, remain a crucial element within mathematical communication — even in the current age of electronic mail. This can be seen both on the national level (at meetings of the LMS, DMV, AMS, etc.) and internationally, with huge mathematical congresses ever growing in size. Conferences and other meetings serve many more purposes than simply communicating information about recent mathematical research, and this has always been the case, with each particular historical period setting different priorities.

The title of our book alludes to an article reporting on the 1936 ICM with a pun in its title: “Oslo under the integral sign” (**Dunnington, 1936a**). The article stresses the unifying and harmonising aspects of international mathematical communication and sees them exemplified in the Oslo congress of 1936; the congress had chosen the sign for a contour integral as its logo — this appears also on the title page of the congress proceedings (Figure 1.1).<sup>1</sup> We know of course that international communication at that time was very much influenced by the rise of the Nazis in Germany and dictatorial regimes in other countries as well. However, the report’s author, G. Waldo Dunnington (1906–1974), who was known for his boundless admiration of German mathematics, and who wrote an influential biography of Gauss (**Dunnington, 1955**), is probably not a very good source for a critical judgement of the darker aspects of that congress and of the particular historical conditions under which it was held.<sup>2</sup>

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<sup>1</sup>Dunnington also wrote in his report that “the delegates to the Congress wore a badge in the form of an integral sign, which entitled them to ride free on the street cars and busses in Oslo and vicinity [*sic*]” (**Dunnington, 1936a**, p. 93).

<sup>2</sup>Dunnington lavished praise upon the report that Walther Lietzmann from Göttingen gave at the congress to the International Commission on Mathematical Instruction (ICMI) (**Lietzmann, 1937**). He described this report, which strongly reflected the implications of political changes in Germany for school mathematics, as “exceedingly interesting and enlightening as to mathematics in the schools of present-day Germany” ((**Dunnington, 1936a**, p. 88); see also the remarks in Chapter 10 of the present book). Dunnington also accepted an invitation to attend the bicentenary celebrations of Göttingen University in June 1937, even planning to bring with him a “group of American students in order that this youth acquires a better understanding of and good friendship with Germany” (quoted from a German letter from Dunnington to the rector of Göttingen University, before April 1937, kept as a copy in University Archives Göttingen: Sekr., IB2). Participation in these celebrations was controversial among American mathematicians, as had been that of George David Birkhoff (1884–1944) in the 550th anniversary celebrations of Heidelberg University in 1936, prior to the Oslo congress, which Dunnington mentioned in his report without judgement (**Dunnington, 1936a**, p. 89). The AMS, as an organisation, finally declined politely to participate in the Göttingen event after

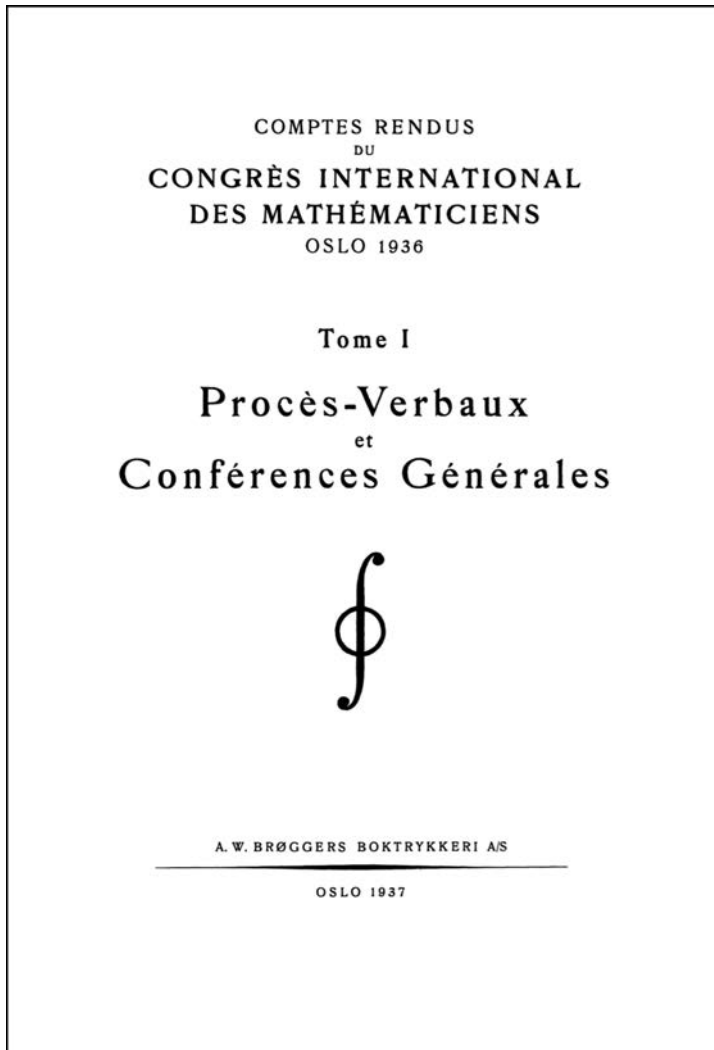


FIGURE 1.1. Title page of volume I of the proceedings of the Oslo congress (Source: <https://www.mathunion.org/icm/>)

