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From Mendana to Riesenfeld: Early Accounts of and Speculation on Taro Irrigation in the Asia-Pacific Area

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The earliest written account of taro irrigation in the Asia-Pacific area apart from early Chinese sources appears to be from Mendana's voyage to the Solomon Islands in 1567, when irrigation systems on Guadalcanal were seen. In the intervening 400 years, before serious archaeological investigation of such systems, there was much further description and speculation regarding the history and origins of such systems. Members of Captain Cook's expeditions in the 1770s were impressed by taro irrigation systems they saw in the Hawaiian Islands, Tahiti and New Caledonia. Early visitors to other island groups also saw taro irrigation: John Williams described the practice on Rarotonga in 1823, Wilkes recorded it in the Fijian archipelago during the US Exploring Expedition of 1838–1842, and the missionary John Geddie mentioned taro irrigation in an account written soon after he settled on Aneityum Island in Vanuatu, in 1848. Such early accounts—and what they tell us about the attitudes of those who encountered irrigation systems in the Pacific—are the subject of this presentation.

1. INTRODUCTION

European speculations on the origins of the Pacific peoples using taro irrigation when first encountered by outsiders started with the first Spanish explorers of the 16th century and have continued ever since. The general theories of the nineteenth century on Pacific origins derived mainly from two sources: biblical theology and philologically-inspired Orientalism. In the former vein, whether the Pacific peoples were sons and daughters of Shem or Ham, thus Semitic or 'African' in origin, was a topic of hot debate. Equally, within the Orientalist views of the time, an Indocentric position was dominant, sometimes seen as representing an Aryan origin for the Pacific Islanders and sometimes not (Ballantyne 2002). A less popular view saw an American origin for Pacific peoples, the Polynesians in particular (Lang 1877).

This paper seeks more narrowly to examine how European visitors interpreted the irrigated taro gardens they encountered in terms of the origins of the technology. The 18th and 19th century visitors whose accounts are quoted below may have been aware to various degrees of contemporary debates on the origins of Pacific peoples, but did not explicitly link taro irrigation to them. The two questions—the wider one of the origins of the people and the narrower one of the origin of a particular technology—are of course potentially linked. The two came together in the early 20th century when the presence of taro irrigation was invoked as supporting evidence in Egyptocentric hyper-diffusionist theories on Pacific origins, as

detailed below. Before then taro irrigation systems were sometimes seen as evidence of now-disappeared advanced civilizations or influences but guesses as to their specific origins were not hazarded.

Pacific archaeologists, ironically, often display little interest in the ultimate origins of the theories they espouse concerning migration and diffusion in the Pacific. An account of the early iterations of now-familiar origin theories is salutary in raising issues of whether they are implicated in wider meta-narratives that, on reflection, we might not wish to subscribe to.

2. EARLY ACCOUNTS

The earliest European account of taro irrigation that I have come across is that from Mendana's 'discovery' of the Solomon Islands in 1568. On 19th May of that year the Spaniards of the expedition while on a reconnaissance on Guadalcanal came upon irrigated gardens:

'... we saw many villages up in the hills and many plantations of food on the slopes, arranged very well so that they could irrigate them, which they did. It was well laid out; and by each there was a stream of water' (Amherst and Thomson 1901 (II): 306).

It is clear that there are earlier accounts from the Asian region in Chinese (see this volume) and possibly in other Asian language sources, but I have not been able to locate any of the latter. Surely the taro irrigation of Lan-yu (also known as Orchid Island or Botel Tobago), now part of Taiwan (Kano and Segawa 1956), attracted early attention?

Members of Lieutenant James Cook's expeditions in the 1770s commented on and were obviously impressed by taro irrigation in the Hawaiian Islands, Tahiti and New Caledonia (Cook [Beaglehole] 1961: 538, 1967: 269; Forster 1777(1): 341–342). The Hawaiian irrigation systems also attracted the admiration of members of Vancouver's 1792 expedition. The surgeon on the voyage, Archibald Menzies, described the scene at Waimea on Kaua'i:

'We walked to the confluence of these two streams and found that the aqueduct which waters the whole plantation is bought with much art and labor along the bottom of the rocks from the north-west branch... Indeed the whole plantation is laid out with great neatness and is intersected by small elevated banks conveying streams from the above aqueduct to flood the distant fields on each side at pleasure, by which their esculent roots are brought to such perfection, that they are the best of every kind I ever saw' (Menzies 1920: 28–29).

