

records,  $dt/dh$  during an ascent is normally first negative and later positive. As a mathematician, I recognise, of course, that this implies either an absolute discontinuity—a rare event in nature—or else the existence of at least one surface where  $dt/dh$  is zero. In the latter event one would naturally expect  $dt/dh$  to be small for an appreciable distance on either side of the surface where it vanishes.

Coming now to Mr. Gold, if he will refer to my original letter (NATURE, March 12, 1908, p. 437) he will see that errors of  $\pm 10^\circ$  F. were not asserted to exist as a normal thing, but were suggested as a possible explanation of the following results, which had been quoted by Mr. W. H. Dines as recorded on one and the same occasion (November 11, 1907):—

Station	Height of "isothermal layer"	Temperature of "layer"
Ditcham Park ...	36,000 feet ...	$-42^\circ$ F.
Oxfordshire ...	38,500 ,, ...	$-58^\circ$ F.
Manchester ...	37,000 ,, ...	$-74^\circ$ F.

If Mr. Gold can suggest any other explanation likely to carry conviction to those who are sound in the stratospheric faith, I should be much interested to know what it is.

The figures quoted by Mr. Gold in his letter show that the examples which I had given of the differences between the temperatures recorded by two thermometers of different patterns sent up in the same balloon were not exceptional. Unless I misunderstand his figures, they signify that, taking two thermometers of different types, A and B, the reading from A is the higher when temperature rises and the lower when it falls. Taking both rising and falling readings, the average value of (A ~ B) max. in Mr. Gold's sixteen cases is  $3.2^\circ$  F. In one case it is  $6.3^\circ$  F. It must also be remembered, as explained in my last letter, that if A ~ B represents lag, it is likely to be an underestimate of the true error in the more sluggish thermometer. If we take the range of the algebraic difference A ~ B during the ascent and fall, Mr. Gold's figures give a mean of  $4.6^\circ$  F., the extreme value being  $8.3^\circ$  F.

The fact that on the average of all the readings, both rising and falling, A ~ B (or is it A ~ B?) is small—on the mean of the sixteen cases almost exactly  $1^\circ$  F.—seems to be regarded by Mr. Gold as a great tribute to the accuracy of the instrument makers. This, however, does not necessarily follow, if—as I should naturally assume—the observers followed the procedure customary with meteorologists of applying to their readings before publication the corrections obtained by comparing the thermometers with some recognised standard. This, however, is perhaps hardly germane to the present discussion.

May 23.

C. CHREE.

#### An Optical Phenomenon.

I HAVE a greenhouse facing nearly due south. In a vertical pane of glass there is an imperfection. When the sun shines on this pane no light is transmitted through the imperfection. The result is that on a board or piece of paper held at right angles to the sun's rays there is produced an intense black disc about 1 inch in diameter, the board being held about 8 inches from the glass. This black disc is margined all round by a very narrow, brilliantly white line.

I can form no explanation of the phenomenon, for, so far as I can see, interference has no chance of acting. The glass is quite transparent, and the flaw so small that I could not find the cause of the black spot for some time. The disc is not hot.

So far as I can see, the glass is in tension round a central minute imperfection. By "sighting" the pane at various angles it is possible to detect certain lines. It is difficult, however, to get at them with any accuracy. There is no perceptible difference in thickness.

I cannot find any reference in any text-book to a pane of clear glass which absolutely intercepts the sun's rays in this way.

Can anyone give me an explanation of what appears to be a very unusual phenomenon? V. P.

Crohill, Pendennis Road, Streatham, May 22.

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#### THE OLDEST REMAINS OF MAN.<sup>1</sup>

THE oldest remains of Man with which, until now, we were acquainted date back to the middle Pleistocene, to the Moustier period. They are represented by the cave relics from Neanderthal, Spy, Krapina, Naulette, Malarnaud, and possibly Mentone, by the drift relics from Galley Hill and Bury St. Edmunds. In the memoir under notice, however, we have the description of the two halves of a lower jaw for which a much higher antiquity is claimed.



FIG. 1.—Mandible seen from the side.

They are attributed to the earliest Pleistocene or even to the late Pliocene.

The jaw, which, fortunately, contains its complement of teeth, was found 24.10 metres below the surface in a deposit of sand at Mauer, 10 kilometres south-east of Heidelberg. The date of the discovery was October 21, 1907.

When found, the two parts were thickly coated by the deposit in which they lay; the left half had a piece of limestone firmly cemented to it, both jaw and stone being similarly marked by dendritic deposits of iron and manganese. The sand in which the jaw



FIG. 2.—Mandible seen from above.

was found is of the same age and nature as the sand of Mosbach, and is attributed to the earliest Pleistocene, although the remains of the fauna found within it justify us to some extent in ascribing it to an epoch even more remote—the period of the Cromer Forest Bed in England, the late Pliocene of South Europe. The fauna includes, among many species distinctly diluvial, *Rhinoceros etruscus*, Falc., a horse

<sup>1</sup> "Der Unterkiefer des Homo Heidelbergensis aus den Sanden von Mauer bei Heidelberg." Ein Beitrag zur Paläontologie des Menschen von Otto Schoetensack. Pp. iv+67; 13 plates. (Leipzig: W. Engelmann, 1908.) Price 14 marks.