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Sir Julius von Haast and Roger Duff

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As the most durable class of material culture in the Pacific, stone artefacts have played a central role in explanations of culture change and transmission, migration and origins for over 150 years. In New Zealand Sir Julius von Haast was one of the first to use these artefacts and their archaeological context to develop a dual-phase model to explain the extinction of moa and the time depth of human interaction with these giant birds. Even though his ideas have long since proved to be incorrect, we continue to acknowledge his contribution to the scholarly tradition of archaeological research in New Zealand. Nearly 60 years later, Roger Duff put forward a model of culture change, heavily reliant on adze form, that firmly rooted the origins of Māori culture in East Polynesia. His typology is still widely used across the Pacific today.

Haast (1822–1887) in many respects can be considered the ‘father’ of New Zealand archaeology (Walter 2004:126). This is not for the durability of his theories on the prehistory of New Zealand but rather because of his rigorous application of theory and the high standard of his fieldwork and recording. Indeed, as Walter notes:

although his interpretations of New Zealand prehistory were mostly wrong, we recognise in von Haast’s work a level of methodological systematics, chain of reasoning, and connection with theory that we value in the best archaeology of our own times everywhere. (Walter 2004:126)

Haast stood at the centre of the debate around moa extinction in the second half of the nineteenth century and drew on geology, archaeology and traditional history to validate his hypotheses (Anderson 1989).

Haast was a scholar with a broad interest in the natural sciences. Following his appointment as Canterbury provincial geologist in 1861 and then director of the Canterbury Museum in 1868, he was soon caught up in the intellectual challenge of trying to figure out the role that humans may have played in the extinction of moa and the timing of this extinction. Over a period of 11 years he carried out investigations at several sites in Canterbury – including Rakaia River Mouth (1869), the Redcliffs sand hills (1865–73), Moa Bone Point Cave (1872) and Weka Pass Rock Shelter (1877) – and Otago, namely Shag River Mouth (1872 and 1874) and Otokia River Mouth, Brighton (1880). He also reported on artefacts found at Bruce Bay, Westland, in 1868. Haast's Moa Bone Point Cave investigations were the first stratigraphic archaeological investigation undertaken in Polynesia.

A uniformitarian geologist, Haast's ideas were clearly influenced by Scottish geologist Charles Lyell, French archaeologist Jacques Boucher de Perthes and probably English polymath John Lubbock's *Prehistoric Times* (1865; Walter 2004:126). Using the newly conceived European framework of the emergence of the Neolithic from an earlier Palaeolithic period, Haast applied this directly to a New Zealand setting. In his model, moa were directly analogous to the long-extinct megafauna of Palaeolithic Europe (Haast 1871:75) and the association of moa bones with flaked stone tools 'which in every respect resemble those of the mammoth and rhinoceros beds in Europe' (Haast 1871:85) supported his contention that moa were hunted by a Palaeolithic people in the distant past. Haast's Palaeolithic moa-hunters were responsible for the extinction of the giant bird and they were succeeded by a Neolithic Māori who lived mainly on fish and shellfish and who produced sophisticated polished stone tools.

As early as 1862, Haast had proposed that New Zealand was occupied by a pre-Māori people, based on the discovery of stone artefacts found in swamps and beneath large trees in the Wellington region that appeared to be quite distinct from Māori material culture (von Haast 1948:228). The discovery in Bruce Bay, Westland, in 1868 of a polished stone adze and sandstone sharpening tool beneath a primeval forest confirmed for him

that the people inhabiting or visiting this island at that remote period were much more advanced in civilization than the Moa-hunters, whose tools consisted only of chipped pieces of sandstone, flint, and similar silicious rocks without any attempt at polish. (Haast 1870:119)

The apparent antiquity of these artefacts cast his moa-hunters significantly back in time.

