

His present account is far clearer, and we are in agreement with it in the main. Though he does not admit it, it is obvious that he realizes the justice of our former claim that "the influence of the Weald was neither as paramount nor as far-reaching as is implied by Professor Stamp's treatment".

Coming now to questions of stratigraphical fact, we have yet to see that the Weald was being uplifted at all during Eocene times. Pre- and post-Eocene uplifts are clearly demonstrable, but Professor Stamp in his reply omits all reference to the conclusive fact that the Woolwich Beds overlap the Thanet Sands against the flanks of the Weald, and are in turn overlapped by the Blackheath Beds. If this is not evidence of continuous subsidence, we are concerned to know what is. None of the evidence of uplift adduced by Professor Stamp appears to us to be valid; certainly none of it can reverse the conclusion drawn from the above facts—that Eocene times witnessed the progressive subsidence of the Weald, at least until the end of the London Clay period. Uplift may then have supervened in Bagshot times, as we have already admitted, but even of this there is no proof. We have already explained the Eocene pebblebeds as the rearranged beach deposits of a sinking shore line: we cannot accept the truly extraordinary theory which represents them as being literally shot down the flank of the Weald by uplift.

There are many other points on which we might join issue with Professor Stamp. It is certainly unjust to accuse us of rushing into print: many of our criticisms were framed before we undertook to read the proofs of the textbook. We advise those interested in the subject to read Professor Stamp's original articles and to compare them with his recent account. They will then, we feel sure, find our criticisms amply justified.

In conclusion we may say that the truth seems to be that Professor Stamp has now dropped the offending clause of his theory. He has retreated from the untenable position which resulted from his Wealden uplift idea. We are content if we have hastened, however slightly, the demise of this misleading idea. Clarified by its removal, his theory will certainly prove more acceptable to workers in Eocene stratigraphy. We may say quite definitely that we regard Professor Stamp's work as the most considerable contribution to the subject since the time of Prestwich, and we welcome its release from the unnecessary restrictions imposed upon it by his former published statements.

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THE HANGING VALLEYS OF NANT-FFRANCON.

SIR,—It was a disappointment to be absent from the reading of Professor O. T. Jones's recent paper on "The Upper Towy" at the Geological Society, for both paper and discussion were of keen interest to one who is working in North Wales. Perhaps I may be permitted to make a somewhat belated contribution to the discussion.

The "Arvon" country, between the Menai Strait and the Mountain Land is composed of the three platforms (at about 275, 430, and 550 feet respectively), which are described in *The Geology of Anglesey* (chapter xxxiv). In the course of my mapping of Arvon, I have been much impressed by the wonderful trenches which the Ogwen and its tributaries have cut through these platforms, and with the evident rejuvenescence of the rivers. In December last I was at a point whence one could look up to the remarkable "hanging valleys" of Nant-ffrancon, which have been ascribed to glacial over-deepening. Suddenly—the idea came like a flash—"What if these hanging-valleys be really due to the successive rejuvenations of the Ogwen?"

We have, however, to remember that there has also been some "re-senescence" (if one may coin such a term), owing to the 60 ft. subsidence which has let down the "Submerged Forest"; so that, before that, the total rejuvenescence was rather more than 600 ft. Now, the hanging valleys (as shown by Mr. Dewey) open out at 1,250 feet above sea-level. That is just about 600 feet above the floor of Nant-ffrancon! True, there may be 50 or 60 feet of drift and alluvium lying upon the rocky floor of that valley, but 50 or 60 feet is the least which can reasonably be assigned to glacial erosion. Thus we are left with a remarkable coincidence between the amount of the "hang" and that of the rejuvenescence of the Ogwen.

In which case (see "G. of A.", pp. 783-4) the hanging valleys may be assigned with much probability to Pliocene times. And they must be among the latest of the major pre-glacial features of the mountains. At that stage, therefore, Snowdonia was less deeply cut than it is to-day, and Snowdon itself was only some 3,000 ft. in height. Perhaps, by slow degrees, we may be able to trace out the successive stages of that prolonged erosion, which, beginning possibly in Miocene or Oligocene times, has developed the rugged mountain-region of North Wales.

EDWARD GREENLY.

MAN AND THE ICE AGE.

SIR,—In a previous communication treating of the great advance in our knowledge of the Pleistocene epoch due to Professor Depéret, reasons were given to show that the lowest gravels of the Somme terraces were deposited under genial conditions, and I should like now to call attention to the loess, which by its distribution, composition, and associated faunas would appear to be as definitely glacial, a conclusion established by the work of Sauer, Tietze, Krause, Wieggers, Werth, Lauterborn, Gagel, and Soergel. As a consequence Acheulean I, which occurs at the summit of the older loess, should be contemporaneous with the Riss glaciation, while the late Mousterian, which occurs at the base of the younger loess, should be assigned to the Würm. The early or warm Mousterian then readily falls into place in the Riss-Würm interglacial stage.