

ignorant teachers till 12, 1638, about which time I was sent to Blandford school in Dorset, Mr. Sutton, B. D., who was ill-natured. Here I recovered my health and got my Latin and Greek. Our usher had (by chance) a Cowper's Dictionary, which I had never seen before. I was then in Torrance. Perceiving his method, I read all in the books where Ter. was, and then Cicero, which was the means by which I got my Latin. 'Twas a wonderful help to my phansie in reading of Ovid's Metamorph. in English by Sandys, which made me understand Latin the better. Also I met accidentally a book of my Mother's—Bacon's *Essays*—which first opened my understanding on the moralls, for Tullies Offices were so crabb'd for my young yeares) and the excellent clearness of the style, and hints and transitions." He also notes: "at eight I was a kind of Engineer, and then fell to Drawing. Copied pictures in the parlor in a table book. Not very much care for gram."

XCIV.

THE FIRST SCIENTIFIC TREATISES IN ENGLISH.

Here should be mentioned the founder of the school of English writers, that is to say, to any useful or sensible purpose,—Robert Recorde, the physician, a man whose memory deserves, on several accounts, a much larger portion of fame than it has met with. He was the first who wrote on Arithmetic, and the first who wrote on Geometry in English; the first who introduced Algebra into England; the first who wrote on Astronomy and the doctrine of the Sphere in English; and finally, the first Englishman (in all probability,) who adopted the system of Copernicus. Recorde was also the inventor of the present method of extracting the square-root; the inventor of the sign of equality; and the inventor of the method of extracting the square-root of multinomial algebraic quantities. According to Wood, his family was Welsh, and he himself a Fellow of All Souls' College, Oxford, in 1531; he died in 1558 in the King's Bench Prison, where he was confined for debt. Some have said that he was physician to Edward VI. and Mary, to whom his books are mostly dedicated. They are all written in dialogue between master and scholar, in the rude English of the time.

XCV.

THE SCIENCES AT OXFORD AND CAMBRIDGE.

An acute writer in the *Companion to the Almanac* for 1837 observes:—"The University of Cambridge appears to have acquired no scientific distinction in the Middle Ages. Taking as a test the acquisition of celebrity on the Continent, we find that Bacon, Sacrobosco, Greathead, Eastwood, &c., were all of Oxford. The latter University had its morning of scientific splendour, while Cambridge was comparatively unknown, and (with regard, at least, to definite college foundations,) hardly beginning to exist: it had also its noon-day illustrated by the names of such men as L. iggs, Wren, Wallis, Halley, and Bradley. The age of science at Cambridge is said to have begun with Francis Bacon; and but that we think much of the difference between him and his celebrated namesake, (Roger Bacon,) lies more in time and circumstances than in talents or feelings: we would rather date from 1600 with the former, than from 1250 with the latter. Praise or blame on the side of either university is out of the question, seeing that the earlier foundation of Oxford, and its superiority in pecuniary means, rendered all that took place highly probable. We rejoice in the recollections by the production of which we are enabled to show that this country held a conspicuous rank in the philosophy of the Middle Ages; and we cheerfully and gratefully remember that, to the best of our knowledge and belief, we are in a great measure indebted for the liberty of writing our thoughts to the cultivation of the liberalizing sciences at Oxford in the dark ages. With regard to the University of Cambridge, for a long time there hardly existed the materials for any proper instruction, even to the extent of pointing out what books should be read by a student desirous of cultivating astronomy. Of this we have a remarkable instance.

Jeremiah Horrocks, who is well known to astronomers as having made a greater step towards the amendment of the lunar theory than any Englishman before Newton, and whose course might be well known to every reader, but that he died at the age of 23, was at Cambridge in 1633-1635. From the age of boyhood he had been wholly given to the desire of making himself an astronomer. But he could find no one who could instruct him, who could help him by joining him in the study—"such was the sloth and languor which had seized all." Horrocks found that books must be used instead of teachers: these he could not obtain in the University; nor could he there even learn to what books he should direct his attention. Nor were the books themselves which Horrocks (having

but small means, and desiring the very best,) afterwards bought, in any one instance that we can discover, printed in England.

A school-book of great popularity may be mentioned here. This is the well-known "*Cocker's Arithmetic*." The author, born about 1631, was an engraver and a teacher of writing and arithmetic, and the writer of several books of exercises in penmanship, some of them on silver plates. His celebrated "*Arithmetic*" was not published until after his death, before 1667: in the title-page it is described as "a plain and familiar method, suitable to the meanest capacity, for the full understanding of that incomparable art, as it is now taught by the ablest schoolmasters in City and Country." The first edition appeared in 1677; the fourth in 1682; the thirty-seventh in 1720: there is no copy of either edition in the British Museum, the libraries of the Royal Society, St. John's College, or the London Institution: a copy of the edition of 1678 has been sold for £l. 10s. *Cocker's Arithmetic* was the first which entirely excluded all demonstration and reasoning, and confined itself to commercial questions only. This was the secret of its extensive circulation: upon it, nine out of ten of the subsequent Arithmetics have been modelled; and every method since the author's time has been "according to Cocker."

(To be continued.)

Suggestive Hints towards Improved Secular Instruction.

BY THE REV. RICHARD DAWES, A. M.

XI.

NATURAL PHILOSOPHY.

Nature herself seems to give a very instructive hint on this part of education, in the amusements of early childhood. We see a child as soon as it can use its hands, trying to move, or to lift anything which it can, placing it first in one position, then in another, and trying it in all the various ways which its senses admit of—in fact, making a variety of experiments with it, and this is generally looked upon as a mere amusement: but children when thus employed, are, as has been observed by Dr. Reid, "acquiring the habits of observation, and by merely indulging an undetermined curiosity, are making themselves acquainted with surrounding objects. If some new effect occurs from any of their little plays, they are eager to repeat it. When a child has for the first time thrown down a spoon from the table, and is pleased with the jingling noise upon the floor, if another or the same is again given to him, he is sure to throw it down, expecting the same noise to occur; but if a piece of wood is given, he very soon finds out that the same effect does not take place, and is no longer anxious to repeat the experiment. So long as the noise goes on, the child has pleasure in repeating it, and if two objects are given, one of which produces a noise when thrown down in this way, and the other not, he very soon finds out the difference, and acts accordingly, and this is, in fact, the method of induction. The child is thoroughly persuaded that a jingling noise is sure to follow his throwing down the spoon, and goes on repeating it till he is tired."

"Such," observes the same philosopher, "is the education of kind Nature, who, from the beginning to the end of our lives, makes the play of her scholars their most instructive lessons, and has implanted in our mind the curiosity and the inductive propensity by which we are enabled and disposed to learn them."

It is an observation of the late Professor Daniel, in some of his works, "that the principles of natural philosophy are the principles of common sense," and from my own experience here in introducing this kind of teaching into the school, I am confident that, with those who have been able to remain to an age to profit from it, it has given an interest in what they are learning, and a kind of practical character to it, which no other teaching could give.

I recollect many years ago, going into a school in Germany, and a German gentleman with whom I was, observed of something they were teaching, "das ist kein practicable ding," that is no practicable thing—the impression made at the time has remained on my mind ever since. We look upon the Germans as a people fond of theories, but this appeared to me a sensible remark.

The following hints are intended to show to our school-masters, of the class for which this book is intended, the importance of being so far instructed in subjects of this nature, as to be able to point out in a common-sense way, some of those results in science which bear more immediately on the occupations of life; these will be found not only interesting and instructive to the children while