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WAIRARAPA CHERT SOURCES IN NEW ZEALAND PREHISTORY

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SUMMARY

The natural occurrence of chert beds in the Wairarapa is discussed and the likely sources of the material used by the Maori is outlined. The question of terminology is also examined.

INTRODUCTION

The recovery of chert (flint) flakes from archaeological sites in Wellington, the Wairarapa and elsewhere in the North Island occurs very frequently. In many sites this rock type is more abundant than obsidian which it appears to have replaced or substituted for use as small cutting and scraping implements. The presence of chert beds in the Wairarapa has been known for some time and has been regarded as the main source for southern North Island material. This paper outlines the natural occurrence of Wairarapa chert and indicates the likely sources from which material was obtained by the Maori for use in artefacts.

TERMINOLOGY (FLINT OR CHERT - WHICH?)

The mineral silica (quartz) can be divided into three main naturally occurring groups: (a) Crystalline varieties (e.g., rock crystal); (b) Cryptocrystalline forms (chalcedony - microcrystalline structure, amorphous); (c) Clastic varieties (sand or sandstone). It is the cryptocrystalline rock in the form of flint or chert that found the greatest use in world prehistory. The term flint has long been used (particularly in "Old World Archaeology") both as a synonym for chert (the name favoured in "New World Archaeology") and for a subvariety of it. Although flint has priority of usage, modern recommendations (Pettijohn, 1949: 320) are that chert be used for all forms of chalcedonic silica and that flint as a term be dropped or reserved for artefacts only.

Chert is a dense cryptocrystalline rock composed of chalcedony (microcrystalline fibrous silica and microfibrinous amorphous silica or opal) and cryptocrystalline quartz. Typical chert, either nodular or bedded, is a hard dense opaque rock with usually a smooth conchoidal to splintery fracture, and a dull to vitreous lustre. It is found in numerous colours: from white, green, red, yellow, brown, to grey and

