

## MERCK'S RHINOCEROS FROM WORLEBURY HILL, WESTON-SUPER-MARE, AVON

by

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### ABSTRACT

The discovery of Merck's rhinoceros in a swallet on Worlebury Hill, Weston-super-Mare, Avon is recorded, and a Hoxnian, Middle Pleistocene age suggested.

### LOCALITY

Weston-super-Mare nestles at the foot of a long, 100m. high wooded ridge, which extends from Worlebury Camp in the west, to the hamlet of Worle about 4km. to the east. There is no name for the whole ridge, and the names used for individual parts are geographically confusing (Fig. 47). We are concerned here with quarries which lie immediately west of the Kewstoke-Milton road, which could be described as being on the south slope of Milton Hill or on the Eastern end of Worlebury Hill. We choose to refer to the site as Worlebury Hill and to the whole feature as Worlebury Ridge, because:

- 1) The well-known ancient British Camp of Worlebury lies a short distance to the west.
- 2) Worle is an ancient name, from wor-leah, meaning pheasant-copse.
- 3) existing records refer continually to Worlebury and scarcely mention Milton.
- 4) the use of Milton would be confusing; in Britain there is only one place named Worle: there are almost 100 Miltons, including 4 in Somerset, and one of these, Milton Hill near Wells, is also a Pleistocene Mammal site.

Worlebury Ridge is an inlier of Carboniferous Limestone with Keuper Marl lapping the lower slopes and surrounded by sea and alluvial sediments. Thin lavas and agglomerates are seen in the limestones at Spring Cove and are occasionally exposed on Milton Hill (Reynolds 1921). The Carboniferous Limestone is much quarried. The fossils described in this paper came from a cave near 'the town quarry, Milton', which is in the Black Rock Group ( $C_1$  or lower *Syringothyris* beds); the beds dip at around  $23^\circ$  towards the southeast. The quarry was in two parts, a northern quarry (ST 3395 6272) and a deeper southern (probably the town) quarry (ST 3400 6267). There was a third quarry a little to the east variously known as Milton Quarry or Butt's Quarry (ST 3370 6264). During 1972-3 all three quarries were united and partially backfilled for housing development. Fig. 2 is based on maps around the turn of the century and shows the approximate state of the quarries when the rhinoceros was found. It has been possible to reconstruct the distribution of caves and rifts revealed during quarrying. The caves were all of

