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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION NEWSLETTER

EVIDENCE FOR THE DEVELOPMENT OF THE EARLY POLYNESIAN ADZE KIT

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Abstract

Among portable artifacts the adze has most often been favoured by students of Polynesia in reconstructing the culture history of the area and the origins of its peoples. Of the possibilities previously considered for origin of the Polynesian adze kit, however, an immediate origin in Eastern Melanesia is one most uniformly rejected. This paper explores that possibility by means of early dated assemblages of adzes from Fiji, Tonga, Samoa, the Society Islands, Marquesas and Wairau Bar. It maintains that with only a few quite probable innovations the East Polynesian adze kit can be derived from an ancestral one found in West Polynesia, and this in turn can be derived from an even earlier adze kit present in the Lapita cultural complex widespread in Eastern Melanesia. While such a hypothesis is likely to prove controversial and will be unacceptable to some because it stands in sharp contrast to the results of previous studies based on the distributions of adzes from surface collections, the excavation evidence requires that the hypothesis be examined more closely and given more consideration than it has in current literature now appearing on the subject.

Introduction

This paper aims to achieve the goals of the Newsletter (1) by presenting a revised version of my 1968 ANZAAS Congress paper, (2) by providing a summary

of an early adze assemblage from the Sasoa'a site (McKinlay 1969) in the Falefa valley of Western Samoa to be published in full later, and (3) by placing this new information in a comparative context with the other early adze assemblages of Polynesia, as some of the data are scattered and not readily available, at least to many readers of the Newsletter. While the subject could well be given extended formal treatment, the general availability of these notes now, will be, I think, of real interest to others, especially those dissatisfied with the typological distribution approach of Duff (1970).

The issue in question is the determination of the initial Polynesian adze kit. Duff (1970:7) asserts that "In Polynesia the Neolithic Adze technology arrived in a well developed form with the first men to settle this Archipelago. There is no progression from simpler Pre-Neolithic forms". Then on the basis of typological comparisons between adzes of the Southeast Asian Neolithic and Polynesia he attempts to show that the Polynesian kit entered this area in forms already present in focus 1 (South China-Formosa-Philippines) of Southeast Asia . Thus the Polynesian adze tradition is postulated to have "migrated" from the Philippine area of this focus during the first millenium B.C. (Duff 1970:131).

The basis for Duff's work, as for nearly all distribution studies of adzes in the Pacific, has been scattered museum collections, most of them from relatively uncontrolled archaeological contexts. Yet a great deal has been deduced from them and the results have had a profound effect in formulating general theories of the settlement of the Pacific, the most outstanding contributors being R. von Heine-Geldern, H. Otley Beyer, H.D. Skinner, and

Roger Duff. Because the source of the early New Zealand adze kit was always one of their primary concerns, Skinner and Duff have naturally enough sought to demonstrate its immediate origin in East Polynesia and then its ultimate derivation from Indonesia and Eastern Asia. Their classifications have been developed with these goals in mind and they have in large part been successful as any perusal of the general literature on Oceanic prehistory attests. One consequence of this approach was that the adzes of West Polynesia, while not entirely ignored, have received relatively little attention in most comparative studies.

This may seem surprising in view of the fact that one of the first major Polynesian adze typologies was that of Buck (1930) developed for Samoa. But because it did not easily lend itself to classification of the later adze assemblages of East Polynesia, nor to tracing the Asian origins of the Polynesian adze kit, it seems in general to have been neglected. However, when archaeologists began working in Tonga and Samoa they found it useful to develop their adze typologies along the lines set by Buck (Poulsen 1967, Green and Davidson 1969). This was to be expected, for in both cases the concern was more with tracing local adze development in West Polynesia based on archaeologically recovered assemblages than in tracing the ultimate origins of these forms in Southeast Asia. As will be seen below, neither classification is adequate for tracing the entire development of the Polynesian adze kit, at least not as this is revealed by a series of excavated assemblages of early adzes extending from Fiji, through West Polynesia and into East Polynesia. For that purpose an expanded and more Melanesian oriented approach than any employed to date would seem to be required.

The hypothesis that the initial Polynesian adze kit arrived in a form that could be predicted from distribution studies of surface collections from Southeast Asia and Polynesia has, of course, a number of assumptions about the general culture history of Oceania built into it. One of the most important of these has to do with the belief in prior settlement of island Melanesia and New Guinea by a group who were racially and culturally non-Austronesian and who brought with them the oval to lenticular sectioned "Melanesian" adzes not commonly found in Polynesia. As the Melanesian area has long been recognised as the stronghold of these adze forms, and as no ancestral "quadrangular" Polynesian adze kit seemed capable of identification among the collections from this area, a route through Micronesia has long been favoured by Buck, Duff, and others. Indeed, even with much evidence to the contrary, it is still a hypothesis which in modified form Duff (1967:19-23) finds an acceptable alternative. On the other hand, as a result of their excavations, a number of Polynesian archaeologists including Emory, Golson, Suggs had by the early 1960s come to believe in an immediate origin of the Polynesia cultural complex in the adjacent area of Eastern Melanesia along the lines previously suggested by the linguistic evidence (Green 1967). Some also had grave doubts that distribution studies were capable of revealing the actual outlines of early adze development in Polynesia some 2000 to 3000 years ago, much less their origin at an even earlier date in Southeast Asia.

