

The Founding of Mathematical Reviews

by G. Baley Price

*For
Mathematical Reviews
On the Occasion of Its
Fiftieth Anniversary
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Everett Pitcher's history of the second fifty years of the American Mathematical Society contains the history of Mathematical Reviews [1, pp. 69–89]. This article adds additional details about the founding of Mathematical Reviews (hereafter often denoted by MR), about the efforts made during the first five or six years to build up the subscription list, and about my involvement in these activities.

I became acquainted with the affairs of the mathematicians first of all through membership in the Mathematical Association of America, which I joined in 1926, and in the American Mathematical Society, which I joined in 1929, and through attendance at their national meetings. Even before I received my Ph.D. from Harvard in 1932, I attended the meeting of AMS and MAA at Brown University in the summer of 1930; it was my first national meeting and the first of many which were to follow. In particular, I attended the summer meetings of these two organizations, held in connection with the Harvard Tercentenary celebration, in Cambridge in 1936. Furthermore, I attended every summer and winter meeting of AMS and MAA, beginning with the summer of 1936 and extending through the summer of 1942—with the exception of the summer meeting in 1937, which was held at Pennsylvania State College. Finally, I learned much about the activities of the mathematicians from Dean R. G. D. Richardson. I was an instructor in mathematics at Brown University during the academic year 1936–1937. I had already become acquainted with Dean Richardson before going to Brown; he was not only Dean of the Graduate School and Chairman of the Department of Mathematics at Brown, but he was also Secretary of the American Mathematical Society.

The American Mathematical Society was established at Columbia University in 1888, and it celebrated its fiftieth anniversary there in connection with the summer meeting in 1938. Thornton C. Fry was in charge of mathematics at Bell Telephone Laboratories, then located at 463 West Street in New York City; as Executive Secretary of the Semicentennial Committee [2], he arranged an especially interesting meeting which included a dinner at one of the hotels, a boat ride up the Hudson River to West Point, a dress parade by the cadets, and other events [3]. The report of this meeting records a committee appointment as follows [3, p. 749]:

“Professor C. N. Moore (chairman), Saunders Mac Lane, and G. B. Price were constituted a Committee on Publicity to work experimentally during the next year.”

My membership on this committee eventually led to my involvement with MR.

The next national meeting of the Society and the Association was held at Richmond

and Williamsburg, Virginia, December 27–30, 1938 [4]. At a dinner in Williamsburg, Dean R. G. D. Richardson reported on discussions, already underway, concerning the possibility of establishing an abstracting journal in America [4, p. 199]. Discussion at an informal meeting supported the establishment of an abstracting journal [1, pp. 69–70], and the AMS Council requested President R. L. Moore to appoint a committee to examine the proposal and to proceed, if it deemed wise, with preparations for the publication of a mathematical abstracting journal. The committee appointed consisted of C. R. Adams (chairman), G. D. Birkhoff, A. B. Coble, T. C. Fry, Marston Morse, and G. T. Whyburn.

In an article in the Bulletin [5] entitled “The Society Establishes a New Journal”, Dean Richardson, as Secretary of the Society, supplied the following information:

- a. The Committee (C. R. Adams, Chairman) decided on May 30, 1939, to proceed with the establishment of an abstracting journal to be known as *Mathematical Reviews*.
- b. An Executive Subcommittee consisting of Oswald Veblen (chairman), Thornton C. Fry, and Warren Weaver was appointed to officiate in setting up the machinery to get the journal underway.
- c. The Carnegie Corporation made a grant of \$60,000, and the Rockefeller Foundation made a gift of \$12,000 to cover some of the initial costs. The AMS and the MAA each promised \$1,000 for the first year.
- d. Professors O. Neugebauer and J. D. Tamarkin were appointed the first editors of *Mathematical Reviews*.
- e. The committee decided that reviews in *Mathematical Reviews* would be written in English, French, German, and Italian, but only in these languages.
- f. The committee decided that the annual subscription price of *Mathematical Reviews* would be \$13.00. However, the annual subscription would be \$6.50 for members of sponsoring organizations and \$3.25 for reviewers.
- g. Brown University received a grant from the Rockefeller Foundation for a microfilm service in connection with *Mathematical Reviews*. A later notice [7, p. 195] adds that “a grant of one thousand dollars was announced from the Rockefeller Foundation for an experimental period of two years for the filming of all mathematical papers reviewed in *Mathematical Reviews*.”
- h. The first number of *Mathematical Reviews* would appear in later 1939 or early 1940.