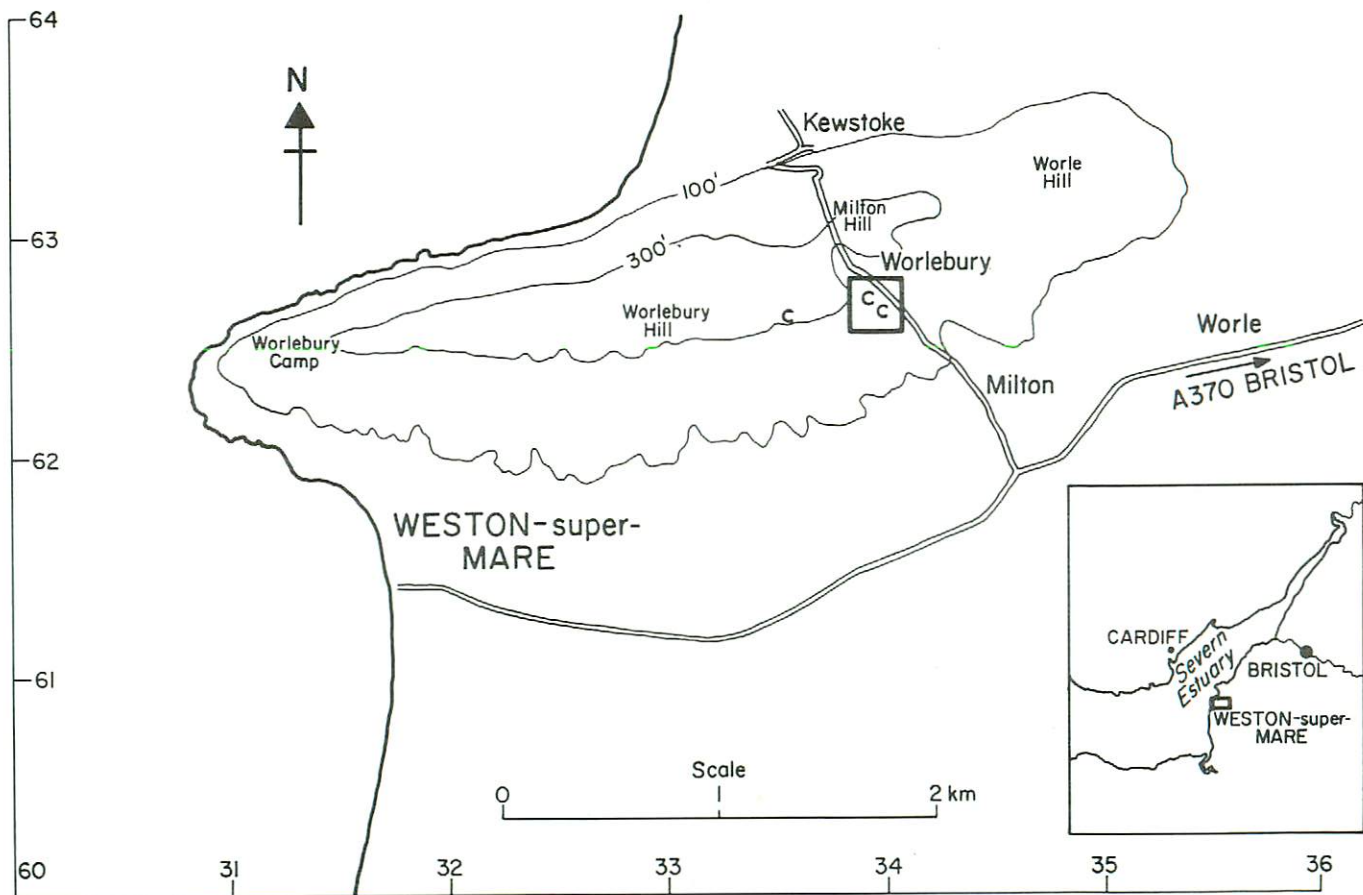
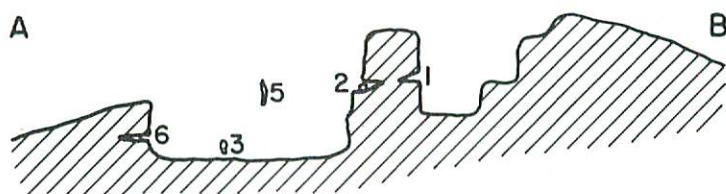
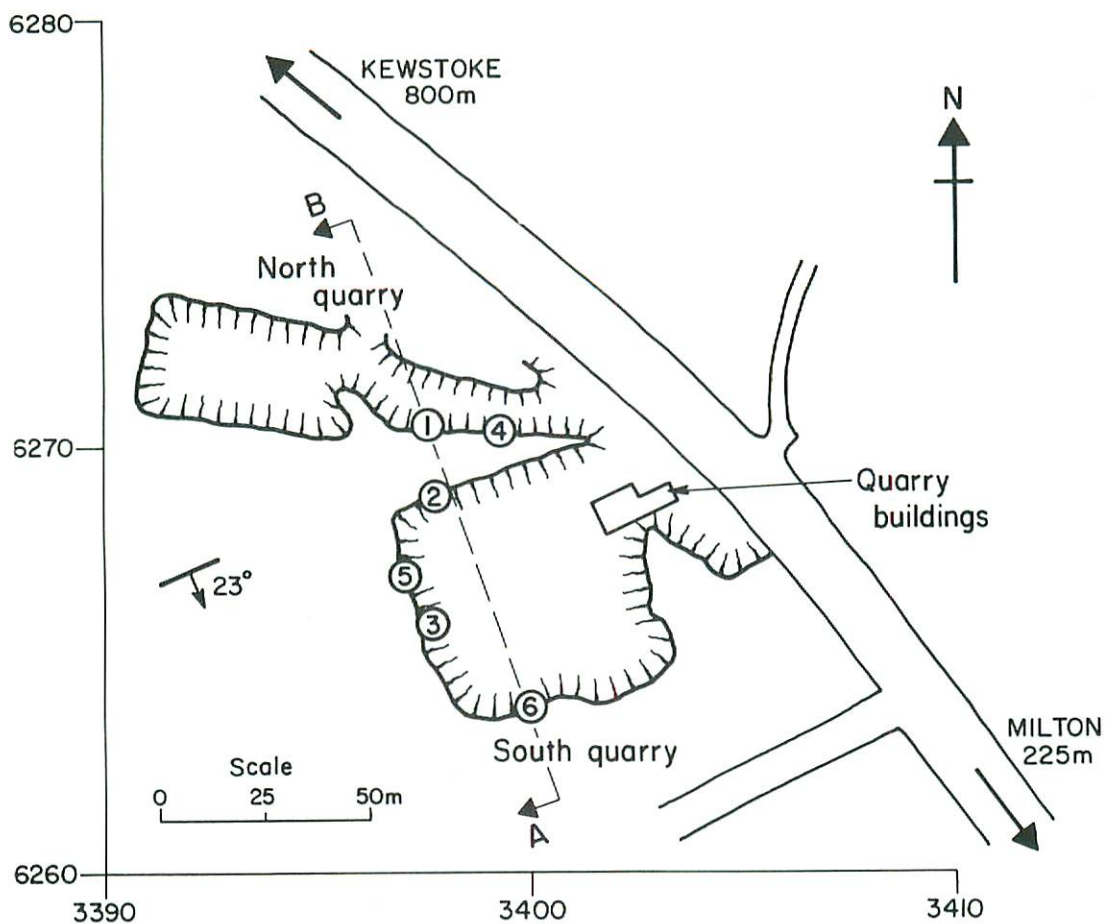


