
The War of the Frogs and the Mice, or the Crisis of the *Mathematische Annalen*

D. van Dalen*

Will no one rid me of this turbulent priest? Henry II

On 27 October 1928, a curious telegram was delivered to L. E. J. Brouwer, a telegram that was to plunge him into a conflict that for some months threatened to split the German mathematical community. This telegram set into motion a train of events that was to lead to the end of Brouwer's involvement in the affairs of German mathematicians and indirectly to the conclusion of the *Grundlagenstreit*.

The story of the ensuing conflict that upset the mathematical world is not a pleasant one; it tells of the foolishness of great men, of loyalty, and of tragedy. There must have been an enormous correspondence relating to the subject. Only a part of that was available to me, but I believe that enough of the significant material could be consulted so as to warrant a fairly accurate picture.

The telegram was dispatched in Berlin, and it read¹:

Professor Brouwer, Laren N.H. Please do not undertake anything before you have talked to Carathéodory who must inform you of an unknown fact of the greatest consequence. The matter is totally different from what you might believe on the grounds of the letters received. Carathéodory is coming to Amsterdam on Monday.

Erhard Schmidt.

A message of this kind could hardly be called reassuring. Brouwer duly collected two registered letters

from Göttingen and waited for the arrival of Constantin Carathéodory. The letters were still unopened when Carathéodory arrived in Laren² on the thirtieth of October.

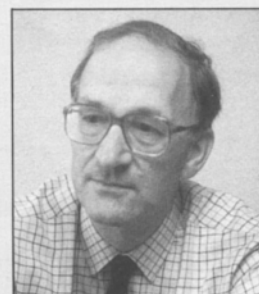
Bearer of Bad News

Carathéodory's visit figures prominently in the history that is to follow.

In order to appreciate the tragic quality of the following history, one must be aware that Brouwer was on friendly terms with all the actors in this small drama, with the exception of David Hilbert; some of them were even intimate friends, for example Carathéodory and Otto Blumenthal.

Carathéodory found himself in the embarrassing position of being the messenger of disturbing, even offensive, news, and at the same time disagreeing with its contents. It was regrettable, he said, that the two unopened letters had been written. The first letter

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* The research for this paper was partially supported by the Netherlands Organization for Advancement of Pure Research (Z.W.O.) under grant R 60-19.

¹ All the correspondence in the *Annalen* affair was in German; in the translations I have exercised some freedom in those cases where a literal translation would have resulted in overly awkward English.

² Brouwer lived in a small town, Laren, some distance from Amsterdam. He also owned a house in Blaricum.

contained a statement that should have carried more signatures, or at least Blumenthal's signature. Carathéodory's name was used in a manner not in accordance with the facts, although he would not disown the letter should Brouwer open it. Finally, the sender of the letter would probably seriously deplore his action within a couple of weeks. The second letter was written by Carathéodory himself, although Blumenthal's name was on the envelope. He, Carathéodory, regretted the contents of the letter.

Thereupon, Brouwer handed the second letter over to Carathéodory, who proceeded to relate the theme of the letters. The contents of the second can only be guessed, but the first letter can be quoted verbatim. It was written by Hilbert, and copies were sent to the other actors in the tragedy that was about to fill the stage for almost half a year.

Hilbert's letter was a short note:

Dear Colleague,

Because it is not possible for me to cooperate with you, given the incompatibility of our views on fundamental matters, I have asked the members of the board of managing editors of the *Mathematische Annalen* for the authorization, which was given to me by Blumenthal and Carathéodory, to inform you that henceforth we will forgo your cooperation in the editing of the *Annalen* and thus delete your name from the title page. And at the same time I thank you in the name of the editors of the *Annalen* for your past activities in the interest of our journal.

Respectfully yours,

D. Hilbert

The meeting of the old friends was painful and stormy; it broke up in confusion. Carathéodory left in despondency and Brouwer was dealt one of the roughest blows of his career.

The *Annalen*

The *Mathematische Annalen* was the most prestigious mathematics journal at that time. It was founded in 1868 by A. Clebsch and C. Neumann. In 1920 it was taken over from the first publisher, Teubner, by Springer.

For a long period the name of Felix Klein and the *Mathematische Annalen* were inseparable. The authority of the journal was mostly, if not exclusively, based on his mathematical fame and management abilities. The success of Klein in building up the reputation of the *Annalen* was largely the result of his choice of editors. The journal was run, on Klein's instigation, on a rather unusual basis; the editors formed a small exclusive society with a remarkably democratic practice. The board of editors met regularly to discuss the affairs of the journal and to talk mathematics. Klein did not use his immense status to give orders, but the editors implicitly recognized his authority.

Being an editor of the *Mathematische Annalen* was considered a token of recognition and an honour.

Through the close connection of Klein—and after his resignation, of Hilbert—with the *Annalen*, the journal was considered, sometimes fondly, sometimes less than fondly, to be “owned” by the Göttingen mathematicians.

Brouwer's association with the *Annalen* went back to 1915 and before, and was based on his expertise in geometry and topology. In 1915 his name appeared under the heading “With the cooperation of” (*Unter Mitwirkung der Herren*). Brouwer was an active editor indeed; he spent a great deal of time refereeing papers in a most meticulous way.

The status of the editorial board, in the sense of by-laws, was vague. The front page of the *Annalen* listed two groups of editors, one under the head *Unter Mitwirkung von* (with cooperation of) and one under the head *Gegenwärtig herausgegeben von* (at present published by).

I will refer to the members of those groups as associate editors and chief editors. The contract that was concluded between the publisher, Springer, and the *Herausgeber* Felix Klein, David Hilbert, Albert Einstein, and Otto Blumenthal (25 February 1920) speaks of *Redakteure*, but does not specify any details except that Blumenthal is designated as managing editor. The loose formulation of the contract would prove to be a stumbling block in settling the conflict that was triggered by Hilbert's letter.

At the time of Hilbert's letter the journal was published by David Hilbert, Albert Einstein, Otto Blumenthal, and Constantin Carathéodory, with the cooperation of (*unter Mitwirkung von*) L. Bieberbach, H. Bohr, L. E. J. Brouwer, R. Courant, W. v. Dyck, O. Hölder, T. von Kármán, and A. Sommerfeld. The daily affairs of the *Annalen* were managed by Blumenthal, but the chief authority undeniably was Hilbert.

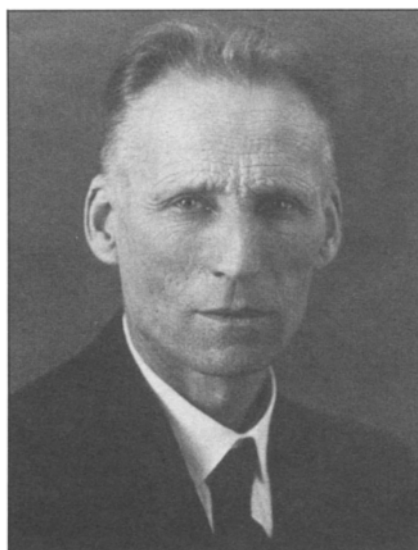
Brouwer and Hilbert

Nowadays the names of Brouwer and Hilbert are automatically associated as the chief antagonists in the most prominent conflict in the mathematical world of this century, the notorious *Grundlagenstreit*. But things had not always been like that; some twenty years earlier Brouwer had met Hilbert, who was nineteen years his senior, in the fashionable seaside resort Scheveningen and had instantly admired “the first mathematician of the world.”³ Hilbert obviously recognized the

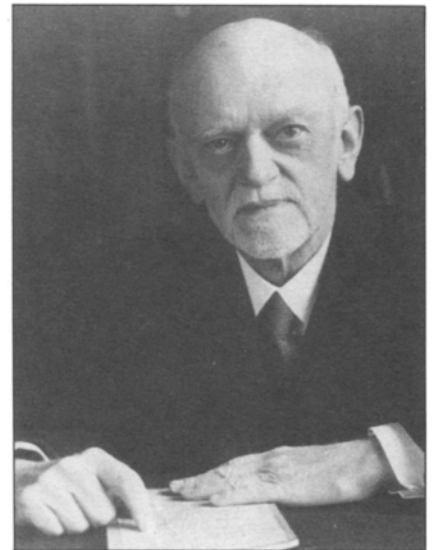
³ From a letter of Brouwer to the Dutch poet C. S. Adama van Scheltema (9 November 1909): “This summer the first mathematician of the world was in Scheveningen, I was already acquainted with him through my work; now I have repeatedly walked with him, and talked to him as a young apostle to a prophet. He was 46, but young in heart and body, he swam vigorously and enjoyed climbing over walls and fences with barbed wire” [2, p. 100].



