CORRESPONDENCE.

TO THE EDITOR OF THE "MATHEMATICAL GAZETTE."

DEAR SIR,—Your note (*Math. Gazette*, Oct. 1900, p. 397) on marking Euclid papers raises another question: *Should a boy have credit for giving the numbers of the propositions he uses*? I think most people will agree that—with two or three exceptions—a few words are better than a number.

Assuming for the moment that *word-references* are to be preferred to *number-references*, why is it so many boys give the latter? I have quite lately been working with boys fresh from many well-known preparatory schools—they almost all give *number-references*; are they taught to give these or do they do so to save themselves trouble? Judging from the awkward *word-references* they at first give, I am afraid they have never been told to give them. The question may be worthy of discussion, for teachers do not seem unanimous about it.

What are the arguments for *number-references*?

(1) Greater exactness of thought.

(2) Greater brevity, and therefore economy of boy's and master's time and thought.

In answer to

(1) I have found *many* cases where a boy gave the number of a proposition, but could not tell me what the proposition proved.

(2) Economy of time and also thought is a good excuse for the lazy—so far as economy of time is concerned, a little thought will enable the average boy to find a very short way of giving a word reference [*e.g.*:—I. 5, $\angle ABC = \angle ACB$ (angles at base of isos. $\triangle$)—I. 15, $\angle AOC$ = vert. opp. $\angle BOD$—I. 16, $\angle ACD >$ int. opp. $\angle BAC$—etc., etc.]. The great object of all teaching should be to make the pupil think (and thus increase his brain power), so that economy of thought is an evil.

Among arguments for a *word-reference* are the following:

(1) It requires a little more thought (there is great danger of becoming too mechanical in this age of bustle and hurry).

(2) It brings the proposition referred to and its essential points more vividly before the mind.

(3) It shows up the boy who has tried to learn his propositions with as little thought as possible and is a safeguard for the thoughtful boy (it is easy to mean the right proposition and give the wrong number).

(4) Great weakness is displayed in geometrical conics by boys who have been in the habit of giving number-references; in writing out propositions or riders, they at first refer to conic properties by number (which is absolutely useless and always will be unless a second Euclid is born), and then they give no references at all (which is perhaps worse).

It would be a great help to teachers generally to hear other people's opinions on this question, and the organ of (what was once) the A.I.G.T. is surely the proper place for such opinions to appear. The question is one of considerable importance and, though I fancy many (if not most) teachers will agree with me, I am afraid many do not practise what they preach.

Of course there are exceptions to every rule; references by number to such propositions as I. 4, I. 8, I. 26, and I. 47, I should certainly allow.—I am, yours truly,

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MATHEMATICAL NOTES.

95. [D. 2. d. α.] *Note on Periodic Continued Fractions.*

1. If ϕ be the periodic continued fraction

$$\underset{*}{a_1}+\frac{1}{a_2}+\frac{1}{a_3}+\ldots+\frac{1}{\underset{*}{a_n}}+\frac{1}{a_1}+\ldots,$$