siderate or courteous of eminent teachers in public school conventions to speak unkindly of the Ladies' Colleges. They have been erected at great cost by the liberality of public-spirited gentlemen, who take a deep interest in the promotion of National as well as private education. They ask no money from the public purse, and might reasonably expect some little encouragement from professional teachers instead of those ungracious cavillings in which some are wont to indulge.

The Ladies' College will nevertheless pursue its onward career, satisfied that it meets a great national want, and that in due time, in spite of all hindrances, it will be acknowledged and honored as a power for good in the higher Christian education of the daughters of the Dominion. I am, yours, etc.,

A. F. Kemp, M.A., LL.D.,

October 21st, 1879. Principal Ottawa Ladies' College.

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*To the Editor of the Canada School Journal.*

Sir,—I have been much interested by the thoughtful article in the September number, by J. H. Stewart, M.A., on the Subjunctive Mood. His remarks on the curious idiom by which hypotheses and their consequences, belonging to the potence, are expressed by the aid of past tenses, are very acute. I would, however, suggest this little modification. Instead of saying that "the speaker mentally transfers himself forward to the future," I should say that "the speaker mentally transfers the events referred to back into the *past*." It comes to much the same thing in the end, but I think the latter way of putting the matter falls in most simply with the actual idioms. Thus, if you wished to translate into Greek such a sentence as 'If he were here (now) I should see him (now),' you would use a phrase with the plain, direct Indicative Mood in the past imperfect tense, and running literally: "If he *was* here I *was seeing* him." Here there can be no question about the speaker transferring himself mentally to the *future*, because the whole sentence—hypothesis and consequence—refers to the *present*. But he does transfer the events or facts contemplated back into the past. On similar principles it is that the French made their conditional mood, "je donnerais (*I should give*) is literally je donner avais," 'I had to give,' just as the future 'je donnerai' is 'je donner ai,' 'I have to give.'

Also with regard to hypotheses like "if the prisoner is guilty, he deserves to be punished," there is no occasion for bringing in the consideration of the prisoner's guilt; this man has no doubt, and consequently he uses the indicative, because the same word will be used if he goes on to say: "If the prisoner is innocent, the witnesses have perjured themselves." We cannot treat each alteration as a matter of which we have no doubt. The indicative is used because the suppositions (with their consequences) have reference to what is actually *the fact*, one way or the other, though we do not know (or express ourselves as if we did not know) which alternative is in accord with the facts. It is important to distinguish '*having referred to* facts,' from '*being in accord with* facts.' The former decides the use of the mood, whether the latter holds good or not.

Allow me, however, to thank Mr. Stewart for his able remarks. "*O! Si Sic omnes!*" I hardly know how you fare out in Canada; but there is a dreadful quantity of thick-headedness on this side of the Atlantic. Yours faithfully,

C. P. Mason.

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## Mathematical Department.

Communications intended for this part of the Journal should be on separate sheets, written on only one side, and properly paged to prevent mistakes. They must be received on or before the 20th of the month to secure notice in the succeeding issue, and must be accompanied by the correspondents' names and addresses.

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### SOME PROPOSITIONS IN EUCLID, BK. II., BY SHORT METHODS.

Those propositions of Euclid, Book II., which, when expressed algebraically, are identities, may, with the exception of Prop. I., be established by using no other figure than the divided line, and yet by methods strictly Euclidean. In fact, they flow naturally from Prop. I. just as the corresponding algebraical identities flow naturally from the Distributive Law of Algebra, to which Prop. I. corresponds.

We suppose Prop. I. established by the ordinary method.

Prop. II. $A \quad C \quad B$. We may speak here of the *divided* line $AB$ and the *undivided* line $AB$. Then by Prop. I. the rectangle contained by the undivided line $AB$ and the divided line $AB$ is equal to the rectangles contained by the undivided line $AB$ and the segments $AC$, $CB$; *i.e.*, the square on $AB$ is equal to the rectangles $AB$, $AC$ and $AB$, $BC$.