Constantin Carathéodory



L. E. J. Brouwer



David Hilbert

genius of the young man and on the whole accepted and respected him. Brouwer's letters to Hilbert for a prolonged period were written in a warm and friendly tone.

Already in his dissertation of 1907 Brouwer was markedly critical of Hilbert's formalism; this caused, however, no observable friction, probably because the dissertation was written in Dutch and thus escaped Hilbert's attention. The relationship remained friendly for a long time; Göttingen was Brouwer's second scientific home, and Hilbert wrote a warm letter of recommendation in 1912 when Brouwer was considered for a chair at the University of Amsterdam. In 1919 Hilbert went so far as to offer Brouwer a chair in Göttingen, an offer that Brouwer turned down.

The initially warm relationship between Hilbert and Brouwer began to cool in the twenties, when Brouwer started to campaign for his foundational views. Hilbert accepted the challenge—he took the threat of an intuitionistic revolution seriously. Brouwer lectured successfully at meetings of the German Mathematical Society. His series of Berlin lectures in 1927 caused a considerable stir; there was even some popular reference to a *Putsch* in mathematics. In March 1928 Brouwer gave talks of a mainly philosophical nature in Vienna (tradition has it that these talks were instrumental in Wittgenstein's return to philosophy). On the whole the future of intuitionism looked rosy.

Gradually the scientific differences between the two adversaries turned into a personal animosity. The *Grundlagenstreit* is in part the collision of two strong characters, both convinced that they were under a personal obligation to save mathematics from destruction.

Brouwer's involvement in the national affairs of the German mathematicians also played a role. In so far as

Brouwer had any political views, they could not be called sophisticated. From the end of the first world war, Brouwer had taken up the cause of the German mathematicians, subjected as they were to harsh measures and an international boycott.⁴ For example, he forcefully opposed the participation of certain French mathematicians in the Riemann memorial volume of the *Mathematische Annalen*, much to the chagrin of Hilbert. His latest exploit in this area was his campaign against the participation of German mathematicians in the International Congress of Mathematicians at Bologna in August 1928. Hilbert put the full weight of his authority to bear on this matter, with the result that a sizable delegation followed Hilbert to Bologna [4, p. 188].⁵

Hilbert's Decision

The stage was set for the final act, and the letter of dismissal was the signal to raise the curtain. It is hard to imagine what Hilbert had expected; he could not have counted on a calm, resigned acquiescence from the highly strung emotional Brouwer. In Brouwer's eyes (and quite a few colleagues would have taken the same view) a dismissal from the *Annalen* board was a gross insult.

⁴ Brouwer's views and actions in this area can easily be (and have been) misrepresented; they deserve a more detailed treatment. The matter will be covered in a forthcoming biography.

⁵ It was felt by a number of Germans, and by Brouwer, that the Germans were tolerated only as second-rate participants at the Bologna conference. Rather than suffer such an insult, they advocated a boycott of the conference. This topic has also received some degree of notoriety, and is in need of a more balanced treatment. It will find a place in the forthcoming biography.

Carathéodory must have revealed some of the underlying motive to Brouwer, who wrote in his letter of 2 November to Blumenthal:

Furthermore Carathéodory informed me that the *Hauptredaktion* of the *Mathematische Annalen* intended (and felt legally competent) to remove me from the *Annalenredaktion*. And only for the reason that Hilbert wished to remove me, and that the state of his health required giving in to him. Carathéodory begged me, out of compassion for Hilbert, who was in such a state that one could not hold him responsible for his behaviour, to accept this shocking injury in resignation and without resistance.

Hilbert himself was explicit; in a letter of 15 October he asked Einstein for his permission (as a *Mitherausgeber*) to send a letter of dismissal (the draft to the chief editors did not contain any explanation) and added,

Just to forestall misunderstandings and further ado, which are totally superfluous under the present circumstances, I would like to point out that my decision—to belong under no circumstances to the same board of editors as Brouwer—is firm and unalterable. To explain my request I would like to put forward, briefly, the following:

1. Brouwer has, in particular by means of his final circular letter to German mathematicians before Bologna, insulted me and, as I believe, the majority of German mathematicians.

2. In particular because of his strikingly hostile position *via-à-vis* sympathetic foreign mathematicians, he is, in particular in the present time, unsuitable to participate in the editing of the *Mathematische Annalen*.

3. I would like to keep, in the spirit of the founders of the *Mathematische Annalen*, Göttingen as the chief base of the *Mathematische Annalen*—Klein, who earlier than any of us realized the overall detrimental activity of Brouwer, would also agree with me.

In a postscript he added: “I myself have for three years been afflicted by a grave illness (pernicious anemia); even though the deadly sting of this disease has been taken by an American invention,⁶ I have been suffering badly from its symptoms.”

Clearly, Hilbert’s position was that the *Herausgeber* (chief editors) could appoint or dismiss the *Mitarbeiter* (associate editors). As such he needed the approval of Blumenthal, Carathéodory, and Einstein. Blumenthal had complied with Hilbert’s wishes, but for Carathéodory, consent was problematic; apparently he did not wish to upset Hilbert by contradicting him, but neither did he want to authorize him to dismiss Brouwer. Hilbert may easily have mistaken Carathéodory’s evasive attitude for an implicit approval. Carathéodory had landed in an awkward conflict between loyalty and fairness. He obviously tried hard to reach a compromise. In view of Hilbert’s firmly fixed conviction, he accepted the unavoidable conclusion that Brouwer had to go; but at least Brouwer should go with honour.

⁶ The work of G. H. Whipple, F. S. Robschey-Robbins and of G. R. Minot, cf. [4, p. 179].

Einstein’s Neutrality

Being caught in the middle, Carathéodory sought Einstein’s advice. In a letter of 16 October he wrote “It is my opinion that a letter, as conceived by Hilbert, cannot possibly be sent off.” He proposed instead, to send a letter to Brouwer explaining the situation and suggesting that Brouwer should voluntarily hand in his resignation. Thus a conflict would be avoided and one could do Brouwer’s work justice: “Brouwer is one of the foremost mathematicians of our time and of all the editors he has done most for the M.A.”

The second letter we mentioned above must have been the concrete result of Carathéodory’s plan. Einstein answered: “It would be best to ignore this Brouwer-affair. I would not have thought that Hilbert was prone to such emotional outbursts” (19 October 1928).

The managing editor, Blumenthal, must have been in an even greater conflict of loyalties, being a close, personal friend of Brouwer and the first Ph.D. student (1898) of Hilbert, whom he revered.

Einstein did not give in to Hilbert’s request. In his answer to Hilbert (19 October 1928) he wrote:

I consider him [Brouwer], with all due respect for his mind, a psychopath and it is my opinion that it is neither objectively justified nor appropriate to undertake anything against him. I would say: “Sire, give him the liberty of a jester (*Narrenfreiheit*)!” If you cannot bring yourself to this, because his behaviour gets too much on your nerves, for God’s sake do what you have to do. I, myself, for the above reasons cannot sign such a letter.

Carathéodory, however, was seriously troubled and could not let the matter rest. He again turned to Einstein (20 October 1928):

. . . Your opinion would be the most sensible, if the situation would not be so hopelessly muddled. The fight over Bologna . . . seems to me a pretext for Hilbert’s action. The true grounds are deeper—in part they go back for almost ten years. Hilbert is of the opinion that after his death Brouwer will constitute a danger for the continued existence of the M.A. The worst thing is that while Hilbert imagines that he does not have much longer to live . . . he concentrates all his energy on this one matter. . . . This stubbornness, which is connected with his illness, is confronted by Brouwer’s unpredictability. . . . If Hilbert were in good health, one could find ways and means, but what should one do if one knows that every excitement is harmful and dangerous? Until now I got along very well with Brouwer; the picture you sketch of him seems me a bit distorted, but it would lead too far to discuss this here.