He was equally impressed in the neighbourhood of Lahaina on Maui Island:

'Even the shelving cliffs of rock were planted with esculent roots, banked in and watered by aqueducts from the rivulet with as much art as if their level had been taken by the most ingenious engineer. We could not indeed but admire the laudable ingenuity of these people in cultivating their soil with so much economy. The indefatigable labor in making these little fields in so rugged a situation, the care and industry with which they were transplanted, watered and kept in order, surpassed anything of the kind we had ever seen before' (1920: 105).

Hawaiian irrigation continued to impress early visitors. Von Kotzebue, travelling in the Group between 1815 to 1818, wrote:

‘The artificial taro fields, which may justly be called taro lakes, excited my attention. Each of them forms a regular square of 160 feet, and is enclosed with stone all round like our basins... I have seen whole mountains covered with such fields, through which the water gradually flowed; each sluice formed a small cascade, which ran through avenues of sugar cane, or bananas, into the next pond, and afforded an extremely picturesque prospect’ (Von Kotzebue 1821(I): 340–341).

Early accounts by visitors to other island groups also mention irrigation. For instance, the subsequently-cannibalised missionary John Williams described the practice as it was on Rarotonga in the Cook Islands in 1823 (1838: 206–7), and Captain Charles Wilkes reported it from the Fijian archipelago during the US Exploring Expedition of 1838–1842 (1845 (III): 42–43).

But it is not the simple reporting of occurrences, however, that interests me in this paper. The interpretations of what was seen are the focus here. European and American reactions to Pacific Island irrigation present the full range from admiration, grudging or otherwise, through indifference, to a conviction that the current populations of the islands could not have constructed the systems that were observed. This latter position led to a search for who *had* constructed them, formulated most explicitly in the period of concern by the *troika*—Ian Langham’s (1981: 153) term—of G. E. Smith, W. H. R. Rivers and W. J. Perry.

The occurrence of taro irrigation became a central prop in what was probably the dominant theory of the settlement of the Pacific in the first half of the 20th century.

To give a flavour of the different reactions I will give a few choice examples. For some the existence of a clearly sophisticated water control technology gave them a new, if often grudging, respect for the achievements of the indigenous Pacific populations they encountered as voyagers or missionaries. Those who did not stray far from the boat often had a quite different perspective of the agricultural competence of those they were visiting. The classic case is perhaps that of the Reverend Robert Steel in his 1880 work *The New Hebrides and Christian Missions*. In referring to the island of Aneityum in southern Vanuatu he quotes (1880: 93) an 1808 poem on the West Indies by James Montgomery¹⁾:

In placid indolence supinely bless’d
A feeble race this beauteous isle possess’d,
Untamed, untaught, in arts and arms unskill’d
Their Patrimonial soil they rudely till’d.

Others were more impressed by what they saw. The Reverend John Geddie, pioneer missionary on Aneityum had earlier written the following account, probably in 1849 less than a year after he had arrived on the island:

‘In their plantations these islanders display much ingenuity and taste... Much skill is displayed

in the irrigation of those places where the ground is dry. Small canals are dug, and water conveyed to them from the nearest stream. The water courses are so constructed that the native, by opening a small sluice at the head of his plantation, can in a few minutes water the whole. I have seen ridges on the sides of hills, in the form of steps and stairs, under cultivation, and watered in this way' (1852: 8).

On a walk across Aneityum on 21st November 1853 the naturalist John MacGillivray recorded:

'In no part of the island had I seen irrigation carried to the same extent as here. One of the artificial channels was upwards of a mile in length, and, in places, as when carried along the side of a steep bank, it must have cost much labour, and a considerable amount of skill' (1853–4: 94–95).

Commodore Erskine on a visit to an area of New Caledonia 30 km southeast of Balade on the river 'Kalaut' also commented in 1853:

'From all we see it is evident that this part of the country is not generally fertile, but a degree of pains seems to be taken in its cultivation that I never expected to see among savages. The face of the hills above the river is covered with rectangular fields, surrounded by channels of irrigation, which as far as can be seen from below, is conducted on a careful and scientific system...'

(1853: 355).

Later on the French administrator and pioneer archaeologist Gustave Glaumont wrote:

“To give an idea of the industry of this people, whom certain travellers have depicted as without religion, without cultivation even as living in the deepest savagery, I will describe the truly ingenious manner with which an irrigated taro garden is installed on the flank of a mountain (Glaumont 1888; translation by Spriggs).

