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A SOLSTICE ORIENTED *AHU* ON EASTER ISLAND

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The idea of orienting architecture with reference to or otherwise indicating or taking account of the position of the rising or setting sun at the equinox or the solstices is, as far as the writer is aware, not a common one in Polynesia. It does appear to occur with some frequency on Easter Island. Examples were first noted in 1955 in the course of excavations at *Vinapu* on the island's south coast. Here a perpendicular to the back wall of *Ahu* No. 1 (*Tahiri*) was found to be oriented to a true azimuth of 114° or within two degrees of the true azimuth of the rising sun at the southern summer solstice (116°). A perpendicular to the back wall of the adjacent *Ahu* No. 2 was oriented to a true azimuth of 91°30' or within 1°30' of the true azimuth of the rising sun at the equinox (Mulloy, 1961, p. 94).

At about the same time Edwin Ferdon discovered on the ramp of an *ahu* near the ceremonial village of *Orongo* at the southwest corner of the island what appears to have been a sort of ranging device to record azimuths of the rising sun. Four shallow, cup-shaped cavities pecked into an outcropping surface formed three ranges, oriented to the positions of the rising sun at the equinox and both solstices. A pole placed in the proper cavity at sunrise on the equinox and solstice days cast a shadow across a corresponding cavity (Ferdon, 1961, pp. 228-29).

During the same year Carlyle Smith recorded at *Ahu Tepeu* that perpendiculars to the back walls of *Ahu* No. 1 and 2 were oriented respectively to true azimuths of 113° and 110°. The result was that the front sides of the two structures, which lay side by side and more or less in line with each other, faced

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within a few degrees of the azimuth of the rising sun at the summer solstice (Smith, 1961, p. 189). Perhaps most noteworthy was that the westward perpendicular to the back wall of *Ahu* No. 1 bore at a true azimuth of 293° or slightly more than 3° off the azimuth of the setting sun at winter solstice.

In 1960 Gonzalo Figueroa and the writer excavated and restored the *A Kivi-Vaiteka* complex located 2.6 km. inland of *Ahu Tepeu*. Here a perpendicular to the back wall of *Ahu a Kivi* was found to be oriented within 35' of the azimuth of the rising sun at the equinox. Furthermore, *Ahu a Kivi* and *Ahu Vaiteka* were located 706.8 meters apart and centered on an axis bearing 2°52' south of the azimuth of the setting sun at the equinox (Mulloy and Figueroa, manuscript).

Though it is obvious that most *ahu* on the island are oriented with their backs to the sea and clearly do not demonstrate the above described kind of solar orientation, of the eighteen local *ahu* that have been studied in detail to date, seven nevertheless suggest the possibility that equinox or solstice orientation was intended. These seven do not include the above mentioned ranging device on the ramp of the *ahu* at *Orongo*. How many more are to be found on the island is not known. However, the above proportions at least introduce the possibility that solar orientation represented a deliberate culture trait here. Since the orientations were rarely precise, the possibility also exists that those recorded may represent coincidence. Thus the additional evidence, to be described below, from an *ahu* offering such orientation, some suggestion from its architectural characteristics that this orientation was deliberate, and a possible second example similar to the *Orongo* ranging device is of interest.

The research described here was part of a continuing project of archaeological investigation and restoration in operation since 1968 under the sponsorship of the Republic of Chile, The International Fund for Monuments Inc., (USA), The National Endowment for the Humanities (USA), and The University of Wyoming (USA). Its purpose has been three-fold: to provide eventually a complete archaeological survey of the island; to investigate in detail selected monuments and other archaeological manifestations in order to record information relevant to the local culture-history about them; and to restore or stabilize these structures to make them available for outdoor museum exhibition. The presently described investigation and restoration was carried out by the writer and Sergio Rapu Haoa, curator of the Easter Island Museum, between July 20th and September 24th of 1972, with the aid of eight local labourers and Jerman Hotu Chavez as foreman. It has been briefly summarized in a previous preliminary report (Mulloy, 1973, pp. 1-9).

