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THE DISTRIBUTION OF FLINT MINES ON PORTON DOWN

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ABSTRACT

Prehistoric worked flint occurs over much of the Ministry of Defence land at Porton Down. Two major groups of flint mines occur on a division of the Upper Chalk recently designated by the British Geological Survey as the Tarrant Member. Recent excavations at Porton Down also reveal extensive flint knapping activity on Tower Hill, whose crest forms an outcrop of the Tarrant Member. Two other members of the Upper Chalk outcrop at Porton Down, the Seaford and the Newhaven; the former is judged too hard to mine and the latter does not possess flint of suitable quality for knapping. It is suggested that correlations between known groups of mines and the type of chalk in which they occur are sought wider afield as the new national survey is published and that meanwhile priority in prospecting for undiscovered flint mines is confined to outcrops of the Tarrant Member.

The Porton Down Range is an area of chalk downland, some 2800ha in extent, straddling the Hampshire-Wiltshire county boundary to the northeast of Salisbury. Two major groups of flint mines – at Easton Down and Martin's Clump – were identified there by J F S Stone earlier this century (Stone 1931, 1933). Both groups are described in Barber et al (1999). The Martin's Clump group was a subject of a recent contribution to this journal (Ride 1998) in which the author discussed the boundary of the flint mining activity.

The Porton Down Range was geologically surveyed by the British Geological Survey (BGS) in October 1999 as part of their national mapping programme. The BGS is introducing a new nomenclature for the Chalk of Southern England (see Bristow et al, 1997) which provides a greater understanding of the change in lithology of the Chalk Group. The traditional Lower, Middle and Upper Chalk Formations are retained to permit integration with older schemes, but ten new members have been introduced. Each new member has distinct lithological characteristics that can be identified in the field.

Three of the six members within the Upper Chalk Formation underlie the Porton Down Range (Fig. 1). In ascending order these are the Seaford, Newhaven and Tarrant Members. The Seaford Member outcrops in the west of the Range abutting the main railway line. Much of the remainder of the Range is underlain by the Newhaven Member, with the Tarrant Member capping the surrounding ridges.

The Seaford Member is generally a firm to moderately hard, smooth, white chalk with numerous, laterally persistent, regularly spaced, nodular and tabular flint courses. In this area of Southern England an intensely hard, porcellanous chalk bed is developed at the top of the Seaford sequence over which the plough merely skitters. This member outcrops over the west of the Range, and where this occurs the ploughsoil is rich in worked flints, although it is doubtful if the hard chalk could have been mined in prehistory. The inference is that naturally exposed flint nodules were worked in these areas.

The next layer, and most extensive at outcrop, is the Newhaven Member, a soft chalk with few flints and these mostly of small size and finger-like or spiky in shape. These flints are generally unsuitable for working.

The uppermost layer at Porton Down, the Tarrant Member, is composed of chalk with a hardness intermediate between the Seaford and Newhaven Chalks. It bears layers of tabular and nodular flint familiar to everyone as the basic ma-

