inbred tendency to observe and compare, and forcing his pupil to attend to dry abstractions, were first to systematize and render scientific the stores of fact his pupil already have, and then to make these the basis of further progress, learning would become easy and pleasant; but alas! where are the teachers to be found competent to take this first step in rational education? They cannot be found till education in science shall have taken a higher place in our systems of instruction.

At present many difficulties oppose this desirable consummation. Nearly all our educators are still wedded to the abstract scholastic methods of education still in use. Even our science textbooks are generally tainted with the same bad leaven. It is difficult to procure apparatus and collections for schools, and still more difficult to secure public appreciation of the work. All scientific educators throughout the world are daily struggling with these disadvantages, and they will in due time be removed. When this shall be, and when science shall have taken its true place as an educator, a new era will have dawned upon the world, in the added force given to intellect, and in the more full and satisfactory solution of all the hard questions which beset society.

(To be Continued.)

CAMPING OUT AT CASCO BAY.

BY A. E. C.

Casco Bay on the coast of Maine is a very attractive resort to the tourist or the naturalist. Extending well inland beyond "where the sea fogs pitch their tents and mists from the mighty Atlantic" its shores combine the dryness and genial warmth of the land breeze with just enough of the flavor of old ocean to make a brief sojourn there during the heat of summer truly delightful. The bay is studded with islands of every variety of size and shape from the small barren rock to those containing large farms, churches and a considerable population. A trip among these islands on a Portland Str. is always an enjoyable excursion. To the lover of Nature or the student of nature Casco Bay offers inducements of no ordinary kind. In addition to the picturesque scenery and the delightful climate the naturalist will find a variety of minerals, a good opportunity of studying marine life, and the exceptional privilege of making a complete collection of post-pliocene mollusks.

It was the writer's good fortune in the summer of '82 to be included in a party of four Scientists who were to spend some weeks on Prince's Point with the double purpose of recruiting physically and studying such natural objects as might fall in our way. The Point projects into the Bay between two Stations of the Grand Trunk R. R., Cumberland and Yarmouth, and may be reached from either. Two of our party, the Professor and Mr. W. were to come on the Maine Central from Waterville, and Mr. H. and myself were to meet them at the Junction. The principals of the party being old campers-out came thoroughly prepared, *utrumque paratus*. They brought an enormous quantity of *impedimenta* but it was all useful when life on the shore began. In addition to tents, camping chests, and various kinds of outfits, such as the uninitiated would never think of, they brought a fine boat, the *Iron Duke*, buoyant enough to carry half a dozen and light enough for two to carry up the beach. The boat, the baggage and ourselves were soon on board a hay-wagon we had chartered and *en route* for the Point. This journey having being accomplished our real camp life begun. Two tents were pitched, the *Iron Duke* was launched and two of the party who knew the ground were in a few minutes loading the boat with cunners and flat fish, while the others were preparing for the first meal. All were busy like Æneas and his companions on the African coast. "Some cut into parts and fix on spits the quivering limbs, others place the brazen caldrons on the shores and prepare the fires." Thus was our life on the shores auspiciously begun.

(*To be Continued.*)

THE TRANSIT OF VENUS.

BY PROF. A. E. COLDWELL.

The great importance attached to this astronomical event has made it the subject of innumerable articles in Scientific magazines, literary periodicals and the daily press, so that almost every intelligent reader has some conception of what the transit is and what results are to be obtained from accurate observations of it. Venus, being an interior planet, at certain times in its orbit comes directly between the earth and the sun and appears to the observer as a dark spot on the disk of that luminary. This passage of Venus across the disk of the sun gives to astronomers an opportunity for getting the difference of the parallaxes of the two bodies, and as their relative parallaxes are known from one of Kepler's laws the absolute distance of the sun from the earth is thus obtainable. This distance is a very important one to the student of the heavens for it is his unit of measure and on its accuracy depends the accuracy of all his other measurements. The comparative distances of the planets from the sun are known from the law "That the cubes of their mean distances are proportional to the squares of the times of revolution." Having then the absolute distance of any one, as the earth, the distances of the others can be easily found. The diameter of the earth's orbit is the astronomers base line for ascertaining the distance of the stars and an error in this base will be increased a great many thousand fold in the operation.

It this connection it may not be uninteresting to give a short sketch of the attempts to get the distance between the earth and sun. The first to attack the problem was Anstarchus (281—264, B. C.,) He attempted to determine the sun's distance by measuring the angle between it and the moon at quadrature. This result was entirely too small being only twenty times the distance of the moon. Ptolamy (20 A. D.) thought that the more distant the sun the smaller would be the shadow of the earth on the moon when the latter was eclipsed. He attempted to measure this shadow and obtained from his observations and calculations 1210 radii of the earth for the sun's distance. This very erroneous result was given to the world in the "Almagest," and accepted as reliable for fourteen centuries. In the 17th century mind began to wake up from its long sleep and this problem was again attacked. By a different process, Huyghens made the distance 99 millions of miles! In 1671,