The congress was the only one on this level to be held during the period of the Nazi regime in Germany (1933–1945) and after the wave of emigrations from it. The Nazis and the war they unleashed led to the postponement by a decade of the next ICM, initially planned for 1940 in Cambridge, Massachusetts. Thus we choose to adapt the title of Dunnington’s report for our purposes, adding, however, a question mark. Indeed, along with the integrating interests of the mathematicians, one has also to take into account the differences and differentials (to stay in the mathematical picture) between the goals of the various participants, which are clearly stressed in the report on the congress that was subsequently produced by

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internal discussions which had pointed to the fact that mathematics in Göttingen had been all but destroyed by the Nazis (AAMS, box 26).

the German mathematician Walther Lietzmann (see below). Lietzmann drew a line between “us” and “them”, the latter referring in particular to those mathematicians who had been expelled from Nazi Germany.<sup>3</sup>

We find the following four major strategies for international scientific communication manifesting themselves in the organisation and the staging of the congress in Oslo. These are exemplified by the actions of several nations, and by various members of the international mathematical community as a whole; we denote them for short by the words in square brackets:

- the newcomer strategy of the ambitious and developing nation [newcomer];
- the expansionist and propagandistic strategy of the (mathematically) established nation [expansionist];
- the isolationist and often fearful strategy of the (politically) ousted nation [isolationist];
- the scientific, for the most part internationalist, strategy of the research mathematician [scientific].

It goes without saying that most of the strategies that were actually pursued had to be mixtures of these four “ideal-type” strategies, even if this made for some contradictions in adopting them. Mathematicians, of course, would usually aspire for unhampered international communication, but at the same time they often shared the political goals of their nation. There were also mixed approaches in national strategies. To be sure, the interests of an ambitious and rising nation (such as Norway, or of Scandinavia as a whole) were served best by preventing monopolies in mathematical research. However, national strategies could be isolationist and expansionist at the same time (particularly in Nazi Germany), and even isolationist strategies, exemplified by the Soviet Union and Italy, were sometimes mellowed by concerns, such as for instance among the Russians, over losing international political impact.

In addition to the four strategies mentioned above, other strategies came into play at least in a rudimentary form, such as private or public economic interests supporting the pursuit of mathematics. However, the economic usefulness of pure mathematical research beyond mathematical teaching, for instance in industry, was less visible during the 1930s, which resulted in a lack of state funding even in nations such as the United States. Also, the predominance of pure over applied mathematical disciplines on the agenda of the Oslo congress (there had been parallel international congresses for applied mechanics since the 1920s) made the “economic strategy” a rather marginal one, at least as far as the congress in Oslo was concerned. One is certainly tempted to identify the desire for international peace and mutual understanding as the significant strategy lying behind the movement for the ICMs, the latter having had their first major event in Zurich in 1897.<sup>4</sup> However it seems to us that “love of peace” is too fundamental, general, and agreed-upon a category to be of much use in the analysis of historical motives, not least due to

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<sup>3</sup>We could not of course go so far as to add a swastika to the signs under which the congress was being held because the Norwegians certainly did not adopt it, although the swastika figured visibly on the wreath laid down by the German delegation at the Abel monument in Oslo (see Figure 3.4 on p. 80).

<sup>4</sup>On scientists and internationalism in the late-nineteenth century more generally, see (Fox, 2016).



FIGURE 1.2. Group photograph at the Oslo congress, taken in the square in front of the historical aula of the university, beneath the statue of the famous Norwegian historian Peter Andreas Munch (1810–1863); Carl Størmer appears in the middle of the front row. (Source: National Library, Oslo, unprocessed 115 Carl Størmer Archives)

its propagandistic misuse even by dictators such as Hitler, or its potential to lead to appeasement and misguided collaboration with oppressive regimes.

Looking in detail at the Oslo ICM (see Figure 1.2) as a special event first requires the realisation that it was the result of a longer trend in the development of mathematical communication.<sup>5</sup>

### 1.2. The prehistory of the Oslo congress

In the following section we give a short overview of the history of the International Congresses of Mathematicians from their inauguration in 1897.

There exist several more global<sup>6</sup> and more specialised<sup>7</sup> accounts of the history of the various ICMs, but few in-depth analyses of any particular congress.<sup>8</sup> In addition, there has so far been little analysis of the *mathematics* of the ICMs, the one paper by Bernard Bru (**Bru, 2003**) on the stochastic work at the Bologna congress

<sup>5</sup>See, for example, (**Lehto, 1998a**). Note also the parallels drawn between Oslo 1936 and Bologna 1928 in our Section 1.2.3.

<sup>6</sup>(**Albers et al., 1987**), (**Curbera, 2009**), and (**Lehto, 1998a**).

<sup>7</sup>(**Parshall and Rowe, 1994**), (**Barrow-Green, 1994**), and (**Riehm and Hoffman, 2011**).

<sup>8</sup>In fact, we are aware of only one such (published) in-depth analysis: (**Guerraggio and Nastasi, 2008**) on the 1908 Rome ICM. The 1950 ICM at Harvard features heavily in (**Barany, 2016**).