He then goes on to do so.

From the Balade area again we have the 1862 account of De Rochas who found:

'A sort of monument to this ingenious art, one that it is astonishing to find in such perfection among a savage people. It is a canal 8–10 km long, running along the side of the mountains, with a skilfulness that would do honour to a civilised people' (1862: 170, translation Spriggs²).

If anything the early commentators focused on the irrigation canals and their lengths rather than the irrigated fields themselves for their particular praise.

Anderson, writing in 1880, was slightly more grudging in his praise:

'The idea of irrigating the plantations by this means is, perhaps, one which would occur to the

most uncivilised savage; but a certain amount of skill displayed in cutting the channels on the side of the hills, which are sometimes wooded, oftentimes rocky, and also in constructing them at a constant very gradual descent, imperceptible to the naked eye, is sufficient to alter any previously assumed notion that the Melanesian is a know-nothing specimen of the ‘genus Homo’ (1880: 229–230).

Inevitably, some with perhaps even more fixed views of racial hierarchy and aptitude, concluded that the systems could not have been built by the present population. Thus Julius Brenchley on his 1865 visit:

‘It would appear...that a more advanced Civilization must have at one time existed on this island [New Caledonia]. Remains of ancient aqueducts are to be found, one eight miles in length... It is evident that the skilful irrigation which has so surprised those who saw it, must be a practice that has been transmitted from better times’ (1873: 347).

Similar sentiments can be found among other early writers. The Aneityum missionary John Inglis stressed the ancient date of the irrigation canals, implying just this and thus tempering his admiration:

‘On Aneityum there is a large system of irrigation, but of an ancient date; long canals cut as scientifically as if levels and inclines had been laid down by the surveyor with the aid of his theodolite. If you ask the natives who made these old canals for irrigation, they tell you they do not know; they suppose they were made by the *natmasses*, that is the gods, or, in other words, the spirits of their forefathers, which, of course, means their forefathers themselves’ (1882: xxiii).

Perhaps the strangest sentiment—I can only presume he is being ironic—comes from the Reverend James Copeland on seeing the irrigation systems on the island of Aneityum in Vanuatu. He noted that there were: ‘... aqueducts for the irrigation of plantations which, though extensive, come far short of that which now unites Glasgow and the Highland Lochs’ (1860: 346).

As New Guinea was opened up for European exploration at the end of the 19th and start of the 20th centuries, irrigation was recorded there as well. By 1914 the idea that the current generations of Pacific islanders could not have themselves built such systems was becoming more standard. Thus Henry Newton could write of irrigation systems in the Wamira area of what is now Milne Bay Province, PNG:

‘Who originated these systems of irrigation no one knows. To all enquiries the answer is given, ‘Our ancestors did it.’ How long ago, no one has any idea; but rough as some of the work is, it shows a good deal of thought and skill in overcoming engineering difficulties. The men who thought out and directed the erection of the aqueduct at Gwagamore, and the one who first carried the water round the cliffs on the bank of the Wamira River were certainly benefactors to their race, and far ahead of the present generation in inventive faculty and in skill’ (1914: 124–125).

In similar vein Felix Speiser discussed the irrigation systems of Vanuatu that he saw during his 1910–1912 visit:

‘The irrigation systems are often so skilfully laid out and sometimes represent such enormous achievements in terms of labour that it is almost inconceivable that a culture like that of the New Hebrides could have produced them. But there can be no doubt that the irrigation systems are the work of the present population since some of them are still in use’ (1990 [1923]: 134).

He attributed his surprise as evidence of local degeneration from a higher stage of civilisation:

‘Though the upkeep of the channel itself calls for a sustained effort which is surprising in the Melanesian, the system as a whole is an achievement of considered planning, foresight and perseverance which is hardly within the capacity of the present natives... It is therefore safe to infer that, in the days when such channels were built, native culture had reached a height and degree of organization of which we today can see only the sorry remains. There must have been powerful leaders who could unite a population imbued with a spirit of initiative and direct their efforts to a joint enterprise’ (ibid.).

In the Territory of New Guinea such attitudes were eventually even passed on the indigenous population, or at least to the members of the Native Police who accompanied exploratory patrols into the Eastern Highlands:

‘Fine taro, broad-leafed and sleek, excited the admiration of the police. Yagi, a solid and sceptical Sepik, paused before one beautiful garden. “Look”, he said. “the Kanakas savvy true. See how they plant the taro. They turn the ground and bring the water in to sweeten it. Oh, wild man, who was it who schooled you?”’ (Sinclair 1966: 67, recounting a 1951 patrol).