The 1939 summer meeting began in Madison at the University of Wisconsin just as World War II broke out [6]. At this meeting the Council decided that the committee consisting of Professor Oswald Veblen and Drs. T. C. Fry and Warren Weaver would continue in charge of MR. Veblen was one of the nation’s leading research mathematicians; he had played important roles at Princeton University and at the Institute for Advanced Study [8]. Veblen was made chairman because of his eminence as a mathematician and his leadership position in American mathematics. T. C. Fry’s position as founder and Director of the Mathematics Section of Bell Telephone Laboratories (later the Mathematics and Statistics Research Center of Bell Laboratories) made him a leading contact with business and industry; his location in New York and his knowledge of how to get things done made him a valuable member of the committee [9]. Finally, Warren Weaver had formerly been a

member, and chairman, of the Department of Mathematics at the University of Wisconsin, but was then an important member of the Rockefeller Foundation in New York. His association with, and knowledge of, the foundations always made Weaver a valuable associate when money and support were required.

The committee proceeded rapidly to start the new journal. The Society's headquarters was located at Columbia University in New York, but the editorial office of MR was established at Brown University in Providence. There were several reasons for this choice, one of which was the fact that Dean Richardson, the AMS Secretary, was there. A more important reason was that Otto Neugebauer, who had been editor of the *Zentralblatt*, had joined the Brown faculty in 1939, and that J. D. Tamarkin had been a member of its Department of Mathematics for a number of years. Thus Neugebauer and Tamarkin were appointed the editors of MR, and Brown was an appropriate location for the editorial office. Another important reason for locating the office in Providence was the fact that Brown had what was probably the finest mathematics library in the nation; it had been built up over the years by R. C. Archibald and others. Access to this library, with its superior holdings of books and journals, was considered to be very important for MR.

The Executive Committee was required to choose a color for the covers of the individual issues of MR before the first number was published. Professor Veblen was the Committee's chairman, and he had had long association with Princeton University. Thus, beginning with the very first number and continuing throughout the fifty years since then, *Mathematical Reviews* has been published in orange covers.

Mathematical Reviews published its first number in record time. The final decision to establish the new journal was made on May 30, 1939, and the first number was displayed at the annual meeting held December 26–29, 1939, at Ohio State University in Columbus, Ohio [7]. Perhaps because I was a member of the Committee on Publicity, several packages of the first number were sent to me, and I distributed them at the meeting.

Many subscribed early to *Mathematical Reviews*. As stated in Pitcher's history [1, p. 72], "before the first issue of MR appeared, there were about 700 subscribers and 350 reviewers, with about 220 of these from the United States and Canada."

The Society faced a serious situation in launching an abstracting journal in 1939. Events in Germany had made MR necessary, but the beginning of World War II in September 1939 made the success of MR difficult both from an editorial and also from a financial standpoint. Reviewers were needed to write the reviews, and subscribers were needed to provide funds to pay the costs of publication, but the war seriously interfered with access to many of the mathematicians in Europe. As the first part of its plan to promote MR, the Society decided to seek sponsoring organizations. A sponsor paid a certain subvention each year, and in return its members had the privilege of subscribing for \$6.50—one half the regular price of \$13.00. For example, the AMS and the MAA agreed in 1939 to become sponsoring organizations by paying \$1,000 annually [5]. As a result, many members of AMS and MAA subscribed to MR. There was a further inducement to become a reviewer: a member of a sponsoring organization who was also a reviewer subscribed for only \$3.25. For whatever reason, MR had many subscribers and reviewers even before the first number

was published. As already stated, the Society and the Association became sponsoring organizations in 1939; others were added slowly under the prevailing war conditions. Each number of MR listed, on cover page 2, all who had become sponsoring organizations up to that time. The following tabulation includes all sponsoring organizations listed in the first seven volumes (1940 through 1946) of MR, together with the date of first appearance on this list.