The long time depth allowed Haast to propose that the North and South Islands had been joined by a land bridge. This hypothesis served to explain the presence of North Island obsidian in South Island sites as a 'people in such a low state of civilisation' could not possibly have been capable of canoe travel between the islands (Haast 1871:84). Furthermore, the presence of land connecting New Zealand with continental parts of the Pacific allowed for these moa-hunting people to be autochthones who had become stranded from an undefined Pacific homeland following a change in sea level (Haast 1871:84). These interpretations of New Zealand prehistory are among those described by Walter as 'mostly wrong'. A brief summary of current understandings of New Zealand prehistory, including the process of human settlement of New Zealand and the approximate date of the extinction of moa, is provided at the end of this chapter.

Haast's investigations in the dunes at Redcliffs (near Moa Bone Point Cave) beginning in 1865 identified extensive areas of ovens associated with moa bone and eggshell, which were covered by a layer of culturally sterile sand on top of which were large shell middens (Haast 1874:75–78). Any admixture of these two layers was attributed to erosion. The Rakaia River Mouth site that Haast visited in 1869 provided him with what he considered to be conclusive evidence for these two separate groups. At the site he observed ovens and middens of moa bone covering an area of about 10–20 ha associated with 'primitive knives' of sandstone and other stone flakes and tools (Haast 1871:83). A sample of these flaked tools were illustrated in his address to the Canterbury Philosophical Institute to support his argument that the moa-hunters were a Palaeolithic society (Haast 1871:Plate VII) (Figure 9.1). Caches of polished stone tools including adzes and other scattered artefacts were attributed to a later Māori population who occupied the site over a considerable period of time. He described a similar distinction between moa-containing middens and shellfish deposits at the Shag River Mouth in 1862 and 1874 – a distinction fiercely challenged by Frederick Hutton of the Otago Museum (Hutton 1876).



Figure 9.1. Flaked stone tools from the Rakaia River Mouth site.

These artefacts were illustrated by Haast in his 1871 paper to demonstrate the level of stone working technology used by the moa-hunters.

Source: Canterbury Museum (E70.57a, E70.57b, E138.316, E138.316.4).

An often overlooked aspect of Haast's work at the Rakaia River Mouth (and later at Shag River Mouth and Moa Bone Point Cave) is the detailed information that he provided about the fauna at the site, both in terms of species present but also taphonomic factors such as butchery evidence and animal gnaw marks (Allen and Nagaoka 2004:195–197). There has been a tendency to focus on the moa, which were at the heart of the debate, but Haast also identified other bird species, sea mammals and shellfish in the sites that he investigated.

Haast's assertion that the extinction of the moa had occurred deep in the past was at odds with other prominent scientists of the time, such as James Hector (1872), Walter Mantell (1869, 1873) and F.W. Hutton (1876), who all believed that the moa were only recently extinct and had been hunted by Māori. Haast used the scarcity of references to moa and moa-hunting in Māori tradition to support his geological and archaeological inferences.

The Moa Bone Point Cave investigations in 1872 were intended to resolve the question over the antiquity of the moa-hunters and whether they possessed polished stone artefacts. Haast employed two workmen to carry out the actual excavation, due to his commitments as director of the Canterbury Museum, and under his direction they excavated two trenches within the cave. Two distinct layers were identified; an upper layer that contained a range of timber, fibre and stone artefacts that were clearly Māori in origin, separated from a lower layer of moa bone, flaked stone tools and a polished adze. The association of this polished adze with the moa bone and other tools forced Haast to concede that the moa-hunters did in fact produce polished stone tools and that his attempts to force the European model of Palaeolithic and Neolithic periods into the New Zealand context were not going to work. He continued to argue for a significant time gap between the extinction of the moa and the arrival of Māori but this was now in thousands of years rather than hundreds of thousands (Green 1972:18).

Haast was also one of the first Europeans to take a particular interest in rock art. In 1876 he employed Thomas Cousins to record the drawings in the Weka Pass rock-shelter in North Canterbury. He also engaged museum employee William Sparks to undertake an archaeological investigation of the shelter. These investigations identified three cultural layers, the lowest containing moa bone and the upper evidence of European use of the shelter. Disappointed by the small quantity of material culture found

during these investigations, Haast concluded that the shelter had only ever been occupied on a temporary basis (1877:53). Of most importance, however, was the art itself, which to Haast proved ‘beyond a doubt, that New Zealand many centuries ago, has been visited by a people having different manners, customs and religious conceptions than the Maoris possess’ (Haast 1879:427).

