

who does not think of Euclid merely as a lower school subject? At the British Association discussion a great mathematician was astonished that I should ever have had to study the fifth book of Euclid. He said he was more fortunate, because he was never taught it. Well, I was never compelled to study it, but I took to it through mere affection such as my critic deems it his good fortune never to have experienced. What I regret is that any kind of demonstrative geometry was given me when a boy, but since it was given me I am glad to think that I had Euclid's philosophy undefiled. I even dipped into those books now never published—the seventh, eighth, ninth, tenth, and also the thirteenth, fourteenth, and the books added by some Greek author whose name I forget, the fifteenth and sixteenth. At the same time, I feel that if demonstrative geometry is to remain a school subject for the average boy, it is absolutely necessary to replace the second and fifth books by algebra. The view to which I hold most firmly of all my views about the teaching of mathematics is that demonstrative geometry ought never to be taught to boys at all; it ought never to be taught in schools. It is a higher university subject. Euclid's treatment of proportion and of incommensurables is one of the most beautiful parts of that exact philosophy which the conventional schoolmasters are constantly seeking to degrade. The old philosophers thought that only a very few men of the most acute race that ever lived on this earth were fit to begin the study of geometry, and we use it as "an instrument for the cultivation of the mind" of the average young barbarian. Even my sense of the parlous state of the country cannot prevent me from grinning at the Rabelaisian humour of the position. Boys are not swine, but if you will force pearls upon them for food (poor boys, they do not know that the pearls are only cheap imitations) you must expect but small results either physically or spiritually. It must always be a pleasant memory to them, however, that they once did have pearls to trample under foot or to give them indigestion, and one may say that they are fairly safe from pearl hunger all the rest of their lives. Will any of my opponents deny that they ceased to study Euclid when they left school, except in the way of their trade as teachers? How many of them know anything of—I need not say Euclid's real philosophy—but even of modern geometry and the beautiful system of transversals developed by the Irish geometers? I recollect a lovely year of my life in which I was introduced to three new things—Tennyson's "Idyls" and McDowell's "Geometry" and Homer's "Odyssey" (Bohn's translation), and I hardly know even now which of the three gave me most pleasure. But I had had the good fortune not to have pearls forced upon me as a boy. Yes, Cæsar wrote a book for the third form; what man who ever passed through the third form would now read Cæsar? Euclid wrote a book for the lower school; a lower school book let it remain.

And  $(a+b)^2 = a^2 + 2ab + b^2$  is equivalent to II. 4. And if  $\frac{a}{b} = \frac{c}{d}$ , then  $\frac{ma \pm nb}{pa \pm qb} = \frac{mc \pm nd}{pc \pm qd}$ , and this is equivalent to the immortal philosophy of the fifth book. "Great God, I'd rather be a pagan cradled in a creed outworn!" I would rather be utterly ignorant of all the wonderful literature and science of the last twenty-four centuries, even of the wonderful achievements of the last fifty years, than not to have the sense that our whole system of so-called education is as degrading to literature and philosophy as it is to English boys and men.

We are not the heirs of all the ages, and we shall not for very long remain in the foremost files of our time if we depend upon the schoolmasters. I place my faith in the common sense of the common people. In one way or another I find that they are learning to compute, to gain a knowledge of natural science. I know of many hundreds of night-school boys who were poor who are now successful engineers, and already youths are being

warned from trying to become engineers because their public school education would actually prevent their having a chance of success. They cannot understand the most elementary lectures in applied science. I know of a large employer who has already told the headmaster of a great public school that he will no longer employ public school boys unless a more rational method of teaching mathematics is adopted. And he is a public school boy himself! I am constantly being asked to recommend men to teach mathematics in technical schools and colleges, and warned that I must not recommend a Cambridge man. There is nobody who has a higher respect for Cambridge mathematics, for the achievements of past and present Cambridge men, than I have; but if Cambridge men will put themselves altogether out of sympathy with the needs of young engineers; if they will make no attempt whatsoever to look at things from the new point of view to which we have been forced; if without any attempt at examination they will in an off-hand way settle it that what we ask for is an illogical and soul-debasing non-educational preparation of an olla podrida of mere formulæ, then in sorrow and not without some anger we must try to get on without them. They do not know what a lovely bit of fighting they are leaving us to do all by ourselves, but I sincerely hope that they will not hamper us. Indeed, they must sooner or later help us against the common enemy, even if they are only to be armed as were the children of the mist. Because Isaac Newton was such a superb bowman and the English yew was ever the finest of materials, they will insist on the use of the antiquated weapon only. I sincerely hope that the English yew, which is very much of a graveyard tree, may not yet flourish over the grave of British industry.

But enough of these notions. I see a great fight ahead of our people, and bows and arrows are better than no weapons, as a twentieth of a loaf is better than no bread at all, and I welcome any instalment of reform, however small, in the teaching of mathematics in the public schools of England. And so long as my help is not rejected on the ground that I openly ask for a much greater reform and may be dangerous to my friends on that account, so long am I anxious to give my help and proud that it should be accepted.

JOHN PERRY.

#### Birds attacking Butterflies and Moths.

WITH reference to my previous letter in NATURE (January 16), I would say that the butterfly referred to was the *Terias silhetana* or *Terias laeta*, probably both.

Another bird that frequently catches these butterflies on the wing is the Indian Bee Eater (*Merops viridis*).

During a Christmas camp this season I came across a field where some twenty or thirty King Crows were busily engaged in catching butterflies; the day I first saw them, butterflies were numerous in this field, and it was easy to get undamaged specimens of *Terias silhetana*, *Terias laeta*, *Junonia lemonias*, *Tarucus theophrastus*, *Lampides elpis*, *Catopsilia pyranthe*, and some others which were not being caught in flight. Some three or four days later few King Crows were to be seen, the butterflies were much diminished in number, and nearly all those caught were damaged specimens. The birds perched on the tall dry Jowari stalks and made short flights on all sides, catching their prey sometimes on the wing, sometimes on the ground.

I could not say with certainty what butterflies were caught on the wing.

The King Crow and the Bee Eater are two of the commonest birds in this part of the country, and must cause a good deal of destruction in the course of a year.

ANNIE E. MCKAY.  
India, February 21.

#### "Nature-Study" Exhibition.

WILL you kindly permit me, while thanking you for the attention which you have already directed towards the above exhibition, to state that it has now been arranged to hold it at