To support these views, however, would obviously require a demonstration from excavated assemblages of the gradual emergence in West Polynesia of an ancient adze kit different in composition from that postulated

by the distribution studies and one which had its immediate origins in an ancestral complex widely distributed on an early time horizon in Island Melanesia. On the basis of pottery such a cultural complex at the appropriate time level was soon identified and named Lapita, but the precise nature of its associated adze kit remained unclear. Then between 1965 and 1969 information on the early adze assemblages from Fiji, Tonga, Samoa, the Society Islands and the Marquesas began to appear in some detail. This makes it possible now to document the probable development of the distinctive Polynesian adze kit from an earlier adze complex associated with Lapita pottery, thus fitting the general hypothesis of an immediate Melanesian origin for early Polynesian culture. The remainder of this paper therefore uses excavated assemblages to outline this sequence and compares it with the previous predictions made from distribution studies as a means of evaluating the results.

The Collections and their documentation

The following early assemblages from Polynesia and Fiji have been used :

Fiji - 4 adzes from VL 16/1 dating to circa 500 B.C. and 7 adzes from VL 16/81 dating to 1000 and 700 B.C. All are fully illustrated in Birks and Birks (1968 : 105-115) and I have studied them personally before their incorporation in this study.

Tonga - 7 adzes from To 1, 5 from To 2, and 2 from To 5, all associated with the early style of Lapita pottery, dating on

two assemblages

Groube's (n.d. & per com.) reanalysis to circa 1000-500 B.C. Of these adzes those from To 2 have the least secure contexts. 23 adzes from To 6 associated with a later and plainer style of pottery derived from the Lapita and dating on Groube's reassessment to circa 500 B.C. to 100 A.D. All adzes are fully illustrated in Poulsen (1967) and as I have only made a brief personal study of them they are grouped as he classified them.

Samoa - 13 adzes from SU-Sa-3, layer 4 in association with a predominantly thick and coarse plain pottery (Green Ms); 14 adzes from Su-Va-1, layer 5, again associated with a thick and coarse plain pottery (Green 1969). Both sites date to between the first to third centuries A.D. 20 adzes from Su-Sa-3, layer 5 associated with a predominantly thin fine pottery having occasional decorated bowl rims and dating between the 1st century B.C. and the 2nd century A.D. (Green Ms.) Their classification has been checked and discussed with Davidson.

two assemblages

Marquesas - 133 adzes (69 complete and 64 fragments) from levels IV, V, VI and VII of area B, and I, II, III, IV, V and VI of area A of site MUH-1 (Sinoto 1966). Data on the adzes are as in Sinoto (1966; 1970) and Sinoto (Ms), but not as in Emory (1968 : Table 4). I also have the advantage of personal study of all the complete specimens and their shoulder indices.

Society Island - 15 adzes from Paeao burial ground, Maupiti. All specimens are fully illustrated in Emory and Sinto (1964) and the same information with typological comparisons is in Emory (1968 : Table 2). From personal study for shoulder indices I would class the three adzes of Plate 3 which Emory lists as Duff 2B quite differently. That in Pl. 3a I class as closest to Type Vb of Samoa, Pl. 3b as Type Ib of Samoa, and Pl. 3c as Type IVb of Samoa. It is almost certain that the latter two are not 2B, and the first is far closer in form to Tongan, Fijian, Samoan and Philippine varieties of the Samoan Type Va than to the usual Duff type 2B adzes from New Zealand.

New Zealand - 70 adzes from 26 burials at Wairau Bar and 143 adzes from the midden of the same site. Data as in Duff (1956 : various appendixes and text) with his more recent revision in classification (1959, 1970) taken into account. A personal study of most complete adzes for shoulder indices has also been carried out. Duff lists grips of 2A adzes as incipient to absent; I would estimate that not more than approximately half have claim to incipient tangs, and have so indicated in my listing of them. A number of the 27 unclassified imperfect adzes mentioned under 2A would fall under Samoan types Ib, Ic, or Id.

two assemblages

These nine collections from six island groups are the most secure and best documented early adze assemblages from Polynesia. Each is among the earliest for its island group, all have been recovered by means of archaeology, and most are of sufficient size within a context of numerous other adze collections to allow controlled comparison. Thus both occurrence and frequency can be considered, along with their dates of the assemblages and their associations with other items in the total cultural complex. It is also possible to show that each differs from later adze assemblages of the same island group and that the earlier assemblage forms an adequate basis for these later developments. Because the later development of East Polynesian adze types has been rather fully documented recently by Emory (1968) it need not concern us further here.

