



Plane Geometry for Schools. Part II by T. A. Beckett; F. E. Robinson

Review by: H. W. Turnbull

The Mathematical Gazette, Vol. 11, No. 159 (Jul., 1922), pp. 129-131

Published by: [The Mathematical Association](#)

Stable URL: <http://www.jstor.org/stable/3603288>

Accessed: 18/01/2015 14:04

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



The Mathematical Association is collaborating with JSTOR to digitize, preserve and extend access to *The Mathematical Gazette*.

<http://www.jstor.org>

which is treated in some detail ; and in dealing with the theory of perspective and of homographic ranges the book reaches its most advanced point.

The arrangement and development is clear and distinct ; a chapter is devoted as a rule to one method at a time. The choice of theorems is good, for they are not overloaded with details, yet they cover very much ground. There are plenty of appropriate examples throughout, with a good set of answers and occasional hints. All this is evidently the outcome of useful practical experience.

A pleasing feature of the book is the insertion of portraits and short historical notes on Cayley and other famous geometers ; but surely the arrangement would be better if these notes came boldly into their natural places in the book instead of at the end. The reference to Descartes would make an excellent addition to the opening of the first chapter, especially if the Greek origins of synthetic methods also received attention somewhere in the text.

As to choice of subject, it is difficult to see why for elementary students so much attention should be paid to cross ratio, projection, and general homographic relations, if at the same time—and this is no accidental omission—there is no mention of involution and reciprocation. To be sure a theory of duality is hinted at on p. 32, but the author must have unduly repressed himself when he exhibits the theorems of Pascal and Brianchon as disconnected phenomena. Again, the book confines itself to plane geometry, and yet for the purpose of definition utilises solid geometry both for projection and for the conic section—quite rightly. But the question at once arises, why not make the book more homogeneous, by bringing in more notions of easy solid geometry and discarding some of the complexities of the later pages ? Desargues' Theorem is actually easier to prove for a solid than for a plane figure. This suggests further possibilities. It seems to the reviewer that a hard line of distinction between plane and solid geometry, where one throws light on the other, is as much to be deprecated as the older line now erased between pure and analytical methods.

This criticism is rather strengthened because the book with few exceptions lacks references, internal and external. There is every reason to believe that a student who has worked through this carefully graded book would be enlightened to know that the general equation of the second degree represents a conic, and that certain other treatises have something to say on this subject of conics in general. The above theorem may be deduced by combining three separate results far apart in the book, but this discovery is left to the reader.

There might be improvement in various details : thus there seems to be some confusion of thought in explaining positive and negative numbers for coordinates. Surely the essence of this lies in its economy ; we measure in *one* direction only along the axis of x , instead of two ; and we succeed in this by postulating positive and negative numbers. The four arrows in Fig. 1, pointing outwards along Ox, Ox', Oy, Oy' , are certainly misleading.

Again, the first great difficulty that beginners have in Coordinate Geometry is to solve a locus problem involving one or more parameters. This has certainly been well provided for in one recent elementary text-book, but is overlooked here.

The definition of a conic section from what its name implies is good, but the classification is very artificial : the *natural* classification depends, from this point of view, on how the plane of the section is situated relatively to the cone rather than its position relative to a circular section of the cone. Nor is it clear whether a right circular or an oblique cone is meant.

The notation $A \rightarrow B, a \rightarrow b$ for a vector AB is unwise, as the arrow is more usefully employed in the symbolic expression of a limit.

The book is well printed and invites perusal ; the figures are very good, with the exception of one on p. 106, which is unduly baffling. An index would improve the usefulness of the book very considerably. The book should serve its purpose for preparation before examination, but it lacks that breadth of treatment which its scope deserves.

Plane Geometry for Schools. Part II. By T. A. BECKETT, M.A., and F. E. ROBINSON, M.A. Pp. 242-452 + viii + (Answers). 1922. (Rivingtons.)

This well arranged volume is in three sections with appendix, good index, and an abundant supply of varied examples (with answers). It completes

a course of plane geometry of straight lines and circles, introducing the ideas of inversion, cross ratio, and a little trigonometry. The book is compact and very complete, and the authors are not afraid of logical procedure; they always try to make clear their assumptions, *e.g.* in limiting their proofs to commensurable ratios.

Where it is needed, a page of suggestive commentary is introduced, and there are a few interesting historical notes on ancient problems impossible to be solved by ruler and compass. The authors cautiously 'suppose' this impossibility and do not commit themselves.

Two details seem a little confusing—the use of capital letters *P*, *Q* for *lengths* of straight lines; and the thick type of line in some of the figures, a form of emphasis which is very subjective and does not help every learner.

A good volume on solid geometry overlapping and extending these two Parts would be very useful.

1. **Elementary Algebra.** By C. O. TUCKEY, M.A. Pp. 278 + xi (Contents) + xii (Answers). 6s. 6d. 1921. (Arnold.)

2. **A Short Algebra.** By H. P. SPARLING, M.A. Pp. 120 + vii. 2s. 4d. 1922. (G. Bell and Sons.)