This letter made Einstein, who in all public matters practised a high standard of moral behaviour, realize that these were deep waters indeed (23 October 1928):

I thought it was a matter of mutual quirk, not a planned action. Now I fear to become an accomplice to a proceeding that I cannot approve of, nor justify, because my name—by the way, totally unjustifiedly—has found its way to the title page of the *Annalen*. . . . My opinion, that

Brouwer has a weakness, which is wholly reminiscent of the *Prozessbauern*,⁷ is based on many isolated incidents. For the rest I not only respect him as an extra-ordinarily clear visioned mind, but also as an honest man, and a man of character.

From these letters, even before the real fight had started, it clearly appears that Einstein was firmly resolved to reserve his neutrality. Einstein called Brouwer “an involuntary proponent of Lombroso’s theory of the close relation between genius and insanity,” but Einstein was well aware of Brouwer’s greatness, and did not wish him to be victimized. It is not clear whether Einstein’s opinion was based on personal observation or on hearsay; there are no reports of personal contacts between Brouwer and Einstein, but one may conjecture that they had met at one of the many meetings of the *Naturforscherverein* or in Holland during one of Einstein’s visits to Lorentz.

Unsound Mind

It did not take Brouwer long to react. Brouwer was a man of great sensitivity, and when emotionally excited he was frequently subject to nervous fits. According to one report (a letter from Dr. Irmgard Gawehn to von Mises), Brouwer was ill and feverish for some days following Carathéodory’s visit.

On 2 November Brouwer sent letters to Blumenthal and Carathéodory, from which only the copy of the first one is in the Brouwer archive—it contained a report of Carathéodory’s visit. The letter stated that “in calm deliberation a decision on Carathéodory’s request was reached.”

The answer to Carathéodory, as reproduced in the letter to Blumenthal, was short:

Dear Colleague,

After close consideration and extensive consultation I have to take the position that the request from you to me, to behave with respect to Hilbert as to one of unsound mind, qualifies for compliance only if it should reach me in writing from Mrs. Hilbert and Hilbert’s physician.

Yours

L. E. J. Brouwer

This solution, although perhaps a clever move in a political game of chess, was of course totally unacceptable—even worse, it was a misjudgment of the matter. In a more or less formal indictment, Blumenthal declares concerning “this frightful and repulsive letter” that apparently Brouwer had picked from Carathéodory’s statements and entreatments the ugliest interpretation. “I must confess, and Cara has written me likewise, that I have been thoroughly de-

⁷ This probably refers to the troubles in Schleswig-Holstein during roughly the same period, when farmers resisted the tax policies of the government. Hans Fallada has sketched the episode in his *Bauern, Bonzen und Bomben*.



AP/Wide World Photos

Albert Einstein

ceived in Brouwer’s character and that Hilbert has known and judged him better than we did.”

So Brouwer’s first action only served to rob him of his potential support.

The conflict had presented itself so suddenly and so totally unexpectedly to Brouwer that he failed to realize to what extent Hilbert saw him as a deadly danger for mathematics, and as the bane of the *Mathematische Annalen*. His belief that the announced dismissal was the whim of a sick and temporarily deranged man emerges from a letter he dispatched to Mrs. Hilbert three days later:

I beg you, use your influence on your husband, so that he does not pursue what he has undertaken against me. Not because it is going to hurt him and me, but in the first place because it is wrong, and because in his heart he is too good for this. For the time being I have, of course, to defend myself, but I hope that it will be restricted to an incident within the board of editors of the *Annalen*, and that the outer world will not notice anything.

A copy of this letter went to Courant with a friendly note, asking him (among other things) to keep an eye on the matter: “As a matter of course, I count especially on you to bring Hilbert to reason, and to make sure that a scandal will be avoided” (6 November 1928).

Courant, after visiting Mrs. Hilbert, replied to Brouwer (10 November 1928) that Hilbert was in this matter under nobody’s influence, and that it was impossible to exert any influence on him.



Ferdinand Springer. This photograph was taken on Hilbert's sixtieth birthday, 23 January 1922.

Apart from Einstein, who kept a strict neutrality, all the editors (mostly reluctantly) did take sides—the majority with Hilbert, but Hilbert himself no longer took part in the conflict. His position was fixed once and for all, and in view of his illness the developments were as far as possible kept from him (e.g., Blumenthal to Courant on 4 November 1928: "Hilbert must not find out about Cara's trip to Brouwer").

One might wonder whether Brouwer, as a relative outsider (one of the three non-Germans among the editors), stood a chance from the beginning; his letter of 2 November to Carathéodory, however, definitely lost him a good deal of sympathy and proved a weapon to his opponents.

The Ripples Spread

In a circular letter of 5 November 1928 Brouwer appealed directly to the publishers and editors, thus widening the circle of persons involved:

To the publisher and the editors of the *Mathematische Annalen*.

From information communicated to me by one of the chief editors of the *Mathematische Annalen* at the occasion of a visit on 30-10-1928 I gather the following:

1. That during the last years, as a consequence of differences between my opinion and that of Hilbert, which had nothing to do with the editing of the *Mathematische Annalen* (my turning down the offer of a chair in Göttingen, conflict between formalism and intuitionism, difference in opinion concerning the moral position of the Bologna congress), Hilbert had developed a continuously increasing anger against me.

2. That lately Hilbert had repeatedly announced his intention to remove me from the board of editors of the *Mathematische Annalen*, and this with the argument that he could no longer "cooperate" (*zusammenarbeiten*) with me.

3. That this argument was only a pretext, because in the editorial board of the *Mathematische Annalen* there has never been a cooperation between Hilbert and me (just as there has been no cooperation between me and various other editors). That I have not even exchanged any letters with Hilbert for many years and that I have only superficially talked to him (the last time in July 1926).

4. That the real grounds lie in the wish, dictated by Hilbert's anger, to harm and damage me in some way.

5. That the equal rights among the editors (repeatedly stressed by the editorial board within and outside the board[†]) allow a fulfillment of Hilbert's will only in so far that from the total board a majority should vote for my expulsion. That such a majority is scarcely to be thought of, since I belong among the most active members of the editorial board of the *Mathematische Annalen*, since no editor ever had the slightest objection against the manner in which I fulfill my editorial activities, and since my departure from the board, both for the future contents and for the future status of the *Annalen*, would mean a definite loss.

6. That, however, the often proclaimed equal rights, from the point of view of the chief editors, was only a mask, now to be thrown down. That as a matter of fact the chief editors wanted (and considered themselves legally competent) to take it upon themselves to remove me from the editorial board.

7. That Carathéodory and Blumenthal explain their cooperation in this undertaking by the fact that they estimate the advantages of it for Hilbert's state of health higher than my rights and honor and freedom of practice (*Wirkungsmöglichkeiten*) and than the moral prestige and scientific contents of the *Mathematische Annalen* that are to be sacrificed.

I now appeal to your sense of chivalry and most of all to your respect for Felix Klein's memory and I beg you to act in such a way, that either the chief editors abandon this undertaking, or that the remaining editors separate themselves [from the chief editors, v.D.] and carry on the tradition of Klein in the managing of the journal by themselves.

Laren, 5. November 1928

L. E. J. Brouwer

[†] From the editorial obituary of Felix Klein, written by Carathéodory: "He (Klein) has taken care that the various schools of mathematics were represented in the editorial board and that the editors operated with equal rights alongside of himself—He has . . . never heeded his own person, always had kept in view the goal to be achieved."

From a letter from Blumenthal to me, 13-9-1927: "I believe that you overestimate the meaning of the distinction between editors in large and small print. It seems to me that we all have equal rights. In particular we can speak for the *Annalenredaktion* if and only if we have made sure of the approval of the editors interested in the matter under consideration.—Although I too take the distinction between the two kinds of editors more to be typographical than factual (I make an exception for myself as managing editor), I very well understand your wish for a better typographical make-up. You know that I personally warmly support it. However, we can for the time being, as long as the state of Hilbert's health is as shaky as it is now, change nothing in the editorial board. I thus cordially beg you to put aside your wish. In good time I will gladly bring it out."

