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SIR JOHN HERSCHEL.

The recent death of Sir John Herschel renders the portrait of that eminent scientist, which we herewith publish, appropriate and acceptable. Such a life as his is necessarily full of interest to all intelligent persons. It is, however, impossible for us to give space for anything more than a mere sketch of the career of this famous astronomer, compiled from various sources. A writer in *Nature* has thus gracefully described his birth and early life:

"John Frederick William Herschel was born at Slough, in the early part of 1792, being the only son of that great philosophical astronomer, of whom it were difficult to decide, and one cares not to inquire, whether the father was or was not more illustrious than the son. Thus the boy was nurtured within sight of that remarkable telescope, wonderful indeed for the day of its construction, which, though in reality among the least of Sir William's achievements, has probably contributed the most to render the name of Herschel famous

among men. His education was conducted chiefly at home, or, at all events, under home influences, and mainly in the society of persons considerably advanced in years; and it is probably to this circumstance that we may attribute much of that singularly retiring, though kindly and affectionate disposition, for which he was so greatly esteemed by all who had the privilege of his acquaintance.

"In 1809, he was removed to St. John's College, Cambridge, where there are still retained, among a few of its oldest members, some curious traditions of his scrupulous attention to the duties of his position. Certain specified selections from the "Principia" of Newton formed, of course, a portion of the curriculum of study. In that day they came to the student in the form of manuscripts, translated and somewhat modified from the Latin text; John Herschel, however, conceived it his duty to read the entire work, just as Newton had left it. We mention this circumstance solely because it furnishes us with an early indication of that staple quality of mind without which no true greatness is ever attained, namely,

thoroughness of work. It is not surprising that such a man carried off the highest honors in the University examination, and that, in 1813, he graduated as Senior Wrangler of the year; the first among a little phalanx of eminent men, than whom the University of Cambridge has seen nothing superior, and not much that is comparable, since.

"It was shortly after his degree that we find the elder Herschel, in one of his latest communications to the Royal Society, referring with evident satisfaction to the fact that he had a son who was now capable of taking an important part in those astronomical, or rather, as they may more properly be called, those cosmical researches which had formed the successful pursuit and the delight of his own life; and before his death he had the pleasure—we might not improperly call it the reward—of seeing his son, in the year 1820, become one of the honorary secretaries of the newly formed Astronomical Society.

"For fifty years and more, the young Herschel continued to be one of its most constant and loyal supporters, employ-



THE LATE SIR JOHN HERSCHEL.

ing some of the last conscious moments of his life in compiling for its service a complete list, or, if we may be allowed the expression, a complete natural history of double stars, commencing with his father's first discoveries, and terminating only with his own decease."

Another writer says: "The real work of Herschel's life began when, in conjunction with Mr. South, afterwards Sir James South, he deliberately set to work to map out the whole of the known stars. Double stars, nebulae, and finally the stars of the Southern hemisphere, were alike catalogued and placed by him.

"These enormous labors carry us down to the year 1838, when Sir John, who had been knighted by William IV., and who was made a baronet at the coronation of the present Queen, returned from the Cape of Good Hope, where he had resided four years at his own expense, for the purpose of completing his catalogue. Every honor that a scientific man can desire fell to his lot. He had awarded to him the Astronomical Society's gold medal; Oxford made him a D. C. L.; he was a Fellow of the Royal Society, and of all kinds of British and foreign societies and academies; and, had he chosen to accept the office, he might, no doubt, have been President of the Royal Society.

"He still continued his work, but henceforward it was of a more varied character. His mind had imbibed from his father a metaphysical turn, and he had, earlier in life, published his 'Preliminary Discourse on the Study of Natural Science,' a work which contributed more than anything else to the popular recognition of his acquirements. Like many others, he translated Homer, and in the *Cornhill* he published a poetical version of a part of Dante's 'Inferno.'