Comparisons between early adze assemblages in Tonga and Samoa

Figure 1 has two purposes. One is to make available in comparative form the details of the early adze assemblages from Tonga and Samoa. The second is to support a claim (Green 1968) that while there is no marked discontinuity between the early adze kits of Tonga and Samoa, the Tongan one does differ significantly in its content by emphasizing forms not present in Samoa and by having only a restricted range of the more usual Polynesian adze types. This claim has recently been rejected by Golson (in press) who finds "no great difference between the early adze kits of Samoa and Tonga". Here it should be noted that at that time Golson did not have access to the Sa-3 data. Also neither he nor I was able to consider the 15 adzes from horizons II and III at To 6, as they were then judged as much too late in time to be

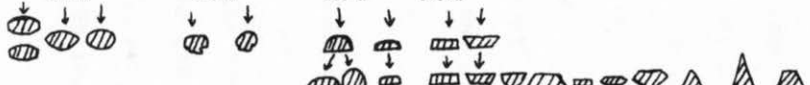
FIGURE 1

COMPARISONS BETWEEN EARLY ADZE ASSEMBLAGES IN TONGA AND SAMOA

I. Summary of early Tongan adzes

Tongan Group :		Stone			Shell		Stone					
		1a	2a	2d	Rect.	Curv.	2b	1a/1b	1b	1c	Misc.	Total
Site No.	Horizon											
To 6	II & III	1	3	1	2	-	3	1	2	2	-	15
To 6	I	3	-	1	-	-	2	-	-	-	2	8
To 3	0 I & II	2	-	-	-	-	-	-	-	-	-	2
To 2	II & III	1	-	-	1	-	2	-	-	-	1	5
To 1	I	-	1	-	3	2	1	-	-	-	-	7
	Total	7	4	2	6	2	8	1	2	2	3	37
	Percent	35.1%			21.6%		21.6%	13.5%				

Outline of cross-section shape :



II. Summary of early Samoan adzes

Samoan type :		NR	NR	NR	NR	NR	Va, b	Id	III	IVa, b	I	Ib	Ic	II	VI	VII	IX	Misc.	Total
Site No.	Layer																		
Sa-3	4	-	-	-	-	-	2	2	2	-	-	1	-	-	2	3	-	-	1	13
Va-1	V	-	-	-	-	-	5	1	-	1	-	-	1	1	1	1	1	1	1	14
Sa-3	5	-	-	-	-	-	5	3	2	-	1	2	4	1	1	-	-	-	1	20
	Total	-	-	-	-	-	12	6	4	1	1	2	5	2	2	3	4	1	3	47
	Percent	56.7%					38.3%		12.8%			42.5%							

Tongan types not represented in Samoan sample

Tongan-Samoan continuity

Samoan overlap with late To 6 horizon

Samoan elaboration, generally of types only weakly reflected in late Tongan contexts except for Types I and IX

included in our discussions. This, fortunately, is no longer the case and the assemblage of adzes from To 6, the largest sample of excavated adzes in secure contexts from Tonga, now becomes the most relevant for comparative purposes.

An analysis of the data in Figure 1 convinces me that the addition of new evidence considerably clarifies the situation, yet provides continued support for my initial assessment. Thus there are differences between Tongan and Samoan adze assemblages 2000 years ago on a presence-absence as well as a frequency basis. In fact it would seem reasonable to claim that some 56% of the adzes in the two Tongan assemblages are not represented in the Samoan collections, and that some 42% of the adzes in the Samoan assemblage are not reflected in the Tongan ones. The latter figure should probably be reduced, if as I suspect, sampling error accounts for the total lack of Type I Samoan adzes in the early Tongan contexts. In fact now that the late horizons of To 6 are included, I am able to observe more continuity than before in adzes related to Samoan Type I and I would also suggest, therefore, that sampling error is involved in the failure of the other overlap types present in the late horizons of To 6 to occur in the earlier Tongan Lapita contexts, particularly as such a case would seem to be strongly supported by the Fijian Lapita evidence (fig. 2). Figures 1 and 2 would also seem to support the contention that it is the elaboration of adze types in the early Samoan levels, lacking in those of Tonga, which provides that assemblage with the closest parallels to the early levels of the Marquesas, this being the other part of the claim disputed by Golson. Hopefully the addition of the new evidence to both the Tongan and Samoan cases has also sharpened the perception of the actual content of the early adze assemblages brought by the first people to

enter Polynesia.

This is perhaps the most important contribution, for the content is not composed entirely of those well developed adze forms which the distribution studies had predicted. On the basis of the above evidence I am inclined to nominate the Samoan adze assemblage as sufficiently differentiated in the Polynesian direction away from the earlier Tongan-Eastern Melanesian forms to qualify as the ancestral Polynesian adze kit.

