

# The history of Zentralblatt MATH – mathematics reviewing under changing political conditions

In its more than 75 years' history, Zentralblatt MATH was confronted with a lot of changes. This mainly refers to the continuation of the editorial work under changing political systems as well as to the rapidly developing technological environment for producing and offering a literature information service in mathematics. This article will give a short survey on these developments.

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## 1. The early years of mathematics reviewing

The foundation of the “Jahrbuch über die Fortschritte der Mathematik” in the year 1869 complied with the need to maintain oversight on the growing number of publications in mathematics with the help of a literature documentation service (see the paper by Silke Göbel in this collection). The basic requirements to be satisfied by such a service had not changed until the “Zentralblatt für Mathematik und ihre Grenzgebiete” (nowadays Zentralblatt MATH) had been founded in 1931, and they are still valid today. Main criteria for a valuable information service in mathematics are quick and complete coverage of the literature, bibliographic precision, convenient search facilities, fair reports and appropriate expertise as refers to the subject editors and the reviewers. How to implement these requirements was subject to several changes in the period of the existence of Zentralblatt MATH. Just compare the different types of printed indexes in the initial phase with the current search facilities available from the Zentralblatt MATH database Z-MATH (see the paper by Olaf Ninnemann in this collection).

As a rule the Jahrbuch undertook some efforts to publish all reports on publications from the same publication year in the same volume. In combination with the ambitions to be as complete as possible this led to a considerable delay in the publication of the reports. Confronted with a permanently increasing number of publications, mathematicians were dissatisfied with

this situation. They needed the information more rapidly. At the end of the 1920's this was one of the reasons for the publisher Springer-Verlag, located in Berlin at that time, to found the new service “Zentralblatt für Mathematik und ihre Grenzgebiete” in cooperation with the mathematicians Richard Courant and Otto Neugebauer. The seat of the editorial office was in Berlin at the publisher's. Some years later the Prussian Academy of Sciences entered this cooperation. The scope was the same as for the Jahrbuch. But the difference was that the reports appeared as soon as possible. When a volume was due for publication, all reviews ready for publication were given to that volume. The reviews appeared ordered by subject. For each volume an index appeared at the end of the volume. Otto Neugebauer guided this service successfully. But the political changes in Germany forced him to leave this country. For a short period he managed his editorial work remotely from Copenhagen. But in 1938 he had to give up.

## 2. The period during and after the war

After Otto Neugebauer had left, Egon Ullrich became the new editor-in-chief of Zentralblatt. At the same time the unique position of the two Germany-based reviewing services in mathematics came to an end. Otto Neugebauer went to the USA and in 1940, relying on the support of some American mathematicians, he founded as a competing service the “Mathematical Reviews”. The reasons for this would serve as a topic for a publication on its own. One of them were concerns that Zentralblatt and Jahrbuch might treat publi-

citations from Jewish authors in an unfair way. There is evidence that the German government started some efforts to interfere with the handling of these publications and the employment of Jewish reviewers. But these efforts remained without visible success as can be seen from the reports from that period. Anyway, among others this gave some good selling point for the new service. A remainder of this reservation against the Germany-based reviewing services could be observed until the middle of the eighties: On the second title page of the Mathematical Reviews hints were given how citations should be standardized. When it came to the Jahrbuch the name had been modified to “Jahrbuch über die Rückschritte der Mathematik“.



Fig. 4: Index preparation for the printed service

During the Second World War there was a merger of Zentralblatt and the Jahrbuch on the organizational level for a certain period. There were gaps in the coverage, but these only resulted from problems with the acquisition of the literature to be covered. Finally, with the end of the war, both services had to terminate their work. The Jahrbuch never recovered from this, but for Zentralblatt it was an interruption only.

In 1947, the German Academy of Sciences, successor of the Prussian Academy of Sciences, and Springer-Verlag started to revive Zentralblatt. The staff for the

editorial work was employed by the academy. The seat of the office was in the Eastern part of Berlin. Hermann Ludwig Schmid, professor at the Humboldt University became editor-in-chief. When he got a call to Würzburg in 1953, the editorial office was split into two parts, one in Berlin and one in Würzburg. This continued until Schmid died in 1956. His successor was Erika Pannwitz, who had a position at Zentralblatt since the thirties and from that time permanently had been involved in the development of this documentation service.

The efforts of the editorial group concentrated on getting back the lost terrain as refers to the complete coverage as well as refers to the acceptance of Zentralblatt by the users and its availability at mathematical libraries. During that period a third reviewing service in mathematics entered the scene. Backed up by the Russian Academy of Sciences VINITI released the Russian documentation journal “Referativnyj Zhurnal Matematika“.

### 3. A cooperation between both Germanies

When the Berlin Wall was erected, the editorial team of Zentralblatt had to split again. Two editorial offices had been established, one in the Western part of Berlin and the other in the Eastern part. The office in the Eastern part remained under the guidance of the German Academy of Sciences (later Academy of Sciences of the GDR). Editor-in-chief was Walter Romberg, who became widely known later after the reunification of Germany as the minister for finances of the interim government of Eastern Germany. Representing all academies from Western Germany, the Heidelberg Academy of Sciences was supervising the office in the Western part. Here Erika Pannwitz continued as editor-in-chief. Printing, distribution, sales and marketing remained with Springer. According to the contract between both parts the editorial work had to happen on a technically equal level and the work load had to be shared at equal parts. Taking into account the complicated political relations between both parts of Germany and the special situation in Berlin, it was almost a miracle that this cooperation continued successfully until 1977. During that time Zentralblatt finally recovered from the drawbacks after the wall and caught up with Mathematical Reviews again.

