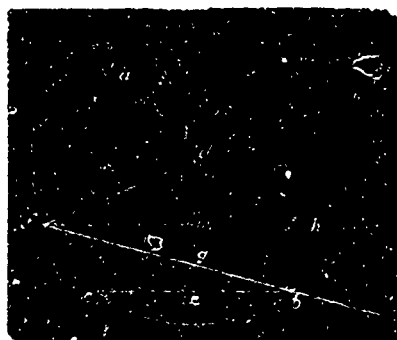


J. P. In your first attempt to solve Prob. 4, March issue, you say, "and by joining nP we have the two triangles $BB'C$ and nPI similar." If this is true, it should have been proved.

W. G. S. Your solution of Prob. 15, May number, was a mere guess method—it had not the merit of those in which the left-hand number of the equation was factored.

We have received the following trisection of a rectilinear angle from Mr. E. Stone Wiggins, of Ottawa. Mr. Wiggins speaks of it as his "solution of the long-famed problem to trisect a rectilinear angle by plane geometry." Mr. Wiggins seems to be in error in respect to the nature of his work. His solution is mechanical, and not the "geometrical" one long sought but not found. There are many other mechanical solutions, more or less easy of application. However, Mr. Wiggins' method is quite ingenious, and worthy a place in our journal.

TO TRISECT A RECTILINEAL ANGLE.



Let abc be any rectilinear angle.

In ab take any point d , and draw de perpendicular to ab .

Take a rule fn , leaving at its extremity f an eyelet that will admit the point of the compasses so as to be in the line of the side fg ; also having, in its side, a slide with a needle h , and which is likewise in a line with the side fg . Measure on the rule from f a distance $fg = db$. Fix the needle h (as you would fix the point of the compasses) at the point b . With a radius equal to db , place one leg of the compasses at d and the other at f , and sweep the instrument—of course carrying the rule with it—towards h till the point g meets the perpendicular de .

The angle fbc is one-third of the angle abc .

Join fd and draw fm perpendicular to de .

Now because fm and be are both perpendicular to de they are parallel, and therefore the angle $gfm =$ the angle gbc . Also because $fg = db$ and $db = df$, being radii of the same circle, $fg = fd$ and the angle $fdm =$ the angle fgm . And since the angle $fmg =$ the angle fmd , and the side fm is common to both triangles, therefore the angle $dfm =$ the angle gfm (I., 26.), and the angle dfg is double the angle gfm , and therefore double the angle gbc . But since $db = df$, the angle $dbf =$ the angle dfb ; therefore the angle dbf is double the angle gbc , that is, the angle fbc . Hence the angle fbc is one-third of the angle abc , and bisecting the angle abf by bg (I., 9.) the angle abc is bisected by the straight lines bf and bg .

NOTE.—When the given angle is greater than a right angle the construction must be made on its supplement.

The part not geometrical in the above occurs where it says "and sweep the instrument . . . the perpendicular de ."

—Under the able management of Mr. Clarkson the new High School at Seaforth is progressing admirably—since the opening in January there has been an average attendance of over 55 pupils.

Practical Department.

SOME CAUSES OF FAILURES IN TEACHING; AND REMEDIES SUGGESTED.

BY W. S. HALL, A.M.

THE CAUSES.

There are several of them. 1st. *The teacher.* The pupil is *not* or *should not* be the conductor of the school; consequently, we must not look at this point for any of the causes. Back of our own instructing, we may go for a place to locate the cause, for, if any blame is to be attached, we are only too ready to throw it on some one else.

It is sufficient to treat diseases as we find them in our own individual practice, not in our neighboring physicians. The primary cause of all diseases is some broken law of nature, either consciously or unconsciously. Now, do we not ruthlessly violate the law of nature when we attempt to break open the child's mind by the sledge-hammer system—compelling him to learn by rote so many rules and definitions, of the purport of which he has but the faintest idea? But you say, "I was taught in that way and know no other." Brilliant excuse for a teacher (?) to use! Study out some other! You require your pupils to study. Most assuredly you cannot be so utterly inconsistent as to require of them a task you are unwilling to perform yourself! Besides, you have not answered the question—you have not even suggested a remedy.

2nd Cause.—One of nature's prime laws is activity, either intellectual or physical. There is neither intellectual nor physical activity in asking a class a certain set of questions, or in hearing the same class recite a precise number of paragraphs from a grammar or history. This, when persistently carried on, is enough to make the brightest class dull—dead.

3rd Cause.—The want of ambition and enthusiasm on the part of the teacher. The school is what the teacher is—unambitious, enthusiastic, brilliant, scintillating, lazy or dull.

4th Cause.—Lack of any just conception of the true dignity of the teacher's office and utter unfitness for the incumbency. The dignity of this profession is second to none. The amount of fitness required for the work is of no mean or low order.

5th Cause.—Lack of a high standard of morality among teachers. Too many consider morality as belonging to the ministerial profession, and as totally distinct from pedagogics.

REMEDIES.

To cure a disease, we must necessarily cure the cause. Now, too frequently the teacher is the cause. This must be removed—radically—not palliated or covered over. He must be educated, in the broadest sense of that term; educated to institute and carry on original thought; educated to independently analyze human nature and the human mind. Before we hang pictures, we must have pegs upon which to suspend them. Before we decorate the mind room with pictures, we must supply and place the pegs. Ideas are the pegs, things the decorations. Teach the pupil the idea of number, before the definition. Definition is the natural outcome of this. It is, then, nothing more nor less than the word-picture of the idea.

2nd Remedy, *Activity*.—Too many teachers are born tired—too tired to be true teachers. I once knew a teacher (?) who had a class in geography numbering seventeen pupils. To each one were propounded these five questions:

"What state on the north of Illinois? What state on the east? What state on the south? What state on the west? What is the capital city?"