The above circular letter was dispatched on the same day as Brouwer's plea to Mrs. Hilbert; the two letters are in striking contrast. One letter is written on a conciliatory note, the other is a determined defence and closes with an unmistakable incitement to mutiny.

Blumenthal immediately took the matter in hand; he wrote to the publisher and the editors (16 November) to ignore the letter until he had prepared a rejoinder. The draft of the rejoinder was sent off to Courant on 12 November, with instructions to wait for Carathéodory's approval and to send copies to Bieberbach, Hölder, von Dyck, Einstein, and Springer. It appears from the accompanying letter that Carathéodory had already handed in his resignation, although he had given Blumenthal permission to postpone its announcement, so that it would not give food to the rumour that Carathéodory had turned against Hilbert.

In the meantime Brouwer had travelled to Berlin to talk the matter over with Erhard Schmidt and to explain his position to the publisher, Ferdinand Springer. Brouwer, accompanied by Bieberbach, called at the Berlin office of Springer, who reported the discussion in an *Aktennotiz* "Unannounced and surprising visit of Professor Bieberbach and Professor Brouwer" (13 November 1928). As Springer wrote, his first idea was to refuse to receive the gentlemen, but he then realized that a refusal would provide propaganda material for the opposition.

Springer opened the discussion with the remark that he was firmly resolved not to mix in the skirmishes and that he did not consider the *Annalen* the sole property of the Company (like other journals), but that the proper *Herausgeber*, Klein and Hilbert, had been in a sense in charge. Moreover, he would choose Hilbert's side out of friendship and admiration, if he would be forced to choose sides.

The unwelcome visitors then proceeded to inquire into the legal position of Hilbert, a topic that Springer was not eager to discuss without the advice of his friends and which he could not enter into without consulting the contract. Thence the two gentlemen proceeded to "threaten to damage the *Annalen* and my business interests. Attacks on the publishing house, which could get the reputation of lack of national feeling among German mathematicians, could be expected."

This threat was definitely in bad taste, not in the last place because the Springer family had Jewish ancestry. Bieberbach's later political views have gained a good measure of notoriety (cf. [3]); it certainly is true that already before the arrival of the Third Reich he held extreme nationalistic views. Brouwer's position in this matter of *Nationalgefühl* was rather complex, it was not based on a political ideology but rather on his moral indignation at the boycott of German science.

Be that as it may, this particular approach was not likely to mollify Springer, who calmly answered that

he would deplore damage resulting from this quarrel, but that he would bear it without complaints under the present circumstances.

Thus rejected, Bieberbach and Brouwer asked if Springer could suggest a mediator, upon which Springer answered that he was not sufficiently familiar with the personal features involved, but that two *deutschfreundliche* foreigners like Harald Bohr and G. H. Hardy might do.⁸

Before leaving, Brouwer threatened to found a new journal with De Gruyter, and Bieberbach declared that he would resign from the board of editors if it definitively came to the exclusion of Brouwer.

In a letter to Courant (13 November 1928) Springer dryly commented "On the whole the founding of a new journal, wholly under Brouwer's supervision, would be the best solution out of all difficulties."⁹ He also conveyed his impression of the visit: "I would like to add that Brouwer, as a matter of fact, does make a scarcely pleasant (*unerfreulich*) impression. It seems, moreover, that he will carry the fight to the bitter end (*der Kampf bis aufs Messer führen wird*).

The Case for the Prosecution

In Aachen Blumenthal was preparing his defense of the intended dismissal of Brouwer and, following an old strategic tradition, he took to the attack. After consulting Courant, Carathéodory, and Bohr he drew up a kind of indictment. I have not seen the draft of 12 November, but from a letter from Bohr and Courant to Blumenthal (14 November 1928), one may infer that it was harder in tone and more comprehensive than the final version. There is mention of a detailed criticism of Brouwer's editorial activities and of matters of formulation ("... leave out *Schrullenhaftigkeit* [capriciousness]. . ."). Moreover Bohr and Courant warned Blumenthal:

To what extent Brouwer exploits without consideration every tactical advantage that is offered to him, and how dangerous his personal influence is (Bieberbach), can be seen from the enclosed notice which Springer has just sent us [the above-mentioned *Aktennotiz*].

The correspondence of Blumenthal, Bohr, and Courant shows an unlimited loyalty to Hilbert, which it would be unjust to ascribe to Hilbert's state of health alone. There is no doubt that Hilbert as a man and a

⁸ This suggestion of the publisher encouraged the impression that the conflict had a political origin. Blumenthal complained to Courant (letter of 18 November 1928) "... the bad thing is, that Brouwer managed to move everything on to the political plane, just what Carathéodory thought he had prevented." The idea of mediation was not pursued.

⁹ Brouwer indeed founded a new journal, the *Compositio Mathematica*, with the Dutch publisher Noordhoff.

scientist inspired a great deal of loyalty in others, let alone in his students. Sentences like “We don’t particularly have to stress that we are, like you, wholly on Hilbert’s side, and also, when necessary, prepared for action” (same letter), illustrate the feeling among Hilbert’s students.

A revised version of Blumenthal’s letter is dated 16 November, and it is this version that was in Brouwer’s possession. It incorporated remarks of Bohr and Courant, but not yet those (at least not all of them) of Carathéodory. It contained a concise *resumé* of the affair so far, and proceeds to answer Brouwer’s points (from the letter of 5 November 1928).

As Blumenthal put it, he partly based his handling of the matter on letters from Hilbert, Carathéodory, and Brouwer, partly on an extensive conversation with Hilbert in Bologna. The contents of the latter conversation remain a matter of conjecture, but it may be guessed that in August at the conference Hilbert had made clear his objections to Brouwer—in particular after Brouwer’s opposition to the German participation in the conference.

From Blumenthal’s circular letter, the editors—and also Brouwer—learned the contents of Hilbert’s letter of 25 October. In answering Brouwer’s points Blumenthal quite correctly stressed that Brouwer interpreted “cooperation” in a too narrow fashion. Hilbert, he said, found it impossible to justify his sharing responsibilities in an editorial board together with Brouwer. As to point 4 of Brouwer’s letter, “the motivation is ugly and thus needs no answer.” The scientific opposition in foundational matters had not played a role, according to Blumenthal. Even Brouwer’s circular letter concerning the Bologna Congress “by which statements Hilbert felt insulted” had, according to Blumenthal, only acted in a catalytic way on his decision: “The motives lie much deeper.”

Concerning Klein’s position, Blumenthal remarked that Klein always acted as a kind of higher authority, to which one could appeal. After Klein’s death Hilbert felt obliged to take on Klein’s role. “Hilbert has recognized in Brouwer a stubborn, unpredictable, and ambitious (*herrschaftlich*) character. He has feared that when he should eventually resign from the editorial board, Brouwer would bend the editorial board to his will and he had considered this such a danger for the *Annalen* that he wanted to oppose him as long as he still could do so.”

How strongly Blumenthal and Carathéodory wished to spare Brouwer, while complying with Hilbert’s wishes, can be seen from the following paragraph:

Cara and I, who were associated with Brouwer in a long-standing friendship, had objectively to recognize Hilbert’s objections to Brouwer’s editorial activity.

True, Brouwer was a very conscientious and active editor, but he was quite difficult in his dealings with the

managing editor and he subjected the authors to hardships that were hard to bear.

E.g., manuscripts that were submitted for refereeing to him lay around for months, while in principle he had prepared a copy of each submitted paper (I recently had an example of this practice). Above all there is no doubt that Klein’s premature resignation from the editorial board is to be traced back to Brouwer’s rude behaviour (in a matter in which Brouwer was formally right). The further course of events has shown that Hilbert was even far more right than we thought at the time.

Since we could not reject the objective justification of Hilbert’s point of view, and were confronted by his immutable will, we have given our permission for the removal of Brouwer from the editorial board [at this point it should be made clear that Carathéodory had not given his permission, as he wrote to Courant (14 November) in his letter with corrections to the draft]. We only wished—unjustified, as I now realize—a milder form, in the sense that Brouwer should be prevailed upon to resign. Hilbert could not be induced to this procedure, so we finally, though reluctantly, have decided to give in to him (*den Weg freigeben*). Mr. Einstein did not comply, with the argument that one should not take Brouwer’s peculiarities seriously.