As time went on and colonial presence in New Guinea approached the hundred-year mark, the new conclusion that irrigation methods had been taught by Europeans was an almost inevitable development. The anthropologist Mervyn Meggitt assumed that irrigation techniques he observed in what is now Enga Province of PNG had been learned from goldminers (1958: 306–307). Patrol Officer J. H. Stitt (quoted in Gorecki 1979: 117) felt the need to ask the local people if irrigation techniques he encountered in the Western Highlands in 1961 had been taught by Europeans, as had G. W. Whiteoak in Enga in 1953 (quoted in Lacey 1979: 15).

3. ABANDONED GARDENS

As the Pacific islands became somewhat better known to outsiders, large areas of abandoned terraces and garden systems were encountered as visitors felt safe enough to penetrate the interiors of islands. John Horne, after describing the ‘ingenuity and much labour’ (1881: 45) that went into the construction of irrigation canals in Fiji, noted that ‘throughout the country there are numerous old *dalo* or *taro* beds, which only require a little repair to fit them for its

cultivation' (ibid: 183). Two papers published in *L'Anthropologie* in 1897 seem, however, to be the first to offer any explanation for the presence of abandoned irrigation systems in the Pacific, referring to New Caledonia and the Marquesas (Glaumont 1897; Tautain 1897: 542). While Tautain saw such abandonment as confirmation of the dying race in the Marquesas ('a sorry people, ripe for death'³) Glaumont's point in his article was to show how industrious the Kanaks (indigenous New Caledonians) had been when left to themselves before the 1850's conquest and colonial subjugation by the French:

'No matter, the traces that remain, all in ruins though they be, are sufficient to demonstrate to us how the Kanak, left to his own devices, was industrious, and how these irrigation works are witness to his intelligence, his hard work and his ingenuity' (Glaumont 1897: 48; translation by Spriggs).

Such reports of abandoned irrigation systems and other 'megalithic' remains in the jungles of such islands were later to lead more definitively to ideas of lost civilisations bringing 'advanced' cultural traits to previously benighted Pacific populations. Abandonment could actually, of course, be explained by the lack of resistance to introduced European disease that had a massive effect on population levels on many islands before European colonial administration—and thus enumeration—were established. Recorded population declines within a century of over 90 per cent in some cases (Rallu and Kirch 2007) are reason enough for the presence of abandoned irrigation systems across the region when the first generations of scholars came to survey them.

In Polynesia, surveys by archaeologists and anthropologists of the Bishop Museum recorded the presence of abandoned canals, terraces and other features associated with taro irrigation in the Austral Islands (Aitken 1930: 16–17, 33–34), Cook Islands (Buck 1944: 249–250), Hawaiian Islands (Bennett 1931; Emory 1924; Handy 1940; McAllister 1933), Mangareva (Buck 1938: 226–227), Marquesas Islands (Handy 1923: 182–187) and the Society Islands (Emory 1933: 33) in eastern Polynesia, and Wallis and Futuna (Burrows 1936: 140) in western Polynesia. Speiser had noted for Vanuatu that: 'Many of the [irrigation] channels, however, are now abandoned and decayed' (1990 [1923]: 134). Depopulation would have been a more cogent explanation than his favoured argument of degeneration.

4. THEORIES OF ORIGIN

4.1 Semple

Glaumont attributed the development of these 'travaux gigantesques' (stupendous works) in New Caledonia to living on a mountainous island with only the rat and bats as game meat and the natural tendency of populations to grow continuously (1897: 48). This idea was given a detailed theoretical exposition in Ellen Churchill Semple's development of the geographer Ratzel's system of 'Anthropo-geography' in her 1910 book *Influences of Geographic Environment*. In a section on 'Precocious development of island agriculture' she notes:

'Where an island offers in its climate and soil conditions favorable to agriculture, tillage begins

early to assume an intensive, scientific character, to supply the increasing demand for food. The land, fixed in the amount of area, must be made elastic in its productivity by the application of intelligence and industry. Hence in island habitats, an early development of agriculture...is a prevailing feature' (1910: 455).

