Georg Cantor. Gesammelte Abhandlungen. Herausgegeben von Ernst Zermelo, nebst einem Lebenslauf Cantors von Adolf Fraenkel. Berlin, Springer, 1932. viii+486 pp.

Cantor's *Mengenlehre,* at least in its elements, is so widely known today that the reader of his collected works will perhaps be more interested in following the remarkable evolution of Cantor's distinctive contribution to mathematics than in re-reading the papers on the theory of aggregates—all of which, by the way, are readily available in almost any mathematical library.

It may be said at once, in view of this, that it will scarcely be worth the while of any library which is feeling the effects of the depression to indulge in this volume. The price (approximately $12) seems too high for 494 pages, only a small fraction of which display technical mathematical printing, and none of which exhibit any really complicated typography. Why the price?

Cantor's first work was in the classical theory of numbers; it shows competence but no marked originality. The first paper (No. 6) to hint at a more critical spirit is the two-page Algebraische Notiz, which aims to give a proof of a fundamental lemma in the Galois theory for which, Cantor says, there is no *proof* apparent in the textbooks. This is a proof of the existence of the basic $n!$ valued function. It might be reproduced with advantage in current texts—if it is not indeed open to objections similar to those which cause some doubters today to reject Cantor's definition of Menge. It seems to me that this short note is the first hint that Cantor was about to leave the beaten path.

There follow the papers on analysis, where the critical spirit is plainly evident, particularly in the memoirs on trigonometric series. Somewhere in this period there seems to have been an explosion which shattered the fairly cautious Cantor of the first period, only to reassemble him into a pioneer. The subsequent history of his mind is so well known that I need not dwell on it.

Zermelo's notes refer briefly to the literature which has grown up around Cantor's theories, with occasional indications of difficulties. On the whole the editing appears to be as impartial as is fitting in collected works.

Fraenkel's "Life" is full of interest, as a human document if nothing else. But, it seems to the reviewer, the biographer might have been more explicit just where he takes refuge in sympathetic generalities. In this instance the facts are not irrelevant to the man's work. Extremists, like Poincaré for instance, may have been led to their unfavorable estimates of Mengenlehre as a contribution to rational thought by contemporary knowledge of the facts, or by gossip about them. However that may be, it seems reasonable to say that historians of mathematics in the future will want to know exactly what happened, for this is one instance where the character of the work and the condition of the mind producing it seem to be inseparably connected. "Indessen kommt es zunächst . . . zu einem geistigen Zusammenbruch bei Cantor im Frühjahr 1884, einer psychischen Erkränkung, deren Erscheinungen sich von nun an bis zu seinem Tode zeitweise wiederholten und ihn mehrmals zwangen, eine Nervenklinik aufzusuchen." This carries "de mortuis nihil nisi bonum" to the limit; science is entitled to the facts—if there are any which would cause the critics of Cantorism to revise their estimates. Ambiguity is not a proper monument to a genius like Cantor.

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