The Ancestral Oceanic Adze Kit and its early Polynesian Development

The arrangement of Figure 2 lends itself to discussion of the early development of the Polynesian adze kit if we proceed by the columns from left to right. This use of numbered columns seems necessary as there is little consistency in designation between the various typologies employed by archaeologists. Where possible I have used named types and the Samoan numbered types in discussion. Also I have indicated the degree to which tangs are present by "T" for examples with a fully developed grip, and "t" for examples with an incipient grip, rather than having the same basic kinds of adzes with and without tangs from one assemblage sometimes fall into different types as happens in the Duff classification. In short I believe Duff provides a lead in the wrong direction in making grip modifications a major basis for distinguishing types when one is attempting to trace the early development of adze types in Polynesia. Rather I view the distinction as a useful one for sorting adzes from a restricted area of East Polynesia which later in time and independent of Southeast Asia developed a number of distinctive grip modifications for hafting the adze head (Emory 1968,

Figure 2

EARLY DEVELOPMENT OF THE POLYNESIAN ADZE KIT

DATES	SITE Assemblages	I	II	III Heavy Tridacna Shell	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	MISC:	TOTAL No:
1,000 to 500 B.C.	Fiji Lapita VL 16/1, 16/81	1	2		3	3	1	1								11
1,000 to 500 B.C.	Tonga Lapita To-1, 2, 5	3	1	6	3										1	14
500 B.C. to 100 A.D.	Tonga Plain Ware To-6	4	5	2	5		3	2							2	23
100 B.C. to 200 A.D.	Samoa Fine Plain Sa-3				8	4	3	1	1	1+1?					1	20
0 B.C. to 300 A.D.	Samoa Coarse Plain Sa-3, Va-1				(1t) 10	2	4		1		5	3			2	27
300 to 1,000 A.D.	Hane, Marquesas Early Levels HUH1		1		18	12	33 (1sh)	36 (7t)		4	10			29 (2T, 1t)		133
800 to 1,100 A.D.	Maupiti Burials Society Islands				5	1		2	1	1 (1t)	1 (1T)		2 (1t)	2 (1t)		15
900 to 1,200 A.D.	Wairau Burials New Zealand		1					22 (1t?)		2	(12T) 12		(4T) 10	22 (1sh, 1T)	1 (1T)	70
1,000 to 1,300 A.D.	Wairau Midden New Zealand	2	1		6	4		40 (20t?)	Flake adzes?	2 (2sh)	35 (35T)		(1sh, 17T) 25	(2sh, 8t, 16T) 26	2 (2T)	143
Classifications	Poulsen 1967	1a	2a, d	Rect. and Curv. Shell	2b	1b	1a/1b: some 1b	1c	NR	2c	1d	NR	1e	NR	3	
	Green-Davidson 1967	NR	Unique	Unique	V a, b	I, IX	1b, d; III	IV a	Ic	IV b	VI, VII	II	VIII	NR	Unique	
	Emory-Sinoto 1964	NR	NR	NR	5	2	NR	3A	1	1	6	NR	4	3B	NR	
	Sinoto Ms	NR	8	NR	5A, B	2A, B	1C: 3E	3B	1B	4C	6A, B, C, E	NR	4A	1A: 3A, G	NR	
	Duff 1959, 1970	some 2b	6A	NR	4C	most 2C	some 2C	2A	NR	some 3D	4E, 4A	NR	3G, E * 3A, C	1E, F 1A, B	5A	

10 30 50 %

T-Marked Tang t-Incipient Tang sh-Shoulder Grip * Duff 1956: type 3B

Bellwood 1970, Green in press).

Column I - Planilateral adze-axes or "lenticular sectioned blades with flat sides" (Bulmer 1964 : 248) are one of the common Melanesian forms of adze-axe blades distributed from Fiji to New Guinea. As Bulmer notes they have often been described as "quadrangular" in contrast to the "oval" or "lenticular" type, especially by those who see in them an "Austronesian influence", but most would agree with her that they are best distinguished from quadrangular adzes of Southeast Asia and Polynesia. Grouped with adzes of this form by Poulsen (1967 : 199 and especially fig. 109) are Tongan adzes closer to Duff type 2B, though some have more curved back surfaces than is common in New Zealand. Duff (1959 : 133) has always noted the resemblance of some of the New Zealand 2B forms to these Fijian, Lauan, Tongan and Rotuman examples, and has, I believe correctly, always explained this as a result of convergence. However, I am not convinced he is right in attributing this convergence to attempts to render adzes of his variety 2A in what are supposedly less tractable varieties of stone encountered in the two areas. Rather both typical planilateral blades with unilateral bevels and others with one bevel, flat sides, a rounded front and less curved back surface are common forms occurring in a variety of stone types in Melanesia where they possess a respectable antiquity in the order of 5000 years in the New Guinea Highlands and 3000 years in the Fiji-Tonga area. Because these adzes and the New Zealand 2B forms appear to have different historical origins, there seems little point in classifying them under one type.

