

IN the recesses of your being earnestly ask yourself these questions: How many good books have I read since I began to teach in this school? How many boys and girls are perceptibly better physically, intellectually and morally because of my teaching and influence? How many evenings during the term have I devoted to study, how many to fantastic frivolity, empty gossip, or unseemly revelry? How many recitations have I conducted listlessly, mechanically, monotonously, impatiently? How much time have I given to preparation for lessons? How many times have I punished or revoked in anger? How oft has the sun gone down on my wrath? How many times have I used slang in the school-room? Looking back over my work do I truly think that it can be said of me now or hereafter, "Well done, good and faithful servant?"

THE Prussian Ministry of Education has just admonished the school teachers in the rural districts under its supervision that numerous steps must be taken at once to preserve the health of the scholars. "Among the immediate and inexpensive measures," says the circular letter, "are the exact adaptation of the back of the school bench to the shape of the pupil's back, general cleanliness, add especially the prevention of dust, which, as all doctors know, is the medium of bacilli, and thus the cause of almost all skin and eye diseases among school children. Regard for the health of the eyes must dictate also the earliest possible abolition of slates. If no substitute can be found the use of slates must be confined at least to the first two years in the primary classes. The children must be so accustomed to the pen in these two years that all exercises from the beginning of the third year can be executed with pen, ink and paper. Slates are so injurious to the eye that they should be used only in cases of absolute necessity."

THE important thing is not so much that every child should be taught, as that every child should be given the wish to learn. What does it matter if the pupil knows a little more or a little less? A boy who leaves school knowing much, but hating his lessons, will soon have forgotten all he almost ever learnt, while another who had acquired a thirst for knowledge, even if he had learnt little, would soon teach himself more than the first ever knew. Children are by nature eager for information. They are always putting questions. This ought to be encouraged. In fact we may, to a great extent, trust to their instincts, and in that case they will do much to educate themselves. Too often, however, the acquirement of knowledge is placed before them in a form so irksome

and fatiguing that all desire for information is choked or even crushed out, so that our schools, in fact, become places for the discouragement of learning, and thus produce a different effect from that at which we aim. In short, children should be trained to observe and think, for in that way there would be opened out to them a source of the purest enjoyment for leisure hours, and the wisest judgment in the work of life.—*Sir John Lubbock.*

QUESTION DEPARTMENT.

A very simple question, asked by a little girl, has proved to be anything but simple in its solution. The question is as follows: Why is the rainbow arched rather than any other shape?

One has a hazy idea that the form is caused by the light striking the falling rain-drops; but to get a complete and yet a simple answer to the question has not been easy. Will you kindly give the solution needed in your valuable educational organ and oblige a group of enquirers, whose scientific knowledge is not the most profound. E. F.

The question is as to the form of the rainbow. This form is that of a bow—an arch—an arc—a part of the circumference of a circle. The higher the sun is, the smaller is the arc. If the sun is in the horizon, we see a whole semi-circle. If, at such a time, we were to measure the rainbow with a sextant we should find that its highest part was about 40° above the horizon, and that the part of the horizon spanned by the bow was a little over 80° . This rainbow, then, is half of the circumference of a circle whose radius is 40° . And the centre of the circle will be found to be that point in the sky directly opposite to where the sun is. Let us call this point the anti-sun. If the sun is above the horizon, the anti-sun will be below it, and the rainbow will be less than a semi-circle, but it will be found on measurement to be still an arc of a circle whose radius is 40° , and whose centre is in the anti-sun. If the sun is higher than 40° there will be no rainbow at all—at least no "primary" bow, which is the one considered here.

These are the chief facts as to the form. Why are these observed facts what they are?

The "hazy idea" is correct. To clear away the haze, take paper and pencil, and sit down and calculate the course of all the sun-rays which fall on one rain-drop. You will find that most of them leave the drop in lines that diverge from each other, "and through this divergence become so enfeebled as to be practically lost to the eye." But "at one particular angle the rays emerge from the drop almost parallel to each other, being thus enabled to preserve their intensity through long atmospheric distances." (Tyndall.) This angle is a little more than 40° , and these rays from this one rain-drop enter a spectator's