

LLANDOVERY ROCKS.	{	6. Shales with grit and highly fossiliferous calcareous sandstone	?
		5. Highly fossiliferous ashy limestone ...	2½ to 3½
		4. Upper trap band about	60
		3. Sandy limestone and calcareous sandstone and grit, crowded with fossils, about	500
		2. Lower trap band ... maximum about	185
		1. Micaceous sandstone, with <i>L. Symondsii</i>	?
			800 to 850

The rocks are affected by the Hercynian flexures which produced the Bristol coal-basin, and the outcrop of the beds in the main follows the horseshoe-shaped outcrop of the Old Red Sandstone. This regularity is lost at Daniel's Wood and Middlemill. Two important transverse faults traverse the outcrops, which are further obscured by the overlap of unconformable Trias. The trap-bands are found to be confined to the Llandovery, the number of recorded fossils has been largely added to, and previous statements as to the thinness and imperfect development of the Ludlow rocks and as to the probable exposure of the district to erosion in Ludlow and Lower Old Red Sandstone times are confirmed. The typical Ludlow fauna of Herefordshire and Shropshire has not been met with, and the series is clearly much attenuated. General remarks on the fossils are appended, and the paper contains lists of fossils in various collections (Bristol Museum, Sedgwick Museum, Earl Ducie's collection, and the Museum of Practical Geology, Jermyn Street), as well as those collected by the authors from the Llandovery and Wenlock formations.

CORRESPONDENCE.

CHANGES OF LEVEL AND RAISED BEACHES.

SIR,—I read with great interest Dr. Jamieson's paper on the above subject in the issue of the GEOLOGICAL MAGAZINE for May (pp. 206–209).

I was, however, surprised to learn that Dr. Jamieson's views were expressed as original, for I laboured under the impression that they were long ago accepted by the majority of British geologists, and I have myself been teaching them for many years.

Professor Sollas ("The Age of the Earth," p. 35) clearly illustrates how such a state of affairs can take place, though not drawing specific attention to this as the cause of the phenomena of raised beaches.

WALTER BALDWIN.

ROCHDALE.

May 22nd, 1908.

THE MAMMALIAN FAUNA OF THE FOREST BED.

SIR,—In a cursory survey of fossil Voles,¹ chiefly from the so-called Forest Bed, I arrived at conclusions which in several respects are at variance with those of former writers on the subject. The

¹ Proc. Zool. Soc., 1902, p. 102.

supposed recent Voles of the Forest Bed I have come to consider as extinct species; the Pliocene Crag types, on the other hand, while entirely absent from the West Runton Fresh-water Bed, were found in the East Runton Forest Bed mixed with types of the former; this leads to the assumption that the Crag types have been washed into the East Runton deposit. The latter explanation, which I did not explicitly formulate at the time, receives strong support from the fact that at East Runton we find likewise a West Runton species of Beaver, together with a Pliocene species (*Castor plicidens*, Maj.), the inference to be drawn being that the provenance of the latter is the same as that of the Pliocene Voles, mingled at East Runton with the West Runton types.

If I am right in my deductions, it follows that the Vole fauna of the Forest Bed will, by the elimination of recent as well as of Pliocene types, prove to have been much more homogeneous than hitherto supposed. This being the case with one restricted group, it appears to call for a revision of all the other mammalian remains.

For many years I have entertained the suspicion that there must be something wrong with our lists of the Forest Bed Mammals. In plain language, the association of recent with Pliocene mammalian species, culminating in the assumption of the musk-ox having been a contemporary of the prototypes of the Upper Pliocene Val d'Arno fauna, is a faunistic impossibility. I therefore deny such an association of which there is no analogy in any other part of the world, although this has been assumed on erroneous determinations, e.g. with regard to the mammalian fauna of Lefte (Upper Lombardy).

I very much doubt whether in the end a single one of the supposed 24 recent species, out of a total of 45 Forest Bed Mammals, will remain, though in some cases it is not possible, for the present, to detect differences between a fragmentary fossil and the corresponding living species.

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AN *ORTHIS* FROM LADOCK QUARRY, CORNWALL.

SIR,—In the Memoirs of the Geological Survey, England and Wales, Explanation of Sheet 346, 1906, p. 35, the following paragraph occurs:—"A fossil has been found in the Ladock Quarry and placed in the Truro Museum. It is an *Orthis*, which Dr. Ivor Thomas, who examined it, thinks is probably new." The occurrence of a fossil in this quarry was so interesting and unlooked for that it seemed impossible to accept it without further evidence. Opportunity for investigation did not occur until April last, when I spent ten days with Mr. Upfield Green working over his promised section of the country between Newquay and Porthluney. The fossil in question was found by Bennett, a stonebreaker, on a pile of stones midway between Ladock and Grampound Road, and *not in the quarry at all*. He told me himself that his son broke the stone, and he noticed this fossil with the remains of several other impressions of shells. He preserved only this one specimen, which was an internal cast, and gave it to Mr. Minard, of Grampound, who afterwards deposited it in the Truro