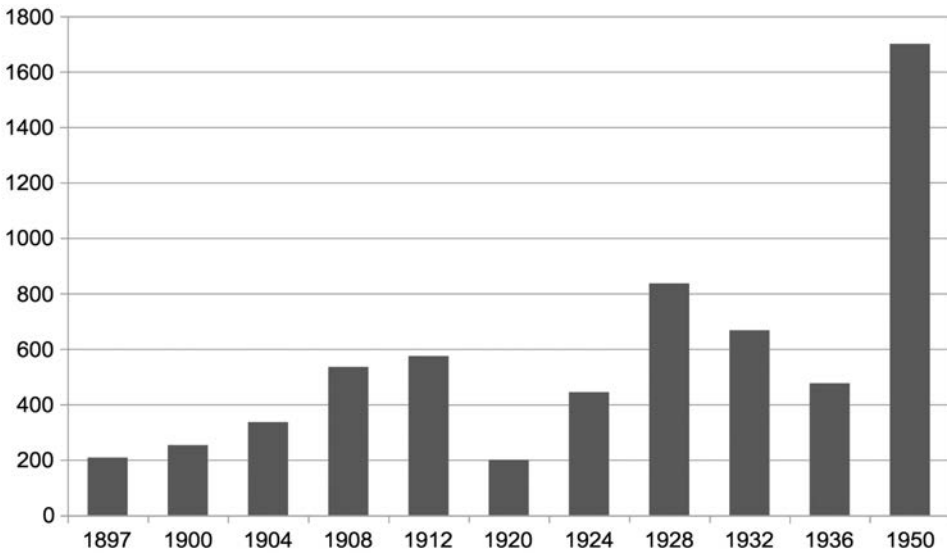


FIGURE 1.3. Indication of the growth in attendance of the ICMs, 1897–1950

of 1928 being an exception. We note, however, that the proceedings of all the ICMs are freely available online via the website of the International Mathematical Union (IMU).<sup>9</sup>

In the following three subsections, we will focus on those events that are most important for the understanding of the circumstances and conditions surrounding the Oslo congress of 1936, and to which later passages in our book will therefore have to refer repeatedly. The three subsections deal in particular with

- the history of the ICMs before the First World War, in particular Rome 1908;
- the so-called boycott of German science, organised in mathematics by the IMU, which was founded in Strasbourg in 1920;
- the ICM in Bologna in 1928, the only such congress before the Second World War that was organised under a dictatorial political regime, and which foreshadowed several communications problems that arose in connection with Oslo 1936.

For overall perspective, we include Figure 1.3, which gives a rough indication of the numbers of mathematicians attending the ICMs from their inception until the 1950 congress. For reference, we also list the dates and venues of the first eleven ICMs in Table 1.1.

**1.2.1. The five ICMs before the First World War, in particular Rome 1908.** We discuss these early ICMs only very briefly because, as we will see, the war changed the conditions for communication considerably.

<sup>9</sup>At <https://www.mathunion.org/icm/proceedings> (accessed 22 January 2019).

TABLE 1.1. Dates and locations of the first eleven International Congresses of Mathematicians

9–11 August 1897	Zurich
6–12 August 1900	Paris
8–13 August 1904	Heidelberg
6–11 April 1908	Rome
22–28 August 1912	Cambridge
22–30 September 1920	Strasbourg
11–16 August 1924	Toronto
3–10 September 1928	Bologna
4–12 September 1932	Zurich
13–18 July 1936	Oslo
30 August–6 September 1950	Cambridge, MA

A preliminary meeting was organised in Chicago in connection with the World's Fair in 1893.<sup>10</sup> Probably the most-quoted indirect outcomes of this Chicago meeting were the beautiful lectures delivered in English by Felix Klein (1849–1925) at Northwestern University in Evanston, Illinois, a few weeks after the meeting (**Klein, 1894**). The Göttingen mathematician had attended the Chicago meeting together with his former student Oskar Bolza (1857–1942), and had used it strategically to stimulate exchange with the then still young mathematical culture in the United States.

The first of the series of regular ICMs was held in Zurich in 1897. After that, a famous one (because Hilbert's problems were presented there) was organised in Paris in 1900. The following ICMs, before the outbreak of the First World War, took place in Heidelberg (1904), Rome (1908), and in Cambridge, England (1912). There are three traditions from the pre-First World War congresses that are worth discussing in some detail, and which are connected in particular with the ICM in Rome in 1908. These are:

- the foundation of ICMI,
- the first ideas concerning the foundation of an international mathematical organisation, and
- the first award of an international prize in mathematics.

The meeting's section IV (Philosophical, historical and didactical issues) led to the formation of the International Commission on Mathematical Instruction (ICMI), which would have a strong presence at future congresses (in the case of the Oslo ICM, see Chapter 10):

The Congress, having recognised the importance of a thorough examination of the programmes and methods of the teaching of mathematics in the secondary schools of the various nations, entrusts to Professors KLEIN, GREENHILL and FEHR the task of constituting an international committee that will study the issue and report on it to the next Congress.<sup>11</sup>

<sup>10</sup>On this preliminary meeting, see above all (**Parshall and Rowe, 1994**).

<sup>11</sup>Translated from the Italian in (**ICM, 1908**, vol. I, p. 33). These discussions had a precursor in a 1905 article by Henri Fehr and David Eugene Smith's response thereto: see (**Lehto, 1998a**, p. 13).

The second point of note is that the assembled mathematicians approved a resolution put forward by Professor Alberto Conti of Bologna:

The Congress votes that the constitution of an International Association of Mathematicians be placed upon the agenda for the next Congress.<sup>12</sup>

However, whereas ICMI did indeed report to the next congress in Cambridge in 1912,<sup>13</sup> the idea of forming an international mathematical organisation was not taken up.<sup>14</sup> It may be that only a political event like a war could lead to such an organisation of mathematics, but then with problematic traits (see below).