Column II - Oval, rounded, and lenticular sectioned adze-axe blades with tapered polls. This is Duff's (1970 : 127) "Melanesian type par excellence" for which he suggests "a southward migration from Japan, via the Marianas and the Carolines, which influenced the Solomons directly, diffusing subsequently, north west to New Guinea and south to New Calendonia and Fiji" (1970 : 25). Corresponding sub-circular gouges in Polynesia and Southeast Asia he places in Type 6A, noting that adzes of this type are not common in Polynesia but that circular gouges are fairly widely distributed in East Polynesia, though not found in West Polynesia (Duff 1959 : 141; 1970 : 20). Because the gouges are consistently associated with the quadrangular adze complex of Southeast Asia, they are believed to be part of the original Austronesian typological assemblage (1970 : 25). To me the early Polynesian adze evidence suggests that the 6A form may have been a development in East Polynesia independent of the common early adze form in Eastern Melanesia-Tonga and also of the 6A gouges of Southeast Asia, particularly as 6A gouges were not seemingly an integral part of the initial or later adze assemblages of West Polynesia. The alternative is to link the oval and lenticular adzes of Tonga with the East Polynesian gouges, as some Marquesan evidence would suggest, and postulate a marked shift in the function of the form in East Polynesia, as major gaps in distribution and differences in time of occurrence militate against a Philippine origin. Like the planilateral adze-axe, the lenticular to oval adze-axe blade has a time depth in Tonga-Fiji of 3000 years, and in the Highlands of New Guinea of 6000 years. It also appears, like the planilateral adze blade, to have largely dropped from the Polynesian adze kit

at the time that this was undergoing modification in West Polynesia.

Column III - Thick bodied shell adzes in Tridacna, with rectangular or curvilinear sections, usually made from the hinge portion of the shell. These adzes belong to Davidson's (Ms) class of shell adzes made from the central or hinge portion of large Tridacna gigas shells, and fall under the division in which some indication of the form of the shell remains. An identical adze to the Tongan forms occurs in the early Vunda Phase in Fiji (Gifford 1951, fig. If; Green 1963 :144) and Poulsen (1967 : 233-34) also compares his Tongan examples to those from a late Lapita site in the New Hebrides and to some of the shell adzes excavated by Gifford in Yap. Hinge adzes of a related type belonging to this same division and occurring in association with a stone quadrangular adze are known in an early Neolithic burial in the Philippines dated to 4360 $\pm$250 B.P. (Evangelista 1964 : 54 and Plate Ia, Fox 1967). They are also one of the shell adze forms in the Outer Eastern Islands of the Southeast Solomons where an adze kit of a number of types, all in shell, dominates despite the availability of suitable stone for adze manufacture and the occurrence of some stone adzes. As Davidson's (Ms) survey shows the factor of cultural preference rather than simple environmental necessity must be invoked on a number of occasions to account for the distribution of these and related shell adzes, and in particular this would apply to Tonga, Fiji, the New Hebrides and the Solomons. Thus the early Tongan examples plus the occurrence in Tonga of Terebra shell chisels and Conus gouges seems to indicate that shell adzes of various types were perhaps a regular component of the original Oceanic and early Polynesian adze kit, and their loss in West Polynesia and to the East may be due to the

limited occurrence of suitable shell materials.

Column IV - Type V adzes with plano-convex sections were first defined by Buck (1930) and assigned by him to a separate type. Later studies by Duff (1956; 1959; 1970) have consistently, and wrongly I believe, classed them with triangular sectioned adzes, apex to the front. Initially Duff viewed them as a minor form of gouge, restricted like the rest of the triangular sectioned adzes with which he placed them, to East Polynesia. Unlike the small Wairau Bar examples, the Marquesan and West Polynesian forms are often among the large examples in an assemblage and are clearly a major form of adze head and should be viewed as such (Emory 1968 : 155).

After Suggs (1961) drew attention to the early importance of the type in the Marquesas and its Melanesian origin, and archaeology in West Polynesia confirmed its importance there in early contexts, Duff (1970 : 13-14, 25, 135), on finding that similar forms occur "rarely but consistently" or "sporadically" in most regions of Southeast Asia, has accepted that the form also has some claim to antiquity in that area, and is therefore the source of the Polynesian form. Those claims of Southeast Asian antiquity have yet to be demonstrated archaeologically, while our evidence shows that the East Polynesian forms, rather than having their immediate origin in the Philippines as he suggests, had their immediate origin in the early adze kit of West Polynesia and Eastern Melanesia. Moreover, it was this form rather than the quadrangular adze to which distributionists are so deeply attached as the hall mark of the Austronesians, which constitutes the major type in the earliest Polynesian assemblages. Nor should a possible relationship with the plano-convex

section and curved fitting edge Tridacna shell adze of identical form found in both Eastern Melanesia and Micronesia be ignored.