To what the reader already knows about Carathéodory’s trip to Brouwer, Blumenthal’s letter adds the following: in Göttingen on 26 and 27 October Blumenthal and Carathéodory discussed the situation. In a last attempt to bring the matter to a good end through a mitigation of the categorical form of the statement of notice, Carathéodory travelled to Berlin and discussed the matter, as it appears, with Erhardt Schmidt. The result was, as we know, the request to Brouwer not to take action before Carathéodory’s arrival.

Finally, Blumenthal proceeded to reproduce the text of Brouwer’s letter to Carathéodory of 2 November, with the “unsound mind” phrase, concluding that “I have thoroughly misjudged Brouwer’s character and that Hilbert has known and judged him better than we have.” The letter ended with the request to the editors for permission to delete Brouwer’s name from the title page of the *Annalen*.

Defence of the Underdog

A few editors responded to Blumenthal’s letter in writing, but the majority remained silent. Only von Dyck, Hölder, and Bieberbach sent their comments. Von Dyck could “neither justify Brouwer’s views nor Hilbert’s action” and he hoped that a peaceful solution could be found. Hölder was of the opinion that he could not approve of a removal of Brouwer by force (27 November).

Bieberbach’s letter showed a thorough appreciation of the situation. And he at least was willing to take up the case of the underdog. In view of his later political extremism one might be inclined to question the purity of his motives; however, in the present letter there



Otto Blumenthal (left) and L. E. J. Brouwer (right) in happier days (1920?).



Richard Courant

is no reason not to take his arguments at their face value. Like Brouwer, and probably the majority if not the whole of the editorial board, Bieberbach contested the right of the *Herausgeber* to decide matters without the support of the majority of all the editors, let alone without consultation. Indeed, this seems to be a shaky point in the whole procedure.

As a matter of fact, the contract between Springer and the *Herausgeber* (25 February 1920) is not very concrete in this particular point. It states: "Changes in the membership of the editorial board require the approval of the publisher." The correspondence does not lead me to believe that Hilbert observed this rule.

Bieberbach observed that a delay in handling papers cannot be taken seriously as grounds for dismissal: such things ought to be discussed in the annual meeting of the board. Bieberbach's comments on Hilbert's annoyance (to say the least) with Brouwer's actions in the matter of the Bologna conference are of a rather scholastic nature and border on nit-picking: the objectionable statements of Brouwer concerned Germans who were to attend the *Unionskongress* in Bologna, and since Hilbert denied that the meeting in Bologna was a *Unionskongress*, the statements did not apply to him.

Bieberbach correctly spotted a serious flaw in Blumenthal's charge involving Brouwer's "terrifying and repulsive" letter:

Finally, I hold it totally unjustified to forge material against Brouwer from letters that he wrote after learning about the action that was mounted against himself. For it is morally impossible to use actions, to which a person is driven in a fully understandable emotion over an injustice that is inflicted on him, afterwards as a justification of this injustice itself.

The point is well taken. It does not exonerate Brouwer from hitting below the belt, but it at least

makes clear that to use it against Brouwer is distasteful.

Bieberbach explicitly stated that he would not support Brouwer's dismissal; on the contrary, he strongly sided with Brouwer, without, however, attacking Hilbert.

The publisher reacted in a cautious way. Springer thought that Brouwer was "an embittered and malicious adversary" and that he should not receive a copy of the circular letter without the permission of the lawyer of the firm. Springer also concluded that the publisher should not state in writing that he officially agreed to Brouwer's dismissal, because it would imply a recognition of Brouwer's membership on the board of editors in the sense of the contract. In short, Springer abstained from voting on Blumenthal's proposal.

Froschen-Mäusekrieg

At this point the whole action against Brouwer seemed to reach a climax. One may surmise a good deal of activity in the camp of the *Göttinger*, as the sympathizers of Hilbert were called.

A certain amount of animosity between Göttingen and Berlin mathematicians was a generally acknowledged fact. The Berlin faction had suffered a setback in the matter of the Bologna boycott, where Hilbert had undeniably carried the day. Born, in his letter to Einstein (20 November), quotes von Mises (a *Berliner*), "the *Göttinger* simply run after Hilbert, who is not completely responsible for his actions (*sei wohl nicht mehr ganz zurechnungsfähig*)."¹ The friction between Berlin and Göttingen was a weighty reason to settle the *Annalen* conflict as speedily and quietly as possible. If there was any risk of a rift in the German mathematical community, it was here.

A key figure, in view of his immense scientific and moral prestige, was Albert Einstein. If he could be persuaded to side with Hilbert the battle would be half won. In spite of personal pressure from Born (20 November 1928) on behalf of Hilbert, Einstein remained stubbornly neutral. In his letters to Born and to Brouwer and Blumenthal one may recognize a measure of disgust behind a facade of raillery.

In the letter to Born (27 November) the apt characterization of “*Frosch-Mäusekrieg*” (war of the frogs and the mice)¹⁰ was introduced. After declaring his strict neutrality Einstein continued:

If Hilbert’s illness did not lend a tragic feature, this ink war would for me be one of the most funny and successful farces performed by that people who take themselves deadly seriously.

Objectively I might briefly point out that in my opinion there would have been more painless remedies against an overly large influence on the managing of the *Annalen* by the somewhat mad (*verrückt*) Brouwer, than eviction from the editorial board.

This, however, I only say to you in private and I do not intend to plunge as a champion into this frog-mice battle with another paper lance.

Einstein’s letter to Brouwer and Blumenthal (25 November) is even more cutting and improving.

I am sorry that I got into this mathematical wolf-pack (*Wolfsherde*) like an innocent lamb. The sight of the scientific deeds of the men under consideration here impresses me with such cunning of the mind, and I cannot hope, in this extra-scientific matter, to reach a somewhat correct judgment of them. Please, allow me therefore, to persist in my “booh-nor-bah” (*Muh-noch-Mäh*) position and allow me to stick to my role of astounded contemporary.

With best wishes for an ample continuation of this equally noble and important battle, I remain

Yours truly,
A. Einstein

Deadlock

The whole affair now rapidly reached a deadlock. A week before, Springer, who had at Blumenthal’s urging sought legal advice, had optimistically written to Courant (17 November 1928) that the legal adviser of the firm, E. Kalisher, was of the opinion that it would suffice that those of the four chief editors who did not want to advocate Brouwer’s dismissal actively would abstain from voting, thus giving the remaining chief editors a free hand. Apparently Springer did not realize that since two editors with a high reputation had already decided not to support Hilbert, the solution, even if it was legally valid, would lack moral credibility.

If this solution should turn out to raise difficulties within the editorial board, the publisher could still fire

the whole editorial board and reappoint Hilbert and his supporters, so the advice ran. In the opinion of the legal adviser the publishing house was contractually bound to the chief editors (*Herausgeber*) only; there was no contract with the remaining editors.

Bieberbach’s letter, mentioned above, apparently worried Carathéodory to the extent that he decided to ask a colleague from the law faculty for advice. This advice from Müller-Erbach (Munich) plainly contradicted the advice from the Springer lawyer. It made clear that

1. Brouwer and Springer-Verlag were contractually bound since Brouwer had obtained a fee.
2. Hilbert’s letter was not legally binding.

Müller-Erbach sketched three solutions to the problem:

1. Springer dismisses Brouwer. A letter of dismissal should, however, contain appropriate grounds.
2. The four chief editors and the publisher form a company (*Gesellschaft*) and dismiss Brouwer.
3. A court of law could count the “*Mitarbeiter*” as editors. In that case the only way out would be to dissolve the total editorial board and to form a new one.

Carathéodory considered the first two suggestions inappropriate because it would not be fair to saddle Springer with the internal problems of the editors. Hence he recommended the third solution (letter to Blumenthal, 27 November). Here, for the first time, appeared the suggestion that was to be the basis of the eventual outcome of the dispute.

Hilbert, the main contestant in the *Annalen* affair, had quite sensibly withdrawn from the stage. The developments, had he known them, would certainly have harmed his still precarious health. In a short notice he had empowered Harald Bohr and Richard Courant to represent him legally in matters concerning the *Mathematische Annalen*. Thus the whole matter became more and more a shadow fight between Brouwer and an absentee.

