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BY THE EDITOR

The publication of the hundredth volume of a learned journal is surely an appropriate excuse for a mild outbreak of retrospective self-congratulation, even if (as in the present case) the occasion does not coincide with any particular anniversary in the history of the journal. With this in mind, the Editorial Committee of *Mathematical Proceedings* have commissioned a number of survey articles by distinguished mathematicians, which will appear in this and the following two parts of volume 100; the purpose of this editorial is to sketch in the historical background and to introduce the survey articles.

The Cambridge Philosophical Society's first venture into periodical publication was the *Transactions*, which began to appear in 1821, only two years after the foundation of the Society. The *Proceedings* began to appear in 1844, and were at first exactly what the name suggests: a record of the proceedings at meetings of the Society, including abstracts of papers communicated to the Society. Frequently, papers which appeared in abstract in the *Proceedings* were published in full in the *Transactions*: thus, for example, A. De Morgan's memoir 'On divergent series, and various points of analysis connected with them' was published in full in *Transactions* **8** (1844), 182–203, and in abstract in *Proceedings* **1** (1844), 6–8. (For a detailed analysis of this paper, see pp. 19–20 of G. H. Hardy's *Divergent Series* (Oxford University Press, 1949).)

Inevitably, the rate of publication of the *Proceedings* was not rapid: it took 22 years to accumulate enough material (245 pages) to fill the first volume, and volume 2 spanned a further 10 years. The material, too, covered the whole range of the Society's scientific interests: papers by De Morgan, Cayley, Stokes and others rubbed shoulders with titles such as 'Is the vertebral theory of the skull to be abandoned?' (vol. **1**, pp. 230–232) and 'On some ice-hummocks in the Gorner glacier' (vol. **2**, p. 355). However, in 1876 the Philosophical Society's Council agreed that the Secretaries might accept papers for publication in the *Proceedings* which had not been communicated in full at meetings, and from 1877 onwards the rate of publication settled down to about one volume (generally in six parts totalling about 400 pages) every three years.

The rate of publication was further increased to one volume every two years from number 11 (1901–2) onwards; but the First World War (and more particularly the difficult economic conditions which followed it) caused some hiccups, and from 1917

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onwards (initially at the instigation of G. H. Hardy) there were extensive discussions about the future of the Society's periodicals. By this time the *Proceedings* had become almost entirely the preserve of papers in mathematics and physics (and was becoming increasingly divorced from its original function as a record of papers communicated to the Society); the *Transactions* still covered all fields of science, but was largely devoted to longer papers, each one occupying a separate issue. The biologists in the Society, feeling dissatisfied with this state of affairs, persuaded the Council to start a new journal (at first called *Proceedings, Biological Sciences*, but soon changed to *Biological Reviews*) in 1923; from then on the *Transactions* (which had never been as regular in its rate of publication as the *Proceedings*) became increasingly moribund, and in 1928 its publication was suspended with the completion of volume 23. From the same year, the rate of publication of the *Proceedings* was increased to one volume per year (generally in four quarterly parts of about 150 pages each).

Until 1935, the Society's three Secretaries handled the editorial work associated with the *Proceedings* between them; but in April of that year the Council approved the establishment of an Editorial Committee. Initially both the Mathematical and Physical Secretaries were members of the Committee (though the Physical Secretary ceased to be so after 1941), and the Mathematical Secretary generally (though not always) held the title of Editor until 1974, when the two posts were separated. For the record, the list of Editors since 1935 is given below; it will be noted that the Editorship was shared between three people for a time in the 1950s.

1935–36	F. P. White	1961–63	J. H. Williamson
1937–45	W. V. D. Hodge	1964–65	T. G. Murphy
1946–47	M. S. Bartlett	1965–67	G. R. Allan
1948–51	R. A. Rankin	1968–72	C. R. F. Maunder
1952–56	F. J. Anscombe	1972–74	A. R. D. Mathias
1953–54	D. R. Taunt	1974–81	J. C. Burkill
1953–55	C. B. Haselgrove	1981–83	J. E. Roseblade
1955–57	H. G. Eggleston	1983–	P. T. Johnstone
1956–60	H. P. F. Swinnerton-Dyer		

In 1939 the requirement that all papers published in the *Proceedings* should have been 'read' (at least in a formal sense) at a meeting of the Society was discontinued; and from then onwards, and particularly after the Second World War, the *Proceedings* became increasingly international in character and less of a parochial record of Cambridge science. (However, the restriction that only Fellows and Associates of the Society could submit papers directly to the Editorial Committee was retained until as late as 1965; before then papers by non-members of the Society had to be 'communicated' by a Fellow.) Since 1939, the only link with the *Proceedings*' original function has been the brief factual record of proceedings at meetings which occupies the last half-dozen pages of each volume (since 1969 each even-numbered volume).