She immediately moves on from this passage to discuss Pacific agriculture, waxing eloquent on the topic of Melanesian agriculture, where irrigation of course gets a honourable mention:

'But it is in Fiji that native island agriculture seems to culminate. Here a race of dark, frizzly haired savages, addicted to cannibalism, have in the art of tillage taken a spurt forward in civilisation, till in this respect they stand abreast of the average European' (1910: 456).

Praise indeed! After a later discussion of terraced irrigation in Polynesia, Island SE Asia and Japan, Semple concludes:

'The mountain environment often occasions a forced development in the form of agriculture among peoples who otherwise still linger in a low state of barbarism or savagery' (1910: 570).

4.2 Elliot Smith, Perry, Rivers and Chinnery

Semple's work was known to the next group of scholars who took notice of taro irrigation in the Pacific region. She had not speculated on the origins of such systems beyond environmental necessity, except to repeat the idea for Java and Lombok that irrigation (there for rice) was introduced by Brahmins from India (*ibid.*). With the Australian anatomist Grafton Elliot Smith as the originator of the 'grand narrative' (see for instance Smith 1916a, b), William Perry and William Halse Rivers really took up the quest for external origins for particular cultural traits found in the Pacific and elsewhere such as irrigation. Langham (1981) gives a detailed presentation of their relationship and the context for their ideas. The starting point was Elliot Smith's idea as summarised by Perry, that: 'Egyptian culture has had an enormous effect upon the civilisation of the earth' (Perry 1915: 13–14). In two key papers presented to the Manchester Literary and Philosophical Society in 1915 and 1916, both of them read on his behalf by Elliot Smith, Perry traced the relationship between the distribution of megalithic monuments and ancient mines, and that of terraced irrigation across the world. The first was entitled 'The Relationship Between the Geographical Distribution of Megalithic Monuments and Ancient Mines' (read 5th October 1915, published as Perry 1915) and the second was 'The Geographical Distribution of Terraced Cultivation and Irrigation' (read 8th February 1916, published as Perry 1916).

The megaliths were all seen as derived ultimately from Egypt, but how to explain their spotty distribution? Perry argued that the push for a migration of Egyptian-derived or influenced peoples was the search for mineral wealth across the world, particularly gold. The trail led from Egypt to India to Island SE Asia and across the Pacific, and ultimately to the Americas where the Mesoamerican civilizations represented a flowering of megalithic culture nearly on a par with Egypt.

Mining and megalithic monuments went together, but there was a problem of mismatch in various areas, one of them being in the Pacific where the use of metal was unknown at European contact. For this region Perry postulated that the resources being sought were pearls and pearl shell and so megalithic monuments should be associated with these resources. He also included the use of irrigation, particularly terraced irrigation, in the cultural package. Sometimes there were mines but no megaliths, but there was irrigation. Sometimes there were megaliths but no mines, but again there was irrigation (Perry 1915). A series of further 'Egyptian' traits could be added or taken away at will to explain away any anomalies, such as mummification, circumcision, pile dwellings, the use of purple dye, conch shells, widow sacrifice and so on.

Perry's grand synthesis *Children of the Sun* was published in 1923. Degeneration is a key concept there and in other writings of this group:

'On the whole the civilization of Oceania, judging from the crafts of stone-working and irrigation, has suffered a considerable decline, so that the present-day communities live alongside remains beyond their capacity to construct' (1923: 32).

W. H. R. Rivers had been converted to this hyper-diffusionist position by 1911 from an earlier Tylorian evolutionary perspective (Rivers 1911; *cf.* Perry 1927: 109). His own paper to the Manchester Literary and Philosophical Society was delivered on May 30th 1916 entitled 'Irrigation and the Cultivation of Taro' (Rivers 1917), some time after Perry's own paper on a similar theme. Elliot Smith was not in the Chair this time but presented a paper immediately after Rivers. Rivers' paper was only published posthumously (Rivers 1926), but seems to have been very little changed in content from that of the published abstract (Rivers 1917). Rivers saw his goal as providing a detailed case study on taro irrigation and its distribution, seeing the intimate relation between taro and irrigation in the Pacific as meaning that taro too was spread by the postulated megalithic culture (Fig. 1). He concentrated particularly on Vanuatu (then the New Hebrides), using information from missionaries as to the distribution of irrigation on particular islands, with further coverage of the rest of the Pacific and (more sketchily) further afield where taro is found.