Haast continued to hold tenaciously to his views, his concession over the Palaeolithic moa-hunters notwithstanding, despite vehement opposition, but by the end of the nineteenth century an increasing number of sites were being discovered that challenged Haast’s model (Anderson 1989:106).

It will thus be seen, that my former views, published in 1871, when these important ethnological questions were first critically examined by me from a geological point of view, have with one exception been fully confirmed by further more extended researches. This exception is the occurrence in Moa-hunter kitchen middens of polished stone implements, together with chipped ones, a fact proved beyond a doubt, during my excavations in the Moa-bone Point Cave. However, this does not lessen in any way the proofs of their age, because as previously pointed out, well finished polished stone implements have been found at the West Coast, in beds, the great age of which cannot be doubted. (Haast 1879:431)

Just over 50 years after Haast’s death, another Canterbury Museum figure made a significant contribution to the development of ideas about New Zealand and Pacific archaeology. Roger Duff (1912–1978) was appointed ethnologist at the museum in 1938. He went on to become director in 1948 and, like Haast, held this role until his death. Duff’s mentor was H.D. Skinner at the Otago Museum (see also White, **Chapter 23**, this volume) and many of his ideas built on Skinner’s earlier work.

The discovery of the Wairau Bar site in 1939 proved a critical moment in Duff’s career. Using the rich artefact assemblage from the site, Duff revived Haast’s moa-hunters but demonstrated that they represented an earlier phase of Māori culture that had its origins in East Polynesia. His moa-hunter period of Māori culture was characterised particularly by tanged adzes (Figure 9.2), stone reels and imitation whale-tooth pendants, all of which had also been found at the margins of East Polynesia. At the other end of the spectrum, the material culture of Māori was defined by that observed by Cook and other European observers in the late eighteenth century (Duff 1956:13).



Figure 9.2. The Duff Type 1A 'horned' adze with its quadrangular cross-section and marked tang is the most distinctive of the early archaic East Polynesian adze suite.

The discovery of this particular example from the west coast of the South Island allowed Duff to extend the distribution of this adze type beyond Marlborough, Canterbury and Otago.

Source: Canterbury Museum (E143.145).

Duff's theoretical framework was essentially an age-area hypothesis whereby it is assumed that the oldest artefact forms have the widest geographic distribution and the younger ones have a more restricted range (Duff 1959:127). A further assumption is that change occurs at a faster pace in the central areas than at the margins. The moa-hunter culture was effectively a South Island occurrence with its expression lasting longest in Southland. Cultural change and innovation occurred in the North Island but it was the arrival of the so-called Great Fleet (drawn from traditional histories and following Buck's ethnologically based developmental stages, see also Furey, **Chapter 31**, this volume), which brought kūmara and taro to New Zealand, that really triggered significant change. These new cultural traits were introduced to the South Island from the north, eventually reaching the far south not long before European arrival in the late eighteenth century. The model relied on a great degree of conservatism in artefact styles and the people represented by the moa-hunter phase were

that portion of the first eastern Polynesian migrants to New Zealand whose culture remained largely static and did not obviously respond to the new environments [...] their conservatism suggests that they represent a single homogenous wave, whereas the marginal distribution of their culture within New Zealand suggests that they were its first human settlers. (Duff 1956:16)

There are tensions within Duff's model. On the one hand, he argued that the introduction of horticultural crops initiated a major period of cultural and economic change, but on the other that Māori culture developed locally out of the moa-hunter culture (Allen 1987:11). Furthermore, Duff's use of traditional data such as Stephenson Percy Smith's canoe chronology (see also Nolden, **Chapter 11**, this volume) confused matters since these traditional accounts argued for cultural replacement with the arrival of the Fleet, whereas in Duff's model these arrivals simply sped up changes that were already slowly underway (Allen 1987:11).