The *ahu* was located in the interior of the southwest part of the island about four kilometers east of the coast at *Hanga Piko* and about two kilometers inland of the southeast coast at *Hanga Poukura* (Fig. 1, inset). Though most local *ahu* were located along coasts, an interior location such as this was not

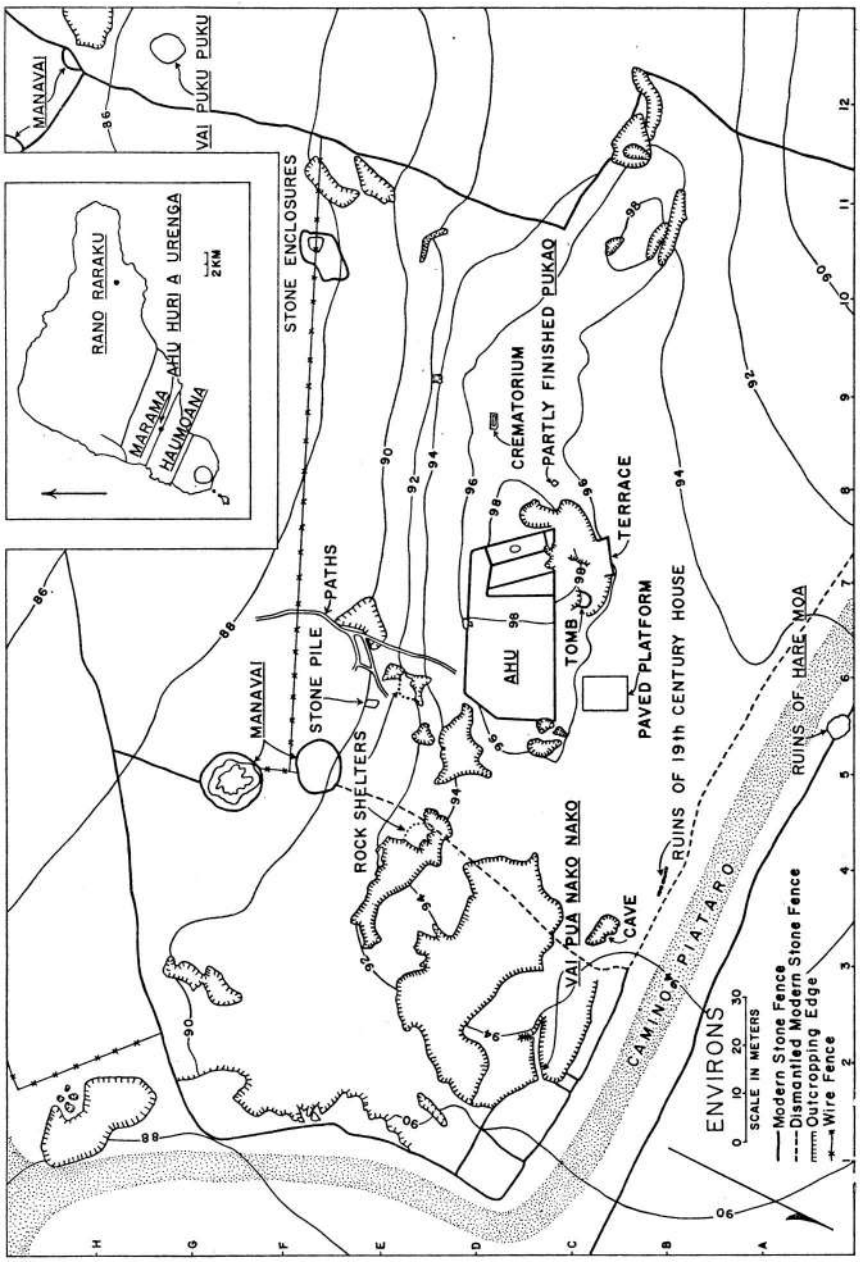

Figure 1. — Map of the Environs of *Ahu Huri a Urenga*.

