

Variations of Refractive Index.

EXPERIMENTS conducted in the research laboratory of the firm of Adam Hilger, Ltd., by Mr. G. M. Fleming show that, in certain circumstances, distinct differences of refractive index may occur in certain liquids at the separating surface between the liquid and a polished glass surface. In a few exceptional cases the differences are very great; in the case of ether, for instance, they may amount to as much as 0.02 in the refractive index.

These results appeared to me of considerable importance, and it was intended that the investigations should be continued here.

As a first hypothesis, I proposed to assume that the effect was due to variations of pressure in the neighbourhood of the interface, such variations of pressure being due to cohesion, and occurring according to the intimacy of contact between liquid and glass. Very attractive lines of thought suggest themselves when the phenomenon is contemplated from this point of view.

Unfortunately, more urgent preoccupations intervened, and the results have therefore been communicated to the director of the British Scientific Instrument Research Association, in the hope that he may find a place in the programme of work for further study in this direction. Meanwhile, I should be grateful if any of your readers could refer me to any prior observations of the kind. F. TWYMAN.

Research Department, Adam Hilger, Ltd.,
75A Camden Road, N.W.1, November 7.

The Audibility of Thunder.

FROM reading a recent letter in NATURE (October 16) discussing the distance that thunder can be heard, I am induced to send you the following observation:—On the evening of February 26, 1912, when camped on North Chincha Island (off the west coast of South America), a brilliant display of lightning in the distant high interior to the east attracted our attention. The cloud-stratum from which the storm evidently issued lay far behind the clear coastal zone and the lower foothills, but hid from my camp the upper regions of the Cordillera. Both I and a Peruvian friend heard quite clearly the low distant peals of thunder. As I had been told that thunder was an almost, if not a quite, unknown phenomenon on the coast—this was the first thunderstorm, indeed, that my companion, a man of more than forty years of age, had experienced—I purposely made a record, during the best part of an hour, of the intervals elapsing between the flashes and the peals, and from my journal I find the average to have been 320 seconds. HENRY O. FORBES.

Beaconsfield, Bucks, November 7.

Linkage in the Silkworm: A Correction.

IN referring to Tanaka's work on silkworms I made (NATURE, November 6, p. 216) a mistake which should be corrected. His discovery was not that two characters linked in the male were not linked in the female, but that in a case of linkage common to both males and females it is only in the males that crossing-over occurs. Since, on the analogy of *Abraxas*, the female is presumably in the silkworm the heterozygous sex, this observation is complementary to and consistent with Morgan's evidence that in *Drosophila* there is no crossing-over in the male, which in that animal is heterozygous in the sex-character. The paper is in Journ. Coll. Agr., Tohoku Imp. Univ., vii., 1916, pt. 3. Also the forms found by Patterson associated with males and females should have been called "asexual," not "inter-sexes." W. BATESON.

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THE PREHISTORY OF SOUTH AFRICA.¹

THE bulk of Dr. McCall Theal's book is as valuable now as it was when first issued, twenty years ago. But though "illustrated and enlarged," it is not "improved" so much as one would have expected. Dr. Theal does not make much use—though he alludes to its publication in 1911—of Dr. Péringuey's important study of the Stone age in South Africa, though the theories of Péringuey and Shrubbsall would have materially helped him in his attempts to picture the first peopling of South Africa by Man. Also, in the scanty evidence he has gathered together of the origin and wanderings of the Bushman race he—as do most other historians of Africa—overlooks the statement of the Italian traveller, Ludovico di Varthema, who in his 1508 voyage across the Indian Ocean stopped at Mozambique, and, journeying a short distance inland to some table-topped mountain, described a short-statured savage people living on the mountain-top whose language consisted largely of "clicks," "like the sounds used by Sicilian mule-drivers." I have myself gathered up and recorded legends in South

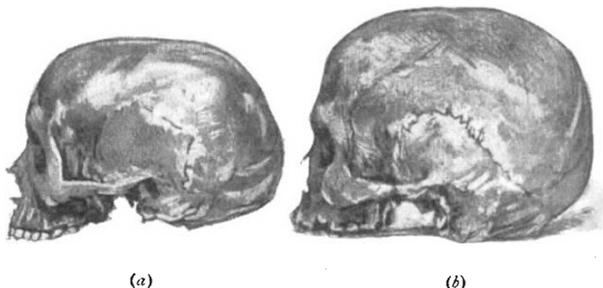


FIG. 1.—Drawings of the skulls of two Strandlooper types: (a) the oldest and most like to the Hamite or the Cro-Magnon of Europe; (b) a Strandlooper skull that is very Bushman-like. The originals are approximately the same size.

Nyasaland of a yellow-skinned, Bushman-like tribe that lived down to a few hundred years ago on the inaccessible upper parts of Mts. Mlanje and Chipirone.

So far as we can trace the race movements in Africa south of the Zambezi prior to the definite entry of South Africa into recorded history, we find them to be something like this: At a comparatively remote period—say, thirty to twenty thousand years ago—there was living in southernmost Africa a human type now named or nicknamed the Strandloopers ("shore-runners"), whose skulls show a slight resemblance to the Bushman type, but whose brain capacity was much higher (1600–1500 c.c. in the male, compared with an average of 1200 c.c. in the Cape Bushman, and an average of 1480 c.c. in the Bantu-speaking Negroes). The higher type of Strandlooper skull (a in Fig. 1) in fact reminds one of the Hamitic skulls of North-east Africa or of the Cro-Magnon type of Europe thirty thousand

¹ "Ethnography and Condition of South Africa before A.D. 1505." By Dr. George McCall Theal. Second Edition in the Present Form (Illustrated), Enlarged and Improved. Pp. xx+466. (London: George Allen and Unwin, Ltd., 1919.) Price 8s. 6d. net.