proposed by the Cambridge Advisory Committee. A manuscript on this topic is also circulating. The sub-Committee consists of 13 members, 3 of them co-opted.

(e) *Preparatory Schools Sub-Committee.*

A meeting was held in July and a draft syllabus has been drawn up at the request of the Committee of the Headmasters' Conference.

(f) *Modern Schools and Primary Schools Sub-Committees.*

A joint meeting was held in July but the attendance was very small; only preliminary discussion has been possible and progress is hindered by the lack of members able to speak with authority and experience in the work of these schools.

(g) *Examinations.*

There is nothing to report from this sub-Committee, which has not yet met.

Two other matters of general policy must be mentioned. The sale of the Association Reports is now sensational, in fact all of them are now either out of print or on the verge of being so. Supplies of Algebra, Arithmetic and Second Geometry are exhausted and reprints of 1000 copies of each have been placed. First Geometry, which had a stock of 188 in July, was down to 65 in September and a further 1000 are on order. Algebra is actually now printing and it is expected that all four orders will be completed within the course of November. Mechanics was 131 in July and is now 62 so that this will clearly demand reprinting before long. The whole position is gratifying and shows clearly the value of this aspect of the work of the Association.

Lastly, the Council should be made aware of the fact that other reports on the teaching of mathematics are being produced, and it is disturbing to find that they are coming from bodies whose function is mainly that of directing educational policy or organising professional unity. There are obvious dangers in an unlimited extension of this practice. The County Borough of Blackpool produced a report during the war for the guidance of teachers in its service, and the I.A.A.M. has just set up a Committee to deal with a new Report on Mathematics. The Teaching Committee has been in correspondence with those responsible for the I.A.A.M. Committee and has offered help, information and advice as well as suggesting that the Association would be glad to nominate representative members to serve on the new Committee. So far there has been no response to this suggestion, though the offer of assistance has been welcomed, and it is the intention of the Teaching Committee to give all possible cooperation.

W. J. LANGFORD,
Chairman—Teaching Committee.

CORRESPONDENCE.

ON SOME TEACHING SUGGESTIONS

To the Editor of the *Mathematical Gazette.*

DEAR SIR,—I am surprised that Messrs. Durell and Robson should suggest in *M.G.* 290, the *complete* disuse of the word "isosceles". Note 1867 is unconvincing. If difficulty of spelling is a satisfactory reason then "equilateral", "hypotenuse" and "symmetry" should also be banned. Spelling devices are the proper solution, *e.g.*: On a base-line *SSEE* draw two equal isosceles triangles, *SOS*, *ELE*. Utter the incantation, "I can spell", and then write the three initial letters in place in the figure.

The result is magical: the pupil is *spell-bound*!

I regard with mixed feelings the modern enunciation quoted in Note 1867. It is a trite, standardised statement, lacking the rhythm, verbal conciseness, smooth flow of words, and (via "isosceles") the linguistic and historic interest of the old version, things which influence some pupils subtly, help their memory and lend interest to a lesson. True, its "if" and "then" are clearly differentiated and stated, but the pupil is thus deprived of the training involved in analysing the old version and setting out these aspects himself, while the teacher loses an interesting and informing discussion with his class. This is no "trivial matter". It illustrates the great danger that, in simplifying and standardising Geometry for weaker pupils, the subject may lose much of its educative character and become merely a training in doing geometrical exercises, as Arithmetic sometimes degenerates into "doing sums". It is to be hoped that enunciations like the old version, and words like "isosceles", will always be retained for setting out some *riders* in general terms. Apart from their educative value, however, they both enable an author or examiner to vary the form and phraseology of his riders. In Ex. XX of Durell's *Elementary Geometry*, three of the first seven riders are enunciated in general terms, and five of them contain the word "isosceles". Has Mr. Durell considered fully this aspect of the matter ? It seems to furnish a reply to Mr. Garreau's query (1st instance). Thus, some pupils, encountering the phrase "a triangle ABC in which $AB = AC$", would first image a scalene triangle ; a stupid pupil might even draw one. The author prevents this waste of energy by inserting "isosceles".

The verbal perambulation necessary in setting a rider on "a parallelogram that is not a rectangle" is a pointed instance of the need for a general term, or name. Such names are essential for clarifying and fixing geometrical ideas in young minds, and for some time I have been cogitating how to deal with the classification of parallelograms for primary school pupils, in the absence of this desirable term. I should be much obliged if Messrs. Durell and Robson would kindly consider whether some term, *e.g.* RHOMB, to include rhombus and rhomboid, could not be introduced for general use.

