a microscope. The plate became uniaxial at 95° C.—A. Hutchinson: On a total-reflection diagram. From this diagram the refractive index of a substance is graphically determined when given the angle of total reflection with respect to a known substance of higher refractive index. By taking the sine of the angle as co-ordinate the curves are straight lines.—T. Crook: The occurrence of Ankerite in Coal. The white crystalline layers often found as infillings of the vertical joints in British coal are ankerite. Dolomite was not found and calcite occurs sparingly as compared with ankerite in the specimens examined.

CORRESPONDENCE.

THE WEALDEN FISHES OF BERNISSART.

SIR,—I greatly regret that the names of new species described by me in my recently published work on the *Wealden Fishes of Bernissart* (Mém. du Musée roy. hist. nat. Belgique, May, 1911) have been antedated by three years.

The cause of this was that the plates, which contain the explanation of the figures as well as the figures themselves, were printed off in 1908, it being expected that the work would be published in the same year. Unfortunately my MS. was not ready in time, and publication was delayed until last year, and then, in going over the proofs, I ought to have corrected the dates in the letterpress, inserting a note of explanation of the matter. Here I committed the mistake of imagining that the date 1911 on the title-page cancelled the date 1908 in the text and on the plates, never thinking that the reader would thereby be led to suppose that these new specific names had already been published in a preliminary Note, which is not the case, and the proper date of publication of the names in question is May, 1911.

RAMSAY H. TRAQUAIR.

COLINTON, MIDLOTHIAN.

HUMAN ART IN THE RED CRAG.

SIR,—In his recent communication [1] to the Royal Society Sir E. Ray Lankester gives an account of the discovery, *below* the Red Crag of Suffolk and the Coralline Crag, of human tools—flint implements. If there were tool-using men living while the basal deposits of the Red and Norwich Crag were being laid down, we should not find it hard to believe that there were men living while the mass of the Red Crag was deposited! Consequently the position taken up by the late Henry Stopes as early as 1881 is vindicated. In that year he read a short paper before the British Association, giving an account of a remarkable shell, engraved with a rude portrait of the human face, found in the stratified deposits of the Red Crag.[2] At that time

[1] See GEOL. MAG., December, 1911, p. 576.

[2] H. Stopes, "Traces of Man in the Crag": Brit. Assoc. Rep., 1881, p. 700.

no one would accept the idea that man was living at so early a date, and the important discovery was practically ridiculed. In 1887[1] Henry Stopes wrote in the preface to a printed lecture, "I have afforded the scientific world matter for laughter for some years. My turn to laugh is surely and rapidly coming, for man will most certainly be proved to be as old as the Crag."

Owing to his early death he published little of the great works he planned, and the remarkable nature of his divinations and his laborious amassing of facts have never been fully recognized; but in this present year, when his prediction regarding the contemporaneous existence of man and the Red Crag fossils is established by others, it is worth recalling the facts about the fossil-portrait—the oldest work of art in the country.

The engraved shell is a specimen of *Pectunculus glycimeris*, a very common species in the Crag. It is naturally bored near the hinge by a small circular hole, which may have given its initial value to the first maker of miniatures. The shell's concave surface has five deep-cut marks, viz., two eyes, circular; a large nose, triangular; a wide mouth, slightly curved, with below it a small, nearly straight mark for a lower lip or chin. The portrait of humanity, though crude, is unmistakable.

The following points should be noticed. The rough surface of these incisions is of exactly the same colour as is the rest of the shell—a bright red-brown; while a fossil surface of this colour cut into to-day is white. Furthermore, this colour is as firmly established as the rest of the shell colour. My father submitted it freely to test, and allowed Mr. E. T. Newton to test it exhaustively. Mr. Newton said in 1897 in his presidential address to the Geologists' Association (p. 75), "The colour of the engraved portions is as firm as that of the rest of the shell."[2] He hesitated, however, to accept the shell as proof of the existence of man in Red Crag times.[3]

Now, however, that implements have been found, and Mr. Stopes' prophecy come to pass, the shell should be accorded its proper place among works of Palæolithic art. It is the first recorded Palæolithic drawing, for though the *Times* in 1885 gave credit to a Frenchman for the first discovery of such early traces of man, Mr. Stopes had read his paper before the British Association in 1881.

MARIE C. C. STOPES, D.Sc. (Lond.), F.L.S.

14 WELL WALK, HAMPSTEAD HEATH, N.W.

[1] H. Stopes, "On the Antiquity of Man": paper to the Dulwich Eclectic Club, 1887.

[2] E. T. Newton, "The Evidence for the Existence of Man in the Tertiary Period": Pres. Add. Geol. Assoc., 1897.

[3] [Mr. E. T. Newton, after dealing *very fully* with the evidence, said in conclusion, "I am afraid there is too much doubt hanging over this carved Crag shell to allow us to accept it as definite evidence of Tertiary Man."—Presidential Address to the Geologists' Association delivered February 5, 1897: Proc. Geol. Assoc., vol. xv, 1897–8 (1899), p. 76.—ED. GEOL. MAG.]