Duff's model for New Zealand prehistory was soon challenged by overseas-trained archaeologists who began to fill the university departments during the 1950s and who brought with them new methodological and theoretical approaches (Davidson 2000). Scholars like Jack Golson (see also Furey, **Chapter 31**, this volume) critiqued Duff's use of traditional and ethnological information on the grounds that they had no place in an archaeological model and that the term moa-hunter was inappropriate to describe assemblages that had no direct association with moa (e.g. Golson 1959). Duff did not significantly revise his model in the face of these criticisms. He was prepared to adopt a series of phases by way of compromise, but with little conviction (Anderson 1989:109).



Figure 9.3. Duff Type 1A from Bora Bora, collected by Reverend J. Arundel in 1838.

Source: Canterbury Museum (E149.10).

Duff amassed an enormous wealth of data on adzes from museum collections all over the world to support his distributional studies, which he expanded into the Pacific. He proposed that ancestral Polynesians originated in Island Southeast Asia, possibly the Philippines, and travelled through Micronesia to central East Polynesia (1959:126). From here they then radiated out to the rest of Polynesia. The Society Islands sat at the heart of the East Polynesian model but for many years he had no definitive evidence to support this contention. In 1948 he found his 'smoking gun' in the museum

of the Whitby Literary Society, which had a quadrangular tanged adze with lugs strikingly similar in form to those found in the moa-hunter sites of the South Island of New Zealand (Figure 9.3). This adze had strong provenance, having been acquired in Bora Bora by the Reverend J. Arundel, secretary to the London Missionary Society, in 1838 (Duff 1960:280).

Perhaps Duff's most enduring legacy to New Zealand and Pacific archaeology is his adze typology. Although the typology was intended to support his distributional ideas described above, its ongoing use demonstrates its usefulness in classifying the suite of adze types across the Pacific. This typology was built on that of Skinner, who had already developed a Pacific-wide classification largely based on cross-section and outline, with additional characteristics such as presence or absence of a tang, the nature of the bevel and the relative length of the cutting edge also considered (Skinner 1923:89). Duff's first published typology was based on the analysis of a cache of adzes from Motukarara near Lake Ellesmere, Canterbury. In it he reduced the number of Skinner's types from 10 to four based on three criteria: cross-section, tang and the width of the cutting edge (Duff 1940: 294). By the time *The Moa-hunter Period of Māori Culture* (1950) was published, Duff had refined his typology to include five types, with the intention that this typology could be applied across all Polynesian adzes. The illustration of several examples of types from outside of New Zealand in his 1950 publication reinforces this intention. A sixth type (adzes of circular cross-section) was added to the 1956 edition. He subsequently went on to publish descriptions of adzes from both East Polynesia (1959) and Southeast Asia (1970). Although alternative typologies based on functional and other attributes have subsequently been proposed (e.g. Cleghorn 1984; Shipton et al. 2016), Duff's typology has largely remained the Pacific standard.

Duff's contribution to Pacific archaeology was not limited to his adze studies. He initiated the first major archaeological work in the Cook Islands with a Canterbury Museum project on Rarotonga in 1962–64, comprising an extensive archaeological survey and selected investigations of key sites (Trotter 1974). He was particularly active in the field in New Zealand, leading work on a number of sites, including a re-examination of Moa Bone Point Cave in order to resolve some of the stratigraphic issues raised in Haast's work, as well as excavations of several key later Māori sites on the Kaikōura coast, including Pariwhakatau and Takahanga Pā.

He was active in the recording of threatened central South Island rock art sites and was proactive in advocating for improved archaeological site and portable artefact protection in New Zealand.

In the nearly 150 years since Haast undertook the first rigorous archaeological investigations in New Zealand, our understanding about the relationship between humans and moa has advanced significantly. We can now assert with much certainty that the process of extinction was rapid and that it only occurred several hundred years ago rather than several thousand. We know with certainty that the first people to interact with moa were Polynesians who arrived by sea as part of a planned colonisation event. However, like Duff, we continue to seek explanations for the drivers of cultural change that saw the emergence of Māori culture from this East Polynesian ancestry.

It did not prove possible to mount an exhibition of objects highlighted in this chapter at the Canterbury Museum.

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