APPENDIX.

through the northern than the southern signs; the sun travels from the equator to Capricorn, and returns from that tropic to the equator sooner, than from the equator to Cancer, and from the latter tropic to the equator. In other words, the time between the vernal and autumnal equinox, exceeds the time between the autumnal and vernal equinox, by about eight days. This is caused by the earth's place in her elliptical orbit being nearer the sun in December than in June, by about 3,000,000 of miles;—the sun being in his *perihelion* in winter, and in his *aphelion* in summer, the earth of course moves swifter in her orbit as she approaches the huge body of the sun.

The sun's disk is a little broader, and his apparent diameter greater, when in his perihelion, than when in his aphelion.

His apparent diameter is 32' 35' 6 in December, — and only 31' 31'' in June. The sun not being in the centre, but in what is called one of the lower *foci* of the orbit, increases the space to be traversed while he remains north of the equator, that is, from the vernal to the autumnal equinox. It is of little consequence, whether we call the greater length of the northern over the southern season seven or eight days.

It is a familiar truth in philosophy, that a cause, however small, steadily, silently and incessantly operating, must produce stupendous effects. The comparative shortness of the southern summer, and the vast expanse of water in that hemisphere,—these united causes have been in operation for ages, and have produced effects that have fixed it forever behind the northern hemisphere.

The nearness of the sun in December by about one-thirtieth of his mean distance, must increase the intensity of his rays, and add to his temporary heat about one-fifteenth.

What has been the effect of the sun's proximity upon the large bodies of land in New-Holland and Buenos Ayres? Has it not scorched and parched the earth's surface, and in many respects, rendered it an unpleasant abode for man? Such is the *peculiar* heat of the atmosphere in New-Holland, that a conflagration caused by an incendiary convict, caused immense destruction. Buildings, fences, and woods are rendered so highly combustible, that it is difficult to check the spread of a fire. Immense lasses have been sustained by the settlers and the British government in consequence. I think this must be owing to the increase of the sun's heat, as his distance is lessened when he approaches the southern tropic. It will be observed that the *average* annual heat is less here than in the north—yet the inferior fertility is not *wholly* owing to that alone. There are, doubtless, many other minor causes; such as irregularity and inequality in the distribution of the heat;—and in the formation of the surface of the soil itself.

Van Dieman's Land produces stupendous trees;—they are said to measure sixty-three feet in circumference, and to reach the height of 180 feet before putting forth any limbs; but with all this exuberant vegetation, there is not one *natural* production of the land which affords the smallest subsistence to man!! We can find nothing like this in the northern hemisphere—nothing like a fertile soil and immense activity in vegetation, and yet that is so niggardly to man! Some cause, or combination of causes, must exist in order to produce this amazing singularity—in order to render these countries so *unlike* any others on the earth. I repeat, that none can be named so apparent and permanent, as the two above stated, that is, the greater obliquity of the sun's rays, and the wide waste of waters in this hemisphere.

It will be said, that the southern zone differs from itself—that Chili differs from La Plata, and that South Africa and Australia differ in many respects. All this is well known and admitted,—but these countries are uniform on one point: they all fall below the countries in the corresponding latitudes north of the equator; and they all cause a degeneracy in the European emigrants.