At this point the dispute had reached an impasse. Although Springer upheld in a letter to Bieberbach the principle that the chief editors could dismiss any of the other editors, the impetus of the attack on Brouwer seemed to ebb. A meeting between Carathéodory, Courant, Blumenthal, and Springer had repeatedly to be postponed and finally had been cancelled.

Courant agreed with Carathéodory that the dissolution of the complete board would be a good solution (30 November 1928); however, it would require a voluntary action from the editors and the ultimate organization of the editorial board should not have the character of a legal trick with the sole purpose of rendering Brouwer’s opposition illusory.

Carathéodory, who, on the basis of Müller-Erbach’s information, had come to the conclusion that the original plan of Hilbert, even in a modified form,

¹⁰ War of the frogs and the mice—a Greek play of unknown authorship; a late medieval German version, *Froschmeusel*, is from the hand of Rollenhagen.

would not stand up in a court of law, expressed his willingness to assist “out of devotion to Hilbert” in the liquidation of the affair, but quite firmly refused to be involved in the future organization of the *Annalen*.

Dissolution

The reluctance of Carathéodory to be involved in the matter beyond the bare minimal efforts to satisfy Hilbert and spare Brouwer (his friend) is throughout understandable. As far as we can judge from the correspondence, only Blumenthal exhibited an unbroken fighting spirit. He realized, however, that his circular had not furthered an acceptable solution (letter to Courant and Bohr, 4 December), and he leaned towards alternative solutions. In particular, Blumenthal wrote, the time was favourable to Carathéodory’s plan. The *Annalen* were completing their hundredth volume, and it would present a nice occasion to open with volume 101 a “new series” or “second series” with a different organization of the editorial board. But at the present time he was facing a dilemma. Because Hilbert’s letter clearly had no legal status, Brouwer was still a *Mitarbeiter* and his name should appear on the cover of the issue that was to appear—this, however, conflicted with Hilbert’s wishes. Could Bohr and Courant, as proxies of Hilbert, authorize him to print Brouwer’s name on the cover? Otherwise the publication would have to be postponed. The authorization probably was given.

It seems that Bohr had also put forward a solution to the affair. From the correspondence of Carathéodory and Bohr with Blumenthal, one gets the impression that Bohr’s proposal was a slight variant of Carathéodory’s suggestion. The main difference was that Bohr advocated a total reorganization of the editorial board. In his proposal there would only remain *Herausgeber*, and no *Mitarbeiter*. So the solution would look like a fundamental change of policy, and hence it would no longer be recognizable as an act levelled against Brouwer.

Apparently Bohr envisaged Hilbert, Blumenthal, Hecke, and Weyl as the members of a new board. And should Weyl decline, one might invite Toeplitz. Blumenthal questioned the wisdom of reinstating himself as an editor; it could easily be viewed as the old board of *Herausgeber* in disguise (letter to Bohr, 5 December). In his letter to Courant, the next day, he considered the dissolution of the editorial board at large as necessary, and he fully agreed that Hilbert should choose the new editors.

From then on things moved smoothly; Springer accepted the dissolution of the editorial board and agreed to enter into a contract with Hilbert on the subject of the reorganized *Annalen*. By and large only matters of formulation and legal points remained to be solved.

One might wonder where Brouwer was in all this—he was completely ignored. In a letter of 30 November to the editors and the publisher he confirms the receipt of Blumenthal’s indictment, which had only just reached him. In a surprisingly mild reaction he merely asked the editors to reserve their judgment—blissfully unaware that nobody was going to take a vote—for the composition of a defence would take some days.

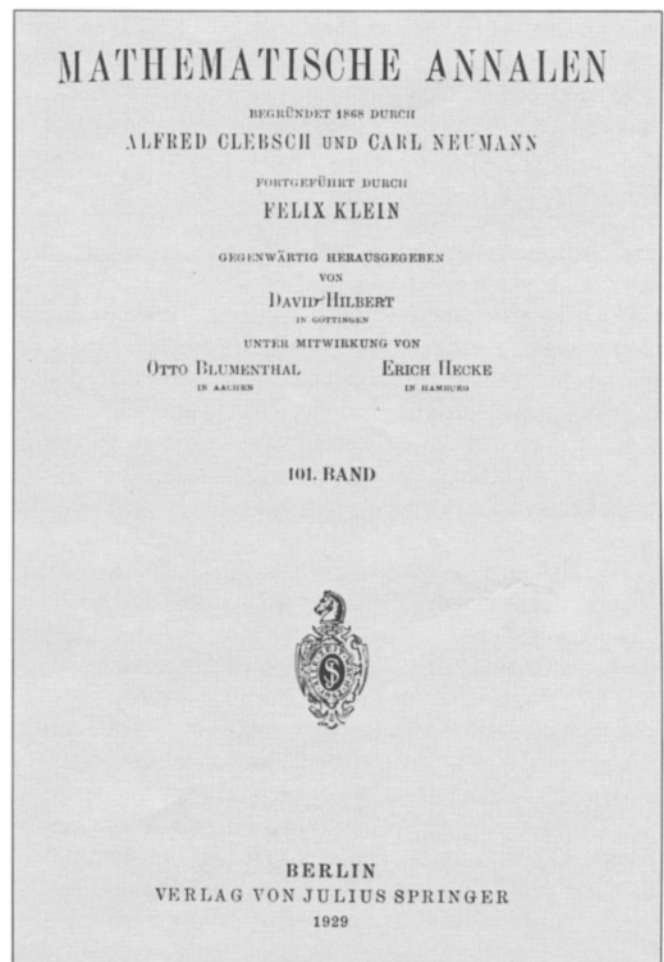
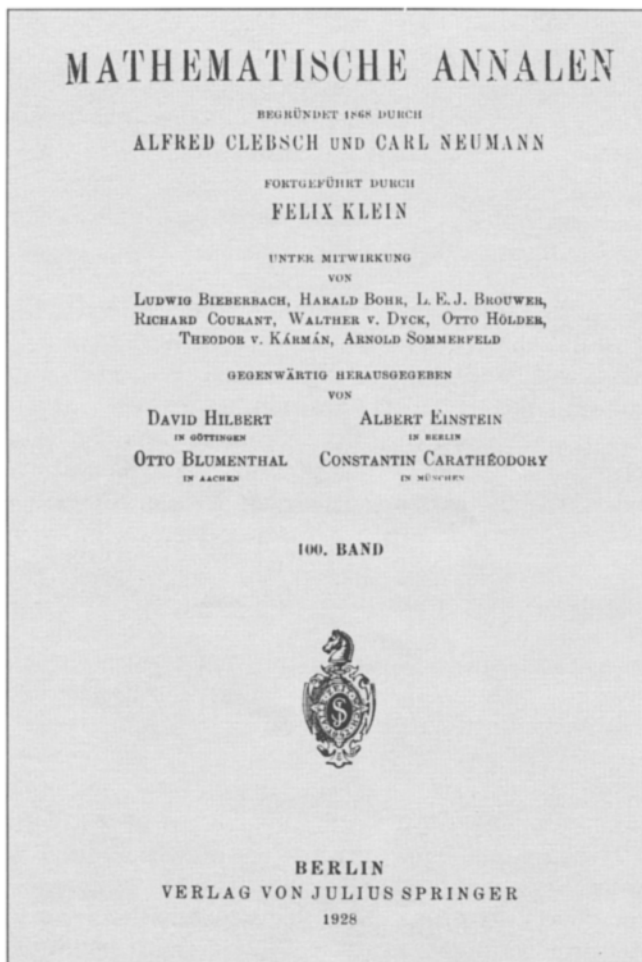
Because the dissolution of the editorial board had to be a voluntary act, it was a matter of importance to get Einstein’s concurrence. The contract of 1920 presented an elegant loophole that would allow both parties to settle the matter without breaking the rules. In §5 the clauses for termination of the contract were listed, and one of them stipulated that if the editors (*Redaktion*) renounced the contract, without a violation from the side of the publisher, the latter could continue the *Mathematische Annalen* at will.

Possibly Einstein’s agreement could be dispensed with, but it is likely that a decision to ignore Einstein’s vote would influence general opinion adversely; moreover, it would be wise to opt for a watertight procedure, as Brouwer would not hesitate to test the outcome in court.