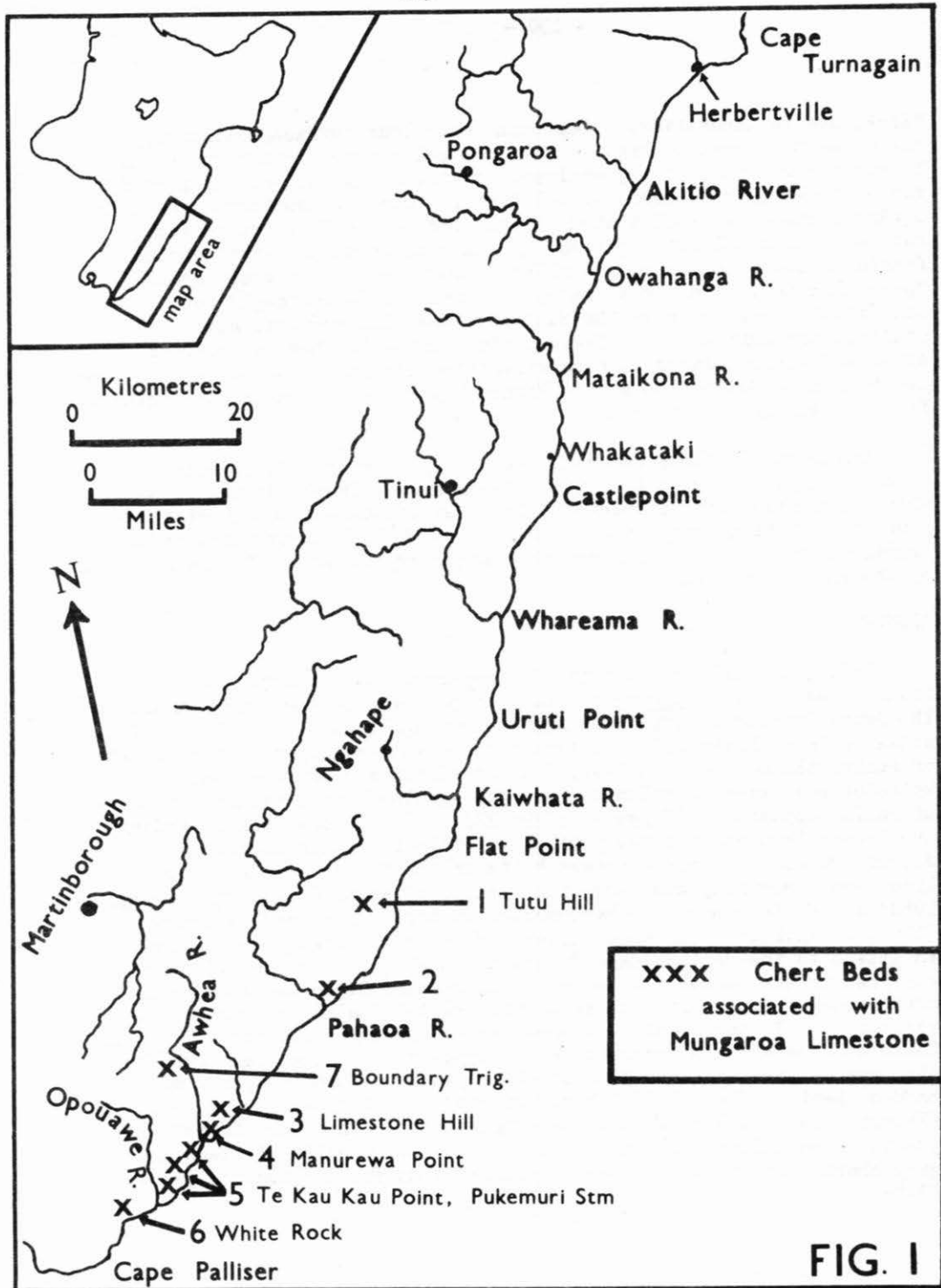


FIG. I

black, due to impurities. Depending on colour surface, weathering can be white, brown or grey. Distinct colours have often given rise to sub-variety names being employed, particularly that of 'jasper' for red or brown (due to iron oxides) forms. Some sedimentary rocks with a high content of precipitated silica also have a distinct cherty nature. These silicified rocks by their hardness and subconchoidal fracture, and if possessing a white colour, have often been termed "porcellanite". In the Wairarapa (as well as Marlborough) such silicified rocks occur in the Mungaroa Formation and were also utilized for artefacts. (Keyes, 1969: 106 - Further examples of adzes and worked flakes in hard silicified limestone have also been seen in the Simcox Collection at the Hawkes Bay Museum. These were obtained from the Aohanga River mouth).

Chalcedonic silica occurs as secondary veins infilling natural cracks and joints in most of the older rocks. Cherts derived from veins have been used as artefacts in sites scattered throughout the country, but it is only in eastern areas of both Islands where bedded cherts occur in large exposures that major exploitation of this material by the Maori took place.

SOURCE

McKay, as early as 1878 (p. 23) remarked that "flints are not found in New Zealand except in the near presence of the Amuri Limestone". The Amuri Limestone (type area Amuri - now spelt Haumuri - Bluff, 17 miles south of Kaikoura) is a limestone formation composed of a variety of rocks, the most distinctive, characteristic and abundant being a white or pale grey (sometimes pink) fine-grained, thin-bedded limestone of chalky appearance (Suggate, 1959: 23). It is considerably indurated and breaks into small tabular blocks. This formation occurs discontinuously in narrow broken belts in the Waipara (as Amberley limestone), Hurunui, and Haumuri districts of North Canterbury (Gregg, 1964) and further north in Marlborough it has been mapped by Lensen (1962) in Kaikoura, Clarence Valley and Kekerengu regions and found to extend to the west of Cape Campbell. In age, this formation is assigned to the Dannevirke Series. At Haumuri Bluff small rounded chert nodules (resembling those of the English Chalk) occur in the limestone. In the middle Clarence Valley where the section is thicker these nodules are also present in the upper part of the limestone, but the base of the limestone is entirely replaced by beds composed of bedded chert. These "flint beds" exposed in other Marlborough sections (Thomson, 1916: 52) reach massive proportions. They were formed from precipitated silica and consist of layers or lenticules of black and grey chert surrounded by a semi-crystalline material (Thomson, 1916: 53-4).

