to the fresh mounts commonly used. The writer has found this damp chamber especially well adapted to the study of the relationship of fungous hyphæ to roots, both in the study of tropisms and in the actual observation of root-hair infections.

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THE COST OF GERMAN PUBLICATIONS

TO THE EDITOR OF SCIENCE: Apropos of the cost of German publications to Americans, it may be interesting to note the cost of membership in the Deutsche Chemische Gesellschaft (including subscription to the *Berichte* and *Zentralblatt*) to Germans and to others. The figures are computed on to-day's exchange rate:

United States		$23.00
England	115 shillings	25.56
France	305 francs	25.28
Belgium	316 francs	24.74
Italy	536 lira	24.55
Norway	176 kroner	28.09
Sweden	104 kroner	27.14
Denmark	124 kroner	26.60
Holland	69 gulden	26.71
Switzerland	91 francs	17.47
Germany	370 marks	.81

It will be noted that Americans fare better than any other nationals except the Swiss. It might be added that in 1921 the subscription for Americans was $16.00.

But do the Germans expect us to believe that the disparity between the cost to themselves and to others is, as was stated by the president of the Gesellschaft, due to the low value of exchange?

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QUOTATIONS

SCIENCE AND THE TROPICS

FROM the late Mr. Chamberlain onwards, successive colonial secretaries have shown a far-sighted appreciation of what science may do for the tropics. The London School of Tropical Medicine, inaugurated and fostered by the Colonial Office, is now a world-center of research and education in the diseases prevalent in warm climates and the measures for resisting them. In another column Sir Arthur Shipley, now happily restored to economic zoology from his arduous and successful tenure of the vice-chancellorship of Cambridge, describes the work of the Imperial Bureau of Entomology, a product of a research committee appointed by the Marquess of Crewe when colonial secretary, and firmly established by the late Viscount Harcourt and Viscount Milner. Its local habitation is rightly placed at the Natural History Museum, which contains the finest collection of insects in the world. It is in close touch with every part of the empire, receives, examines, and identifies specimens sent to it, and acts as a general headquarters in the war against insects, whose successful prosecution is almost a condition of human existence. A third very practical application of science to the needs of the empire, due to the initiation of Viscount Milner when colonial secretary, applies specially to the tropics. A College for the Study of Tropical Agriculture is to open its first session at St. Augustine, Trinidad, this autumn. Last year we were able to welcome the constitution of a governing body to carry out the details of the scheme. Sir Arthur Shipley, chairman of the governors, and his distinguished colleagues have selected a competent staff and devised practical courses extending over three years for a diploma, and shorter periods for training in special subjects or for postgraduate research. The island of Trinidad has provided the site and a handsome grant towards the erection of the buildings, which are now complete. Private persons and commercial companies interested in tropical produce have made benefactions, and other West Indian islands are to contribute towards maintenance. But the benefits of the college in Trinidad will radiate far beyond the Antilles. The conditions of soil and climate which favor the luxuriant growth of tropical fruits, vegetable oils, rubber, and woods also favor the growth of animal and vegetable pests. Insects and moulds which no more than maintained existence in the jungle proliferate under the conditions of cultivation. Much can be done towards identifying and studying these in the museums and laboratories at home, and something also towards the devising of treatment.

But the detection of the early stages, discrimination between methods of treatment, and determination of the most suitable times and modes of applying these can be adequately pursued only in the field. The work of the professors of entomology and of mycology will be eagerly watched in many parts of the empire, and the men they train will have no difficulty in finding useful spheres when the demands of the West Indian islands have been satisfied.—The London *Times*.

SCIENTIFIC BOOKS

Mathematical Philosophy. A study of fate and freedom. Lectures for educated laymen. By CASSIUS J. KEYSER. Pp. xiv + 466. New York: E. P. Dutton and Company.

The common saying, "What man would be a philosopher who might be a mathematician" does not seem to apply to the author of this book, who tells us in the preface that for more than two score years he has "meditated upon the nature of mathematics, upon its significance in thought, and upon its bearing on human life." The book is in the form of twenty-one lectures designed primarily for students whose major interest is in philosophy but it aims to appeal to a much wider circle of readers, including professional mathematicians and the "growing class of those natural-science students who are interested in the logical structure and the distinctive method of mathematics regarded not only as a powerful instrument for natural science but also and especially as the prototype which every branch of science approximates in proportion as its basal assumptions and concepts become clearly defined."

The last lecture of the book is on science and engineering. In this lecture the author considers various definitions of engineering and then proposes the following: *The science and art of directing the time-binding energies of mankind—the civilizing energies of the world, —to the advancement of the welfare of man.* The language of this definition portrays the type of language used throughout the volume. The reader may at times feel that the language is too flowery to convey much real information, but he will generally find that the words are far from empty. Even in the more mathematical parts of the book, where the author speaks of the infinite abelian group of angel flights and discusses the question whether mind is a group, will frequently disclose much careful thought in what might at first appear to be superficial statements.

Professor Keyser has for a long time been preeminent among American mathematicians as regards a certain type of popularization and the present volume is perhaps, up to the present time, his most successful effort along this line. The scientist who wishes to acquire a knowledge of the nature and bearing of some of the fundamental mathematical concepts without going deeply into the subject will find here a unique opportunity. It is true that this knowledge is here presented in a sugar-coated form and that there is a danger that some of the readers may not get within this coating, but it is to be hoped that many others will become really interested in the subject matter and will give it sufficient thought to derive a lasting benefit therefrom. Teachers of mathematics will probably find here attractive features of their own subject which had escaped their attention. In fact, the present writer found the lecture devoted to the group concept worthy of a second reading although he had given much thought to this particular concept before reading this lecture.

The book under review occupies a unique and useful place in the mathematical literature of to-day. It deals with a considerable number of fundamental mathematical concepts, including those of transformation, invariance, infinity, hyperspace, group, variable and limit. Considerable attention is given to systems of postulates and the properties which are essential to a genuine system. In particular, it is noted that the Hilbert system of postulates for geometry is not intrinsically superior to others. On page 43 our author refers to the system of postulates "devised by the late Professor Hilbert and found in his famous 'Foundations of Geometry,'" which would naturally be construed to mean that Hilbert died before the publication of this book. This is fortunately not the case.