So pressure was brought to bear on Einstein. James Franck, a physicist and a friend of Born, begged him to listen to the new plan. He stressed the political side of the issue, “At this time, . . . , whether the mathematicians split into factions, or whether the affair is arranged smoothly, depends on your decision. It would almost be an ill-chosen joke (*ein nicht all zu guter Witz*) if in this case you would be claimed for the nationalistic side” (undated).

Franck was not the only person to discover a (real or imaginary) political aspect in the controversy at hand. Blumenthal had already complained to Courant (18 November) that Brouwer had managed to introduce the political element into the matter. Born also, in his letter to Einstein of 11 November, tied the conflict to the political issue of the German nationalists and the animosity of Berlin vs. Göttingen.

The successful conclusion of the undertaking was conveyed to Springer by Courant. In his letter of 15 December he announced the cooperation of Einstein, Carathéodory, Blumenthal, and Hilbert. At the same time he proposed that a new contract be made between Hilbert and the publisher, and that Hilbert get *carte blanche* for organizing the editorial board. Blumenthal should be invited to continue his activity as managing editor and, according to Courant, he would probably accept. Also—and this is a surprising misjudgement of Einstein’s mood—Courant thought that there was a fifty per cent chance that Einstein would join the new board. As far as he himself was concerned, Courant thought it wiser to postpone his own introduction as an editor until the dust had settled (the matter apparently had been discussed earlier).



Mathematische Annalen, volume 100 (1928) and volume 101 (1929). Notice the change in editors from volume 100 to volume 101.

Finally Courant suggested that the publisher alone should inform all present editors of the collective resignation. With respect to Brouwer, he advised Springer to write a personal letter explaining the solution to the conflict, and to stress that he [Springer] would regret it if Brouwer were left with the impression that the whole affair would restrict his freedom of practice, and that the publishing house would be at his disposal should he wish to report on his foundational views. It is not known whether this letter was ever written, but Courant's attitude certainly was statesmanlike and conciliatory.

"No Personal Motives"

Once the decision was taken, no time was wasted; after the routine legal consultations the publisher carried out the reorganization and the editors were informed of the outcome (27 December). In spite of Courant's considerations mentioned above, the letter was signed by Hilbert and Springer. Brouwer, like everybody else, was thanked for his work and was given the right to a free copy of the future *Annalen*

issues. The matter would have been over, were it not for some rumblings among the former editors and for a desperate but hopeless rearguard action by Brouwer.

Carathéodory had been considerably distressed during the whole affair; from the beginning he had been torn between his loyalty to Hilbert and his abhorrence of the injustice of Brouwer's dismissal. His efforts to mediate had only worsened the matter and the final solution was an immense relief to him. In a fit of despondency he wrote to Courant (12 December) "You cannot imagine how deeply worried I was during the last weeks. I envisioned the possibility that, after I had parted with Brouwer, the same thing would happen with all my other friends." He had even considered accepting a chair at Stanford that was offered to him.

In his answer (15 December) Courant tried to set Carathéodory's mind at ease: he believed that he had succeeded in convincing Hilbert that Carathéodory, in his position, could not have acted differently; the matter was settled now "without fears of a residue of resentment on Hilbert's part."

Two days later Courant wrote that the night before

he had discussed the whole matter with Hilbert, who asked Courant to tell Carathéodory that "he thinks that you would have done everything for him, as far as possible." Hilbert was completely satisfied with the result of the undertaking, and in his opinion the *Annalen* were even better protected now than through his original dismissal of Brouwer ". . . and by and by it has become completely clear to me that in fact no personal motives have inspired Hilbert's first step. . . ."

Carathéodory expressed his pleasure with Hilbert's attitude (9 December) but he was not wholly satisfied with Courant's evaluation of the motives behind Hilbert's move. "Now, he himself has given as the exclusive motive for his decision that he felt insulted by Brouwer; I would find it unworthy of him, to construe after the fact, that only impersonal motives had guided him."

The last remark could hardly be left unanswered by Courant. He had worked hard to pacify the participants in the affair, and here one of the former *Herausgeber* was lending support to the rumour that Hilbert was not completely devoid of some personal feelings of revenge. In an attempt to quench this source of dissent he and Bohr admonished Carathéodory. Courant calmly repeated his view (23 December) and referred to Hilbert's personal statements that he "fostered no personal feelings of hate, anger or insult against Brouwer." Even a bit of subtle pressure was brought to bear on Carathéodory: "Our responsibility to Hilbert at this point is even greater, as he is not yet filled in on the development of the conflict; in particular he does not surmise your visit to Laren and the disconcerting report of it by Brouwer."

Bohr was less subtle in his approach (same letter); if Carathéodory were not convinced of Hilbert's impersonal motives, he should ask Hilbert himself. "For, that Hilbert—without being aware of it and without being able to defend himself—should first be considered 'of unsound mind' and then 'not to the point' (*unzurechnungsfähig* . . . *unsachlich*), that is a situation, that I as a representative of Hilbert, cannot in the long run witness without action."

In spite of Bohr's saber rattling, Carathéodory stuck to his guns: "To judge Hilbert's motives is a very complicated matter; I believe that I see through his motives because I have known his way of thinking for more than 25 years. It is true that the motivations that you indicate, and which H. also expounded in Bologna in discussion with Blumenthal, were there. The total complex of thoughts that caused the explosion of feeling of 15 October [cf. letter to Einstein, 15 October] was much more complicated."

Who was right, Courant and Bohr, or Carathéodory? The matter will probably never be completely settled. There is no doubt that the question of "how to safeguard the *Annalen* from Brouwer's negative influence (real or imagined)" was uppermost in Hilbert's

mind. But who is to say that no personal motives were involved? There are Hilbert's own statements (e.g., to Blumenthal and Courant) to the effect that no personal grudge led to his action, but how much weight can be attached to them? In any case they contradict the letter of 15 October.

Last Ditch

The whole problem seemed to have been settled satisfactorily. Hilbert, who was only partially informed of the goings on, wrote to Blumenthal (Blumenthal to Courant, 31 December) "a triumphant letter, that everything was glorious." Courant had written a conciliatory letter to Brouwer (23 December) in which he expressed the hope that the solution to the matter satisfied Brouwer. He also wished to convince Brouwer that no personal motives had played a role in Hilbert's action, and definitely no motives "whose existence were in conflict with the respect for your scientific or moral personality." Little did he know Brouwer!

To begin with, Brouwer had not yet received the letter from Springer and Hilbert, so he was unaware that the matter had been settled (unless he was informed by one of the other editors).

As a matter of fact Brouwer launched another appeal to the publisher and the editors the same day Courant was offering Brouwer the "forgive-and-forget" advice. Brouwer insisted that in the interest of mathematics the total editorial board of the *Mathematische Annalen* should remain in function; as he realized that a written defense from his hand would inevitably wreck the unity of the editors, he was willing to postpone such a letter; moreover, Carathéodory, in a letter of 3 December, had promised him to do his utmost to find an acceptable solution, and had begged him to be patient for a couple of more weeks. Sommerfeld had also pressed Brouwer to wait for Carathéodory's intervention.

The final solution, as formulated in the Hilbert-Springer letter, did not satisfy Brouwer. He recognized that the reorganization of the *Annalen* was mostly, if not wholly, designed to get rid of him. Also, Brouwer had explicit views on the ideal organisation of the *Annalen*.

In a circular letter (23 January 1929) to the editors, Blumenthal and Hilbert excluded, Brouwer rejected the final solution. According to him, the *Mathematische Annalen* was a spiritual heritage, a collective property of the total editorial board. The chief editors were, so to speak, appointed by free election and they were merely representatives *vis-à-vis* the mathematical world. Thus, Brouwer argued, the contractual rights of the chief editors were not a personal but an endowed good. Hilbert and Blumenthal, in his view, had abstracted this good from their principals, and hence were guilty of embezzlement, even if this could by

sheer accident not be dealt with by law (the reader may hear a faint echo of Brouwer's objections to the principle of the excluded third [1]).

Brouwer then proceeded to attack Blumenthal's role in the *Annalen*. He repeated Blumenthal's earlier views on the equal rights of all editors and referred to certain irregularities in the management of the *Annalen* in 1925 resulting in Blumenthal's promise to resign after the appearance of volume 100.