Prop. III. We have here the divided line $AB$ and the undivided line $AC$, and by Prop. I. the rectangle $AC$, $AB$ is equal to the rectangles $AC$, $AC$ and $AC$, $CB$; *i.e.*, the rectangle $AC$, $AB$ is equal to the square on $AC$ together with the rectangle $AC$, $CB$.

Prop. IV. By Prop. II. the square on $AB$ is equal to the rectangles $AB$, $AC$ and $AB$, $BC$. But by Prop. III. the rectangle $AB$, $AC$ is equal to the square on $AC$ together with the rectangle $AC$, $CB$, and by the same prop. the rectangle $AB$, $BC$ is equal to the square on $BC$ together with the rectangle $AC$, $CB$. Therefore the square on $AB$ is equal to the squares on $AC$, $CB$ together with twice the rectangle $AC$, $CB$.

Prop. V. $A \quad C \quad D \quad B$. By Prop. IV. the square on $CB$ is equal to the squares on $CD$, $DB$ with the rectangles $CD$, $DB$ and $CD$, $DB$. But by Prop. III. the rectangle $CD$, $DB$ with the square on $DB$ is equal to the rectangle $CB$, $BD$, *i.e.*, to the rectangle $AC$, $DB$; and this rectangle $AC$, $DB$ with the other rectangle $CD$, $DB$ is by Prop. I. equal to the rectangle $AD$, $DB$. Hence the square on $CB$ is equal to the square on $CD$ with the rectangle $AD$, $DB$.

Prop. VI. $A \quad C \quad B \quad D$. By Prop. IV. the square on $CD$ is equal to the square on $CB$, the rectangle $CB$, $BD$, the rectangle $CB$, $BD$ and the square on $BD$. But the rectangle $CB$, $DB$ is equal to the rectangle $AC$, $BD$. And the rectangle $CB$, $BD$ with the square on $BD$ is by Prop. III. equal to the rectangle $CD$, $DB$. And by Prop. I., the rectangles $AC$, $BD$ and $CD$, $DB$ are together equal to the rectangle $AD$, $DB$. Therefore the square on $CD$ is equal to the square on $CB$ with the rectangle $AD$, $DB$.

Prop. VII. $A \quad C \quad B$. By Prop. IV. the square on $AB$ is equal to the square on $AC$, twice the rectangle $AC$, $CB$ and the square on $CB$. To each add the square on $CB$. Then the squares on $AB$, $BC$ are equal to the square on $AC$, twice the rectangle $AC$, $CB$ and twice the square on $CB$. But the rectangle $AC$, $CB$, with the square on $CB$, is by Prop. III. equal to the rectangle $AB$, $BC$. Therefore the squares on $AB$, $BC$ are equal to the square on $AC$ and twice the rectangle $AB$, $BC$.

Prop. IX. $A \quad C \quad D \quad B$. By Prop. IV. the square on $AD$ is equal to the squares on $AC$, $CD$ with twice the rectangle $AC$, $CD$. To each add the square on $DB$. Then the squares on $AD$, $DB$ are equal to the squares on $AC$, $CD$, $DB$ with twice the rectangle $AC$, $CD$. But twice the rectangle $AC$, $CD$ is equal to twice the rectangle $BC$, $CD$, and this together with the square on $DB$ is by Prop. VII. equal to the squares on $BC$, $CD$, *i.e.*, to the squares on $AC$, $CD$. Therefore the squares on $AD$, $DB$ are together double the squares on $AC$, $CD$.

Prop. X. $A \quad C \quad B \quad D$. The proof of Prop. IX. applies word for word to Prop. X.

In favor of the ordinary methods of establishing these propositions it may perhaps be said that they furnish us with exercises in geometrical proof and with a knowledge of the equality of certain parts of certain figures, and that they afford the advantage of dealing more immediately with the magnitudes themselves rather than with their names. On the contrary, it must be admitted that geometrical principles should be established by the clearest and most direct methods possible, and that it is an easy matter and the best plan to furnish whatever exercises on these principles