Rivers attempted to explain, certainly better than Perry had, why there were mismatches in some areas between cultural traits seen as part of the Egyptian 'package':

'If a culture is carried from one place to another by means of migration, an exact agreement in the distribution of its elements is most unlikely. We must expect that, for one reason or another, one element of culture will fail to take root here and another there. Other elements, again, will flourish for a time in the new home, and will then degenerate or disappear, owing to some character of the new environment unsuited to their success...' (1926: 273–274).

Rivers used this to suggest two waves of migration of the megalithic culture, the first of which introduced irrigation and mummification, while the second introduced extended burial among other traits. Vanuatu was not a perfect exemplar of a simpler form of diffusionism, mainly because of the seeming lack of irrigation on Malakula Island with its otherwise impres-

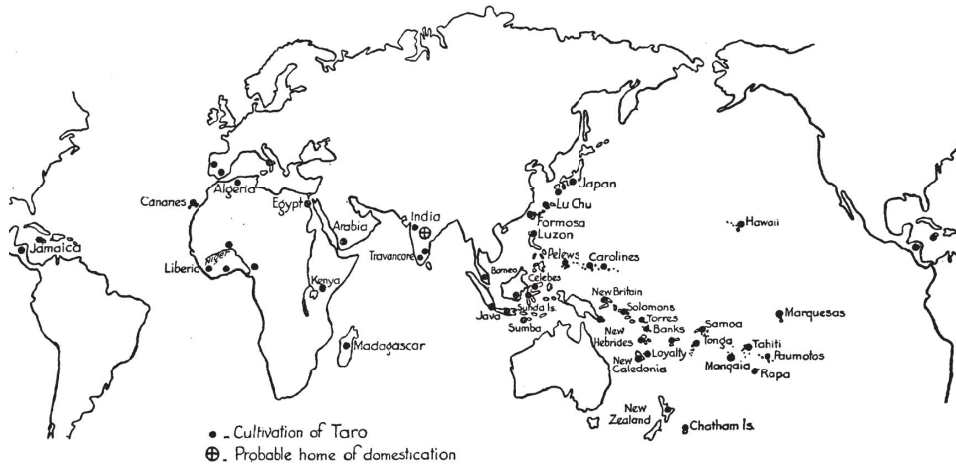


Figure 1 W. H. R. Rivers' map of the distribution of taro and associated irrigation works (from Rivers 1926)

sive megalithic remains⁴). Rivers was, however, particularly enthusiastic about New Caledonia. Not only did it have the most developed irrigation in the Pacific, but:

'this island has also preserved more completely than any other part of this area the complex of customs assigned by Elliot Smith and Perry to the megalithic culture, possessing as it does no less than nine of these elements, namely stone monuments, mummification, sun-cult, sacred chieftainship, incision, tattooing, distension of the ear-lobes, deformation of the head and irrigation' (1926: 276).

He then considered the rival hypothesis of independent invention, according to which 'the people of different parts of the world were led or driven to the discovery of irrigation and terraced cultivation whenever the character of the soil was unsuited to the simpler modes of cultivation' (1926: 280). This would seem to be in large part Ellen Churchill Semple's (1910) view, quoted earlier. At the end of the paper he throws down the gauntlet:

'The advocates of independent origin ought to be able to tell us why those peoples of Southern Melanesia who preserved their dead on platforms and discovered certain rude forms of mummification, should also have discovered and elaborated to so high a degree the arts of irrigation and terraced cultivation. They ought also to be able to tell us why other peoples of so similar physical and mental character should have been led to inter their dead in the extended position at or about the same time as it was found that the yam provided a more profitable and less troublesome crop than taro. Only when the advocates of independent origin have dealt with such topics as these and have shown why such apparently disconnected processes as the growth of taro by irrigation and mummification of the dead should be associated will their guiding idea become more than a vague and empty speculation' (1926: 281).

The last scholar I want to discuss in this context is E. W. Pearson Chinnery, a magistrate from 1909–1917 in what he calls British New Guinea, but was actually at the time already the Australian Territory of Papua. Chinnery was the first to bring the Austronesians explicitly into the argument. He was a correspondent of Rivers and was much influenced by Perry's and Elliot Smith's writings. This is clear from his 1919 paper 'Stone-Work and Goldfields in British New Guinea'. During his time in the Territory he 'Saw numerous things which convinced me that at some period New Guinea had been strongly influenced by people who differed in many respects from the existing inhabitants' (1919: 271).