The third and final remark to make with regard to internationalism at the Rome ICM is that this was the first congress at which an international mathematical prize was awarded. Four years earlier, in Heidelberg, it had been announced that Giovanni Battista Guccia (1855–1914), the founder of the *Circolo matematico di Palermo*, had made 3,000 francs available for the award at the next congress of a prize, to be named the Guccia medal, for a work making substantial progress in the theory of algebraic curves.<sup>15</sup> A judging panel consisting of Max Noether (1844–1921), Henri Poincaré (1854–1912), and Corrado Segre (1863–1924) was established, and the decision was to be made in the manner of the prizes traditionally awarded by the Paris Academy: through the assessment of submitted memoirs. However, since none of the memoirs received were deemed of sufficient merit to warrant the prize, it was instead awarded to Francesco Severi (1879–1961) for his overall contributions to geometry.<sup>16</sup> This was the only time that the prize was given, though its single award may later have provided some impetus to the establishment of the Fields Medal.

All four internationally leading nations, plus neutral Switzerland, had thus been organisers of an ICM before the war. The ICM in Cambridge in 1912 figured officially and in the proceedings as the fifth international congress. It would be the last ICM to carry a number explicitly, and the reason lay in the political problems that followed the war.<sup>17</sup>

**1.2.2. The IMU and the boycott of the 1920s.** In 1918 and 1919, starting just before the end of the First World War, representatives of the scientific academies in the Allied (*Entente*) powers began discussing the future of scientific cooperation after the war. The result was the creation of the International Research Council (IRC), and the decision to exclude Germany and its allies from

<sup>12</sup>Translated from the Italian in (ICM, 1908, vol. I, p. 33).

<sup>13</sup>See (ICM, 1912, vol. I, pp. 54–56); see also the comments in (Lehto, 1998a, p. 14).

<sup>14</sup>Indeed, remarks made by the president of the Cambridge congress, Sir George Darwin, suggest that he was resistant to the idea, deeming the existing arrangements for the organisation of the ICMs to be sufficient (ICM, 1912, vol. I, p. 40).

<sup>15</sup>See (ICM, 1904, p. 53), and also the remarks in (Guerraggio and Nastasi, 2008, pp. 75–76).

<sup>16</sup>See (ICM, 1908, vol. I, pp. 209–216); see also the comments in (Brigaglia, 2002, p. 195), as well as those in (Guerraggio and Nastasi, 2008, pp. 115–119).

<sup>17</sup>On a more anecdotal level, this led to a lasting controversy over the numbering of the congresses; in 1932, Hermann Weyl (1885–1955) — then the president of the *Deutsche Mathematiker-Vereinigung* (DMV) — would, with a combination of sternness and idiosyncratic humour, remark that the 1932 Zurich congress was the  $n$ th International Congress of Mathematicians for some  $7 \leq n \leq 9$ , and that axiomatic mathematics was insufficient to decide exactly which number was the right one (ICM, 1932, vol. I, p. 71).

international science. Under the auspices of the IRC, whose early president was the French mathematician Émile Picard (1856–1941), an International Mathematical Union (IMU) was set up in 1920 in Strasbourg. There, in the newly recaptured region of Alsace on the border between France and Germany, an ICM with restricted internationality took place at that time.<sup>18</sup> The first president of the IMU was the Belgian mathematician Charles de la Vallée-Poussin (1866–1962). The official goal of the Union was to facilitate international cooperation of mathematicians and to organise international congresses. However, conceived of in the immediate post-war atmosphere, the IRC and the IMU were heavily influenced by nationalistic arguments among politicians and scientists alike. On a practical level, the IMU served only as a union for Allied mathematicians.

Neutral countries — including the Scandinavian ones — were invited to join the IRC and the IMU and did so in 1919 and 1920. Soon thereafter, some neutral countries, such as the Netherlands and Denmark, began lobbying for an opening towards the Axis powers, but strong Belgian and French opposition counteracted British and American willingness to normalise affairs.<sup>19</sup> Thus the exclusion of Germany and its wartime allies lasted until the mid-1920s and also prevented the participation of their mathematicians in the ICM in Toronto in 1924. But the fact that this congress had to take place in Canada<sup>20</sup> and not in the United States (which had been chosen in Strasbourg as the next venue) was the result of existing American resistance to the boycott. In the proceedings of the Toronto ICM, many American and British mathematicians, as well as some from neutral countries, voiced their concerns about the boycott. That the mathematicians gathered in Toronto did not automatically confirm Brussels as the next venue for an ICM was one of the results of these concerns. Indeed, some mathematicians came to regret their previous participation in the Strasbourg congress in 1920.<sup>21</sup>

The brothers Niels and Harald Bohr (1885–1962 and 1887–1951), the physicist and the mathematician, respectively, showed their impatience with the situation in an interview in Copenhagen in September of 1925 with Augustus Trowbridge, a functionary of the Rockefeller Philanthropies (he was from the International Education Board). They announced that the Scandinavian countries would most likely

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<sup>18</sup>On the IMU, see (**Lehto, 1998a**); on the role of M. Fréchet in the organisation of the Strasbourg congress, see (**Siegmund-Schultze, 2005**). The number “six” appears nowhere in connection with the Strasbourg congress — not even in the speeches.

<sup>19</sup>We will see in Chapter 2 that this did not mean that all Scandinavian mathematicians were united in this endeavour: the president of the Oslo congress, Carl Størmer, leaned more to the French side.

<sup>20</sup>The Canadian John Charles Fields (1863–1932) stepped in as organiser (**Lehto, 1998a**, pp. 33–34). We owe the creation of the Fields Medal to this twist of events, and thus also to political reasons: see below.