Volume 1, no. 1, January, 1940

The American Mathematical Society

The Mathematical Association of America

Volume 1, no. 2, February, 1940

Accademia Nacional De Ciencias Exactas, Fisicas Y Naturales

Volume 1, no. 4, April, 1940

Het Wiskundig Genootschap Te Amsterdam

Volume 1, no. 7, July, 1940

The London Mathematical Society

Volume 3, no. 2, February, 1942

Union Matematica Argentina

Volume 5, no. 6, June, 1944

The Edinburgh Mathematical Society

Volume 6, no. 5, May, 1945

The Institute of Mathematical Statistics

Volume 7, no. 7, July-August, 1946

L'Intermédiaire des Recherches Mathématiques

The special arrangements for sponsoring organizations was the first part of the Society's plan to promote MR, but much more was needed. Dean Richardson felt that it was necessary to conduct a strong campaign to obtain the maximum possible number of subscribers, and I now turn to a description of the second part of the effort to promote MR. Although I had no title, I became in fact an assistant circulation manager. Perhaps my membership on the Committee on Publicity was justification for use of me in promoting MR. Dean Richardson asked me to spend the months of July and August, 1940, in Providence working on the subscription campaign, and I did so. I was strictly a volunteer: I received nothing—not even a contribution toward my travel expenses—for my efforts on behalf of MR.

On my way to Providence in early July, I stopped in New York to see Dr. Fry at Bell Telephone Laboratories at 463 West Street. On this occasion there were definitely discussions concerning publicity for mathematics. Dr. Fry gave me a tour of the Laboratories; in particular, he gave me a demonstration of an analog machine which he had built for locating the complex roots of polynomial equations, and also of the Stibitz Relay Computer. Stibitz, a member of the Bell Telephone Laboratories staff, had constructed, out of standard telephone relays, a computer which would perform the four arithmetic operations of addition, subtraction, multiplication, and division

on complex numbers. This computer was operated through a standard teletypewriter keyboard.

In Providence I began work on a campaign for subscribers; it was the second phase of the promotion of MR. This part of the promotion consisted of locating a volunteer in each mathematics center in the United States who would personally call attention to the importance of Mathematical Reviews and its need for support and subscriptions. I remember especially Harry Bateman, who agreed to be an MR representative at the California Institute of Technology. He was a distinguished mathematician and a member of the National Academy of Sciences, but he was especially active and enthusiastic in promoting Mathematical Reviews in the neighborhood of Los Angeles.

Dr. Fry spent several days in Providence while I was there in the summer of 1940; his business concerned MR. On one day, at least, the activity concerned fishing: he took a group of us fishing off Cape Cod. There was also some swimming at Crescent Beach on Cape Cod. On one occasion Dean Richardson sent me to Maine to discuss an item of MR business (I do not remember what it was!) with Professor Veblen, who spent his summers at his cottage at Brooklin, Maine (a small town located west across Blue Hill Bay from Mt. Desert Island). Professor Veblen was still chairman of the Executive Committee, and much of the business with him from that time on concerned microfilm reading machines.

The summer meeting in 1940 was held September 10–12 at Dartmouth College in Hanover, New Hampshire [10]. This meeting was notable for an historic event and for an announcement. The historic event was a demonstration of the Stibitz Relay Computer: Bell Telephone Laboratories connected the teletypewriter keyboard for this machine to the computer at 463 West Street in New York City over a telephone line and demonstrated the remote access operation of the Stibitz computer. This demonstration for the mathematicians of the Stibitz computer gave additional impetus to the development of computers at the beginning of World War II.

The announcement at the Dartmouth meeting was the following [10, p. 862]:

“The Committee on Scientific Aids to Learning (supported by funds from the Carnegie Corporation) has appropriated a sum not to exceed \$10,000 for microfilm reading machines, the distribution of which is to be for the benefit of Mathematical Reviews and to be arranged by the Executive Committee of that journal.”

