Revision contains about sixty members and, as the preface puts it, "the organization plan has been thoroughly revamped". There are ten subcommittees, one of which, the Subcommittee on Scope, is advised by fifteen panels, the members of which are not necessarily members of the Committee of Revision. There are also eighteen additional committees, advisory boards and panels dealing with such problems as insulin, steroids, vitamins, hyaluronidase, pyrogens and style.

Latin titles have been dropped practically entirely, and this is a good thing because a large proportion of the Latin names used for describing drugs have been invented during recent years and invented differently in different countries. Pharmaceutical Latin is no longer an international language. It is satisfactory to see that the titles of new articles are generally the non-proprietary names recommended by the United Nations World Health Organization, but sad that so many of these names are far too long. In each monograph there is a statement of category which indicates, often in a single word, the main use or action of the drug described. This new and original feature will be useful to those who are puzzled by some of the new names. The abbreviation mcg. is used to mean microgram; and this is unlikely to be generally accepted because a logical application of traditional usage suggests that it means milligram.

A new section is devoted to the mathematical procedures used in connexion with biological assays. This is by no means a faithful copy of the similar section which appeared in the last "British Pharmacopoeia". It is more complicated and less general in its scope, being specially adapted to the methods of assay which actually appear in the "United States Pharmacopoeia". The methods used by the microbiologists, however, vary among themselves so much in arbitrary details that it would be impossible to provide formulæ for all of them, and the final interpretation of the results often depends on the actual drawing of the curve of best fit. There is nothing about probits because probits are not used in any official method of assay. This section will undoubtedly be useful to those who have to fulfil the official requirements laid down in this book.

The Committee of Revision must be warmly congratulated on the successful completion of a gigantic task. Necessary expenses are financed by the sale of the book, and the whole project is a fine example of what can be accomplished by unofficial enterprise aided by unselfish public spirit. J. H. GADSDEN

THE LETTERS OF JOHANN BERNOULLI

Der Briefwechsel von Johann Bernoulli

Herausgegeben von der Naturforschenden Gesellschaft in Basel. Band 1. Pp. 532. (Basel: Birkhäuser Verlag, 1955.) 60 francs. 60 D. marks.

THE city of Basle produced, in about a century, twelve mathematicians of significance, of whom eight were bearers of the name Bernoulli. Four of the twelve were really distinguished mathematicians; these were the immortal Euler and three of the Bernoullis—Johann, his elder brother Jakob and his son Daniel. The publication of the complete works of Euler was undertaken more than forty years ago;

now a similar publication of the works of the Bernoullis is being begun. A complete publication of the works of the greater Bernoulli is being attempted, except that letters which have been printed before—for example, in the complete works of Leibniz and Euler—are excluded; a selection will also be given of the works of the lesser Bernoullis and of J. Hermann, a pupil of Jakob. The whole is expected to run to about twenty-two volumes.

The first volume is devoted to correspondence to and from Johann Bernoulli. It covers the period from 1690 to 1706, when Johann succeeded his brother Jakob as professor of mathematics at Basle on the death of the latter. The first eighty pages of the volume are an editor's foreword to the whole series. This includes historical notes, in particular a most interesting account of the disappearance of most of the Bernoulli papers from sight about the year 1800, and their rediscovery after a long search nearly a hundred years later. This account reads like a detective story, with most of the mathematical detectives following their clues with an acumen worthy of Dr. Watson rather than of Sherlock Holmes.

The letters published fall into three groups. First come four letters from Johann to Jakob, the only ones between them known to survive. The rest were apparently destroyed by Johann's descendants out of filial piety, because they depicted too well the quarrel between the brothers. The four remaining are, however, enough to illustrate why the quarrel arose. They show Johann as a person very conscious of being cleverer than Jakob, who had taught him mathematics, and unwilling to allow in others claims for priority which he always expected to be conceded to himself.

The second group is of letters to and from l'Hôpital (mainly from him). The editor makes it clear, in a lengthy introductory note, that these letters, together with lessons earlier given to l'Hôpital in Paris by Johann, were in fact the main source of l'Hôpital's celebrated book on the calculus: "Analyse des infiniment petits". The essentials of the book were provided by Johann, who was for some years a pensioner of l'Hôpital; the latter's chief contribution was the clarity with which the ideas were expressed. The letters are mainly concerned with the application of the calculus to geometry; they include Johann's discovery of the rule, usually called l'Hôpital's, for the evaluation of indeterminate forms of the type $0/0$. During his lifetime Johann claimed that much of l'Hôpital's work was really his own, quoted without acknowledgment. Johann's known predilection for imputing plagiarism to others has led earlier historians to be scornful of his claims; but in this instance they appear to have been justified.

These groups of letters are in French; the third group is a heterogeneous set, in French, German, Latin and Dutch. It has little mathematical interest, but some historical. It is mainly concerned with Johann's tenure of a chair of mathematics in Groningen, 1695–1705, and with negotiations for his transfer to Utrecht. One is reminded of the many-sided character of learning in those days on first reading a letter on a medical subject (Johann was originally trained as a doctor) and then finding an epigram in Latin verse addressed to him, to which he replies in similar verse.

The whole has been very carefully edited, with copious notes and indexing. The volume is beautifully produced and will form a valuable addition to any library.

T. G. COWLING