uncommon. It lay in and toward the north side of the short valley of east-west orientation defined by *Maunga Orito* on the south and *Maunga Keto Keto* and *Maunga Vai o Hao* on the north. The *ahu* occupied the highest point in this pass between the west and southeast coasts. The surrounding locality of uncertain borders was called *Manavai Tokerau* by extension from the specific feature of that name which was a wind-protected, depressed area between *Maunga Keto Keto* and *Maunga Vai o Hao,* located just north of the *ahu.* The site lay within and just west of the fork of two modern roads extending eastward from the modern town of *Hanga Roa, Camino Piataro* on the north and *Camino Vaitea* on the south. Immediately east of this fork was the well-known location called *Ko te Hikonga Ha'u o Miti Rangi a Ika Uri* (place where *Ika Uri* stole the hat of *Miti Rangi*). (Englert, 1970, p. 59).

The site lay in territory said to have been occupied by the *Marama* kin group (*mata*) though it was also close to the border of *Haumoana* territory (Métraux, 1940, p. 8). Santiago Pakarati Rangitaki said that the *ahu* lay within *Haumoana* lands. But whether the border or the above mentioned kin groups existed at the time the *ahu* was built cannot be demonstrated (Fig. 1, inset).

The *ahu* lay on land owned by Martîn Rapu Pua who kindly consented to exchange it for another plot so that the restoration could be accomplished. He had lived on the site as a boy and reported that his grandmother, Luisa Pakomio Angata, had told him that the *ahu* was called *Huri a Urenga.* Santiago Pakarati also independently gave the same name. Several islanders thought that the name signified "Turning over by *Urenga*" and suggested that it might refer to the person or perhaps the group who overthrew its statue, rather than being the original designation of the structure. The name might also mean "Turned toward *Urenga*" in which case *Urenga* might be a geographical feature not identified or even a now forgotten way of referring to the rising sun at the winter solstice which the statue faced. The *ahu* was not recorded in Englert's survey (Englert, 1948, pp. 515-533) or in any of the previous inventories, though it was recorded in 1970, as part of the inventory of the present project under the name *Ahu Vai Puku* (McCoy, 1973, p. 148). This name, sometimes used today, was probably derived in modern times, from a small spring called *Vai Puku Puku* (outcropping spring), that emerges from a lava extrusion about 150 meters south of the *ahu* (Fig. 1, G-12).

The form of the *ahu* was rather unusual because its vaguely trapezoidal plaza was partly constructed of artificial fill enclosed within a retaining wall which also enclosed the platform at the west end (Fig.2). The structure rested near the east end of an elongated, uplifted ridge on the valley floor of approximately east-west orientation, and about 200 meters long (Fig. 1). The ridge appeared to have been formed of lava and red scoria extruded from an underlying crack and was partly covered with a scanty deposit of soil and decomposing

