Bibliographie de la Relativité, suivie d'un appendice sur les déterminants à deux dimensions, le calcul des variations, les séries trigonométriques, et l'azéotropisme. By Maurice Lecat. Bruxelles, Lamertin, 1924. 292+47 pp.

M. Lecat's bibliography of relativity should find a place in all university libraries and also in the personal libraries of those who are working in this field. In carefully checking the list against my own (limited) store of bibliographical information I found only one omission, viz. the pamphlet by A. N. Whitehead entitled *The Principles of Natural Science*, a lecture delivered at Bryn Mawr on the eighteenth of April, 1922, and published by Bryn Mawr College. In view of the limited circulation which this pamphlet received I feel justified in saying that M. Lecat's book is a remarkably complete index of the world's literature on relativity as it was on the day of publication, April 10, 1924.

C. N. Reynolds, Jr.

Höhere Mathematik. Teil I: *Differentialrechnung und Grundformeln der Integralrechnung nebst Anwendungen.* By R. Rothe. Leipzig, B. G. Teubner, 1925. vii+185 pp.

This little volume is one of the collection of Teubner's Technische Leitfäden, whose purpose is to give to technical students the theoretical foundations of their work in a brief and handy form.

The volume under discussion, the first of three on "Höhere Mathematik", is devoted mainly to the differential calculus. The chapter headings are: (1) Numbers, variables, and functions, (2) Main theorems of the differential calculus and fundamental integration formulas (3) functions of two or more variables, (4) differential geometry of plane curves, (5) complex numbers, variables and functions. The treatment is brief and concise, but there is no attempt to sacrifice rigor and clearness to brevity. The number of exercises is rather small, especially in comparison with similar books in this country, but on the whole they are well chosen. Of applications (and we assume this to mean applications of a technical nature) there are fewer than one would expect from the title of the book. The chief ones are references to questions of approximations, brief mention of linkages (in connection with curves in polar coordinates) and occasionally a problem in the exercises with an engineering setting.

The book is interesting as indicating perhaps what the mathematica equipment in the direction of the calculus, of an engineer in Germany is supposed to be. The opening chapter, which is really an introduction to the theory of functions of a real variable, would to seem to indicate that a student of calculus is supposed to cope successfully with a rigorous treatment of limits and continuity. American textbooks

especially those intended for engineering students, seem to avoid mentioning such concepts rigorously. The closing chapter of the book, which gives the elements of the theory of functions of a complex variable, is another indication of this broadness of scope. Perhaps American engineers would not be so overawed by differentiation and integration processes if the mathematical foundations were broader.

T. H. HILDEBRANDT

Les Erreurs Philosophiques de M. Einstein. Étude directe de la Relativité. By G. Joly. Paris, Edition Spes, 1925. 64 pp.

Amidst the mass of temporary literature evoked by the contact between the enthusiastic disciples of Einstein or of his competitors, and the perturbed conservatives of the older schools, this little book finds a natural place. It is an attack vigorously directed against the body of Einstein's conclusions.

The author cordially concedes that all of Einstein's formulas and equations are to be accepted as "guaranteed by several of the most eminent specialists," and a large part of this small book is devoted to the effort of establishing (for the restricted theory) these very formulas upon the basis of classical mechanics. A distinction is drawn between the mathematical calculations and the philosophical conclusions and the latter are rejected *in toto* by this author. The author admits what he calls the *fact* of relativity, which he claims consists in the circumstance that linear measurements reveal nothing concerning actual locations, but only relative distances. In fact he asserts incidentally that "*no point is at rest in the universe*" (italics quoted). However the author insists that the establishment of one of the formulas which he accepts as do the relativists "supposes *implicitly* comparison with a system fixed in absolute space, where lengths and times have an absolute measure". "Relativity has no sense except by comparison with the absolute, it presupposes the latter and may be deduced from it. In denying this reality, M. Einstein is led to a conception which 'is not expressible in words but only in mathematical formulas.'" "The perturbations rightly signalized by M. Einstein are most of the time so slight as to elude experimental verification. ... There is no need of a special theory to correct aberrations due to these relative movements. ... It suffices to take account of their causes in laying down the equations."

The modern student of relativity may find interest in some of the simple methods used here in discussing the elementary features of the restricted theory, but the book seems chiefly designed to aid and comfort those who cannot dispute mathematics with Einstein but who would like to feel that the old Newtonian system is as good as ever.

A. A. BENNETT