"His other works were numerous, but of late years his principal contributions to literature were either articles in the quarterlies, or papers in *Good Words*, intended to explain in popular language, such subjects as volcanoes, comets, the sun, light, and the outlines of mathematical problems of astronomy.

"Few philosophers of an age which has produced a Faraday and a Brewster have attained distinction equal to that of Sir John Herschel. His mathematical acquirements and his discoveries in astronomy, in optics, in chemistry, and in photography, were all of a very high order, and, being aided by an admirable style, secured for him the widest reputation among men of science, both in England and abroad.

"Sir John Herschel married, in 1829, Margaret Brodie, daughter of the Rev. Dr. Alexander Stewart; by whom he had a family of nine daughters and three sons. He is succeeded in the title by his son, Mr. William J. Herschel, of the Bengal Civil Service."

A writer in *Appleton's Journal* thus speaks of the celebrated Herschel family. "The little that is known of Sir John's ancestors is honorable. Abraham, Isaac, and Jacob, as the representatives of three generations were called, were sound Protestants, in days and in places where Protestantism was a reproach. Abraham Herschel, the great-great-grandfather of John, was expelled from Mahren, his place of residence, on account of his Protestantism. Isaac, his son, was a farmer near Leipsic. Jacob, son of Isaac, declined agricultural pursuits, and gave expression to the family aptitude for music by making it his profession, by bringing up five sons to the same calling, and by developing musical ability in all his ten children. Among the five was the astronomer, Frederick William, who was born at Hanover in 1738, and came to England at one-and-twenty, a professional musician, but caring even more for something else than music—for metaphysics. To the end of his life, when he was known all over the world for his astronomical discoveries, his chief delight was in metaphysical study and argumentation. Perhaps we may ascribe to this taste, prevailing in the little household at Slough, the tendency of his scientific son to diverge into metaphysical criticism whenever his theme, or any interruption of it, in the course of composition, afforded occasion."

"Sir John grew up among four elderly persons, three of whom at least were devoted to the same pursuits. His father was fifty-two at the time of his birth. His mother was a widow when Sir W. Herschel married her. As the marriage was a remarkably happy one, we may assume that the lady sympathized in her husband's pursuits, or at least honored them. The other two were Miss Caroline Herschel, celebrated as the discoverer of five comets, and a brother, who gave assistance in the observatory. How soon the child became aware of how the nights were passed by these students, we have never heard. Perhaps he was unaware that, while he was sleeping the night away, his father and aunt were awake to the utmost stretch of their faculties, he at the telescope, communicating with her by a set of mute signals; and she in another room, noting his observations, and making calculations for him by lamp light, nothing moving but the pendulum and her pen, and nothing heard but the clock and an occasional movement of the ponderous machine.

"But the house was kept quiet by day, for the watchers to sleep; and this must have been impressive to the child, and so must the visits of awe-struck strangers. Few were admitted, it is said; and none were allowed to use the great telescope; but here and there one was favored with an admission to the observatory, to be shown the method of commanding the field of search, or to be permitted (as one has recorded) to read small print at midnight "by the light from the small star in the foot of the goat." It is not surprising that John should have evidenced his love of natural philosophy before he left Eton.

His lifelong and very conspicuous veneration for his father points to a happy childhood and youth under his eye. Comfort abounded at home, as far as money could procure it. The astronomer had four hundred pounds a year from the king; his lady had a considerable jointure;

and the sale of his improved specula afforded a considerable income. It was from a thoroughly happy home that the boy went to Eton, and afterward to Cambridge."

INSTRUMENT FOR PARTING LADIES' HAIR.

Joseph L. Meek, of New York city, has been turning his attention to the growing wants of ladies in dressing their hair. He has provided an instrument, by the use of which, it is claimed, ladies may be able to part their hair with that geometrical accuracy so much desired. As will be seen it consists of a yoke, which, placed over the crown of the head,



holds a slotted guide, by means of which the comb is, in making the part, forced to follow the medial line between the ears of the hair, whose ears are supposed to be in an exact horizontal line when their heads are level.