The first phase of the promotion of MR consisted of the effort to obtain sponsoring organizations as described above; the second phase consisted of the appointment of local representatives to seek subscriptions; and the third phase used the offer of a free Microfilm Reading Machine to attract and hold subscribers. The Committee on Scientific Aids to Learning was interested in promoting the use of microfilm reading machines as library aids, and the grant was made to achieve the widespread distribution of a large number of these machines to individuals. At the same time these microfilm reading machines were distributed free but in a way that attracted subscribers to MR. An early announcement of these machines and the conditions under which they were available was a full page advertisement on cover page 4 of the December 1940 number of Mathematical Reviews. I was not involved in the preparation of this advertisement. However, a part of the execution of the plan was my responsibility. I wrote an article entitled “Mathematical Reviews Offers a Reading Machine For Microfilm” which was published on the first two pages of the January 1941 number

of the Bulletin [11]. This article was signed “G. B. Price” without a title or any explanation of why I wrote it. The terms of the offer are explained in the following quotation [11]:

“A reading machine for microfilm will be given—as long as the available supply lasts—to any person who has paid his subscription, *at the rate to which he is entitled*, to Mathematical Reviews in advance for three years beginning January, 1941.”

My article also explained that the microfilm reader, called Students Microfilm Reader, was built by the Spencer Lens Company in Buffalo, New York, and that it sold at a retail price of \$32.00.

The December 1940 meeting of AMS was held at Louisiana State University in Baton Rouge from December 30, 1940, to January 1, 1941. The following paragraph appears in the report of this meeting [12, p. 182]:

“The Committee on Scientific Aids to Learning with a view to aiding the use of microfilm as well as to supporting Mathematical Reviews has appropriated \$10,000 for purchase of Students Microfilm Readers (see this Bulletin, p. 1). It was reported that over 6,000 notices regarding the Students Microfilm Readers had been sent to individuals and libraries and that applications for more than 350 of these machines had been received by Mathematical Reviews during the last ten days of 1940.”

As this report indicates, the response to the offer of microfilm readers was immediate and widespread, and no further promotion of them was required. Pitcher adds the following information [1, pp. 72–73]:

“The initial stock of 400 machines was exhausted and more were made available. The Society sold both microfilm copies and photocopies of the papers it reviewed, except for books and copyrighted material. . . . This service ceased after 1947.”

The Society seems to have been satisfied that these efforts (sponsoring organizations, local representatives, and microfilm readers) were enough, and that they had produced a satisfactory number of subscribers to MR. In any case, I am not aware that there were any further organized efforts to obtain support and subscribers. The remainder of this account traces the results produced by these early efforts, as stated in the reports of meetings in the Bulletin, through the end of the war in 1945.

At the December 1940 meeting at Louisiana State University I was elected a member of the Council of the American Mathematical Society for the three-year term 1941-1943 [1, p. 172]. This new position continued my connection with MR and brought me into even closer contact with all of the affairs of the Society.

The report of the 1941 summer meeting in Chicago contains the following paragraph [13, p. 838]:

“Professor G. B. Price reported for the Committee on Circulation for Mathematical Reviews that the total mailing list had increased from 1,222 on July 1, 1940 to 1,369 on July 1, 1941. He also stated that new subscriptions are continuing to arrive from China, Japan, Russia, England, et cetera, thus emphasizing the truly international character of this journal.”

This quotation contains the only reference I have found to a Committee on Circulation. Perhaps there was a committee and I was its only member, but I was never aware that I had a title of any kind or belonged to an official Committee on Circulation.

The report of the December 1941 meeting states that Professors O. E. Neugebauer, J. D. Tamarkin, and Oswald Veblen were elected as members of the Editorial Committee of Mathematical Reviews [14, p. 189], and that “the Executive Committee of Mathematical Reviews reported that the subscription list of that journal, as of December 1, 1941, was 1,400” [14, p. 190].

The report of the 1942 summer meeting contains the following paragraph [15, p. 803]:

“It was announced that reports were sent in August to the Carnegie Corporation and Rockefeller Foundation regarding their grants to Mathematical Reviews. The Society also announced that the problem of the importation of journals from European Axis and Axis-controlled countries had been solved for Mathematical Reviews. Under an arrangement concluded with the American Library Association, Mathematical Reviews is permitted to purchase all the journals to which it has been subscribing, thus continuing full coverage of the mathematical literature of the scientific World.”