As regards other points of the letter, the danger mentioned above again needs consideration. There is considerable educational value for pupils in learning, or discovering, that a mathematical term, or idea, is no longer adequate, and must be replaced, supplemented or extended. Thus, it is an illuminating experience for them, and an interesting one, to find, what is apparently forgotten in (iv), that, in "Graphs", a straight line is called a curve, and that this word "curve" no longer means merely a curved line, but one of a "family" of lines. Such cases help to humanise the subject by showing mathematics as a growing organism, gradually improving ideas and practices of its youth, as it develops. The contribution this may make to the historical outlook of the pupil and to his social and moral development can only be referred to here. From this point of view, however, suggestion (ii) seems reasonable, for elementary pupils could appreciate the need for the convention. But not so the first alternative in (vii), *viz.* that AB should mean the whole line through A and B. It is sometimes forgotten that the symbol AB already has two meanings. It is both a descriptive and a quantitative term, *e.g.* AB is a line ; $AB = CD$. At present, in both aspects it indicates the same piece of line, but with the change the two pieces would be different. Pupils to S.C. standard would not see the need for this ambiguity. Nor do I see any reason for confronting them with it and what it involves. As to dispensing with such phrases as "AB produced", they represent ideas, essential to elementary geometry, which need symbolic expression under any convention. To make AB indicate the infinite line would, no doubt, obviate the need of this particular phrase, or, rather, its equivalent, but on some occasions only. We should still need its equivalent, and it would probably be a clumsier phrase, *e.g.* " the part of AB beyond B ". In fact, the ambiguity introduced into the meaning of AB would necessarily increase the complication of geometrical phraseology as a whole.

Suggestion (v) fails for similar reasons. S.C. pupils would hardly appreciate the distinction between quadrilateral and quadrangle, and certainly not the need for it. And the term " quadrangle ", meaning a figure of merely 4 points, *without angles*, is a most unhappy one to introduce to elementary pupils. I well remember my own long confusion over this term and the likeness of the two figures, when I started higher geometry. Similar objections rule out suggestion (iii). It postulates an ambiguous term, $x^{\frac{1}{2}}$, for pupils for whom definiteness is a first essential. Would they be expected to give four answers to an exercise such as $64^{\frac{1}{2}} + 36^{\frac{3}{2}}$, or, in logarithmic work, interpret $10^{\cdot 5}$ ambiguously? In the quadratic root formula would they be allowed to write as equally correct, $\surd(b^2 - ac)$ preceded by + or − or $\pm$? Or would there be a further convention standardising one of these terms or forbidding their use?

To sum up, the general effect of adopting suggestions (vii), (v), (iii), would be to increase the difficulty and artificiality of mathematics for elementary pupils. The advanced pupil would lose much of the educational value mentioned above; and his master would lose in interest and effectiveness of teaching method, through anticipation of some of his subject-matter by the suggestions.

There remains one other suggestion, (vi), and this I am glad to support. The three-letter formulae for congruence seem to me to be used very satisfactorily by S.C. candidates. May I put forward for consideration this set of formulae for similarity :

AAA/SP, SP/AAA, SASP/S,

and, for the ambiguous case,

ASSP/AS, ASSP/2R.

The large capital S should be replaced by some approved sign for similarity, *e.g.* Greek sigma, which is easily written, especially the small letter, σ. In considering the ambiguous case, it should be borne in mind that such formulae should serve not merely as references for examiners, but also as aids to the pupil's memory of the content of the propositions.

Yours faithfully, R. S. Williamson.

NEED FOR A SYMBOL.

To the Editor of the *Mathematical Gazette*.

Sir,—Considering the ubiquity of the word " bisect " in elementary geometry, it is rather surprising that no generally recognised symbol is in existence for it.

By way of suggestion, " AB bisects CD " might be written " $AB \mid CD$ ", and, further, " AB bisects CD at right angles " as " $AB \top CD$ ".

Cracknell and Perrott use the vertical line for " is perpendicular to ", possibly because the better-known symbol $\perp$ is difficult to print (by analogy with the old factorial sign $\underline{\lfloor\;\;}$). Does a new symbol seem called for, or are there too many already?

Yours truly, C. C. Puckette.

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