Fig. 47: Map showing locality of Worlebury Hill



SECTION 'A'-'B'  
(not to scale)

Fig. 48: Plan of quarries and diagrammatic section through quarries



phreatic origin and developed along joint and bedding planes in the limestone. The features of the caves, numbered and positioned on Fig. 48, are as follows:

*Cave 1* 5m. up face with entrance 2m. wide and 1.5m. high: width maintained but height lost within 3m. of entrance, due presumably to the slope of the bedding plane roof. Floor deposit a reddish earth with stones and rubble, which blocked penetration to Cave 2.

*Cave 2* 10m. up face in lower south quarry: large entrance partly hidden by bushes, opened out onto a narrow ledge. Cave entered by squeezing past large boulder at entrance. Cave triangular cross section, 1m. wide, 1m. high and 3m. long. Undulating floor deposit similar to that of Cave 1; floor rose steeply to choke which probably separated it from Cave 1.

*Cave 3* about 2m. above floor of quarry at foot of 20m. high west face.

*Cave 4* phreatic rift; 5m. long and 2m. high.

*Cave 5* 12m. up west face of south quarry; high narrow rift, impassable after 2m.

*Cave 6* impenetrable rift, 2m. high at entrance developed in joint paralleling the dip.

Caves 1, 2, 3 and 4 were probably all developed in the same bedding plane and may have formed a single cave system. Caves 1 and 2 were almost certainly connected with each other. The caves probably were connected with the surface swallet in the destroyed area of the northern quarry, and this is likely to be the system in which Doorbar found the rhinoceros teeth.

## HISTORY

The only reference in the scientific literature to the discovery is in Davies (1920). A field party from the University of Bristol Spelaeological Society visited the site in the summer of 1919. They found that the cave was in two parts and contained a remarkable series of 'water pipes' [sink holes]; The shaft of a swallet largely destroyed by quarrying was also noted. The report continues—'some years ago rhinoceros teeth were found lodged in the ledges of this shaft' (p. 24). The presence of rhinoceroses in the quarry is also noted in two newspaper reports (Anon. 1914 and Anon. 1925). The fossils were discovered by the Reverend J. H. H. Doorbar, then Curate-in-Charge of Milton and later Vicar of Kewstoke.