3. **Plane Trigonometry.** By A. DRESDEN, Ph.D. Pp. 110 + iv. 8s. 6d. 1921. (Wiley.)

4. **Mathematics for Students of Agriculture.** By S. E. RASOR. Pp. 290 + vi. 1921. (Macmillan, New York.)

These books are all nicely arranged and, except No. 3, are well printed. They are not so discursive as some of the best recent books on the subjects. The first, which bears no date, would be improved if it had an index.

It is clear that the thought given to improving the teaching of algebra is bearing fruit. We have now a fairly definite aim—to give shape to the idea of the undetermined variable, to generalise arithmetic through formulae to notions of functions and to certain characters or behaviours of certain easy functions. The theory of variation and a few steps in the calculus are brought into a good general course for all students, and the more formal manipulation of symbols, enjoyed by the mathematical boy but not by the majority, is relegated to a special course for the few.

A Short Algebra nearly covers a course for the pass standard of the School Certificate Examination. It includes variation, progressions, and just mentions the binomial theorem, but excludes notions of the calculus. The main idea of the book is to reduce formal manipulation to a minimum and to establish the idea of a function. The writer thinks that the calculus needs a separate volume; he has also for shortness cut out nearly all explanatory matter from the bulk of the book and left nothing but examples. This is unfortunate, for it detracts from its educational value, as it throws the whole onus of teaching upon the teacher. These examples are so exceedingly well graded that, were the needed explanation added quite shortly, many boys in an average class could learn direct from the book.

Elementary Algebra covers the same ground, and includes a little of the calculus and has a section of more difficult aspects of the elementary work for those who intend to go further into algebra. The text explains the steps as it proceeds, and there is careful attention to details which prove stumbling blocks to beginners. Thus the name "Directed Numbers" is given to positive and negative numbers—a useful designation; and the little that is said about these numbers is not misleading. Further on, a logarithmic proof is given that $x^n \rightarrow 0$ if $n \rightarrow \infty$ and if $|x| < 1$.

It is a good plan that, for example, where results can be given without intermediate work, the book supplies a list of answers only to the even numbers of the questions.

For some reason it does not seem necessary to be precise and to define technical terms as methodically as this used to be done. Here, for instance, "terms" are spoken of on p. 29 and defined on p. 34. What was wrong in the older books was to crowd in a heap of unnecessary technicalities; we could

not reach the interior comfortably because the furniture choked the doorway. Now the way is open, but we still like to know what we mean when we talk.

The book is a good straightforward course, without attempt to justify procedure by its history or otherwise.

Plane Trigonometry, which is too expensive for its length, is an attempt to reduce the dull load of trigonometrical detail to a moderate size. Its chief interest is the point of view, namely that in discussing $\sin x$, $\cos x$, and so on, we are dealing with functions of x . So a large place is given to graphs of these functions, and to inverse functions. Projection is early insisted on, and a good economical proof of the addition theorem results. The book emphasises arithmetical trigonometry, and does not go further than solution of triangles.

Whether it would suit beginners at school is open to question, but it promises to be useful for first-year work of ordinary students at the University. It lays good foundations for further advance.

Mathematics for Students of Agriculture. This is a useful manual for those who are interested in the applications of mathematics to the common things around them. The book gives a general course involving arithmetic, algebra, geometry, surveying, mechanics, and includes progressions, logarithms and the binomial theorem. There is variety of illustration and a pleasing lack of irrelevant trivialities.

The book, however, is dogmatic, so that in one sense it is little more than a large collection of relevant formulae with a running commentary on how to use them, but not on how they arise.

The chapters on practical ways of measuring, and especially on land surveying, are more detailed, and the author has something interesting to say on the difficulties which beset the American Congress when in 1785 a law was passed which proposed to divide the extensive non-developable surface of their land into townships six miles square, "as near as may be."

H. W. TURNBULL.

GENERAL TEACHING COMMITTEE.

The Committee met on Saturday, 8th April, at 29 Gordon Square, W.C., and, among other business, passed the following resolutions:

Sequence in Geometry. That in the opinion of the General Teaching Committee of the Mathematical Association it is most undesirable that examining bodies should reduce the freedom of the teacher by imposing an obligatory sequence of propositions in Geometry.

Examination Questions. That a sub-committee be appointed to consider criticisms of mathematical questions set in public examinations.

Letters containing such criticisms should in future be sent to Mr. W. J. Dobbs, 58 Priory Road, South Hampstead, N.W.6.

W. E. PATERSON, *Hon. Secretary*.

Examination Questions Sub-Committee (*v.* page 83 of the *May Gazette*).—The members of the Sub-Committee appointed to consider criticisms of examinations are: Miss E. Glauert, Scarborough High School; A. W. Siddons, Rendalls, Harrow-on-the Hill; W. J. Dobbs, 58 Priory Road, Hampstead, N.W. 6.

Examination questions on pure or applied mathematics within the school range, if open to criticism, should be sent with comments to one of the above.

W. J. DOBBS, *Hon. Sec.*

ERRATA.

P. 87, vol. xi. Note 626, last line. For "perpendicular" read "parallel."

P. 85, vol. xi. Note 621, line 7 up. Delete "John."