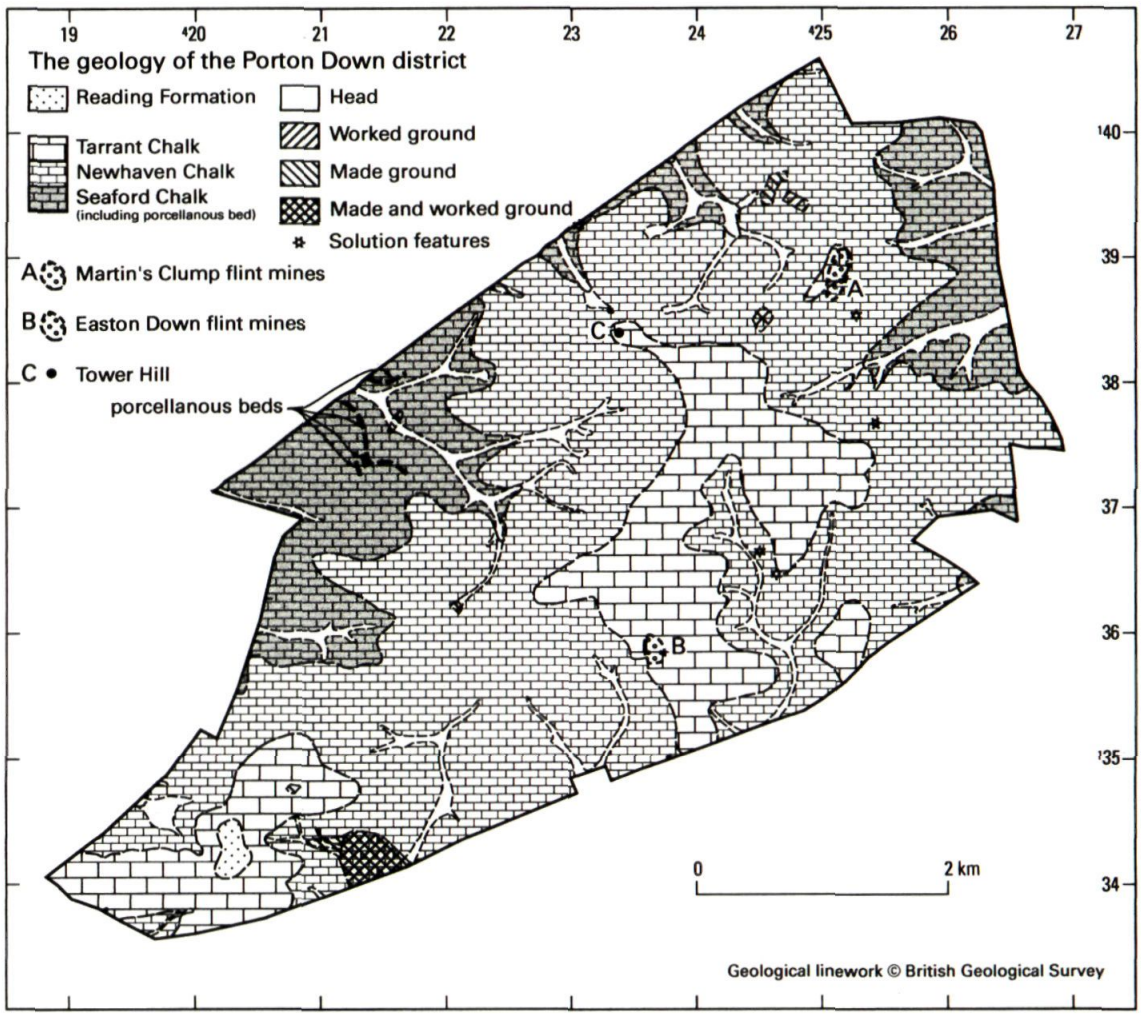

Fig. 1 The geology of the Porton Down district

terial of flint-and-brick walling – suitable for all knapping purposes.

Both the Martin's Clump mines and those at Easton Down are situated on the outcrop of the Tarrant Chalk Member. The full extent of the Easton Down mines has not been determined; Stone (1931) suggested that land to the south of the visible flint mine shafts had been mined but that the remains of the shafts had been ploughed out. Certainly, this area (Area C on his map, B in Fig. 1) lies mainly on the Tarrant Chalk Member. It is possible to estimate that the strata on Easton Down dip southwards at about 1.5 degrees, the southern edge of the Tarrant Member being defined by a positive (concave) break of slope.

The position is similar at Martin's Clump (A in Fig. 1), where the southern slope dips into a dry valley known locally as The Breck. Mining activity there cannot be traced below a similar break of slope. This fact was confirmed in 1984 when a ca-

ble trench was dug down the hillside; worked flint disappeared from the spoil at about the level of the southern edge of the Scheduled area of flint mines, and follows approximately the 130m contour.

A nearby hill, known as Tower Hill (C in Fig. 1) from an early eighteenth century folly that once stood there, was surveyed by the Royal Commission on Historical Monuments of England (now part of English Heritage) in 1998. This survey showed extant earthworks that could have been part of the folly's gardens or were of prehistoric origin. In 1999, the Porton Down Conservation Group opened a trench fifteen metres long by a metre wide on the crest of Tower Hill to determine if an earthwork feature that encircles the crest is a prehistoric enclosure or modern landscaping. A great abundance of worked flint flakes and associated debitage were discovered with tools of Neolithic type, including a thumb scraper, two awls and long, delicate blade flakes. Undisturbed ground yielded chalk with flint of knappable quality. The excavation is on-going and interpretation now would be premature. Surveying by BGS identified the crest of Tower Hill as an outcrop of the Tarrant Chalk Member that at this locality contains solution pipes (exposed by excavation) of Clay-with-flints incorporating Reading Bed pebbles. The Clay-with-flints is essentially a Quaternary redistribution of Tertiary material.

The most likely origin of the worked flint on Tower Hill is from nodules found on the hill itself since, by analogy with the mines at Easton Down and Martin's Clump, economy of effort was practised by knapping (roughly, at least) nodules adjacent to the pits from whence they were dug.

The names of the Chalk subdivisions discussed here are of comparatively recent origin. Geological maps, at the 1:50,000 scale, showing the new Chalk nomenclature are becoming available as the BGS mapping programme advances. The Winchester and Salisbury geological sheets, on which Porton Down falls, are due to be published in the next few years, and other areas will follow or accompany them. This availability will enable a wider check to be made on the correlation between the Chalk Members and known groups of flint mines. Meanwhile, on the Southern Chalk, it would seem prudent to concentrate effort on prospecting for undiscovered mines on the Tarrant Member.

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