The northern extension of the Amuri Limestone occurs in eastern Wairarapa where correlatives of various beds in the Haumuri or Marlborough sections have been recognized. The limestone equivalents have been formally described as Kaiwhata Limestone (van den Heuvel, 1960: 314; Eade, 1966: 110), Manurewa Formation and Mungaroo Limestone (Waterhouse and Bradley, 1957: 522, 524) as well as being included under other formation names in unpublished manuscripts (McLean, 1953: 61; Rishworth, 1953: 62). Kingma (1967), however, selected "Mungaroo" as the formation name for all limestones that are the equivalents of the South Island Amuri Limestone Formation. Wairarapa exposures of Mungaroo Limestone are scattered and discontinuous, and often in thin alternating bands. Sections that include the lower massive chert beds are few and restricted. Exposures often show lateral sedimentary facies variations with considerable interfingering of mudstones and greensands. Kingma (1967) has shown that chert and limestone beds also intercalate with underlying sediments of the older Whangai Formation (Haumurian) and the overlying Dannevirke Series sediments. Because of these complexities it is often not clear whether chert beds are in fact at the base of the Mungaroo Limestone or part of the underlying Whangai Formation. In some areas downward migration of silica has produced marked silification of beds in the Whangai (Pick, 1955: 42, 71; Waterhouse and Bradley, 1957: 521). In northern Wairarapa the Mungaroo Limestone thins and disappears and chert beds are found in parts of the Whangai Formation (Kingma, 1962). It is from these chert beds mainly at the base of the Mungaroo Limestone or as part of the Whangai Formation, or from nodules within the Mungaroo Limestone, that chert was obtained by the Maori for use in artefacts.

EXPLOITATION

Whether material for North Island artefacts was derived from a Wairarapa or a Marlborough source cannot be determined but, as local chert was used within the Wairarapa, it seems likely that this area would form the main centre of distribution. Unlike quarries for other raw materials which show their tell-tale scattering of flakes and chips at the base of an outcrop, this is entirely lacking near any chert exposure. All observations suggest that chert was collected in the form of nodules exposed in stream banks or from naturally splintered blocks which can be prised loose from bedded cherts. Worked cores and flakes nearly always show a deep weathering surface which indicates that the raw material was collected as nodules. There is no way of telling which area was most favoured for obtaining raw material except by deduction from any nearby flaking and working sites and by colour. Such evidence, however, is scattered all along the Wairarapa coast,

especially near river mouths. In southern Wairarapa where chert is directly associated with the Mungaroa Limestone it is regularly of a grey to black colour. Further north on the coast of Herbertville, south of Cape Turnagain, Mr P. L. Barton of Wellington has recorded areas of eroding midden (Sites N.154-155/4 to 8) in which large quantities of chert flakes and cores occur. Many of these flakes (as well as including grey to black varieties) have a more yellow or brownish colour. This slight colour differentiation suggests that they are from a northern Wairarapa source derived from chert nodules from beds in the older Whangai Formation.

OCCURRENCES

Kingma (1962, 1967) shows the distribution of Mungaroa Limestone and the underlying Whangai Formation which are the sources of Wairarapa chert. Geological mapping projects have described in detail many of the well-known chert exposures in this area which were probably known to the Maori but it will be only by further detailed field work that any additional outcrops will be recorded. However, there is not likely to be any way of proving whether the localities were also exploited by the Maori. The main occurrences of chert known in southern Wairarapa are indicated in Fig. 1; numbers on the map refer to localities listed below:

Locality 1. Eade (1966: 110) records chert bands in the Whangai Formation occurring east of the Tutu Fault. The best exposure is on the ridge west of Tutu Hill (heading to Mt Adams) where the band is 90 feet thick (N.166/269210 to 273207). The chert consists of lenticles up to nine inches thick and 30 inches long, weathered white on the exterior but dark-grey to black inside.

Locality 2. Grey and black chert nodules in the Mungaroa Limestone are known to occur at the Pahaoa River mouth (McKay, 1878: 23).

Locality 3. Chert outcrops occur near Limestone Hill (n.168-169/024964) in the Awhea Formation (Waterhouse, 1955: 50).

Locality 4. From the mouth of the Awhea River to the north of Manurewa Point black cherts occur in hard calcareous Manurewa Formation strata (Waterhouse, 1955: 48).

Locality 5. Chert nodules and concretions are known to occur in the Whangai Formation from Manurewa Point south along the coast to Te Kau Kau Point (Waterhouse and Bradley, 1957: 521). Pukemuri Stream was taken by Waterhouse (1955: 91) as a reference section for chert bed exposures.

Locality 6. Chert outcrops on the spur north of White Rock were also reported by McKay (1878: 23).

Locality 7. McLean (1953: 62) records large black chert nodules associated with the Mungaroa Limestone which forms a prominent hill on which Boundary Trig is situated (N.165/996053) south of Tukurumuri.

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