Hydraulic Mining.

A correspondent of the *Evening Post*, writing from California, says that the ancient river bed from which so much gold has been taken in this State is in many places covered with earth to the depth of two or three hundred feet. Once, perhaps, they say here, it ran in a valley, but now a huge hill covers it. To dig down to it and mine it out by ordinary processes would be too expensive; therefore hydraulic mining has been invented. Water brought from a hundred or one hundred and fifty miles away and from a considerable height, is led from the reservoirs through eight, ten or twelve inch iron pipes, and, through what a New York fireman would call a nozzle five or six inches in diameter, is thus forced against the side of a hill one or two or three hundred feet high. The stream when it leaves the pipe, has such force that it would cut a man in two if it should hit him. Two or three and sometimes even six such streams play against the bottom or a hill, and earth and stones, often of great size, are washed away, until at last a great slice of the hill itself gives way and tumbles down. At Smartsville, Timbuctoo and Rose's Bar, I suppose they wash away into the sluices half a dozen acres a day, from fifty to two hundred feet deep; and in the muddy torrent which rushes down with railroad speed through the channels prepared for it, you may see large rocks helplessly rolling along.

Not all the earth contains gold. Often there is a superincumbent layer of fifty or more feet which is worthless, before they reach the immense gravel deposit which marks the course of the ancient river; and from this gravel, water worn and showing all the marks of having formed once the bed of a rushing torrent, the gold is taken. Under great pressure this gravel—which contains, you must understand, rocks of large size, and it is not gravel in one sense of the word, at all—has been cemented together, so that even the powerful streams of water directed against it make but a feeble impression; and to hasten and cheapen the operation, a blast of from 2,500 to 3,000 kegs of powder is inserted in a hill side, and exploded, in such a way as to shatter and loosen a vast bulk of earth and stones, whereupon the water is brought into play against it.

You know already that the gold is saved in long sluice boxes, through which the earth and water are run, and in the bottom of which it is caught by quicksilver; and so far the whole operation is simple and cheap. But in order to run off this enormous mass of earth and gravel a rapid fall must be got, into some deep valley or river; and to get this has been the most costly and tedious part of a hydraulic mining enterprise. At Smartsville, for instance, the bed which contains the gold lies above the present Yuba river, but a considerable hill, perhaps two hundred and fifty feet high, lies between the two, and through this hill each company must drive a tunnel before it can get an outfall for its washings. One such tunnel, driven for the most part through solid and very hard rock, has just been completed. It cost \$250,000 and two years labor, and was over three thousand feet long; and until it was completed not a cent's worth of gold could be taken out of the claim.

CANDLES WITH PERPENDICULAR AIR PASSAGES.—Our English cotemporaries report the introduction, by a well known firm, of a candle with holes, close and parallel to the wick, throughout the length of the candle. The idea of the makers is, that air will be supplied, by these passages, to aid combustion; but how the air through the holes can do more than the air immediately surrounding the flame, we are unable to perceive. A tubular wick, to supply air to the interior of the flame, might increase the combustion, but the perforated candle seems only suitable for an advertising trick.

Sea-Bathing.

There are circumstances necessarily connected with a visit to the sea-side, which greatly tend to increase its beneficial effects. In almost all instances the used up man of business or of pleasure, the man suffering from general debility, occasioned by his mental or physical powers having been overtaxed, or from continued residence in close, unhealthy towns, and persons suffering from general languor and lassitude, or undergoing difficult and tedious convalescence from the effects of severe illness or accident, are benefited. To these people it is not the sea air alone, nor yet change of air; but it is change of scene and habit, with freedom from the anxieties and cares of study or business, the giddy rounds of pleasure, the monotony of every day life, or of the sick room and convalescent chamber, which produce such extraordinary beneficial effects—a seemingly perfect renovation of wasted energies and renewal of the powers of life—effects not to be obtained by means of any purely medical treatment.