It is recorded that a large swallet appeared some hundred feet up on the north shoulder of the quarry. Doorbar cleared loose earth from the swallet and found a practically complete set of rhinoceros teeth and a few other animal remains; this was in January 1909. By 1913 quarrying had revealed a cavern on the quarry floor; when earth and silt were removed from the cavern, a fire was lit and smoke emerged through the swallet. Other teeth continued to be found at depths of '15, 20, 25 and 30 feet from the crest of Worlebury Hill'. It is also recorded that three very fine ox teeth came from the same swallet.

On the basis of the two newspaper reports the fauna of the swallet would appear to comprise a nearly complete rhinoceros dentition, including a milk tooth, three fine ox teeth and a few other remains of prehistoric animals. Mr. Boyd Dawkins thought it a very fine collection. The collection remained the property of the Revd. Doorbar and in 1953 his widow donated it to Woodspring Museum. There was no catalogue and it was all accessioned under the same number. However it is clear that some of the specimens could not have come from the swallet, and in view of the uncertainty we will refer only to those whose provenance is certain. Along with the specimens, Mrs. Doorbar donated 8 lantern slides illustrating the Worlebury rhinoceros teeth; among these are two ox teeth which can be identified with ones in the collection. On the slides one of the upper molars is labelled as an incisor and a premolar is labelled as a milk tooth: it is understandable that Doorbar would not have the expertise to recognise these errors, but it is surprising they were not spotted by Boyd Dawkins. Throughout, in the newspaper articles and in the labelling of the specimens, the fossils are referred to as woolly rhinoceros. Actually one tooth in the Doorbar collection was that of a woolly rhinoceros. Its preservation is different from the Worlebury rhinoceroses and similar to the specimens from Uphill, a late Pleistocene site about 4.5km. to the south from which woolly rhinoceros is recorded.

#### DESCRIPTION

The fossils reliably referable to Worlebury swallet comprise individual and isolated teeth, all without roots, many broken and incomplete, but otherwise the preservation is good. There are 29 teeth or identifiable fragments, and a collection of small tooth fragments. All these can be referred to two individuals, A and B (Fig. 49). The teeth of individual A are slightly smaller and rather more worn than those of individual B. Both individuals were fully grown adults. Slight colour differences also help to separate the individuals; the enamel of teeth belonging to rhinoceros A have a yellowish tone due to an iron oxide staining, while in case of rhinoceros B the teeth have remained fairly white. This suggests that they came to rest in different parts of the swallet. Further it would seem that the two skulls and mandibles were probably carried into the swallet reasonably intact and soon after death. Conditions in the swallet soon after entombment may have caused the bone to decay and also the tooth roots, leaving only the tough enamel and dentine of the tooth crowns. Whether the rest of the skeleton was ever buried cannot be known, but it is likely that the keen eyes of quarrymen 70 years ago would not have missed bones. Rhinoceros bones do not often preserve well and no complete skeleton of Merck's species is known.

We identify the Worlebury rhinoceroses as belonging to Merck's species, *Dicerorhinus kirchbergensis*. Merck's rhinoceros is a very distinctive Pleistocene species, identifiable on the form of the enamel, the pattern of the cusps, and the profile as seen in side view (Fig. 50). It