To reach this goal a lot of problems had to be attacked. The biggest one was to get rid of the backlog of missing reports. The workflow had to be reorganized. The procedures became more efficient, because advanced information technology could be applied. This development mainly was the merit of Ulrich Güntzer, who became editor-in-chief after the retirement of Erika Pannwitz. He entered a cooperation with other institutions like



Fig. 5: The office in West-Berlin in the sixties

Chemie-Information, Großrechenzentrum für die Wissenschaft, TU Berlin to benefit from their computing facilities for the editorial work at Zentralblatt. At that time the annual production of mathematical papers had reached a level which could not be handled by manual work anymore. The production of the indexes for the single volumes and of the higher cumulated indexes had to be given to the computers at the partner institutions. This kind of modernization was continued by the author of this article, when he became editor-in-chief in the early seventies.

#### 4. Changing Zentralblatt into a reference data base

In the second half of the seventies the government of the FRG launched a programme with the goal to reorganize all information and documentation activities in Germany. This also had consequences for the office of Zentralblatt in West-Berlin, because the money the Heidelberg Academy of Sciences needed to run this office came from the government. The interference of the government with the cooperation between the two academies was taken by the Academy of Sciences of the GDR as a reason to terminate the cooperational contract. Officially it was argued that there was no need for this cooperation anymore. But it was quite obvious that the cooperation only could survive as long as it did not come to the notice of a higher political instance in the GDR. The ongoing discussions in the FRG violated this condition. Hence the Academy of Sciences of the GDR was forced to cancel the cooperation. Even more, all reviewers from the GDR had to quit the service for Zentralblatt while they had no problems to continue with writing reviews for our American competitor.

The funding for the office in West-Berlin had to be increased to enable them also to care about the work from the Eastern part. Simultaneously the office became a department of a new institution called Fachinformationszentrum Energie, Physik, Mathematik, which later changed the name to FIZ Karlsruhe. FIZ Karlsruhe shared the editorship with the Heidelberg Academy, and it became responsible for the financial support of the editorial activities, although the seat of the office still remained in Berlin. Zentralblatt could benefit from the internal cooperation within FIZ Karlsruhe for the further development of the application of IT technology to the editorial work. It could be used for the printing of Zentralblatt. But more importantly the electronically stored data could be used to offer a searchable reference data base for mathematics, called MATH. MATH was the first service for mathematics of this kind. At the beginning of the eighties, about 50,000 papers in mathematics were published annually. This amount of information could not be handled appropriately by a printed reviewing service.

## 5. The Europeanization of Zentralblatt MATH

In the eighties and the years to follow the efforts of the editorial office concentrated mainly on the further development of the database MATH. This was a part of STN at FIZ Karlsruhe at first, but rather soon mathematicians developed a preference for the Internet. Hence Zentralblatt had to offer a web based service. Here Zentralblatt could benefit from the work of our French partner, the Cellule MathDoc in Grenoble. Thanks to their help rather soon a very convenient software indexation and data base retrieval was available. This led to a web based offer of MATH at the beginning of the nineties as a counterpart to the offer in STN. Meanwhile the online version of Zentralblatt MATH became the principal offer while the printed version lost in importance. Handling almost 100,000 items annually would have blown up the printed version to a level where it is difficult to read. Starting with this year the printed version will contain only a part of the reviews processed at the office. This will enable users still to browse through by subject area without being lost in the bulk of information. A more detailed account of the data base facilities can be found in the article written by Olaf Ninnemann.

The eighties also were the period for an interesting experiment: the merger of Mathematical Reviews and Zentralblatt. This experiment failed. A lot of reasons for this could be imagined. The official reason formulated by the American side for not continuing the negotiations after a series of meetings was that they don't consider the merger as scientifically wise.

I do not know anybody who understood that argument, but it was not a secret that the AMS was not prepared to share the control over such a merged service at equal rights. On the European side this attitude led to the decision to consider Zentralblatt as the reference database which may provide better service to the European mathematicians. At the beginning of the nineties, under the presidency of Jean-Pierre Bourguignon the European Mathematical Society EMS became an additional supervising institution for Zentralblatt. They took over the responsibility for the cooperation of Zentralblatt with the Cellule MathDoc. The europeanization of Zentralblatt started at that time. The idea was to distribute some part of the input work to partners in Europe such that the whole enterprise may be considered as a European one later. To install such a cooperation smoothly an appropriate collaborative network had to be established which allows for remote work on the database and network access to the administrative facilities available so far at the office in Berlin only.

With support of the EMS an application for a project within the Fifth Framework Programme of the European Union was successful. The project was called LIMES (Large Infrastructure in Mathematics – Enhanced Services). With the results of LIMES the cooperation for a distributed input could be improved. It became easier to integrate new partners. This also went beyond Europe. In July 2007 Zentralblatt MATH started a cooperation with the library Academia Sinica (LCAS) in Beijing with the goal to have all Chinese publications in mathematics covered by them. After almost one year it can be noticed that this cooperation is a big success for both sides. The input for Chinese publications has reached a satisfactory level, and as a mathematical community of growing importance the Chinese mathematicians have the possibility to improve the visibility of their research achievements.

Another important field for future activities is the automatization of larger parts of the input work. Information available electronically should be transferred to the input entry without any cut and paste procedure. The work at the office should be reduced to the added values only: indexing and preparation of reviews using external experts. At present there are a lot of difficulties to establish such tools, because the electronic offers are too heterogeneous.



Fig. 6: List of the LIMES-partners