With bathing in the open sea, there is to be considered, first, the shock experienced on entering water at its natural temperature, when shivering, convulsive respiration and oppression of the chest are always experienced, although but for a moment, and pass away on immersion and free action in the water; secondly, the stimulating effects of the saline substances; thirdly, the mechanical action and pressure of the large moving mass of water and the motion of the waves acting as douches, which, combined, are not in all cases well borne by delicate persons and children. The direct effect of cold bathing is sedative and benumbing, and causing the blood to recede from the surface of the body into the grand arterial trunks, congesting the brain and internal organs, depressing the vital powers, and as it were bringing on death. It is this direct effect we have to guard against, and this we can only do by encouraging sufficient and healthy reaction, indicated by the genial glow, feeling of general vigor, and increased appearance of blood to the surface of the body, sometimes wearing the aspect of a healthy skin, but at others exhibited by small red patches like measles, diffused redness as in scarlatina or spots like flea bites. It is, therefore, how to avoid the direct evil effect, and how to encourage sufficient and healthy reaction, that we have to consider.

First, the duration of a cold bath should not be too prolonged, and it is to be laid down as an unexceptional rule, that a certain degree of vigor and power of reaction are essential in all by whom cold sea bathing is to be attempted. Thus it is not advisable that old people, the weak and delicate, including children, or such as are disposed to internal congestion or hemorrhage, should take a cold sea bath. General lassitude, with tendency to sleep, headache, or toothache, sensitiveness of the breast, increase of appetite, and constipation, are frequent results of a cold bath at the commencement of a course of sea bathing.

For bathing, therefore, in the open sea, it is desirable to prepare the delicate and unaccustomed by giving them a few preliminary tepid baths, which produce a gently stimulating action on the skin, acting at the same time as a sedative to the nervous system; and by gradually lowering the temperature of these baths, the patient becomes strengthened to undergo the shock of a cold bath without risk, the severity of which very rapidly becomes diminished by the force of habit in bathing. The latter part of the month of July, is the most suitable time to commence a course of cold sea-bathing, the delicate or invalided having been previously inured by tepid baths.

In the morning, before ten o'clock, the temperature of the sea is at its lowest, and it is, therefore, at this time unsuited to the uninvigorated and delicate, while it is most bracing and invigorating to the strong, and to such as can aid reaction of the circulation by the exercise of swimming. The sea reaches its maximum temperature at twelve o'clock, and continues the same until five; it is, therefore, during this time the delicate should bathe, the earlier the better, but in this, of course, persons must be guided by the tide.

Beet Root Sugar.

The London *Grocer* gives the following statistics:—The number of manufactories at present engaged in the manufacture of this article is on the increase in Central Europe. It appears that there are no less than 1663, which are divided as follows: "Great Britain and Italy have each 1 manufactory; Sweden, 4; and Holland, 20. Next comes Belgium, with 135; then Austria, with 228—136 of which are in Bohemia, and 26 in Hungary; and Germany, with 310. Prussia possesses 230 of this number, the greater portion of which—namely, 143—are in the province of Saxony. The South German States have fewer in proportion, Wurtemberg having 6, Bavaria 5, and Baden only 1, which is, however, perhaps the largest in Germany or elsewhere, consuming annually a million cwt. of beet root. Russia and France have about an equal number of these manufactories—namely, 481 and 483. The most of the sugar in France is made in the Department du Nord, which has 167 manufactories, or more than a third of the whole. At present, this article is not produced in any of the following European countries: Spain, Portugal, Denmark, Greece, Turkey, or Roumania. In America, it is still in the very first stages of development. It was unsuccessfully attempted for several years in the State of Illinois, but a manufactory has lately been set going in the State of Wisconsin.

THE fastest railroad train in the world, probably, is said to be a new express on the Exeter and Great Western Railways, from Plymouth to London, the journey of one hundred and ninety-four miles being arranged to occupy four hours and a quarter.