red roses, all of one kind, on the table and another on the secretary; then at once the room seemed to become filled with roses of various red colors and of all sizes, in great bunches, wreaths and chains, and with regular banks of them, all around me, but mixed with some green foliage, as in the real bouquets. This beautiful illusion lasted only a short time. About this time I had a decided rush of blood to my head, with marked congestion, which caused me to lie down. I then had a very disagreeable illusion. Innumerable human faces, of all sorts and sizes, but all hideous, seemed to fill the room and to extend off in multitudes to interminable distances, while many were close to me on all sides. They were all grimacing rapidly and horribly and undergoing contortions, all the time growing more and more hideous. Some were upside down.

The faces appeared in all sorts of bright and even intense colors—so intense that I could only liken them to flames of fire, in red, purple, green and yellow colors, like fireworks.

At this time I began to become alarmed and sent for the doctor, but he did nothing, for the effects were wearing off when he came. Real objects at this time appeared in their true forms, but if colored they assumed far more intense or vivid colors than natural; dull red becoming brilliant red, etc. A little later, when standing up, I had the unpleasant sensation of having my body elongate upward to the ceiling, which receding, I grew far up, like Jack's bean-stalk, but retained my natural thickness. Collapsed suddenly to my natural height.

At this time I noticed the parlor organ and tried to play on it, to see the effect, but could not concentrate my mind nor manage my fingers. About this time my mind became confused and my remembrance of what happened next is dim and chaotic. Probably there was a partial and brief loss of consciousness. Laid down to wait for the doctor. Looking at my hands, they seemed to become small, emaciated, shrunken and bony, like those of a mummy. Mrs. Y. says that at this time her hands and arms seemed to grow unnaturally large.

When I attempted to scratch a spot on my neck, it felt like scratching a rough cloth meal-bag full of meal, and it seemed as large as a barrel, and the scratching seemed quite impersonal. Later I imagined I was able, by a sort of clairvoyance, to tell the thoughts of those around me. Soon after this our conditions rapidly assumed the very hilarious phase, similar to that of the early stages, with much involuntary laughing and joking. This condition gradually diminished after three o'clock, until our mental conditions became perfectly normal, at about six o'clock P.M. The entire experience lasted about six hours. No ill effects followed. There was no headache, nor any disturbance of the digestion.

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SCIENTIFIC BOOKS

Plane Trigonometry and Applications. By E. J. Wilczynski, Ph.D., University of Chicago. Edited by H. E. Slaught, Ph.D., University of Chicago. Boston, New York and Chicago, Allyn and Bacon. 1914. Pp. xi + 265.

Elementary Theory of Equations. By L. E. Dickson, Ph.D., University of Chicago. New York, John Wiley & Sons. 1914. Pp. v + 184.

Among the prominent features of the former of these two elementary text-books is the fulness of its explanations of fundamental processes. In fact, it might at first appear that nothing was left for the teacher to explain, but the numerous illustrative examples and problems should serve to awaken discussion and to enliven the recitation periods. The clearness with which the fundamental ideas are developed tends to make the book unusually easy for the student.

The book is divided into two nearly equal parts. The first part is devoted to the solution of triangles, and is published separately for the use of secondary schools. In this part practical applications to surveying are emphasized, and the use of the slide rule and the logarithmic tables are clearly exhibited. The

author's extensive experience as a practical computer, combined with his keen mathematical insight, have enabled him to provide against the usual difficulties and pitfalls which beset the path of the beginner in this field.

The second part treats the more advanced parts of elementary trigonometry together with applications to simple harmonic curves, simple harmonic and wave motion, and harmonic analysis. The two parts are intended to cover the work in plane trigonometry usually given during the freshman course in the colleges. Notwithstanding the unusually large number of trigonometries which are now on the market, this book seems to have important characteristic properties.

From the standpoint of pure mathematics plane trigonometry may be of comparatively little importance, but it occupies a strategic point in the mathematical training of most students who take freshman mathematics in our colleges and universities. The numerous direct applications of this subject and the training which it provides for a wise use of approximate results combine to make it especially important that the student should have clear views at this point in order that mathematical thinking may become natural to him. Professor Wilczynski's book seems to guard to an unusual degree against vague or incorrect impressions.

Professor Dickson's *Elementary Theory of Equations* relates to a subject where both textbooks and students are much less numerous than in the subject considered above. The classic work by Burnside and Panton, in two volumes, is too extensive for the available time in many institutions. Moreover, it omits the important subject of systems of linear equations. Some of the more recent works aim to lead up to modern theories too rapidly to give enough room to the classic fundamental theories.

In the present book the author has provided for two courses by marking with a dagger many of the more difficult sections which could be omitted without breaking the continuity of the course. The aggregate of the sections thus marked is more than fifty pages, and the rest constitutes a very brief course in this subject. A large number of illustrative problems are solved in the text, and about five hundred graded exercises are distributed through the various chapters. To the reviewer the book appears to excel all others extant for a first course in this subject.

As might be expected, the author has paid especial attention to rigor and conciseness in presentation, and has made a wise selection from the vast amount of material relating to the subject in hand. His masterful skill in reaching the essential points by the most direct means is everywhere apparent. In addition to a treatment of the rational integral function in one unknown, the book contains a good introduction to the theory of determinants and the solution of a system of simultaneous linear equations.

For the sake of simplicity very few modern concepts are introduced. The Galois theory is entirely omitted and the subject of invariants is only illustrated by a few examples. The concept of rank of a determinant is introduced but the closely related concepts of matrix and rank of a matrix are not developed. The introduction of these concepts would have enabled the author to state more concisely some results relating to a system of linear equations.

G. A. MILLER

Rubber and Rubber Planting. By R. H. LOCK, Sc.D. London, Cambridge University Press; New York, G. P. Putnam's Sons. 1913. Pp. 13 and 245. 5 by 7 inches.

The purpose of the author of this book has been to present an introductory outline of the subject, as stated in the title, to meet the needs of as wide a circle of readers as possible. One can not but feel that the result would have been more satisfying if the limitation of the size of the volume had not prevented the author from doing what he really wished to do. A better end could perhaps have been gained by confining the treatment to the most important rubber plant, economically regarded, *Hevea Braziliensis*. Had this been done, the least satisfactory chapters (II., X. and XI.),