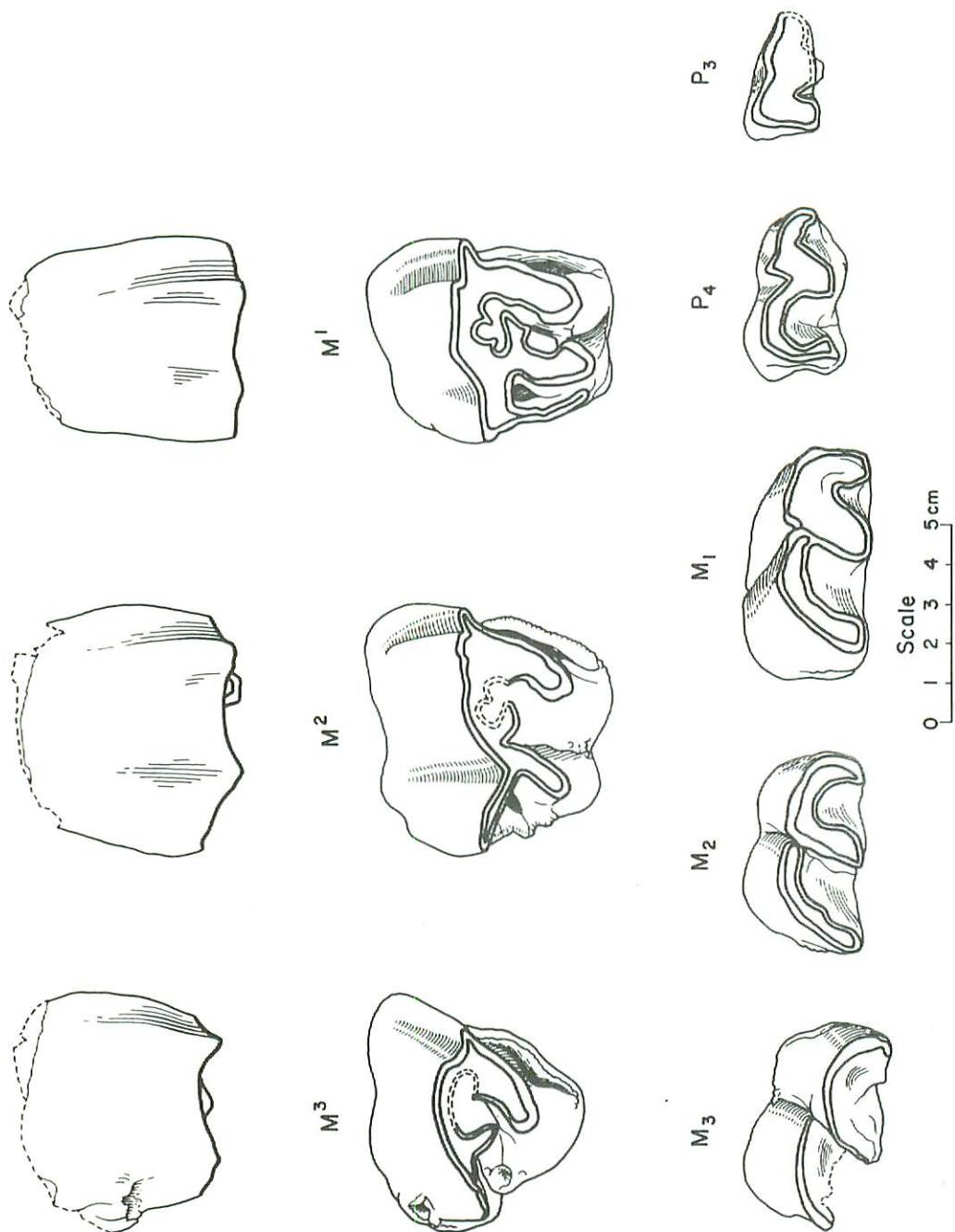


Fig. 50: Upper and lower dentition of *Dicerorhinus kirchbergensis*. Top: labial view of upper right molars; middle: occlusal view of upper molars; bottom: occlusal view of lower left dentition M<sub>3</sub>-P<sub>3</sub>

	A						B					
	LEFT			RIGHT			LEFT			RIGHT		
	No.	a-p	trs	No.	a-p	trs	No.	a-p	trs	No.	a-p	trs
M <sup>3</sup>	1	—	54	12	61	52						
M <sup>2</sup>	6+5			13+14			2	66	62	16+17		
M <sup>1</sup>	4	52	61	11+18			3	53	58	15	53	58
P <sup>4</sup>	8+9						7					
P <sup>3</sup>	10											
P <sup>2</sup>												
M <sub>3</sub>	22						21	53	33			
M <sub>2</sub>	23	52	30				20	51	—	25		
M <sub>1</sub>				26	52	34	19	47				
P <sub>4</sub>	27+28											
P <sub>3</sub>				24	40	29						
P <sub>2</sub>				29	31	22						

Fig. 49: Data on teeth of *Dicerorhinus kirchbergensis* from Worlebury Hill. A and B individual rhinoceroses.

a-p: maximum antero-posterior length of buccal tooth border.

trs: maximum transverse tooth dimension.

