

used, accomplishes all that is required. Hence the fine "new formula" lenses, *dry* (also provided with fronts to be used as immersion lenses), are as yet an unsurpassed boon for this special class of work. And certainly it is one which, in relation to biology, has a most important future. I know of course, that the optician has irresistible limitations to deal with; but the "new formula" dry lenses I have referred to, prove, in comparison with the preceding lenses, made by the same firm, that the dry lens was capable of most serviceable improvement. The same applies to a $\frac{1}{8}$ -th-inch lens, made recently at my request by the same skilful makers. As an analytical optical instrument, it is possessed of capacities far greater than are represented by its mere increase of *magnifying power over the $\frac{1}{8}$ -th-inch objective*, by the same makers; and equally so in relation to their $\frac{1}{10}$ -ths of six or seven years ago, when the superior magnifying power of the latter is considered. And yet the $\frac{1}{8}$ -th-inch and the $\frac{1}{10}$ -th-inch to which I refer, were admirable glasses, and have done excellent service. What is important, therefore, is that the larger demand for lenses that will "resolve" readily, difficult lined and beaded objects, which can certainly be best done, all things being equal, with "immersion" lenses; and to the improved manufacture of which Carl Zeiss' oil immersion gives apparently a new departure: should not lead the best opticians in England, the Continent, and America to abandon efforts for the still greater improvement of their dry lenses. They are of the greatest value to the practical biologist, working amidst the minutest living things in Nature, and from the study of which so much may be anticipated.

There is another feature in the use of this lens which is a drawback. The essential oil is a solvent of most of the varnishes and gums used in mounting, and "finishing," microscopical "slides;" and consequently some of our cherished "tests"—placed near the edge of the cover, and which we have been in the habit of using for years, will not serve us. And this, of course, has a wider application. But this may be overcome by coating the edge with shellac-varnish, which the oil does not dissolve; only this is extremely brittle, and is not to be depended on.

But it is further necessary, in using this lens, that the objects should be mounted in balsam, or some other fluid with an equal refractive index. The majority of "dry" mounted objects are by no means better shown by this lens than by an ordinary immersion lens. But this may be overcome if the objects, such as frustules of diatoms, be "burnt" on to the cover. This intimately unites the crown glass cover and the object, making them practically one. If this be not done the ray coming from the object has to enter air before passing into the lens, so neutralising the special properties of the glass. But here again the *special objects*—used, for example, as "tests"—and obtained as the result of years of careful selection, are of no avail.

But this glass will be of great value in the study of rock structures, &c., because the oil will render them transparent without special polishing; and its great working distance will in such work be a great boon.

It may perhaps be right to note that this lens, although not provided with the complex arrangement of "screw-collar adjustment," and although *only* "immersion," is higher in price than the most costly $\frac{1}{4}$ -th by any English maker, although the latter lens may have the screw collar correction, and be both "immersion" and dry.

W. H. DALLINGER

St. James's Parsonage, Woolton, Liverpool, May 1

Science for Artists

IN NATURE, vol. xviii, p. 29, there is an article upon "Physical Science for Artists," in which one of my pictures is thus described: "No. 309. The Sunrise Gun, Castle Cornet, Guernsey—Tristram Ellis. Sky colour good; impossible colour of water under sky conditions given."

It is not usual for an artist to answer a criticism, but in this instance I do so purely upon scientific grounds. The water shown is slightly ruffled with a breeze blowing *towards* the spectator, and hence reflects a part of the sky which makes a greater angle above the horizon than the reflection makes below it. The central part of the sea would reflect that portion of the sky which is at the very top of the picture, and if the critic will kindly re-examine, he will find the colours of those parts almost identical. As the sky gets greener towards the zenith with the given kind of sunrise, the sea appears greener than the portion of the sky shown, and this effect is heightened by the strong *green local*

colour of the water in the *shadows*. The sea was painted after careful consideration and study direct from nature, and remembering the breeze is nearly parallel with the line of vision, is, I think, correct. If the wind had been at right angles to this line the colour would have been quite different, and perhaps this is a matter which the writer of the article did not at the moment take into consideration.

TRISTRAM ELLIS

Kensington, May 10

Time and Longitude

THERE is a practical answer to the problem put by Mr. Latimer Clark (NATURE, vol. xviii, p. 40). As a matter of fact the day begins, or rather the day is first named at the 180° meridian east or west from Greenwich; but this initial line, if I may call it so, diverges in the South Pacific to about 170° west from Greenwich, bringing many of the islands, as Fiji, Friendly, Sunday, Chatham, &c., into the same date with the nearest civilisation, Australia and New Zealand, Asia, &c. Without notes I cannot trace this line accurately between the Isles, but to take certain cases. Fiji counts its day east from Greenwich, Hawaii and Society west from Greenwich. At this moment I forget which division the Navigators enter, so to answer the problem, Where did last Monday begin?—At about 170° west longitude. Where did it end?—At 180° west in North Pacific. How long did it exist?—At any one place twenty-four hours, but taking adjacent places on either side of the initial line, Monday will have been a date during forty-eight hours; or if a vessel should be just on the eastern side of the 180° meridian, and keeping, as she should, Greenwich time through American route, Monday will have been a date during very nearly forty-nine hours.

The case proposed by Mr. Latimer Clark is no hypothetical one. During the war of 1855 the squadron in the Pacific was sent across to co-operate with the fleet in China. It found itself a day behind the China fleet as it had entered the Pacific round Cape Horn, whilst the China fleet had passed round the Cape of Good Hope, and for a short time the two fleets side by side kept different days. Again the steamers from San Francisco to Japan alter their dates temporarily whilst in Japan to suit the local reckoning, and enter both dates in the log.

J. P. MACLEAR
May 13

Menziesia Cœrulea

I AM rather surprised to see it stated by the Rev. M. J. Berkeley in NATURE (vol. xviii, p. 15) that the late "Dr. Thomas Thomson was so fortunate, after three times ascending the Sow of Atholl, as to *rediscover* the long lost *Menziesia cœrulea*." I doubt if it was ever lost, certainly it has not been long lost. I find, on looking over my Herbarium, that my specimen was collected August 6, 1867; since then I have heard of it having been found by others. I saw several plants which I left, and I have little doubt that some of them are there still. Fortunately the preservation of the plant is due to the following circumstances:—1st. That it flowers in May; few botanists visit the Highlands till later in the year. 2nd. The plant has a considerable general resemblance to *Empetrum nigrum*. I have seen them growing in the *same tuft*; in such a case it requires a very sharp eye to distinguish one from the other even at a short distance. 3. The plants are *widely scattered* over the hill, so that it would require days to enable any one to say that it was lost; indeed no plant is likely to be lost so long as the natural conditions remain unchanged. It may be stolen but not lost. I take for granted, of course, that every true botanist will be merciful in such a case.

Edinburgh, May 6

ALEX. CRAIG CHRISTIE

"Hermetically Sealed"

WHAT is hermetic sealing? I have been under the belief that it means sealing with the material composing the object to be sealed; as in the case of sealing a glass tube in the spirit-lamp. M. Bordier's charming paper on the Greenland Eskimo (NATURE, vol. xviii, p. 16), says that an aperture in a hut is hermetically sealed with goldbeater's skin; and that a fisherman is hermetically enveloped round the loins by a leathern bag. You may, perhaps, think it worth while, in the interest of accurate scientific terminology, to settle the point.

W. T.
May 10