The report of the 1943 summer meeting contains the following paragraphs [16, p. 826]:

“It was announced that a report was sent in July to the Carnegie Corporation regarding the grant to Mathematical Reviews. Attention was called to the fact that the number of Mathematical Reviews subscribers for 1943 was 1,239. This subscription list is undoubtedly larger than that of any mathematical journal which is not provided by a mathematical society to its members as one of the privileges of membership.

“It was reported that fifteen microfilm reading machines had been sent to the London Mathematical Society for distribution to scientific organizations in Great Britain. It was also reported that a microfilm reading machine and copies of the Semicentennial volumes had been donated to the library of the American Philosophical Society.”

I did not attend the meeting at New Brunswick, New Jersey in September, 1943, because of conditions brought on by World War II, and I did not attend another mathematics meeting in the United States until after the end of the war. In September, 1943, I agreed to join (as a civilian) the Operational Research Section at Headquarters Eighth Air Force, and I left Lawrence on October 14, 1943, for Washington and England. Thus I did not quite complete my three year term on the Council of the Society. Furthermore, in 1943 I was elected an Associate Secretary of the Society, but I was replaced after a year because my absence in England made it impossible for me to serve [1, p. 243]. I remained in England until the end of the war in Europe in May 1945.

The war reduced the number of meetings the Society was able to hold. The 1944 annual meeting was held in Chicago, November 26–27, 1943; the following paragraph is contained in the report of this meeting [17, pp. 28–29]:

“The Mathematical Reviews Editorial Committee reported that there had been a marked decrease in the amount of mathematical material published throughout the world, that the editors had been able to obtain material from Russia regularly, and that an almost complete

supply of material published in Germany up to the beginning of 1943 had been secured.”

The report of the 1944 annual meeting contains the following paragraph [18, p. 31]:

“The Mathematical Reviews Editorial Committee reported that abstracts of mathematical literature have been published in the usual form despite the continued difficulties ensuing from the war. The situation regarding foreign literature has been somewhat alleviated and the coverage of the mathematical literature of the world is practically complete with the exception of certain journals from Italy. The editors feel that this situation will be relieved shortly. During the year the Edinburgh Mathematical Society has been added to the list of sponsors of Mathematical Reviews. The total number of subscriptions is at present 1,332, while the financial situation continues to develop favorably.”

The war ended finally in August 1945, and I was able to return to The University of Kansas and to resume my activities with the mathematicians [20]. In particular, I attended the 1945 annual meeting, which was held once more in Chicago. The report of this meeting contains the following paragraph [19, p. 41]:

“The Mathematical Reviews Editorial Committee reported that during the latter part of 1945 the size of the issue was increased from 28 to the original 32 pages and it is expected that this increase in size will be the minimum increase in 1946. The gaps in the foreign literature are being filled although there are still quite a few remaining, particularly in the Italian literature. In 1945 Mathematical Reviews obtained the sponsorship of the Institute of Mathematical Statistics. The subscription list contains 1,382 names. This is a remarkable record when one considers the fact that most foreign mathematicians have been unable to subscribe during this period.”

Mathematical Reviews was founded in 1940 with a degree of uncertainty about its ultimate future. The year 1945, which brought the end of World War II, should be considered the end of the founding period, and the 1945 report to the Council emphasizes that Mathematical Reviews ended this period in a sound condition which guaranteed its permanence and success in the future. In spite of the war, the journal had maintained a large subscription list during its first six years as shown by the following tabulation (see also [1, p. 80]):

| | |
|------|-------|
| 1940 | 1,222 |
| 1941 | 1,369 |
| 1942 | 1,400 |
| 1943 | 1,239 |
| 1944 | 1,332 |
| 1945 | 1,382 |

Further, Mathematical Reviews added an eighth sponsoring organization in 1945 (the ninth was added in 1946), it had a large group of reviewers, and it was in a strong financial position (“for a few years, MR had run at a modest profit” [1, p. 79]). The founding of Mathematical Reviews had succeeded, and it stood ready, as 1946 opened, to provide reviews of the mathematical literature during the period of greatly increased activity which followed World War II.

References and Notes

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