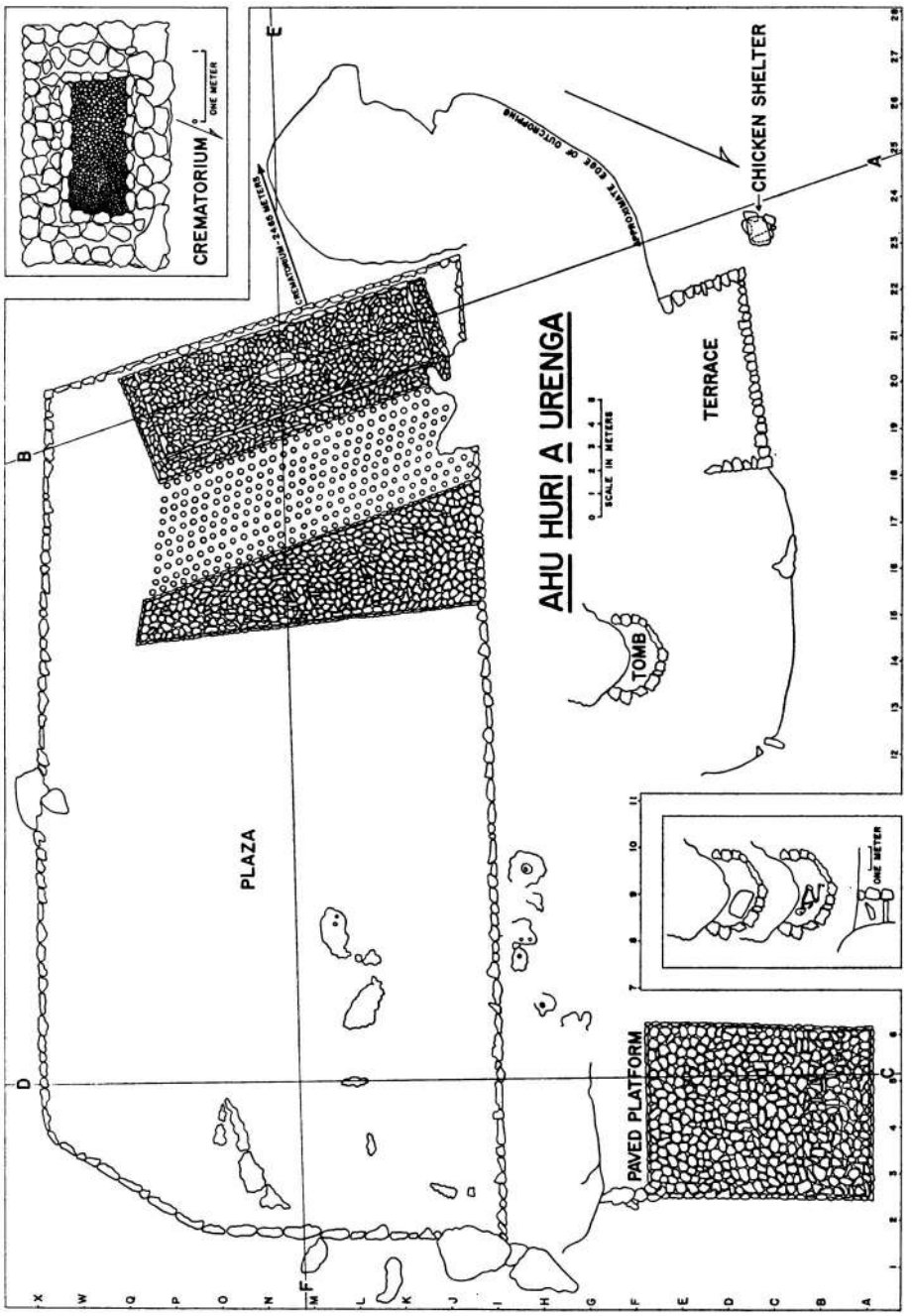

Figure 2. — *Ahu Huri a Urenga* after Restoration.

stone. Much of the scoria was similar to, but not identical with, that of the topknot (*pukao*) quarry at *Punapau* about a kilometer to the northwest. Maximum elevation of the ridge above the valley floor to the south, where lay a broad expanse of good agricultural land, was about fourteen meters. From the north side it was elevated only about five meters. The platform of the *ahu* was located at the highest point of the ridge and the plaza declined eastward along its crest. From the point of view of the achievement of a structure of apparent maximum elevation and size with minimum effort the location was the best in the vicinity. Most of the area and its environs were covered with a thick growth of relatively tall grass, while an extensive grove of eucalyptus planted many years ago by Williamson-Balfour Co. lay immediately southeast of the *ahu*.

On initial inspection, remains of the low, rectangular *ahu* platform appeared to be about thirteen meters long and four meters wide and without lateral wings. Almost its entire north half had been nearly destroyed by a bulldozer cut made in 1969 by the Longhi Co. in search for suitable scoria for construction purposes. The south end appeared to be in better condition although little more than an amorphous rubble surface was visible. The single statue had been overthrown to a prone position toward the plaza and broken transversely across the lower part of its face. The pedestal appeared to have been nearly centrally placed on the platform and had been formed principally of three large, flat slabs supported by other stones, of which all had been much displaced from their original positions.. Immediately east of the platform, numerous beach boulders that apparently formed part of a ramp pavement projected through the surface.