<sup>21</sup>For example, Norbert Wiener (1894–1964), who later wrote: “In many ways this was an unfortunate decision. It was one which later led me to regret my little share in sanctioning the meeting by my presence. The Germans were excluded as a sort of punitive measure. In my mature, considered opinion, punitive measures are out of place in international scientific relations” (**Wiener, 1956**, pp. 49–50). Attitudes some years later are recorded in the protocol of the IMU session in Zurich in 1932, in which Wiener and Oswald Veblen (1880–1960) attacked the IMU “vigorously” as “useless”. The two Americans were supported by Harald Bohr; see (**Fehr, 1932**, p. 277).



withdraw from the IRC if the boycott continued. Trowbridge quoted them indirectly in the following way:

Scientifically, the Germans are as important to us as any nation. We are not politically unanimously pro-German, but scientifically we are. . . [Trowbridge] was rather surprised at the heat with which the Scandinavian view was presented.<sup>22</sup>

Purely scientific reasons were not sufficient to convince French and Belgian mathematicians, who had suffered personally the most from the war, to resume international contacts — or at least these sufferings put a considerable delay on normalisation.

Brigitte Schroeder-Gudehus, in her analysis of the German reaction to the scientific boycott in the 1920s (**Schroeder-Gudehus, 1973**), goes one step further. She finds that many scientists, among them mathematicians, were not leading international reconciliation after the war but obstructing it. Even when the German government became sufficiently politically active to join the League of Nations in the mid-1920s, many of those scientists who had felt offended by the boycott, and who were not convinced of Germany's main responsibility for the outbreak of the war, still hesitated.

At an extraordinary meeting of the IRC in Brussels in June of 1926, the exclusion clause was repealed, and Germany was invited to adhere to the various international scientific unions (**Schroeder-Gudehus, 1973**, pp.110–111). However, the German government failed then in its efforts to convince leading German scholars to join the unions. Moreover, the mathematicians on both sides were still divided about reconciliation when it came to the next congress, the ICM in Bologna in 1928.

**1.2.3. The ICM in Bologna 1928 between various nationalist and internationalist motivations.** In the aftermath of the war, Italy had retained its prominent position within the international mathematical community.<sup>23</sup> On the international stage, Italian scientists, as members of one of the victorious nations, were heavily involved in the foundation of the IRC (**Greenaway, 1996**, Chapter 2), and consequently also of the first IMU (**Lehto, 1998a**, §1.4). Thus, leading Italian mathematicians such as Vito Volterra (1860–1940) were complicit in the exclusion of Germany and her wartime allies from international scientific activities during the early 1920s.

In a more ambiguous position than Volterra stood Salvatore Pincherle (1853–1936), president of the IMU between 1924 and 1928. He was at the same time the organiser of the 1928 Bologna ICM, which was the first congress after the First World War at which the mathematicians of all nations were once again welcome. The legal and political sleight of hand employed by Pincherle in order to bring this about, and the consequent split between the IMU and the ICMs, is well described elsewhere, so we do not dwell on it here.<sup>24</sup> We must stress, however, the (political) parallels between Bologna 1928 and Oslo 1936: for instance, in both cases background tensions led to boycotts of each congress by certain parties (see below).

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<sup>22</sup>Quoted in (**Siegmund-Schultze, 2001**, p. 59).

<sup>23</sup>For more about Italian mathematics after the First World War, see Chapter 5.

<sup>24</sup>See instead (**Lehto, 1998a**, §2.4), (**Guerraggio and Nastasi, 2008**, Chapter 6), (**Riehm and Hoffman, 2011**, Chapter 10), or (**Siegmund-Schultze, 2016a**, pp. 58–60).

Scientific internationalism was protested, but German and Italian nationalism came to the fore, both in the preparation of the congress and during the event itself.

Bologna saw the first return of a German mathematical delegation of considerable size (76 mathematicians), led by David Hilbert (1862–1943), who was known for his internationalist position. Hilbert planned to give a political talk in Bologna. Although, for unknown reasons, it appears that the presentation was not delivered, the manuscript has survived and contains an often-quoted passage:

It is a complete misunderstanding [of our science] to construct differences or even incompatibilities according to peoples and races, and the reasons for which this has been done are very shabby ones. Mathematics knows no races.<sup>25</sup>

The participation of German mathematicians had been disputed in the run-up to the congress, when even the influential Dutch topologist and mathematical intuitionist L. E. J. Brouwer (1881–1966) had advised his German colleagues not to take part for the sake of their honour. In the end, a number of German mathematicians boycotted the congress in protest at their earlier exclusion (**Lehto, 1998a**, p. 46). After the congress, on 20 November 1928, the mathematical physicist from Göttingen, Max Born (1882–1970), who was in Bologna, wrote about this in a letter to his friend Albert Einstein (1879–1955):

Hilbert is not politically very left-wing ... But when it comes to the question of the intercourse between scientists of different countries, he has a very sharp eye for detecting what is best for the whole. Hilbert considered, as we all did, that Brouwer's behaviour in this affair, where he was even more nationalistic than the Germans themselves, was utterly foolish. But the worst of it all was that the Berlin mathematicians were completely taken in by Brouwer's nonsense. ... I can understand this in Erhard Schmidt's case, for he always did lean to the right in politics, as a result of his basic emotions. For Mises and Bieberbach, however, it is a rather deplorable symptom. (**Born and Einstein, 1971**, p. 98)

It is worth mentioning that there were among the boycotters of Bologna such widely different characters as the future Nazi Ludwig Bieberbach (1886–1982), who did not dare show up in Oslo, and the other mathematicians from Berlin, Richard von Mises (1883–1953) and Erhardt Schmidt (1876–1959). The future Jewish refugee von Mises, in 1936 shied away from the effort involved in long-distance travel from his place of refuge (Istanbul), while the German nationalist Schmidt gave a rather naive propaganda speech for the Nazis in Oslo (see Chapter 2).

