

## Day Three: Thursday Morning, August 27, 1835

### GREAT ASTRONOMICAL DISCOVERIES

Lately Made

BY SIR JOHN HERSCHEL, L.L.D, F.R.S, &c.

#### At The Cape of Good Hope.

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[Continued from yesterday's Sun]

"The astonishing and beautiful discoveries which we had made during our first night's observation, and the brilliant promise which they gave of the future, rendered every moonlight hour too precious to reconcile us to the deprivation occasioned by those two cloudy evenings; and they were borne with strictly philosophical patience, notwithstanding that our attention was closely occupied in superintending the erection of additional props and braces to the twenty-four feet lens, which we found had somewhat vibrated in a high wind that arose on the morning of the 11th.

The night of the 13th (January) was one of pearly purity and loveliness. The moon ascended the firmament in gorgeous splendor, and the stars, retiring around her, left her the unrivalled queen of the hemisphere. This being the last night but one, in the present month, during which we should have an opportunity of inspecting her western limb, on account of the libration in longitude which would thence immediately ensue, Dr. Herschel informed us that he should direct our resources to the parts numbered 2, 11, 26 and 20 in Blunt's map, and which are respectively known in the modern catalogue by the names of Endymion, Cleomedes, Langrenus, and Petavius. To the careful inspection of these, and the regions between them and the extreme western rim, he proposed to devote the whole of this highly favorable night. Taking then our twenty-five miles breadth of her surface upon the field of view, and reducing it to a slow movement, we soon found the first very singularly shaped object of our inquiry.

It is a highly mountainous district, the loftier chains of which form three narrow ovals, two of which approach each other in slender points, and are united by one mass of hills of great length and elevation; thus presenting a figure similar to that of a long skein of thread, the bows of which have been gradually spread open from their connecting knot. The third oval looks also like a skein, and lies as if carelessly dropped from nature's hand in connection with the other; but that which might fancifully be supposed as having formed the second bow of this second skein is cut open, and lies in scattered threads of smaller hills which cover a great extent of level territory.

The ground plan of these mountains is so remarkable that it has been accurately represented in almost every lineal map of the moon that has been drawn; and in Blunt's, which is the best, it agrees exactly with my description. Within the grasp, as it were, of the broken bow of hills last mentioned, stands an oval-shaped mountain, enclosing a valley of an immense area, and having on its western ridge a volcano in a state of terrific eruption. To the north-east of this, across the broken, or what Mr. Holmes called 'the vagabond mountains,' are three other detached oblong formations, the largest and last of which is marked F in the catalogue, and fancifully denominated the Mare Mortuum, or more commonly the 'Lake of Death.'

Induced by a curiosity to divine the reason of so sombre a title, rather than by any more philosophical motive, we here first applied our hydro-oxygen magnifiers to the focal image of the great lens. Our twenty-five miles portion of this great mountain circus had comprehended the whole of this area, and of course the two conical hills which rise in it about five miles from each other; but although this breadth of view had heretofore generally presented its objects as if seen within a terrestrial distance of two and a half miles, we were, in this instance, unable to discern these central hills with any such degree of distinctness. There did not appear to be any mist or smoke around them, as in the case of the volcano which we had left in the south-west, and yet they were completely indistinct upon the canvass. On sliding in the gas-light lens the mystery was immediately solved. They were old craters of extinct volcanoes, from which still issued a heated though transparent exhalation, that kept them in an apparently oscillatory or trembling motion, most unfavorable to examination. The craters of both these hills, as nearly as we could judge under this obstruction, were about fifteen fathoms deep, devoid of any appearance of fire, and of nearly a yellowish white color throughout. The diameter of each was about nine diameters of our painted circle, or nearly 450 feet; and the width of the rim surrounding them about 1000 feet; yet notwithstanding their narrow mouths, these two chimneys of the subterranean deep had evidently filled with lava and ashes with which it was encumbered, and even added to the height, if not indeed caused the existence of the oval chain of mountains which surrounded it.

These mountains, as subsequently measured from the level of some large lakes around them, averaged the height of 2,800 feet; and Dr. Herschel conjectured from this and the vast extent of their abutments, which ran for many miles into the country around them, that these volcanoes must have been in full activity for a million years. Lieut. Drummond, however, rather supposed that the whole area of this oval valley was but the exhausted crater of one vast volcano, which in expiring had left only these two imbecile representatives of its power. I believe Dr. Herschel himself afterwards adopted this probable theory, which is indeed confirmed by the universal geography of the planet. There is scarcely a hundred miles of her surface, not excepting her largest seas and lakes, in which circular or oval mountainous ridges may not be easily found; and many, very many of these having numerous enclosed hills in full volcanic eruption, which are now much lower than the surrounding circles, it admits of no doubt that each of these great mountains is the remains of one vast mountain which has burnt itself out, and left only these wide formations of its ancient grandeur. A direct proof of this is afforded in a tremendous volcano, now in its prime, which I shall hereafter notice.

What gave the name 'The Lake of Death' to the annular mountain I have just described, was, I suppose, the dark appearance of the valley which it encloses, and which, to a more distinct view than we obtained, certainly exhibits the general aspect of the waters on this planet. The surrounding country is fertile to excess: between this circle and No. 2 (Endymion), which we proposed first to examine, we counted not less than twelve luxuriant forests, divided by open plains, which waved in an ocean of verdure, and were probably prairies like those of North America. In three of these we discovered numerous herds of quadrupeds similar to our friends the bisons in the Valley of the

Unicorn, but of much larger size; and scarcely a piece of woodland occurred in our panorama which did not dazzle our visions with flocks of white or red birds upon the wing.