These included various classes of stone tools (including mortars and pestles), stone circles and rock art, pottery, shell ornaments (see Spriggs in press for the significance of the latter) and taro irrigation systems. In his concluding discussion, Chinnery links these immigrants with introduction of the Austronesian language and some elements of higher culture, that of the 'Proto-Polynesians' (1919: 283). Penetration into the interior of useful arts such as agriculture and mortars and pestles are linked in his opinion to early miners in search of gold. Indeed he adopts the opinion of contemporary European miners who sometimes encountered mortars and pestles at depth in their alluvial workings, that one such mortar found on the Yodda goldfield was a 'dolly for crushing quartz, and had been so used by a former people' (opinion quoted in Monckton 1905: 31).

4.3 Riesenfeld and Later

Our survey comes to an end with Alphonse Riesenfeld's massive synthesis, published in 1950 but completed some years previously, on *The Megalithic Culture of Melanesia*. He drew on the earlier speculations of Elliot Smith, Perry and Rivers but remained agnostic about any Egyptian connections, tracing back the Megalithic culture only as far as mainland SE Asia, with a complex pattern of spread across the region. Some of the cultural traits included by others in this putative culture were dropped by Riesenfeld, and others added. The culture was seen as Austronesian-speaking and ancestral to Polynesian cultures, but overlain in Melanesia by the later spread of darker-skinned Melanesian groups. Riesenfeld's dating of the spread of the Megalithic culture, in the absence of any directly dated archaeological sites, was both very late and inevitably ill-founded (1950: 680–685). Irrigation, however, remained one of the mainstays of the theory:

'These light-skinned stone-using immigrants who were a sea-faring people using probably big outrigger canoes, introduced into Melanesia a very highly developed type of agriculture with artificial irrigation or drainage according to the necessities of the country. Besides the stone-work rendered necessary by this system of agriculture, the very complicated works of earth-shifting connected with it are a characteristic feature of these stone-using immigrants' (Riesenfeld 1950: 666).

In press at the time Riesenfeld's work was published was the most comprehensive-to-date survey of where taro irrigation was found across the Pacific, that of Hans Damm (1951). Damm's own speculations on the origins of taro irrigation in the Pacific came directly from Heine-Geldern's (1932) pre-Riesenfeld ideas on the two-stage spread of Austronesian culture

from Southern China through Island Southeast Asia and on separately to Melanesia and Polynesia; a concern with origins was not, however, a significant part of Damm's paper.

Just as Riesenfeld's volume was published, the post-war boom in direct archaeological investigation was beginning, the first Pacific radiocarbon date was obtained by Kenneth Emory from O'ahu, Hawaii in 1951 (as recounted in Krauss 1988: 338), and excavation commenced at the site of Lapita in New Caledonia in the following year (Gifford and Shutler 1956). The pre-radiocarbon diffusionist approach to the region's history quickly appeared very old-fashioned and was largely discounted from the early 1950s onwards. Archaeological interest in taro irrigation, however, did not pick up until the late 1960s and 1970s with the work of scholars such as Earle, Golson, Kirch, Riley and Yen (Earle 1978, 1980; Golson 1977; Kirch 1975, 1977; Riley 1975; Yen *et al.* 1972). The questions of the distribution of taro irrigation across the Pacific, its origin or origins and its putative cultural correlates were not taken up again in any detail in print until over 30 years after Riesenfeld's publication (Spriggs 1982).

The revival of old debates, often in ignorance of extensive earlier discussions, is a recurring event in Pacific Studies. One notes, for instance, disturbing parallels in the debate between Spriggs (1982, 1990) and Kirch and Lepofsky (1993) over whether the distribution of pondfield irrigation in the region is to do with the migration of Austronesian speakers across the Pacific versus independent invention of taro irrigation at multiple locations. This debate seems to be a re-run of that engendered by W.J. Perry's (1923) *Children of the Sun*, and countered by the reviews of American-trained anthropologists such as Robert Lowie (1924).

We now know that the mortar and pestle complex discussed by Chinnery dates from the early Holocene and has nothing to do with any putative early gold miners (Swadling and Hide 2005; Swadling *et al.* 2008). The later-introduced Austronesian languages in New Guinea, however, are associated with Lapita-derived cultures approximately 2800–2000 years ago that also introduced pottery, the pig, some kinds of shell ornaments and the styles of rock art noted by Chinnery—and perhaps some kinds of irrigation (Spriggs 1990: 185; 2002: 83–89)? Again, we can see how supposedly modern approaches to cultural origins in the region in fact have a long history, often associated with particular overarching theories with which we might not care to be associated.

