while the water below supplies some of the heat rendered latent by the evaporation of the water, the air above it supplies its share, and is cooled. In both cases the heat thus lost is made good by the direct radiation from the sun. Through a moderately dry atmosphere the rays pass with comparatively little heating effect, but are largely absorbed on entering the water. Consequently the loss of heat which the water suffers by evaporation at the surface of separation is made good more abundantly than that sustained by the air; and the difference in power of absorption of radiant heat exhibited by these two substances is thus sufficient to keep up a permanent difference of temperature between the water and the air immediately above it.

Starting with air and water at the same temperature, we may imagine the process taking place in three acts. First, the water at the surface evaporates, and the air on the one side, and the water on the other, are cooled; second, in order to make up for the heat thus rendered latent and lost, the sun shines upon both alike, but the water absorbs a larger proportion of the heat of its rays than the air does; and finally, a portion of this excess is then removed from the water by the simple contact of the air at its surface. The nett effect of these causes is to produce a permanent excess of temperature of the surface-water of the sea over that of the air above it, provided that that air is not completely saturated with moisture.

From what I have seen and experienced in the regions visited by the south-west monsoon in the east, I cannot doubt that there are often cases where the most carefully exposed wet- and dry-bulb thermometers would show identical readings, and the atmosphere is completely saturated with vapour of water. Thus it is probable that the temperature of the air would not be inferior to that of the water. Further, when, on the eastern coasts of Asia, the south-west monsoon blows out of the China Sea and penetrates far into the North Pacific, off the coasts of Japan it attains a latitude of naturally lower temperature than that from which it proceeded, so that much of the water with which it was laden, and which is held diffused through it as a mere gas, is condensed and remains suspended in it, producing a visible haze, which obscures the horizon and condenses on all solid objects exposed to it. Here the conditions are reversed, and instead of the air losing heat to evaporate the water, it receives the heat liberated by the condensation of the steam removed from waters of lower latitudes. Such conditions are, however, certainly exceptional, and there can be little doubt that, as a rule, the temperature of the surface-water of the sea is higher than that of the air. The temperature of the air depends on that of the water which tends to warm it and the degree of its own dryness, by virtue of which the water has a tendency to evaporate into it and, by extracting heat from it for this purpose, to cool it.

It is obvious that local circumstances such as currents may produce differences between the temperature of the air and the water, but such cases are not here under consideration.

J. Y. BUCHANAN

Mendoza, March 18

THE REV. T. W. WEBB

BY the death of the Rev. Thomas William Webb, M.A., F.R.A.S., English astronomy has lost one of its most assiduous and accomplished votaries. Mr. Webb, who had reached the age of 79 years, passed a long life as the incumbent of two obscure Welsh livings, held by him in succession. At Tretire he may be said to have laid the foundations of those astronomical tastes which took their finished and best-known shape during the later years of his life whilst he was incumbent of Hardwick, in Breconshire. He was a genial and right-thinking parish priest, whose highest aim was the performance of his duty. For the sake of astronomy it was well perhaps that he obtained so little ecclesiastical advancement; for had things been otherwise it is probable that he would never have developed those scientific tastes which have made his name almost a household word. It was my privilege to make his acquaintance upwards of twenty years ago, and I look back with extreme pleasure to the many letters which have passed between us on practical matters connected with observational astronomy and the use of instruments. Whilst Mr. Webb in bygone years used to write a good deal in the current scientific magazines of the day, especially the *Intellectual Observer* and the *Student*, it was by his "Celestial Objects for Common Telescopes" that he became chiefly known in the astronomical world. This work, published in the year 1859, was designed to be a cheap popular abridgment in a modified form of Admiral Smyth's "Celestial Cycle," which had done right good service in providing English amateurs with information as to what to look for and how to find. By 1859 Smyth's work had become both out of print and somewhat out of date, and Mr. Webb's unpretending abridgment filled at once an undoubted void. It is indeed not wholly correct to speak of Webb's "Celestial Objects" as an abridgment of Smyth's older, larger, and more expensive volume. It was this; but it was also a good deal more, for whilst it offered to the possessors of small telescopes convenient lists of objects deserving of their attention, it also supplied an enormous amount of original information connected with the sun, moon, and planets, and the use of telescopes. This information, though no doubt suggested by Admiral Smyth's style, was no mere *rechauffé* of other people's work, but represented the personal experience of an intensely industrious and persevering man working under great difficulties through lack of instrumental means.

I shall never forget the feeling of blank astonishment which crept over my mind one day when (in, I think, the year 1864) Mr. Webb told me that the first edition of his book, and all his magazine articles up to that date describing double stars and clusters, were founded on studies pursued by means of a telescope set up in his garden and not equatorially mounted. This, I well remember, was not said in any spirit of boasting in the garb of mock modesty, but was the casual utterance of a simple truth disclosed without effort or intention. I do not think I ever came in the way of any student of nature of whom it could be so truly said that he was "without guile."

Mr. Webb was every inch a gentleman, and a philosopher in the highest sense of the word. Every line that he wrote contained either the record of some fact noticed by himself, or a sensible deduction from some other facts. When his facts had come to an end his pen ceased to pass over paper, and the result was that no one ever read a sentence written by him without learning something useful, set forth in the fewest possible words, often, indeed, in a form of concentration which erred on the side of inconvenient brevity; but in these days of penny-a-lining (and it may even be admitted that there is even such a thing as science penny-a-lining) Mr. Webb's habitual terseness cannot be described as a vice. His private letters show that, where necessary for the instruction of a young astronomer, he never grudged time and trouble for going into details. The highest praise that can be awarded him is that he not only did many useful things himself, but that he set an example of patient and industrious research which resulted in many young men all over the British Empire seeking to imitate his cheery and sensible style of work and thought.

G. F. CHAMBERS