"At length we carefully explored the Endymion. We found each of the three ovals volcanic and sterile within; but, without, most rich, throughout the level regions around them, in every imaginable production of a bounteous soil. Dr. Herschel has classified not less than thirty-eight species of forest trees, and nearly twice this number of plants, found in this tract alone, which are widely different to those found in more equatorial latitudes. Of animals, he classified nine species of mammalia, and five of ovipara. Among the former is a small kind of rein-deer, the elk, the moose, the horned bear, and the biped beaver. The last resembles the beaver of the earth in every other respect than in its destitution of a tail, and its invariable habit of walking upon only two feet. It carries its young in its arms like a human being, and moves with an easy gliding motion. Its huts are constructed better and higher than those of many tribes of human savages, and from the appearance of smoke in nearly all of them, there is no doubt of its being acquainted with the use of fire. Still its head and body differ only in the points stated from that of the beaver, and it was never seen except on the borders of lakes and rivers, in which it has been seen to immerse for a period of several seconds.

"Thirty degrees farther south, in No. 11, or Cleomedes, an immense annular mountain, containing three distinct craters, which have been so long extinguished that the whole valley around them, which is eleven miles in extent, is densely crowded with woods nearly to the summits of the hills. Not a rod of vacant land, except the tops of these craters, could be descried, and no living creature, except a large white bird resembling the stork. At the southern extremity of this valley is a natural archway or cavern, 200 feet high, and 100 wide, through which runs a river which discharges itself over a precipice of grey rock 80 feet in depth, and thus forms a branching stream through a beautiful campaign district for many miles.

Within twenty miles of this cataract is the largest lake, or rather inland sea, that has been found throughout the seven and a half millions of square miles which this illuminated side of the moon contains. Its width, from east to west, is 198 miles, and from north to south, 266 miles. Its shape, to the northward, is not unlike that of the bay of Bengal, and it is studded with small islands, most of which are volcanic. Two of these, on the eastern side, are now violently eruptive; but our lowest magnifying power was too great to examine them with convenience, on account of the cloud of smoke and ashes which beclouded our field of view: as seen by Lieut. Drummond, through our reflective telescope of 2,000 times, they exhibited great brilliancy. In a bay, on the western side of this sea, is an island 55 miles long, of a crescent form, crowded through its natural sweep with the most superb and wonderful natural beauties, both of vegetation and geology. Its hills are pinnaled with tall quartz crystals, of so rich a yellow and orange hue that we at first supposed them to be pointed flames of fire; and they spring up thus from smooth round brows of hills which are covered with a velvet mantle. Even in the enchanting little valleys of this winding island we could often see these splendid natural spires, mounting in the midst of deep green woods, like church steeples in the vales of Westmoreland.

We here first noticed the lunar palm-tree, which

differs from that of our tropical latitudes only in the peculiarity of very large crimson flowers, instead of the spadix protruded from the common calyx. We, however, perceived no fruit on any specimens we saw: a circumstance which we attempted to account for from the great (theoretical) extremes in the lunar climate. On a curious kind of tree-melon we nevertheless saw fruit in great abundance, and in every stage of inception and maturity. The general color of these woods was a dark green, though not without occasional admixtures of every tint of our forest seasons. The hectic flush of autumn was often seen kindled upon the cheek of earliest spring; and the gay drapery of summer in some places surrounded trees leafless as the victims of winter. It seemed as if all the seasons here united hands in a circle of perpetual harmony.

Of animals we saw only an elegant striped quadruped about three feet high, like a miniature zebra; which was always in small herds on the green sward of the hills; and two or three kinds of long-tailed birds, which we judged to be golden and blue pheasants. On the shores, however, we saw countless multitudes of univalve shell-fish, and among them some huge flat ones, which all three of my associates declared to be cornu ammonae; and I confess I was here compelled to abandon my sceptical substitution of pebbles. The cliffs all along these shores were deeply undermined by tides; they were very cavernous, and yellow crystal stalactites larger than a man's thigh were shooting forth on all sides. Indeed every rood of this island appeared to be crystallized; masses of fallen crystals were found on every beach we explored, and beamed from every fractured headland. It was more like a creation of an oriental fancy than a distinct variety of nature brought by the powers of science of ocular demonstration.

The striking dissimilitude of this island to every other we had found on these waters, and its near proximity to the main land, led us to suppose that it must at some time have been a part of it; more especially as its crescent bay embraced the first of a chain of smaller ones which ran directly thither. The first one was a pure quartz rock, about three miles in circumference, towering in naked majesty from the blue deep, without either shore or shelter. But it glowed in the sun almost like a sapphire, as did all the lesser ones of whom it seemed the king. Our theory was speedily confirmed; for all the shore of the main land was battlemented and spired with these unobtainable jewels of nature; and as we brought our field of view to include the utmost rim of the illuminated boundary of the planet, we could still see them blazing in crowded battalions as it were, through a region of hundreds of miles. If fact we could not conjecture where this gorgeous land of enchantment terminated; for as the rotary motion of the planet bore these mountain summits from our view, we became further remote from their western boundary.

"We were admonished by this to lose no time in seeking the next proposed object of our search, the Langrenus, or No. 26, which is almost within the verge of the libration in longitude, and of which, for this reason, Dr. Herschel entertained some singular expectations.

[To be continued.]