Indeed, the Bologna ICM was as politically eventful as that in Oslo eight years later. This makes the congress particularly interesting for the historian of mathematics, although it has perhaps not been studied as thoroughly as it might have

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<sup>25</sup>See (**Siegmund-Schultze, 2016a**), in which the complete text of Hilbert's planned speech is published both in the German original and in English translation. It is argued that no known contemporary source (proceedings, printed reports, or private letters) alludes to Hilbert's talk; the biography of Hilbert (**Reid, 1970**) claims that it was actually delivered, but without giving a source.

been.<sup>26</sup> The Italian organisers were not just driven by internationalist motivations, and from the French both Émile Picard and Émile Borel were absent, probably for different political reasons.<sup>27</sup> As (Curbera, 2009, p. 88) has noted, the ICM was “a great international exhibition for the Fascist state of Benito Mussolini”. The fascist regime certainly made itself felt at the congress, not least through the state patronage sought by Pincherle, who had joined the National Fascist Party at the end of 1926 (Capristo, 2016, pp. 292–295). If we browse the congress proceedings, we find frequent indications of state involvement, notional or otherwise: for example, Mussolini himself is named as president of the congress’ “honorary committee” (“comitato d’onore”) (ICM, 1928, vol. I, p. 23), while the proceedings record “the cordial hospitality” (“la cordiale ospitalità”) (ICM, 1928, vol. I, p. 18) offered by Bologna’s Casa del Fascio, as well as the greetings of the mayor of Bologna:

Fascist Bologna is proud to welcome you and to be able to show  
you what it has become under the vivifying impulse of Fascism.<sup>28</sup>

A further, quite inconspicuous, indication of a fascist presence may also be seen on the title page of the proceedings (Figure 1.4), where the dates of the meeting are given as “3–10 settembre 1928 (VI)”, the “VI” indicating that this was the sixth year of the regime.<sup>29</sup>

Despite the readmission of German mathematicians, the tensions of the decade were palpable in Bologna, which may have contributed to the decision there to return to the neutrality of Switzerland and Zurich for the 1932 ICM. International tensions rose once again in the years after Bologna, not least under the influence of the world-wide economic crisis of 1929.<sup>30</sup>

In Zurich, as in Bologna before, the political problems of international mathematical collaboration were discussed openly, for instance in the meeting of the IMU (see below). It was also in Zurich in 1932 that the president of the congress, Rudolf Fueter (1880–1950), informed the assembled mathematicians about the decision made by the recently deceased John Charles Fields, to donate a “gold medal for young mathematicians”.<sup>31</sup> The Fields Medal would be awarded for the first time at the ICM in Oslo in 1936; see Section 9.22.

At the meeting of the IMU at the ICM in Zurich on 11 September 1932, the IMU was declared liquidated (“mise en liquidation”) and its assets were for the

<sup>26</sup>(Capristo, 2016, p. 289) observes that “[t]o date, the Congress has been studied almost exclusively as an episode in the history of the International Mathematics Union (IMU) and its internal conflicts”, and calls for an analysis of the Bologna ICM similar to that advanced in the present book for the Oslo congress. Some recent steps in this direction have been taken by (Cioli, 2016). On the mathematical side (namely, stochastics), note also (Bru, 2003).

<sup>27</sup>Picard was quite explicit in boycotting the congress because German mathematicians would be present (Capristo, 2016, pp. 300–304), although Borel’s position is more ambiguous; (Capristo, 2016, pp. 297–300), following (Bru, 2003), suggests that an opposition to fascism may explain Borel’s absence. The plenary lecture that he was due to deliver at the ICM was given instead by Cartan (ICM, 1928, vol. I, p. 67).

<sup>28</sup>Translated from the Italian in (ICM, 1928, vol. I, p. 69).

<sup>29</sup>It is worth reiterating the observation made in (Siegmond-Schultze, 2016a, p. 59) based on information from Norbert Schappacher, namely that the “VI” does not indicate that the editors deemed this congress the sixth ICM (thereby discounting Strasbourg and Toronto), as has sometimes been suggested.

<sup>30</sup>In this connection, the German mathematician Hermann Weyl noted in an address to the Zurich congress: “Many an international congresses were cancelled last year; the congress of mathematicians takes place.” (Translated from the German in (ICM, 1932, vol. I, p. 73).)

<sup>31</sup>Translated from the German in (ICM, 1932, vol. I, p. 43).

