

retain a temperature increasing downwards from the surface, as in the actual condition of our planet.*

Now the opinion originally suggested by Sir W. Herschel, that our sun and its attendant planets were all moving onward through space, in the direction of the constellation Hercules, is very generally thought by eminent astronomers to be confirmed. But even if its reality be no longer matter of doubt, conjectures as to its amount are still vague and uncertain; and great indeed must be the extent of the movement before this cause alone can work any material alteration in the terrestrial climates. M. Poisson has supposed, for the sake of illustration, that the temperature of the space through which our system has passed before arriving at the place which it now occupies in the heavens, exceeded 212° Fahr., in which case he can explain the observed rate at which the heat increases as we descend downwards from the surface of the earth. But the temperature of boiling water or 212° Fahr., is now very rarely developed in dry sand exposed to the rays of the noonday sun at the equator; the idea, therefore, of the surface of the entire globe having, at any period, received from the stars alone (in the night for example) a glare of light and heat beyond that now generated by a tropical sun, is enough to alarm the most fearless imagination.

Variable splendour of stars.—There is still another astronomical suggestion respecting the possible causes of secular variations in the terrestrial climates which deserves notice. It has long been known that certain stars are liable to great and periodical fluctuations in splendour, and Sir J. Herschel has lately ascertained (Jan. 1840), that a large and brilliant star, called *alpha* Orionis, sustained, in the course of six weeks, a loss of nearly half its light. “This phenomenon,” he remarks, “cannot fail to awaken attention, and revive those speculations which were first put forth by my father Sir W. Herschel, respecting the possibility of a change in the lustre of *our sun itself*. If there really be a community of nature between the sun and fixed stars, every proof that we obtain of the extensive prevalence of such periodical changes in those remote bodies, adds to the probability of finding something of the kind nearer home.” Referring then to the possible bearing of such facts on ancient revolutions, in terrestrial climates, he says, that, “it is a matter of observed fact, that many stars *have* undergone, in past ages, within the records of astronomical history, very extensive changes in apparent lustre, without a change of distance adequate to producing such an effect. If our sun were even *intrinsically* much brighter than at present, the mean temperature of the surface of our globe would, of course, be proportionally greater. I speak now not of periodical, but of secular changes. But the argument is complicated with the consideration of the possibly imperfect transparency of the celestial spaces, and with the cause of that imperfect transparency, which may be due to material non-luminous particles diffused irregularly in patches analogous to

* Poisson, *Théorie Mathémat. de la Chaleur*, Comptes Rendus de l'Acad. des Sci., Jan. 30. 1837.