This Fregean is, it would seem, an anti-intensionalist. It seems to me that the real moral of Gödel's second incompleteness theorem is the same as the moral that Frege drew from similar examples of non-extensionality in natural language—the need for an intensionalist semantics.

But, subtleties aside, we know how to interpret formalisms; and the same formalism can have various interpretations, even if we leave the logic alone. What we ultimately want are the strongest plausible constraints between our interpretation (which may as well be in English) and our formalism. There are other approaches to generalizations of G2, not treated at any length in the book, that are more suited to a "semantic" justification—Feferman's classification of r.e. predicates and Jeroslow's use of Post canonical systems are two approaches that are directly relevant.

This is an admirable and rewarding book, much meatier than I have had the space to indicate fully.

DAVID D. AUERBACH

WOLFGANG SCHÜLER. ***Grundlegungen der Mathematik in transzendentaler Kritik. Frege und Hilbert.*** Schriften zur Transzendentalphilosophie, vol. 3. Felix Meiner Verlag, Hamburg 1983, xv + 190 pp.

This work discusses Frege's and Hilbert's contributions to the foundations of mathematics from a transcendental point of view. In Chapter I, Frege and Hilbert are criticized for "objectifying" matters without taking into account their constitution by the transcendental subject. For example, it is claimed that in Frege's analysis of thoughts into concepts and objects, a "unifying element" ("Einheitselement") between concept and object is lacking which is suggested to be present in the act of knowing, when properly analyzed transcendentally. Similarly, Hilbert's theory is criticized for taking consistency in a purely formal sense, and failing to see it as arising from assertions that are posed ("gesetzt") by a knowing subject in an act of reflection. The notion of "transcendental" that underlies these investigations is independently developed in Chapter II. It essentially refers to the Fichtean approach which is based on the idea of an original act ("Tathandlung") by which the transcendental subject creates both itself and the objective world. In the final chapter, Chapter III, it is argued that certain realistic and idealistic components in Frege's and Hilbert's conceptions are due to the missing transcendental perspective in their works. Here realism and idealism are taken as one-sided outcomes of objectifying thinking, their proper synthesis being possible only within the framework of a transcendental philosophy.

The book is written in a traditional German philosophical style that is typical for a certain branch of transcendental philosophy. It does not discuss attempts in recent analytic philosophy to give an understanding of transcendental arguments. Relying only on Kant and (more basically) Fichte, it does not even take into consideration Husserl's variant of transcendental philosophy, which has become very important for modern approaches. Being essentially completed in 1980 (see the foreword), it does not take into account the discussion arising from Hans Sluga's arguments that the origins of Frege's thought lie in nineteenth century German transcendental philosophy (***Gottlob Frege***, Routledge & Kegan Paul, 1980). But even the earlier international literature on Frege (e.g. that by Dummett) is almost totally neglected, and the same holds for basic work on the foundational claims of proof theory (by Kreisel and Prawitz, for example). The book contains some logical formalizations of theories such as Hilbert's axiomatization of elementary geometry. These logical parts are trivial to trained logicians, however, and are probably too demanding to those working in the philosophical tradition to which this book belongs.

I definitely think that there is something in what the author claims, that is to say, a transcendental perspective may be fruitful for the philosophy of mathematics. This goal cannot, however, be achieved by simple commitment to a traditional philosophical terminology that has proved unconvincing for decades.

PETER SCHROEDER-HEISTER

K. WAGNER and G. WECHSUNG. ***Computational complexity.*** Mathematics and its applications. VEB Deutscher Verlag der Wissenschaften, Berlin, and D. Reidel Publishing Company, Dordrecht etc., 1986, 551 pp.

Complexity theory became an independent branch of computer science in the early seventies. Several recognizable branches of this theory have been established. One of the more voluminous ones is the analysis of algorithms, an area where specific concrete problems are investigated and upper and lower bounds are determined for the time and space complexity of their solution methods. There also exists a more foundational branch where the notions concerning complexity themselves, and the machine models on which they are based, are investigated. The book by Wagner and Wechsung deals with the latter branch.