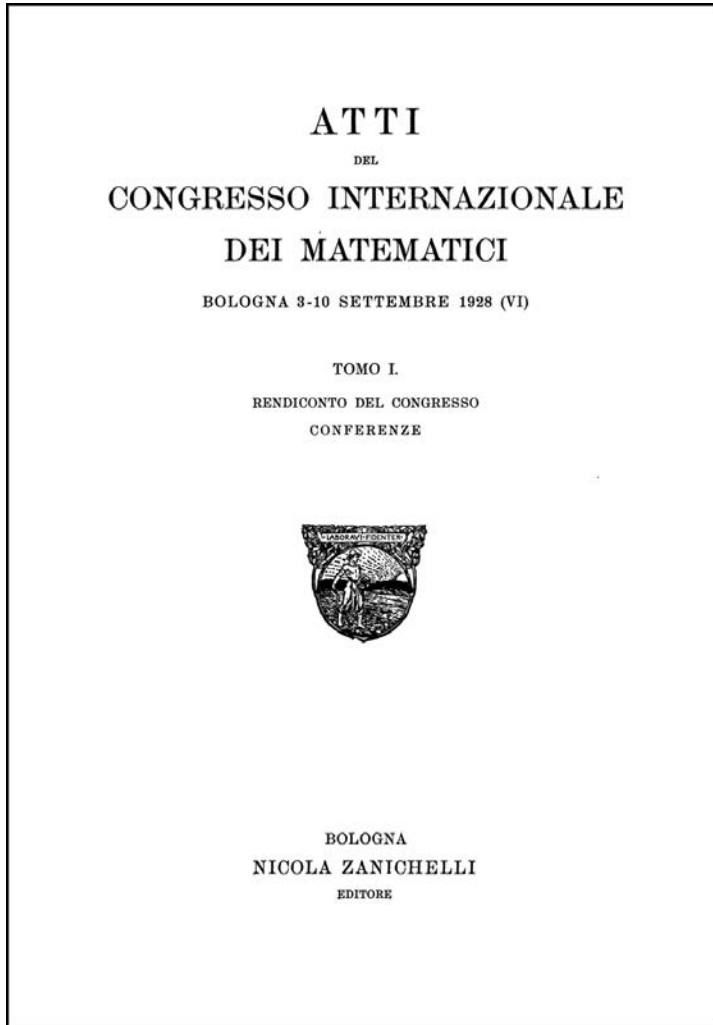


FIGURE 1.4. Title page of volume I of the proceedings of the Bologna congress (Source: <https://www.mathunion.org/icm/>)

time being (“provisoirement”) deposited at the Banque de France. This decision followed lively discussions about the function and tasks of the Union (**Fehr, 1932**). The mood then reigning is probably best indicated by the fact that although the session was led by the French mathematician Georges Valiron (1884–1954), the decision was nevertheless taken against the French-Belgian foundation of 1920. Interestingly enough, it was the Swiss educator Henri Fehr (1870–1950), who, when publishing Valiron’s report in the journal *L’enseignement mathématique*, described the dissolution of the IMU as a “gross ingratitude”, pointing to the financial contribution of the IMU to the creation of the “two medals” to be awarded by the congress and acknowledging the financial support “by a great number of governments” (**Fehr, 1932**, p. 278). This might also indicate that the relative merits of the IMU were greatest in the context of mathematical education, where government

support was crucial. *L'enseignement mathématique* had become the official organ of ICMI, the commission founded in 1908 (see above). The Americans present in Zurich, however, were more focused on research and the unhampered exchange of ideas than educators such as Fehr. They held that it

would appear that a permanent international organization had no problems important enough to warrant its existence; [and] that if an international organization in mathematics were to continue, it should be divorced from connection with national governments. (**Richardson, 1932**, p. 773)

According to Valiron's protocol, the liquidation of the IMU was considered provisional, subject to the deliberations of a commission that was to be founded. Indeed, the Zurich congress decided the following on its concluding session on 12 September 1932:

An international commission is formed in order to re-study the question of international collaboration in the sphere of mathematics and to make propositions with regard to its reorganisation at the next congress. (**ICM, 1932**, vol. I, p. 61)

The following mathematicians were elected members of that commission: Severi (president), P. S. Aleksandrov (1896–1982), H. Bohr, Lipót Fejér (1880–1959), Gaston Julia (1893–1978), Louis J. Mordell (1888–1972), Esteban Terrades i Illa (1883–1950), de la Vallée-Poussin, Oswald Veblen (1880–1960), Hermann Weyl (1885–1955), and Stanisław Zaremba (1863–1942).

On the same day, it was also decided that Oslo should be the venue for the 1936 congress (**ICM, 1932**, vol. I, p. 60). Although the proceedings are silent on the matter, one has to assume that the choice of Oslo was once again influenced by the desire to have the congress in a politically neutral venue.

However, before the Oslo congress could take place, other unexpected and catastrophic political events, as described in the preface, took place; these, above all the seizure of power in Germany by the Nazis in 1933, would shape the future congress considerably. Under the immediate impression of the refugee crisis, the secretary of the AMS, R. G. D. Richardson (1878–1949), wrote the following to Harald Bohr:

Since the war, we have been constantly compelled to think of colleagues as nationals and not as citizens in the international domain.<sup>32</sup>

### 1.3. Sources

In compiling this book, we have used a mixture of printed and unpublished sources, the latter pertaining in particular to the policies of the Norwegians and the Germans in relation to the congress. Many of these sources are being exploited in this context for the first time.

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<sup>32</sup>This is in a letter from Richardson to Bohr of 26 June 1934, which is quoted in (**Siegmund-Schultze, 2001**, p. 16).