5. CONCLUSIONS

The earliest descriptions of taro irrigation systems in the Pacific by Europeans often expressed surprise and appreciation of the skill and labour exercised in their construction and operation. Stereotypes of ignorant and lazy savages were broken down by what they saw; even otherwise very negative commentators such as missionaries intent on converting the heathen from their wicked ways were impressed. Then a thought occurred to some of the more sceptical. Perhaps it wasn't the present inhabitants of the islands who had made these systems, but a lost higher civilization. These ideas were at first inchoate.

The islands became better explored by outsiders as missionisation and colonial subjugation developed hand in hand. Large areas of abandoned irrigation terraces were recorded on

some islands. Such abandonment was not generally recognised to be simply the result of the ‘fatal encounter’ of Pacific Islanders with European diseases they had no resistance to, an encounter that had started beyond the frontiers of European control. Instead, it fed into ideas of a vanished civilization spreading enlightenment and then disappearing.

While some saw the development of irrigation as having been a response to population growth in constrained island environments, a powerful hyper-diffusionist theory soon developed that sought to explain too much. With Ancient Egypt defined as the fount of all knowledge and civilization, migrants or cultural emissaries from there came to be seen as the bearers of a megalithic culture that included irrigation as one of its defining traits. They spread all over the world, entering the Americas via the Pacific Islands, bringing civilization to that continent as well. But degeneration had set in as the civilizing impulse waned, and it was believed that the Islanders could certainly not build and could barely maintain the sophisticated agricultural systems that European visitors had marvelled at.

At the same time Pacific populations were at their nadir, some commentators believed they would die out entirely, and all except Tonga became subject to direct and sometimes brutal colonial rule. This rule was informed by the theories that have been discussed here, of superior and inferior peoples, of those who invent and those who merely use. It reaffirmed the superiority of the coloniser, and the supposed passivity of the colonised.

We need to remember this story. We need to be vigilant, as we debate the origins and development of taro irrigation in the Pacific—or indeed the origins and development of just about anything in the region—that we are not merely reinventing the wheels of a very rickety hyper-diffusionist wagon, overdetermined by the attitudes and prejudices of the past. And with China as the inevitable source of civilization, dominant as it is in the ‘Asian century’, now that Egypt and India have lost salience in contemporary Orientalist discourse.

NOTES

- 1) The Scottish poet James Montgomery (1771–1854) first published these lines in his poem ‘The West Indies, Part 1’ as part of a volume of *Poems on the Abolition of the Slave Trade* (Montgomery *et al.* 1809). He actually wrote:

In placid indolence supinely blest
A feeble race these beauteous isles possess’d
Untam’d, untaught, in art and arms unskill’d
Their Patrimonial soil they rudely till’d.

The poem refers to the genocide of the Carib people following Columbus’ ‘discovery’ of the West Indies.

- 2) The original reads: ‘une sorte de monument de cet art ingénieux, et qu’on est étonné de trouver avec une telle perfection chez un peuple sauvage. C’est un aqueduc de 8 à 10 kilomètres de long, conduit sur la croupe des montagnes, avec un habileté qui ferait honneur à un peuple civilisé’.
- 3) The original reads: ‘Triste peuple, mûr pour la mort!’
- 4) Although not common on Malakula, irrigation was in fact later recorded among the Seniāng in the South West Bay area (Deacon 1934: 177). Riesenfeld (1950: 557) claimed that Oliveau (1911: 344) had also recorded irrigation in NE Malakula on the island of Vao, but perusal of the original

sources shows this to be a general statement about the presence of irrigation in Vanuatu. Deacon, who was to some extent a follower of Rivers' ideas, noted an association between the distribution of dual organization, matriliney and irrigation in NW Santo, NE Ambae, 'North' (in reality, Central and South) Pentecost, and Maewo (1929: 497). He could have also added the Banks Islands, where all three also occur (see Codrington 1891: 303–304 for Vanua Lava and Ward 1979 for reference to irrigation on Gaua, Motalava and Ureparapara as well). Deacon later interpreted dual organization as an originally widespread social form, overlain by a 'Mat Skirt Culture' carried by light-skinned immigrants (1934: 705). He saw this as 'a culture characterized by mats (with red patterns stained on them), which were used as clothing; taro-irrigation; kava-drinking; tattooing; Tagaro mythology; and a distinct language type...where it is found in Malekula, its presence is a sporadic intrusion' (1934: 704).

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