pupil without aid from the questioner:—

Place one and say how many squares face you. Write down the number.—Answer: One.

Add as many as make a square larger. How many have you added?—3.

Write down the number. What is the total?—4.

Add as many as make the square. How many have you added?—5.

And the total?—9.

What sort of numbers are 1, 3, 5?—Odd numbers.

And the numbers 4 and 9?—One even, the other odd.

And what numbers make up 4?—Two two's.

And 9?—Three three's.

What sort of numbers, then, are 4 and 9? Square numbers.

Continue to build up squares. How many do you add next?—7.

Write down the number and say what are down altogether.—1, 3, 5, 7, and the total 16.

How many numbers?—4.

And the total the square of what?—4.

Then the mode of forming the successive addition was deduced, and the fact that $1+3+5+\ldots+(2n-1)=n^2$ was established, and, it may be said, was discovered by the pupil.

THE HEURISTIC METHOD SUITABLE FOR CHEMISTRY AND PHYSICS.

There is, however, no subject that offers such scope for this method as chemistry and physics. An eminent chemist, in answer to an inquiry of mine as to his view of this question, and also as to the exact points of controversy, writes as follows:—

Elementary chemistry and physics are subjects admirably fitted to assist in educational development by heuristic methods, and very easy problems, such as "Why does iron rust?" "What happens to chalk when it is burnt?" may be put before the student, so that he may get some idea of the methods of discovery, *and learn to help himself.* A knowledge of the facts of a science, however interesting, will scarcely assist us in our everyday life. The controversy is between those who simply think that "knowledge is power" and those who hold that it is the knowledge of how to use knowledge that avails. Chemistry, to be of value educationally, must, according to the latter, be taught as are carpentering, cookery, and dressmaking—not by attendance at lectures (though these occasionally may be useful to students of such subjects), but by practical methods of investigation. Guide and assist the student by all means, they say, but let him depend as far as possible on himself.

The setting of little problems, as here indicated, is possible early in the teaching of science, but it is not quite the beginning. The first stage involves seeing and reasoning; the second doing, seeing, and reasoning.

Exercises in observation of experiments, performed by the teacher must precede experiments in the hands of the pupil, or much will be lost. One of the most enthusiastic advocates of this method, and of what he calls "juvenile research," Prof. Armstrong, seems to recognize this point of order, for he says:

In practice, the one serious difficulty met with has been to induce students to give themselves the trouble to consider what information is gained from a particular observation; to be properly inquisitive, in fact. I cannot think that this arises, as a rule, from mental incapacity. When we consider how the child is always putting questions, and that nothing is more