Column V - Type I and IX adzes with quadrangular sections, the back wider than the front. Those of Type I have a thin modified rectangular section, while those of Type IX possess the thicker section of a modified square. Some classifications do not separate the two types, but studies of shoulder indices have convinced me that the distinction may prove significant. Type I has always been recognised as a typical Western Polynesian adze form. It is an uncommon form in East Polynesia where it was replaced by a similar form, but with the front wider than the back (Samoan Type IVa). While it is the most common form in Samoa, excavation evidence demonstrates that it achieves its dominant position in the later part of the Samoan sequence (Davidson 1969, Green and Davidson 1969). Duff (1959 : 133) initially viewed it as "an original Indonesian diffusion to Western Polynesia", but in his recent study of Southeast Asian Neolithic adzes could document it only for Focus 3, and then not in Indonesia and only rarely in Indo-China (Duff 1970 : 19, 74). Because it does not occur in his Focus 1, and in particular not in the Philippines area from which the remaining Polynesian adzes forms are said to derive, this poses something of a problem for distribution studies. On the evidence of the early adze assemblages from West Polynesia and Fiji, it is obviously not a Polynesian innovation, as it occurs in the Lapita cultural complex of Fiji dating back to 1000 B.C. It also occurs in a number of presumed "Austronesian" pottery contexts along the New Guinea coast around Port Moresby which date to several 1000 years ago (Bulmer 1969, n.d.; Vanderwal

n.d.). Thus it is more likely to be an important and widespread adze form occurring in early contexts in the areas of Melanesia settled by Oceanic speakers of Austronesian, and its immediate Polynesian source is that area, rather than Indonesia.

Column VI - Variants of Type I which Poulsen, Sinoto, and I have found it worthwhile to distinguish : they include small, well-made adzes finely ground on all surfaces as in Samoan Type III, small thin examples of the same form but not so well made (Samoan Type Ib) and examples where the front edges have been rounded by grinding (Samoan Type Id). Although not yet adequately demonstrated, some of these variations may possess historical or functional significance. The explanation for their occurrence in the original Polynesian adze kit is presumably the same as that for Type I and may reflect some experimentation with this form in the course of modifying that adze kit.

Column VII - Type IVa was originally defined by Buck as a thin quadrangular adze in which the front was wider than the back. It was classed as 2A by Duff (1956 : 163) who was originally undecided whether it was the type from which his 1A (tanged quadrangular) developed or a logical degeneration from 1A when that form became too small and thin. In a later study (1959) he inferred from the wider distribution of 2A in all Polynesian groups that it predated the specialization of his tanged Type 1 and had diffused to Polynesia from Indonesia. From his Southeast Asian studies he has now concluded that his 2A is "the proto-type simple rectangular adze" from which his stepped rectangular (Types 1A, B and C) and later stepped

triangular (3A) and simple triangular (3D and G) evolved in Focus 1 of Southeast Asia and for which "a strong case can be made that these all diffused to Polynesia, in particular East Polynesia". (Duff 1970 : 13). The excavated evidence indicates that Buck Type IVa adzes occur in Lapita contexts on the Polynesian border at some time between 500 and 1000 B.C. and in the Tongan and Samoan assemblages shortly thereafter. But the type did not become a numerically important part of the early Polynesian adze kit until after the settlement of East Polynesia (Sinoto 1970). The importance Duff assigns to this form of quadrangular adze in the early Polynesian adze kit therefore reflects his East Polynesian-Southeast Asia bias derived from the distribution evidence. In contrast the archaeological evidence would suggest that Type I (Duff 2C) and Type IVa (Duff 2A) were both present but not of overwhelming importance in the ancestral adze kit. In later contexts in West Polynesia Type I became a dominant form, while in the early East Polynesian adze kit a thin variety of Type IVa was initially favoured, but then later completely replaced by a number of other types in various island groups.

Column VIII - Type Ib, a minor variant of a Type I adze which is also recognised by Sinoto, is one in which the sides have not been ground flat, but are left unfinished, forming a sort of irregular lateral edge. Presumably most are poorly made examples of Type I, or perhaps of Type IVa, as would seem to be the case with some of the unclassified 2A adzes from Wairau Bar.

Column IX - Type IVb is a version of Type IVa with a rounded back.

Its early Samoan occurrence is attested by one well-made complete specimen and another fragment which could just possibly be of Type V. It is a very uncommon form in Samoa and its historical position there is not well known. Because Poulsen and Sinoto also classify the form separately its recognition seems worthwhile, especially as some examples illustrated by Duff (1956 : fig. 40) from Wairau Bar under Type 3D are clearly of the same form. But the type, while early, can only provisionally be assigned to the original Polynesian adze kit. However, it could be viewed as a possible proto-type for triangular adzes with apex to the base, which it appears is how Duff would classify it. It will also rank as a Polynesian innovation unless one accepts its historical relationship to a similar adze form of 100 A.D. from the Philippines (Duff 1970 : 132), in which case the usual problems of major gaps in distribution and acceptable chronological relationships arise.

