$$\frac{\partial\phi}{\partial z}=\frac{1}{2}\frac{\partial^2\phi}{\partial x^2}.$$

In the various questions of analysis that arise, the author has used the notion of upper and lower functions whose significance for theoretical probability was recently discovered by Petrowsky.

Continuous stochastic processes are shown to lead to distributions given by the normal probability function while discontinuous stochastic processes are shown to lead to distributions given by the Poisson exponential function. Much of Chapter IV deals with the distribution of chance fluctuation restricted as to direction, and with a generalization of the LaPlace-Tchebycheff proposition concerning the approach of the probability function for the sum of n variables $x=x_1, x_2, \cdots, x_n$ to a function v which satisfies the differential equation

$$\frac{\partial v}{\partial t}+\frac{1}{2}\frac{\partial^2 v}{\partial x^2}=0.$$

The fifth chapter gives a proof of the theorem giving the probability of an upper bound of $|s_m|$, where $s_n=x_1+x_2+\cdots+x_n$, in terms of repeated logarithms.

The theorems developed relate in many cases to the probability of events occurring in relation to an assigned time, and are thus connected with the diffusion problems to which the whole of Chapter III is devoted.

H. L. Rietz

Questions non résolues de Géométrie Algébrique. By L. Godeaux. Actualités scientifiques et industrielles, No. 77. Paris, Hermann, 1933. 24 pp.

This little pamphlet contains an accurate and well written account of the present state of three famous unsolved problems:

Involutions in space.

Conditions for rationality of a three-dimensional variety.

Demonstration of the irrationality of the general cubic variety in four-way space.

The bibliography contains titles of 12 books and of 71 recent articles.

Virgil Snyder

Vorlesungen über Algebra. Unter Benutzung der dritten Auflage des gleichnamigen Werkes von Gustav Bauer in fünfter vermehrter Auflage dargestellt von L. Bieberbach. Leipzig, Teubner, 1933. x+358 pp.

The fifth edition of Bauer's *Algebra* differs very little from the fourth.* The principal change has been the rewriting of Chapter 2 of Section 1 to include a discussion of number fields and rings. On the basis of this addition the author has made minor changes throughout and has included in Chapter 5 of Section 1 a second proof of the fundamental theorem of algebra. There are also a few trivial changes in the chapters on linear equations, matrices, and groups, and a number of additional references to original articles.

L. T. Moore

* Reviewed in this Bulletin, vol. 35 (1929), p. 581, by T. H. Gronwall.