Carathéodory also deplored the end of the old régime. When confronted with Hecke's comments on the practice of the past (letter from Courant to Carathéodory, 17 December): ". . . that Hecke, when he learned about the organisation of the editorial board and the competency of the *Beirat* [the advisory editors] grasped his head and judged a revision and a more strict organization absolutely necessary," Carathéodory heartily disagreed (to Courant, 19 December 1928):

For, Klein had organised the board of editors of the *Mathematische Annalen* in such a way that it formed really a kind of Academy, in which each member had the *same rights* as the others. That was in my opinion the main reason why *Annalen* could claim to be the first mathematics journal in the world. Now it will become a journal like all other ones.

The wisdom of severely restricting the size of the editorial board was questioned. Already on 2 February 1929 Blumenthal sent out a note on the future organization of the *Annalen*, in which he drew the attention to the decline of the journal compared to other journals. Since the *Nebenredaktion* had been eliminated (*ausgeschaltet*) one simply needed a larger staff: "the increasing necessity of scientific advisers follows inevitably from the increasing specialisation." In short Blumenthal proposed to reinstate something like the old *Mitarbeiter* under a different name. In the same letter he broached the question of the successor of Hilbert, should he step down. One finds it difficult to reconcile this letter with the arguments that were put forward in favour of the solution to the conflict.

Parting Shot

The *Annalen* settled down under the new regime. Due to tactful handling of all publicity, the excitement in Germany died out, even, as Courant wrote to Hecke, among the colleagues in Berlin—and Brouwer was completely ignored. After waiting for months—and probably realizing that the battle was over and that everybody had gone home—Brouwer fired his parting shot, the letter of defense against Blumenthal's indictment of 16 November 1928. The letter is three-and-a-half folio sheets long and contains a report of the events mentioned above as experienced by Brouwer.

In the first place he denied Blumenthal's claim that Brouwer had substituted his own interpretation for Carathéodory's version of the developments leading

to, and including, Hilbert's action. The views, he wrote, were not mine, but "views that during the aforementioned visit, came up between Carathéodory and me in mutual agreement, i.e., that were successively uttered by one of us and accepted by the other." He also elaborated the grounds for not acquiescing in the dismissal. He had told Carathéodory that

he would consider a possible dismissal from the editorial board not only a revolting injustice, but also a serious damage to my freedom to act (*Wirkungsmöglichkeit*) and, in the face of public opinion, as an offending insult; that, if it really came to this unbelievable event, my honour and freedom of practice could only be restored by the most extensive flight into public opinion.

At the end of the otherwise friendly visit of 30 October, Carathéodory had once more returned to the matter. At Brouwer's exclamations Carathéodory could only answer "What can one do?" and "I don't want to kill a person." The final farewell was accompanied by Brouwer's bitter "I don't understand you any more," "I consider this visit as a farewell," and "I am sorry for you."

After attacking Blumenthal for his desire to remove Brouwer from the board of editors, Brouwer went on to answer Blumenthal's points. Without repeating the argument *verbatim*, some points may be taken from it to represent Brouwer's side in the discussion. Blumenthal accused Brouwer of rudeness; the latter answered that if Blumenthal meant by "rude" the "desire for integrity (duty of every human) increased by the will for clarity (the destiny of the mathematician)," there could have been cases of rudeness, in which—in Brouwer's words—neither the vanity of the author, nor the wish of Blumenthal to appear pleasant, could be spared. These cases, moreover, were entrusted by Blumenthal to Brouwer as a trouble shooter, and thus Blumenthal could not possibly find support among his fellow editors if and when he complained.

The matter of the resignation of Klein was, according to Brouwer, misrepresented; an author had, after his paper had been turned down by Brouwer, appealed to Klein and made the contents plausible. When Brouwer afterwards showed Klein that the author was ("not formally, but materially") wrong, Klein saw that he could not fulfill his promise to the author. In the discussion with Brouwer, Klein then uttered the opinion that the public was misled by the lists of editors on the cover of the journal, and that, as far as he was concerned, he could no longer carry the responsibility for this impression. He retired soon afterwards.

The reproach concerning the long delay of papers at Brouwer's desk was dismissed by Brouwer as nonsense. Papers with lots of mistakes take time—and never a paper got lost, as happened with Hilbert, he said. In any case, Blumenthal's reproaches had never been uttered before.

The battle being lost, Brouwer no longer attempted to reverse the reorganization of the *Annalen*. He

merely challenged Blumenthal to open the archive of the *Annalen*, claiming the correspondence would fully vindicate Brouwer.

Not Just Another Battle

The whole history of the *Mathematische Annalen* conflict was quietly incorporated into the oral tradition of European mathematics. Little is known of the aftermath; the *Göttinger* had won the battle, and they may have been tempted to pick a bone or two with some of the minor actors. For instance, Harald Bohr drafted a letter to the effect that "Schmidt for once realizes that he is vulnerable and that it is dangerous just to make a telephone call to Brouwer" (letter to Courant, 31 December 1928). After some reflection the letter to Schmidt was never sent.

From the gossip generated by the *Annalen* affair, a few rumours have surfaced in print. Only in one case could some evidence be unearthed, to wit the claim that Brouwer's dismissal was partly motivated by the fact that he had reserved the right to handle all papers from Dutch mathematicians [4, p. 187]. Professor Freudenthal told me that this was indeed commonly believed at the time of the conflict. By chance this particular rumour was confirmed in the draft of a letter from Felix Klein to the Dutch mathematician Schouten (13 March 1920). Klein wrote that "Prof. Brouwer . . . who at his entry in the editorial board of the *Annalen* has reserved the right to decide, in particular about Dutch papers. . . ." In general not much is known about the actual use Brouwer made of this prerogative; the letter of Klein dealt with a paper of Schouten that had received a negative evaluation from Brouwer.

Looking back, without the emotions of the contemporaries, we can only say that the whole affair was a tragedy of errors. Hilbert's annoyance with Brouwer was understandable. There had been a long series of conflicts, the *Grundlagenstreit*, the Göttingen chair that was turned down, the Riemann volume of the *Annalen*, and finally the Bologna affair. In a sense there had been an ongoing battle and each antagonist was firmly convinced that the survival of mathematics depended on him. Hilbert's illness, with the real danger of a fatal outcome, must have influenced his power of judgment. I do not see how Brouwer could have marched the *Annalen* to its doom. One has to agree with Einstein: if Brouwer was a menace of some sort, there were other ways to safeguard the *Annalen*. The question of the real motives behind Hilbert's action remains a matter of conjecture. Most likely the letter to Einstein shows an unguarded Hilbert with personal motives after all.

For Brouwer the matter had, in my opinion, far more serious consequences. His mental state could, under severe stress, easily come dangerously close to instability. Hilbert's attack, the lack of support from

old friends, the (real or imagined) shame of his dismissal, the cynical ignoring of his undeniable efforts for the *Annalen*; each and all of these factors drove Brouwer to a self-chosen isolation.

Although it is most unlikely that intuitionism would have become the dominant doctrine of mathematics, there was a real possibility that it would develop into a recognized, although limited, activity. As it was, history took another turn, the development of intuitionistic (or constructive) mathematics suffered a setback, from which it recovered only some forty years later.

After the *Annalen* affair, little zest for the propagation of intuitionism was left in Brouwer; he continued to work in the field, but on a very limited scale with only a couple of followers. Actually, his whole mathematical activity became rather marginal for a prolonged period. During the thirties Brouwer hardly published at all (only two small papers on topology); he undertook all kinds of projects that had nothing to do with mathematics or its foundations. For all practical purposes, 1928 marks the end of the *Grundlagenstreit*.

Acknowledgments: The material used for this paper comes from various sources; the letters of Einstein are published with the permission of the Department of Manuscripts and Archives of the Jewish National and University Library at Jerusalem; the Niedersächsische Staats- und Universitätsbibliothek Göttingen gave permission for publication of the quotation from Klein's letter to Schouten; Professor Freudenthal kindly made some of the correspondence available, and material from the Brouwer Archive has been used. I have received advice and help from a great number of people and institutions to whom I express my gratitude. I would like to thank in particular P. Forman, H. Freudenthal, H. Mehrtens, D. Rowe, and C. Smorynski.

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