The exigencies of wartime forced a reduction in the rate of publication to three parts per year from 1943 to 1946 inclusive; but afterwards the journal recovered rapidly, and by the early 1950s some 800 pages per year were being published. There was a dip in the late 1950s, but thereafter the size of volumes again grew rapidly, reaching a peak of 1390 pages in volume 63 (1967). Recognizing that the individual issues, and the

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completed volumes, were becoming inconveniently large, the Council approved an increase in the rate of publication to six issues per year, divided into two volumes of three parts each, from 1969 onwards (volumes 65–66). Since then the annual output has remained reasonably steady at around 1200 pages per year.

The last major event in the journal's history was the change of title from *Proceedings* to *Mathematical Proceedings*, which took place at the beginning of 1975. It was prompted by the recognition that the old title did not accurately reflect the journal's contents (and had not done so for over thirty years), and tended to lead to misunderstandings on the part of librarians and others. However, the volume numbering was continued uninterrupted, thus bringing us to volume 100 in the second half of 1986.

As indicated earlier, the *Proceedings* from its inception provided a home for the communications of some of the most distinguished British mathematicians of the 19th century. And throughout its history it has published papers which have had a fundamental influence on the development of various fields of mathematics (not only by Cambridge mathematicians, although authors with Cambridge connections have naturally tended to predominate in its pages). It therefore seemed to the present Editorial Committee that an appropriate way to celebrate the publication of volume 100 would be to select a number of such papers from past volumes of the *Proceedings*, and in each case to invite an expert in the relevant field (if appropriate, the author of the original paper) to write a survey article tracing the subsequent development of the field and the influence which papers published in the *Proceedings* have had on it. The papers which we selected as the starting-points for such survey articles are listed below in chronological order, together with the authors and titles of the surveys.

1. L. J. Mordell, On Mr Ramanujan's empirical expansion of modular functions, vol. **19** (1917), 117–124. This paper proves the multiplicativity of Ramanujan's tau-function (itself introduced the previous year in a paper in the *Transactions*) using the technique of Hecke operators (which Mordell discovered independently of, and earlier than, Hecke). R. A. Rankin reviews this paper and its influence in a survey entitled 'Fourier coefficients of cusp forms'.

2. L. J. Mordell, On the rational solutions of the indeterminate equations of the third and fourth degrees, vol. **21** (1922), 179–192. This contains the first appearance of the Mordell–Weil theorem, which is reviewed by J. W. S. Cassels in 'Mordell's Finite Basis Theorem revisited'.

3. G. Birkhoff, The structure of abstract algebras, vol. **31** (1935), 433–454. This paper is generally recognized as the foundation-stone of universal algebra, which subject is reviewed by Birkhoff himself under the title 'Fifty years of universal algebra'.

4. S. J. Taylor, The Hausdorff α-dimensional measure of Brownian paths in n-space, vol. **49** (1953), 31–39. This was the first of a series of important papers by Taylor and others on Hausdorff measure and Brownian motion, a field which is reviewed by Taylor himself under the title 'The measure theory of random fractals'.

5. R. Penrose, A generalized inverse for matrices, vol. **51** (1955), 406–413. This paper was the starting-point of the modern development of generalized inverses, which is surveyed by A. Ben-Israel in 'Generalized inverses of matrices: a perspective of the work of Penrose'.

6. M. F. Atiyah, Bordism and cobordism, vol. **57** (1961), 200–208. The subsequent

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history of bordism theory, which began with this paper, is reviewed by P. S. Landweber in 'A survey of bordism and cobordism'.

7. B. J. Day and G. M. Kelly, On topological quotient maps preserved by pullbacks or products, vol. **67** (1970), 553–558. The pivotal significance of this paper in the development of categorical topology is explained by J. R. Isbell in his article 'General function spaces, products, and continuous lattices.

Of the seven articles listed above, those by Rankin and Cassels will be found in Part 1 of Volume 100, immediately following this editorial; the others will appear in the subsequent parts of the volume†. The different authors have of course interpreted their commissions in slightly different ways, but all of them have (in the writer's opinion) produced interesting and entertaining surveys, and I cannot conclude this editorial without thanking them warmly, on behalf of the Editorial Committee, for their contributions to our celebration.

† Unfortunately, the article by Birkhoff will not be ready in time for inclusion in volume 100, but we hope to publish it as soon as possible thereafter.

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