Measurements in millimeters.

No.: Identification number on each tooth or tooth fragment.

Where no measurements appear, teeth incomplete.

is also a very large rhinoceros, which is probably why it was confused with the much commoner woolly rhinoceros.

Two teeth, left M<sub>3</sub> and left M<sub>2</sub> also from the swallet, are identified as *Bos primigenius*, although they are no bigger than a domestic cow. There are several other aurochs teeth in the Doorbar collection, but their provenance is not certain. A very large navicular bone in the collection belongs to a giant ox, perhaps a *Bison*, but there is no certainty that it comes from Worlebury.

## DISCUSSION

The Worlebury rhinoceros teeth compare very closely with a large series of specimens described from German sites by Schroeder (1930) in the only major paper on Merck's rhinoceros. Kaup in 1841 described the species as *Rhinoceros mercki*, but following the law of priority and generic division this has become *Dicerorhinus kirchbergensis* (Jäger) 1839. It is convenient to continue to refer in the vernacular to Merck's rhinoceros.

Merck's rhinoceros is found in Europe in interglacial faunas of Holsteinian (Hoxian) and Eemian (Ipswichian) age. It is frequently accompanied by the straight-tusked elephant, *Palaeoloxodon antiquus*. In England Merck's rhinoceros is common at Swancombe and Clacton, both fluvial sites of Hoxnian age. It is recorded but rare at Gray's Thurrock, which may be Ipswichian in age. It probably evolved from the similar but smaller early Pleistocene *Dicerorhinus etruscus*, a species which is recorded from Westbury-sub-Mendip. Merck's rhinoceros is usually thought of as a woodland species, but Loose (1975) regarded it as a savannah type capable of both browsing and grazing. The species ranged across Europe into southern Siberia.

The weight of the evidence therefore would favour a Hoxnian age for the Worlebury site; the presence of aurochs is consistent with this, but in the absence of other diagnostic species there can be no proof that the age is not Ipswichian. Hoxnian sites are unknown in the Mendip area which makes this discovery particularly interesting. The lower part of Kent's Cavern in Devon may be Hoxnian in age, but the site has not yielded a rhinoceros.

Worlebury Hill site is about 60m above O.D.; the hill however is surrounded by sea and land rising no more than a few metres above sea-level, so any rise above present sea level would leave Worlebury Hill an island and in this situation unlikely to be the habitat of rhinoceroses. However the question of Hoxnian sea levels is a subject on which we have no evidence in this region and it must therefore remain unanswered.

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#### REFERENCES

- |                 |      |  |
|-----------------|------|--|
| ANON.           | 1914 | <i>Western Mercury</i> , Sat. 23 May, p.4  |
| ANON.           | 1925 | <i>Weston-super-Mare Gazette</i> , Sat. 7 March, p.7   |
| DAVIES, J. A.   | 1920 | Field Work, April, 1919-February, 1920. <i>Proc. Univ. Bristol Spelaeol. Soc.</i> 1, 21-24.  |
| LOOSE, H.       | 1975 | Pleistocene Rhinocerotidae of W. Europe with reference to the recent two-horned species of Africa and S. E. Asia. <i>Scr. geol.</i> 33, 1-59, 9 figs., 13 pls., 15 tbls. |
| REYNOLDS, S. H. | 1921 | <i>A Geological Excursion Handbook for the Bristol District.</i> (2nd Edition). 224 pp., 48 figs., Bristol: Arrow-smith.   |
| SCHROEDER, H.   | 1930 | Über Rhinoceros mercki. <i>Abh. Preuss. Geol. Landesanst.</i> 124, 1-114, 26 pls., 3 tabs.   |