Column X - Types VI and VII are adzes with triangular sections, apex to the front which Duff would place under various varieties of his Type 4. With the exception of his variety 4C, which we have already suggested should not be included in this group, and a unique grooving gouge from Southeast Asia (4H), the remaining adzes of Duff Type 4 are all confined in distribution to Polynesia. They occur there with and without grips, the forms without grips being the wider spread. Duff (1959 : 137) considers them to be second in age to his Type 2 in Polynesia and a "Polynesian elaboration on an ancestral theme, diffused through the Society Islands". Some scattered examples occur in various contexts in Fiji and are best explained as one result of continued contacts favoured by two-way voyaging between the Fiji-Tonga-Samoa island groups (Palmer 1969a). From the archaeological evidence, and their limited

and late occurrence in Tonga and Fiji, one is tempted to see them as a Samoan innovation and addition to the Polynesian adze kit. Their further elaboration with the addition of a lashing grip occurred at a later date in East Polynesia, after the form was initially established without a grip.

Column XI - Adze Type II is essentially a Type I adze, as Buck recognized, in which the back is left with a ridge rather than flaked flat. It is a Samoan form not recognized in other classifications presumably because it does not occur. I believe it worthwhile noting that the first adze of this type excavated from layer V at Va-1, I initially typed as 3G in a preliminary report using the Duff classification. In the final report where we employed the more satisfactory Buck classification it was assigned to Type II (Green 1969 : 131-32). This adze type with its roughly triangular section surface becomes one of the most common forms in the later part of the Samoan sequence and may be a West Polynesian equivalent of the reversed triangular sectioned adze with grip modification common in East Polynesia. The form without grip is uncommon and not well dated in West Polynesia, lacking in the early Marquesan levels (Sinoto 1968 : 114), and very rare in Easter Island and Hawaii (Emory 1968 : 161-164). It thus could be that experimentation in the direction of a reversed triangular adze began in Samoa with Types II and IVb, and this laid the basis for the development of an uncommon form of Type VIII without grip in both East and West Polynesia from which the common later East Polynesia forms with definite tangs developed.

Column XII - Type VIII includes those adzes with triangular sections, apex to the back which Duff would place in his Type 3. Initially he

considered these to be a "late Polynesian invention, based on the Society Islands" (1969 : 137) and the evidence assembled here would certainly support him, especially that for the tanged forms. In his latest work he has tried to derive them from the Philippine Neolithic on what I would consider rather slender evidence and a bit of chronometric magic.

Polynesian adzes of his Type 3 are extremely rare in Southeast Asia. Thus Duff begins by citing the Philippine occurrence in Albay Cave of three of his varieties, 3A, D, and G, which are from very late Neolithic jar burials dated to circa 100 A.D. (1970 : 132). These he assigns to Beyer's Late Neolithic (1750-200 B.C.), and suggests its earlier date, 1750 B.C. should be greatly reduced to allow the Middle Neolithic, which he calls Austronesian 1, to last into the 1st millenium B.C. Then noting that the Philippines possessed five of the six East Polynesian adze types, he concludes "that the Polynesian adze tradition migrated during the late moment of the Middle Neolithic (Austronesia 1) during the first millenium B.C." (Duff 1970 : 131). The Albay cave sites have two radiocarbon dates 91±250 B.C. for Cave No. 2, the habitation-burial cave; A.D. 179±250 for Cave No. 1, a burial cave (Solheim 1961 : 163; Evangelista 1967 : 77) and fall at the very end of the late Neolithic. A dated assemblage closer in age to the time Duff nominates, i.e. 960±100 B.C. (Green 1965 : 385) contains three adzes, "one rectangular, one lenticular, and the third trapesoidal in cross section, all thin and rectangular in plan view" (Solheim 1961 : 162). This assemblage would compare nicely with one entering West Polynesia from Melanesia at about the same time, especially if the even earlier Philippine Neolithic thick bodied tridacna shell adzes were to be included in it. But there is as yet little evidence at this time

or earlier for the existence in the Philippines of either the Duff Type 3 adzes without grip or those with stepped butts belonging to his Types 1A or 3A.

Column XIII - The above leads naturally into a discussion of Duff Type 1A, for which no comparable form exists in West Polynesia, so that it is not represented in either the Buck classification or the revisions of it. However, a definition of the early form of this type would emphasize the possession of thicker, sometimes almost square to rounded square and the vertical rectangular section of these adzes and stress that they occur in forms to which tangs were initially not commonly applied. On the evidence it would appear that from adzes of this type, like those that occur in the Marquesas, the consistently tanged quadrangular adze of Duff Type 1A evolved and spread in the manner he has suggested (1970 : Fig. on page 16). What I find difficult to accept is Duff's route from the Philippines direct to East Polynesia advocated to explain this development, and have criticised the hypothesis in detail elsewhere(Green in press; see also below). I would suggest it is more likely that the tanged quadrangular adze form is a Polynesian innovation based on already existing quadrangular types, particularly those we have called Types IX and IVa.

Conclusion

We may now review Duff's most recent statement on the major source for the early adze development of East Polynesia, which to be understood I believe must be quoted in full.

