matics but in physics, chemistry and in mechanics. The Conic Template gives a parabola, one inch unit, an hyperbola with asymptotes at 60°, and an ellipse, the directrices coinciding with the latera recta of the parabola and hyperbola. They are 8d. and 4d. in celluloid and nickel respectively. There is also a confocal stencil giving parabolas to scales 2 cms. and ½ in. confocal ellipses, 1¼ in. distance between foci; hyperbolas with axes, directrices and latera recta marked, the asymptotes making angles of 80° and 100° The two ellipses and these hyperbolas give confocal conics. There is also a rectangular hyperbola $xy=1$, to scale ½ in. They are not so large as the curves received some time ago from Messrs. Brooks & Co., in which the scale for parabola and hyperbola was 1 in. unit, the ellipse with major axis 3 in. and minor axis 2 in. They also included a cycloid, roulette of circle 2 in. diameter, and the curve $y=x$, unit one inch. If we remember rightly they could be obtained at 1s. each. The advantage of an accurately constructed figure to the student of geometrical conics is obvious enough, and those who have these useful aids will find them of material benefit.

Tables of Logarithms and Anti-Logarithms to Five Places. By E. ERSKINE SCOTT. Student's edition. Pp. 384. 5s. net. 1912. (C. & E. Leyton, 56 Farringdon Street.)

Table of Logarithms and Anti-Logarithms (four figures), 1 to 10,000. Arranged by Major-Gen. J C. HANNYNGTON. Pp. 41. 1s. 6d. net. 1912. (C. & E. Leyton.)

The Erskine Scott Tables have long been held in high repute by those engaged in actuarial and similar work. The publishers have now issued a Student's Edition, using the stereotyped plates employed in printing the revised edition of 1892, and omitting from the larger volume whatever does not seem necessary for the practical computer. The logarithms of all natural numbers from 1 to 99,999 form the first table, and the second comprises the natural numbers corresponding to all logarithms from ·00001 to ·99999, the latter being printed on green paper. The type is beautifully clear. General Hannyngton's four-figure tables of logs and anti-logs is nicely printed, and is prefaced by a short explanation of the use of logarithms. Considering the thick board binding, the quality of the paper, and the size of the type, it cannot be said to be dear at 1s. 6d. net.

Annuaire pour l'An 1912. 1fr. 50c. net. Pp. 692+124. 1912. (Gauthier-Villars.)

This handy and compact volume, a phenomenon of cheapness, makes its appearance with unfailing regularity. The first 350 pages are this year devoted to astronomy. We may note, on the authority of Prof. E. W Brown, that the table of elements of the asteroids is not quite reliable. The second part consists of physical and chemical tables. Finally we have two articles: The mean temperature of the various districts in France, by M. Bigourdan (the "mean" being practically the arithmetical mean of twenty-four observations taken from hour to hour, day and night), and an introduction to the Method of Mean Squares by M. Hatt.

CORRESPONDENCE.

Navy Yard,
Portsmouth, N.H., *Jan.* 27, 1912.

To Editor, *The Mathematical Gazette.*

DEAR SIR,—I am glad to have your note* of Nov 28, 1911, in regard to the question of Mathematical and Engineering standpoints of Descriptive Geometry, and only regret that press of work has delayed my answer, as this is a subject that I have thought much about and have discussed with many people. In fact, the text book I have written was the result of the constant dissatisfaction expressed by practical men with methods of instruction in Descriptive Geometry.

Before my book was written the prevailing text book on the subject was

* This was to elicit a reply to the reviewer's query on p. 165. [W J. G.]

written by Church. In fact, it still is the one principally used in this country as it takes time to get a new method known and used. I am glad to know and to inform you, however, that my book has been adopted by at least three of our large universities.

The study of Descriptive, as ordinarily conducted, is a very interesting mental drill, and the imagination is trained and developed. It is considered by many instructors as the one mathematical study that must be given the student at whatever cost.

My interest in this was due to duty at the U.S. Naval Academy where I was in charge of Mechanical Drawing. Incidentally I wrote a text book on that subject which has been and is still used there and in other schools with great success for the last twelve years. With the more advanced students we took up the making and reading of complicated practical drawings. After doing this work for some days, one of the Midshipmen remarked in a surprised way, "Why, this is Descriptive Geometry!" This branch he had studied two years before in the Mathematical Department. After he recognized the kind of work he advanced more rapidly, but kept complaining that he had studied Descriptive in the First Quadrant, and that it was difficult to follow the practical Drawings made in the Third Quadrant. This started my ideas along that line, and I realized for the first time that my own study of Descriptive, which I loved, was something that bothered me in reading practical drawings. It still does in spite of the work put on the book and the use of the cages.

It will be noted that the Practical Drawings in France are in the same quadrant as in the Descriptive Geometry, but that in both England and the United States the practical drawings are all in the third quadrant. So, the methods usually adopted for the study as a mathematical proposition are right in the line of progress for the practical men in France, but this study in your country and mine is a detached idea that is quite interesting but does not lead directly to practical utility. With us everything tends to study that may be used immediately in practice, and no time can be used for beautiful theoretical propositions that cannot at once be used in practice the day after graduation. I am not saying that this is the best way for general development, but it is the way of to-day.

So, since the mental drill is just as good in the third quadrant as in any other, why not use that one and prepare the student for the business of life? Also, he can do clear thinking in this way, whereas otherwise he must try to forget what he has so laboriously learned.

A few years later than the time I spoke of above I was the head of the Department of Marine Engineering and Naval Construction at the U.S. Naval Academy, and the subject of Descriptive Geometry was turned over to my Department—to my delight. I taught it as a part of Mechanical Drawing, running in the Descriptive as fitted with the progress in Drawing. I immediately started the ideas now in book form, and we were all at once impressed with the fact that the Midshipmen were actually understanding and liking Descriptive. Before that, as taught in Mathematics, it was considered a grind and a few only would understand it and would work out the problems for the others to copy. Also, the Head of the Department of Mathematics told me that he never expected the Midshipmen to get much out of Descriptive.

Then, the Midshipmen drifted without realizing it into practical drafting, and the course is so successful that no more time is required for the two branches of Mechanical Drawing and Descriptive Geometry than used to be required for Mechanical Drawing alone.

Speaking of the study of this subject as a drill, my friend and classmate, Prof. Spangler of the University of Pennsylvania, Dean of Engineering, teaches Descriptive in all four quadrants, so that his graduates are ready to see any drawing, no matter how drawn. This is, of course, ideal, but few of us have the time for the students to do this.

Pardon my long dissertation, but you must remember that you brought it on yourself by requesting an enthusiast to give his ideas.

Yours very sincerely,

F W Bartlett,
Captain, U.S. Navy.

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