GOODNESS.—The wind is unseen, but it cools the brow of the fevered one—sweetens the summer atmosphere—and ripples the surface of the lake into silver spangles of beauty. So goodness of heart, though invisible to the material eye, makes its presence felt, and, from its effects upon surrounding things, we are sure of its existence.

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NOTICE.

In order to extend the circulation of the EDUCATIONALIST, we issue a few copies more than we have subscribers for, which we send to our friends, whom we will hold as subscribers unless the papers are returned before the next number reaches their post office.

MAGNITUDE OR SIZE OF THE EARTH.

Having ascertained the figure of the earth, our next inquiry must be as to its magnitude; and since it is a globe, all that we are required to know is the length of its diameter. If a line were described surrounding the globe, so as to form a circle upon it; the centre of which should be at the centre of the globe, such a circle is called a great circle of the earth. Now if we knew the length of the circumference of such a circle, we could easily calculate the length of its diameter. For the proportion of the circumference to the diameter is exactly known. But we could calculate the circumference if we knew the length of one degree upon it; since we know that the circumference consists of 360 degrees, we should, therefore, only have to multiply the length of one degree by 360 to obtain the circumference, and should thence calculate the diameter. It will be necessary, at this stage, to show how the latitude of a place is obtained.—Now let us suppose two places selected which are upon the same meridian of the earth, and therefore have the same longitude, and which are not very far removed from each other. Let the two places selected be such that the distance between them can be easily and accurately measured. Now let the latitude of the two places be accurately determined, and let us suppose that the difference between these two latitudes is found to be a degree and a half, and suppose that on measuring the distance between them that distance is found to be one hundred and four miles, we would then infer that such must be the length of one degree and a half of the earth's surface, and that consequently the length of one degree would be two-thirds of this or 69⅓ miles. Having thus found the length of a degree, we should have to find by the usual mode the diameter of the earth, which would prove to be a little under 8000 miles. We conclude then that the earth is a globe eight thousand miles in diameter.

DISTANCE OF THE EARTH FROM THE SUN.

When we say that the distance of the earth from the sun can be measured with the same degree of accuracy, with which we ascertain the distances of bodies on the surface of the earth, those who are unaccustomed to investigation of this kind usually receive the statement with a certain degree of doubt and incredulity; they cannot conceive how such spaces can be accurately measured, or indeed, measured at all. Thus when they are told that the sun is at a distance from the earth amounting to 95,000,000 of miles, the mind instantly revolts from the idea that such a space could be exactly ascertained and measured. But let us ask why is this difference? why is this unbelief? Is it because the distance thus measured is enormously great? To this we reply that the magnitude of a distance or space does not constitute of itself any difficulty in the admeasurement. In fact, on the contrary, it is often the case that we are able to measure large distances with greater accuracy than small ones; this is frequently so with surveys conducted on the surface of our globe. If then the greatness of the magnitude does not constitute of itself any difficulty, to what are we to ascribe the doubt entertained in regard to such measurement? But some object by saying that the object is inaccessible to us; that we cannot touch it; that we cannot travel over the intermediate space, and measure it. But again let us ask whether this circumstance of being inaccessible constitutes any real difficulty in the measurement of the distance of an object.

The military engineer, who directs the projectiles against the buildings within a town which is besieged, can, as we well know, level them to cause [illegible] of any individual building [illegible] may have been [illegible] To do this he must know the exact distance of the building from the mortar. Yet the building is inaccessible to him; the walls of the town the fortifications, and perhaps a river intervene. Yet he finds no difficulty in measuring the distance of this inaccessible building. To accomplish this, he lays down a space upon the ground he occupies, called the base line, from the extremities of which he takes the bearings, or directions of the building in question. From those bearings, and from the length of the base line, he is enabled to calculate, by the most simple principles of geometry and arithmetic, the distance of the building. Now imagine the building to be the sun, and the base line to be the whole diameter of the globe of the earth, in what respect would the problem be altered? The building within the town is inaccessible—so is the sun—the base line of the engineer is exactly known—so is the diameter of the earth—the bearings of the building from the end of the base line are known—so are the bearings of the sun's centre from the extremities of the earth's diameter. The problems are in fact, identical. In short, the measurement of distances of objects in the heavens is effected upon principles, in all respects similar to those which govern the measurement of distances upon the earth, nor are they attended with a greater difficulty, or more extensive sources of error. Thus then the distance of the earth from the sun is calculated to be 95,000,000 of miles.

The earth is not always the same distance from the sun. And it is a remarkable fact that the earth is most remote from the sun at midsummer, and nearest to the sun at midwinter. But how is it known that the earth is nearer the sun at one time than at another, and that it is nearest in midwinter? Well, it has been ascertained by the following observations. In astronomical telescopes there are placed by a particular arrangement within the eye-pieces, certain very fine threads or wires which are extended parallel to each other across the field of view. These wires are so constructed, that by a simple mechanical contrivance, they may be moved towards each other, preserving, however, their parallelism. The mechanism which so moves them, is made to measure exactly the distance between them. When such telescope is presented to the sun or moon, the wires may be adjusted by turning a screw, that one of them shall touch the upper, and the other the lower limb of the disk [illegible]