light, a portion of which will fall upon the field of view. Suppose we denote by the number 10 the additional illumination of the field due to this cause; then the brightness of the moon's image will be $60 + 10 = 70$, that of the surrounding image of the corona $61 + 10 = 71$. The excess, therefore, of the brightness of the latter will be now only one-seventieth of the general illumination, which, as we have seen before is not sufficient to render the difference perceptible.* On the other hand, the chance of succeeding in the observation would have been materially increased by placing a diaphragm with a small aperture in front of the lens, thus protecting it from a great portion of the extraneous rays. M. Arago in his account of the total eclipse of 1842, gives a remarkable instance of the way in which the possibility of making this observation depends on the character and condition of the telescope. He was observing at Perpignan, in company with MM. Mauvais and Laugrier, and was himself at once struck with the phenomenon, which he had not expected. He directed the attention of his fellow-observers to it, but it was only with difficulty that M. Mauvais could detect it by means of his telescope, while M. Laugrier's would *not give it* at all, though both those gentlemen saw it distinctly in M. Arago's instrument. The telescopes used at Prescott had been carefully cleaned; but it is very difficult to keep an object glass, and still more an object mirror, perfectly free from all moisture. And, besides, it must be remembered, that no amount of care in cleaning could have ensured the success of the observation, if the object-glass or reflector was imperfectly polished. It is to be regretted that the precaution of placing a diaphragm in front of the object-glass was omitted, as this might very probably have rendered the phenomenon visible.

In conclusion, we may be permitted to observe, that a partial eclipse, however large, fails in exhibiting most of those astonishing phenomena which render a total eclipse the most striking of all celestial occurrences; and that in proportion as the magnitude of the phenomena decreases, so does the difficulty of observation increase. Considering also the shortness of the period to which the manifestation of the phenomena is confined, and the fewness of the opportunities that one person's lifetime affords for such occurrences, if any disappointment be felt that more was not accomplished on the present occasion, we would refer to a remark made by Professor Smith of Edinburgh, on the eclipse of 1851. He says, "on asking a worthy American, who had come with his instruments from the other side of the world, pointedly to observe the eclipse, what he had succeeded in doing? He merely answered, with much quiet impressiveness, that if it was to be observed over again, he hoped *that he* would then be able to do something, but as it was he had done nothing; it had been too much for him."

* This illustration is not strictly accurate, inasmuch as the effect of a film of dust or moisture on the object glass would be not only to increase the general illumination of the field, but to *diminish* the direct light received from the corona and the sky in the neighbourhood. It will be seen, however, that if we take this into consideration, the effect of the film in preventing our seeing the moon's disc projected on the corona will be increased. Thus, if we denote by a, the general illumination of the field, and by b, the additional light of the corona when the object glass is clean, the ratio of the excess of brightness of the image of the corona, to that of the portion of the field where the image of the moon is formed, will be $\frac{b}{a}$; when the general brightness of the field is increased by a quantity, c, in consequence of the interposition of a film on the object glass, the corresponding ratio will be $\frac{b}{a+c}$ the *difference* of the brightness remaining the same. This is obviously less than the former ratio. If, now, we take into account the effect of the film in diminishing the direct light, since the light of the corona and the atmospheric illumination will be diminished in the same ratio, we may write ma and mb for a and b, m being some proper fraction. Thus the ratio on which the visibility depends, will become $\frac{mb}{ma+c}$ which is less than $\frac{b}{a+c}$, and so, *a fortiori*, less than $\frac{b}{a}$.

Note on the Object of the Salt Condition of the Sea.

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For what beneficent purpose has the great Creator of all things ordained that the sea shall be salt? To this often mooted question, no satisfactory answer has hitherto been returned. So far as I can ascertain, the following suggestions are all that have been proposed as yet in elucidation of the subject: First, that the sea is salt, in order to preserve it in a state of purity. Secondly, in order to render the water of greater density, and consequently to impart a greater buoyancy to bodies floating in it. And thirdly, in order to cause its freezing point to be lower than that of fresh water, and hence to preserve it from congelation to within a shorter distance of the poles than would otherwise be the case.

The first suggestion is scarcely tenable, because, without the intervention of other conditions, the amount of saline matter present in the sea is not sufficient to prevent the putrefaction or decomposition of organic bodies. In many salt marshes and on sheltered coasts, it is well known for instance, that after heavy gales at sea, accumulations of sea-weed frequently collect to such an extent as to occasion by their decomposition the most injurious miasma. During calms, again, on low tropical coasts, gaseous emanations arising from the decomposition of animal matter in the sea, have often been remarked. In these and other similar cases, it is to be borne in mind, however, that the decomposing matters are present in unusual quantities under the influence of peculiar or temporary causes. Under ordinary conditions, it has now been satisfactorily shewn that organic impurities—and these only can affect the present question—diffused through a vast body of moving water, whether fresh or salt, become altogether lost, and with extreme rapidity: so much so, indeed, as apparently to have called forth a special agency to arrest the total destruction of organised matter in its final oscillation between the organic and inorganic worlds. I allude to the myriads of microscopic creatures which inhabit all waters, and whose primary function is ably surmised by England's great anatomist, Professor Owen, to be that of feeding upon, and thus restoring to the living chain, the almost unorganised matters diffused through their various zones of habitation. Not only do we find these creatures in every stagnant pool, but the sea itself teems with them in all their varied types. "The application of the microscope," says Humboldt, "increases in the most striking manner our impression of the rich luxuriance of animal life in the ocean, and reveals to the astonished senses a consciousness of the universality of life. In the oceanic depths, far exceeding the height of our loftiest mountain chains, every stratum of water is animated with polygastric sea-worms,