The most important printed source is, of course, the *Comptes rendus de congrès international des mathématiciens, Oslo 1936* (i.e., the congress proceedings), which appeared in two volumes in Oslo in 1937, and was reprinted in one volume in 1967.<sup>33</sup>

Caution is necessary when using the congress proceedings for historical analysis, even though the proceedings appeared a year after the event and should therefore have been an accurate record. The list of “members”, that is, the “Liste des Membres du Congrès” (**ICM, 1936**, vol. 1, pp. 29–38), gives all the Russian (eleven) and Italian (five) mathematicians who originally registered, but who, according to other contemporary sources, did not take part (as discussed in Chapters 4 and 5). The breakdown of the members of the congress by country (**ICM, 1936**, vol. 1, p. 39) is additionally marred by the vaguenesses stemming from the uprooting and the mass emigration of mathematicians at that time, and from the principal problem of whether to count the country of origin of a mathematician or that of their present residence. Also, the mathematical contributions printed in the proceedings do not necessarily reflect the physical attendance of the respective author at the congress; in particular, the proceedings contains a very short note by the Moscow topologist L. S. Pontryagin (1908–1988) (**ICM, 1936**, vol. 2, p. 140), despite the fact that he did not attend the congress.<sup>34</sup>

Finally, the reports of the various countries to the International Commission on Mathematical Instruction (ICMI) were not printed in the proceedings, although they were part of section VIII (Pédagogie) of the congress. They were published for the most part in the Swiss journal *L’enseignement mathématique*, volumes 36 (1937) and 37 (1938), with the exception of Lietzmann’s report, which had already appeared in Germany as (**Lietzmann, 1937**).<sup>35</sup>

To the best of our knowledge, the most detailed published reports on the congress are (**Lietzmann, 1936**) and (**Dunnington, 1936a**).<sup>36</sup> Some political background for the German participation is given in personal recollections written by Lietzmann around 1942 and published posthumously in (**Lietzmann, 1960**, pp. 60–62). Written from the perspective of one participant, the recollections in (**Behnke, 1978**, pp. 247–249) provide a vivid picture. Contemporary Norwegian newspapers also provide some reports on aspects of the congress: we reproduce and discuss some of these in Chapter 6 and Appendix A.

The only printed source which gives an explanation for the non-participation of the Russians in the congress is (**Esakov, 2000**), which publishes the decision

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<sup>33</sup>The proceedings are also available online: see footnote 9 above. We therefore omit the original text of the translated quotations from these proceedings that appear throughout the present book. Indeed, in the interests of saving space, we similarly omit the original text of any published source that is quoted here in translation.

<sup>34</sup>In fact, (**Fehr, 1936**, p. 382) mentions that the note was read by Solomon Lefschetz (1884–1972) from Princeton.

<sup>35</sup>In *L’enseignement mathématique*, volume 36 (1937), p. 236, there is a reference to (**Lietzmann, 1937**), but also a remark that this publication was now obsolete due to very recent educational reforms in Germany, and could therefore not figure as the official German report to ICMI for this journal. The ICMI reports that were presented in Oslo are discussed further in Chapter 10.

<sup>36</sup>In addition, there are two much shorter contemporary reports, (**Fehr, 1936**) and (**Morse, 1936**), although the latter is unreliable since it lists the planned talks by Gel’fond and Khinchin without mentioning that they were not actually given. As far as we have been able to find, there is no report in *Science* or *Nature*, nor in the *Jahresbericht der Deutschen Mathematiker-Vereinigung*.

by the Soviet Politburo not to send a delegation. Corresponding materials for the Italian case comprise the few archival sources that we use in Chapter 5.

Not unexpectedly, some important *unpublished* sources at our disposal concern the preparation for the congress by the Norwegian organisers and the German delegation. The Norwegian sources that see particularly heavy use here are the archives of the Norwegian Ministry of Church and Education (Kirke- og undervisningsdepartementet: KUD) and a range of letters to and from the major figures in the organisation of the congress, held in the Manuscript Collection of the National Library in Oslo.

With regard to unpublished German sources, one that is very useful for us is a 15-page type-written report for the German Ministry of Education (Reichserziehungsministerium: REM), which the head of the German delegation, Walther Lietzmann, sent to various German, mostly political, authorities in mid-August 1936, after participating in the congress.<sup>37</sup> This report (WLR 1936) consists of two parts, a political part (pp. 1–5) and a mathematical one (pp. 6–15). There is some overlap between this unpublished report and (**Lietzmann, 1936**), particularly in the mathematical part. Nevertheless, we include the unpublished report here as an appendix (Appendix D), in both transcription and English translation, not least because we quote from it occasionally, but also because even the mathematical part contains many political side-remarks. The political part also reports on the preparation of the German delegation, in particular, on political criteria for its composition, which can be traced in more detail in two other unpublished sources: the files of the Nazi-dominated REM (Bundesarchiv Berlin, REM 2905), and in the Walther Lietzmann Papers in the Göttingen Municipal Archives (Depositum 89). A third, somewhat less important, source for German participation in Oslo is the files of the “Deutsche Kongreßzentrale” (DKZ; see Chapter 3), held at the Hoover Institution at Stanford University. The files in Berlin and Stanford both contain copies of Lietzmann’s unpublished report. Finally, the correspondence of the German-Jewish emigrant to America, Richard Courant (1888–1972), who participated in Oslo, with German and other mathematicians, including the Russian P. S. Aleksandrov, is another valuable source (Richard Courant Papers: RCP).

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<sup>37</sup>From the standpoint of the historian of mathematics, it is fortunate to have an internal report such as the one by Lietzmann, although it was produced against the backdrop of a serious curtailment of the participation of Germans in Oslo and has to be read carefully given its political context.