"Any examination of the adze assemblages of the third focus of

Southeast Asian development and of the Philippines in particular raises the question of the extraordinary coincidence of types with those of Eastern Polynesia. Despite the enormous sea gap involved it is difficult to avoid the conclusion that the dominant Eastern Polynesian tradition was carried from the Philippine Sea six thousand miles easty-by-south to the Society Islands or Marquesas areas of Eastern Polynesia, and from these centres by radial diffusion to the major Eastern Polynesian Groups. The hypothesis of this seemingly incredible trans-Pacific transmission is both strengthened by the existence of geographically "logical" stepping-stones such as the Micronesian archipelagoes of the Marianas, Carolines, Marshals and Gilberts, and weakened by the absence of archaeological demonstration of the presumed transit forms in these islands. The time-stayed survival of the Neolithic into the early Nineteenth century in Polynesia also raises the continuing difficulty of deciding which end-products in Polynesia represented convergent or parallel developments rather than specific transmissions". (1970 : 125).

My assessment of this hypothesis is that Duff is correct in using the words "seemingly incredible". 1) Adze collections certainly have been described for some of the intervening islands he names and if distribution studies have a general validity then the relevant East Polynesian adze forms should have turned up in some of them; they might also have been expected among the adzes from excavations in a number of early pottery bearing cultural complexes in Western Micronesia, some of which date back to the first millenium B.C. 2) The date he nominates for departure, as noted above, is in the first millenium B.C., so the migrants must have tarried somewhere because occupation of East Polynesia on any known evidence does not antedate

100-200 B.C. and is probably some centuries later. 3) Even if they left between 200 to 400 A.D. well into the early Philippine Iron age, and went more or less direct, they would still have had to be some generations at sea not to have arrived in East Polynesia before the relevant forms of tanged and reversed triangular adzes are established in the Marquesas or Society Islands. 4) Finally and far more important than any of the above, this hypothesis ignores all the evidence put forward over the years that the majority of the early cultural complex in East Polynesia derives from West Polynesia. I have attempted to show here that the early adze evidence from Polynesia also follows this pattern. Thus documentation of the actual early West Polynesian adze kit and some indication of the one from which it originates in Eastern Melanesia, allows the derivation of the early East Polynesian adze kit of the Marquesas or the Society Islands from it with little difficulty. Emory (1968) and Sinoto (1970) who have also reviewed this evidence for the same purpose, have come to the same conclusion. Why then, one may ask, does Duff reject it ?

Three major innovations are initially required in East Polynesia. They may be summarized as 1) the development of the reversed triangular sectioned adze of Type VIII based on Samoan Type II or IVb as a probable proto-type, 2) the development of a much thicker bodied quadrangular adze form, and 3) the application to a number of these adze forms of a variety of grip modifications to assist in lashing the adze to a medium to heel type haft. As Emory (1968) and the evidence presented in Figure 2 shows, the Polynesian development of the tang was a gradual process occurring in East Polynesia, so that only a few and mostly incipient tangs occur in the early

adze assemblages of the Marquesas and Society Islands. Sometime after 600 to 800 A.D. the technique had become sufficiently well established in Central East Polynesia to occur thereafter on all but the adzes of Easter Island, indicating an early separation for the latter. Earlier attempts at informal incipient tangs are known from one early example on a Type V adze from Samoa, and from a variety of contexts in Fiji (Palmer 1969b). As Palmer points out, this is to be expected, for if tentative but repeated attempts to create lashing aids are found in the earliest East Polynesian contexts, after which they become an established feature, then there could well have been sporadic and unsustained efforts of the same kind in older horizons farther West. Such isolated cases, some of them from early contexts and others in surface collections, can now be cited for Fiji, Tonga and Samoa. But nowhere is there evidence for any sustained development in this direction in that region. Rather the elaboration into specific forms of butt modification, some of them with rather striking parallels to forms thousands of years older in cultures many thousands of miles to the West seemed to have occurred quite independently at a much later date in East Polynesia.

In short once the time element is added by means of early dated assemblages, the difficulties of deciding which end-products in Polynesia represent convergent or parallel developments can be resolved, though not in favour of the major hypothesis which Duff has advanced on the basis of his distribution studies. Thus taking one of his earlier statements : "the point can be made that archaeology might never establish a better time

sequence of Polynesian adze types than can be deduced from distribution" (1959 : 127) the reply might now be : distribution studies can never establish better time sequences than archaeology and they must be used cautiously when carried out in advance of or without reference to archaeologically dated materials. This Duff has failed to do in his most recent study.

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The following officers and members of Council were elected at the Annual General Meeting held at Auckland on Monday, 17 May:

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EVIDENCE FOR THE DEVELOPMENT OF THE EARLY POLYNESIAN ADZE KIT

R. C. Green, Vol. 14, No. 1.

Corrections

Page 19	Line 6	the for "their"
Page 28	Line 1	cutting for "fitting"
Page 32	Line 12	for "triangular section surface" read triangular section on the back surface
Page 34	Line 9	for "and the" read or a
Page 42	Line 4	insert in press in front of "Aspects of the Neolithic...."
Page 42	Line 15	"Tonga Lapita Pottery and Polynesian Origins", in press in Sept 1971 Journal of the Polynesian Society.