

WEEKLY MISCELLANY.

Devoted to the Intellectual and Moral Improvement of the Young.

Vol. 1. Halifax, N. S. Thursday, January 28, 1864. No. 31.

PUBLISHED WEEKLY, AT \$1 PER YEAR
IN ADVANCE, BY

W. Cunnabell, 155 Upper Water Street.

Subscriptions received by the Agents, and at the
office of publication.

HALIFAX, N. S. JANUARY 28, 1864.

ECLIPSES AND THEIR CAUSES.

According to the almanacs for 1864, there will be two eclipses this year—both of the Sun—the first will take place on the 5th May, the second on the 30th October; but neither of them will be visible in Nova Scotia.

One of the most striking and rare occurrences of this kind was an annular eclipse of the Sun, which took place on the 15th March, 1858. The prediction of this remarkable phenomenon attracted general attention in England, and the people turned out to watch the eclipse, with every variety of aid to observation, from the humble bit of smoked glass to the imposing telescope. This eclipse was of greater magnitude than any one which had occurred during the previous hundred years, or will be again visible till time has made more than an indention on the twentieth century.

The following explanation of these celestial phenomena—which we transcribe from the *Family Herald*—will doubtless be interesting to our readers generally:—

Cause of Eclipses.—All opaque or dark bodies, when light is shining, cast a shadow in an opposite direction to the light. This shadow is nothing but a privation of light in the space hid by the dark body intercepting the luminous rays. Every planet and satellite is illuminated by the sun, and casts a shadow through space towards that part of the heavens which is opposite to the sun. When the earth comes between the sun and the moon, the moon is in the earth's shadow, and having no light of her own, she suffers a real eclipse from the interception of the sun's rays. When the moon comes between the sun and the earth, the sun appears partly or wholly covered, and is said to undergo an eclipse: though, properly speaking, it is only an eclipse of that part of the earth on which the moon's shadow falls. An observer, looking from the moon's surface would see this shadow, like a dark line of greater or less length, travelling across the earth.

Why are there so few Eclipses of the Sun?—If the moon's orbit or path were always in the same plane as the earth's orbit, its shadow would fall upon the earth at every change, and eclipse the sun to some parts of the earth. But one half of the moon's orbit is elevated several degrees above the ecliptic (the plane in which the earth always moves, and in which the sun appears to move in the heavens) and the other half of the moon's orbit is as much depressed below the ecliptic. Consequently, it is only when the moon is in or near one of the nodes or points where the two orbits intersect one another, that she can come between the earth and the sun. In every other part of her orbit she will pass either above or below the sun. Take two hoops or rings, placing one within the other, and then make the inclination of the rings different, the two points where the orbits or planes join are the nodes.

Why do Solar Eclipses only occur at New Moon?—The moon being an opaque body is only seen by the sun's light reflected from it. At full moon the moon is in opposition, or in the part of her orbit opposite the sun, and the light appears reflected from the whole disk. The moon's diurnal rotation on her axis occupying exactly the same time as her revolution round the earth, it follows that the same hemisphere of the moon is always turned to the earth, although every part of her surface is successively presented to the sun. The different appearances of the moon in various parts of her orbit depend on her position in respect to the observer, who sees greater or less of her disk irradiated by the sun, and reflecting his rays. When the moon comes round in her orbit to the same direction as the sun, no part of the light which she receives can be reflected, the disk facing the earth being consequently, wholly invisible. This is called the time of conjunction, or new moon. At this time it is "full earth" to the inhabitants of the moon, if such there be; the earth shining like an orb of light thirteen times the size that the full moon appears to us. When the moon has moved an eighth part of her orbit, a quarter of her enlightened surface is seen from the earth, and so on throughout her phases, till again in conjunction. She then becomes invisible, passing either above or below the sun, except when in or near a node of her orbit, when she is seen as an opaque body, covering the whole or part of the sun's disk.

Cause of Eclipses of the Sun being Total, Partial, or Annular.—If the moon

does not happen to be in one of the nodes, or exactly in a straight line with the earth and sun, but a few degrees (about 16) above or below, a partial eclipse will be produced, the upper or lower parts of the sun being obscured to certain parts of the earth's surface, according to the moon's position. If the moon is exactly in one of the nodes the eclipse of the sun will be either total or annular; in the former case the whole solar disk being hid; in the latter, a narrow ring of the disk remaining uncovered. This difference is caused by the relative distance of the moon from the earth at the time. Any opaque object held before the eyes will hide a larger or lesser space from vision, according as it is held near or at a greater distance. The rays of light from the space covered no longer reach the eyes. The moon's orbit round the earth not being a perfect circle, but elliptical in shape, it is nearer to the earth, or to the sun at some times than others. When an annular eclipse occurs, the relative distance of the moon is not sufficient to intercept the whole disk of the sun, and rays of light reach the eye from the annulus or ring of the sun remaining uncovered. At other times the relative distance of the moon is such as wholly to intercept the sun's rays, and a total eclipse occurs. The shadow of the moon, as of all spherical bodies, being conical, and the cone not being large, from the comparatively small size of the moon, it can only cover a limited portion of the earth at a time. If the moon's orbit were at a greater distance from the earth—so great that the apex or point of its conical shadow could not reach any part of the earth's surface—there would be no eclipse of the sun at all; but the passing of the moon across the sun's disk could only be observed, like the transit of a planet, by astronomers.

Family Department.

A French Beverage.—Boil four ounces and a half of powdered ginger in fourteen quarts of water, wine measure. Then beat up four whites of eggs to a froth, and mix them, together with nine pounds of white sugar, in the preceding. Then take nine lemons, and peel them carefully; add the juice and the rind to the foregoing ingredients. Put the whole into a barrel; add three table-spoonfuls of yeast. Bung down the barrel, and in about twelve days bottle it off. In fifteen days it will be fit for drinking; but it improves by keeping.