Surrounding the platform and extending eastward along both sides of the ridge to form an irregularly trapezoidal enclosure about forty-three metres long by twenty meters wide, protruded scanty remnants of a retaining wall, which had enclosed the rubble and earth fill, which had underlain the former plaza surface and supported the platform. Few stones of this feature appeared to remain precisely *in situ*, though many more or less displaced ones were evident. These walls were probably largely deliberately destroyed as part of the vandalism accompanying the overthrow of the statue, with stones being pried out and cast down the lateral slopes. The retained fill then followed them to re-establish a transversely convex surface similar to the pre-occupation surface of the ridge.

North of the platform and built against the descending slope of the outcropping on which it rested, appeared the much destroyed remains of a nearly rectangular terrace about nine meters long by four meters wide (Fig. 2, D-21). Northwest of this terrace four stones formed a small, irregular enclosure covered by another stone (Fig. 2, C-24). This structure appeared to be built of debris from the destroyed terrace and may have been constructed recently, since it was identified by Jerman Hotu as a presently used kind of chicken shelter. Northwest of the

ahu platform lay a red scoria outcropping (Fig. 2, C-8). Parts of its surface had been dressed as if to form a rough cylinder. It may have been a partly finished statue topknot (*pukao*), but whether it was intended to be used on the statue of this *ahu* was not clear. If it was to have been used here, the fact that it remained unfinished while the statue had obviously been erected, suggests that a method of erection different from that previously described (Mulloy, 1970), in which *pukao* and statue were erected together, might have been contemplated. On the same north slope about eight meters east of the terrace several protruding stones suggested a buried structure that later proved to be a tomb (Fig. 2, F-14). Farther east on the same slope and close to the north wall of the *ahu* were five cup-shaped cavities that appeared to be part of a ranging device (Fig. 2 H-9; Fig. 4, upper, right). Still farther east along the slope and opposite the north end of the *ahu* plaza a number of visible, flat stones suggested a paved surface (Fig. 2, C-4; Fig. 3, lower left). West of the back wall of the *ahu* a row of four vertically placed stones suggested a destroyed crematorium (*avanga*) in a typical location (Fig. 1, D-9).

South of the *ahu* and incorporated in the stone fence forming the south side of *Camino Piataro* were the almost destroyed remains of a structure that Martin Rapu identified as a stone chicken house (*hare moa*) (Fig. 1, A-5). Emerging from the east side of an outcropping northeast of the *ahu* was a small cavity that he identified as a cave entrance (Fig. 1, C-3). Subsequent excavation here disclosed no significant cave. Farther east was a narrow crack in the flat upper surface of a lava exposure about fourteen meters long (Fig. 1, C-2). Santiago Pakarati identified it as a water source called *Vai Pua Nako Nako.* It had been lined with cement to form a stock-watering trough by the Williamson-Balfour Co., but may also have been a prehistoric water source. It was dry when observed.

Within the eucalyptus grove southeast of the *ahu* were what appeared to be two formerly inhabited rock shelters (*karava*) (Fig. 1, E-4, E-6). They were investigated but no significant evidence was found. Just north of these was a large, obviously artificial stone pile from which protruded an old fig tree (Fig. 1, E-6). To avoid destroying the tree, it was not investigated. It may have been a chicken house (*hare moa*). Immediately west of the above complex was a configuration of paths formed by removing small stones from the surface (Fig. 1, E-7). They may have been associated with the rock shelters, the *ahu,* or both. South of the above mentioned features were the ruins of two protective agricultural enclosures (*manavai*) (Fig. 1, E-5, F-5). The northernmost of these was nearly circular and about twelve meters in maximum diameter. The walls, made of rough masonry about 80 cm. thick, had been destroyed to an average height of about 90 cm. This enclosure was constructed with inner and outer faces of selected stones and a core of rubble. It was cleaned and the walls restored to the height permitted by use of the displaced stones —

about 1.3 meters (Plate V, A). The southernmost structure was similar and about fourteen meters in maximum diameter. Its walls remained intact to about the same height. A large eucalyptus tree grew in its centre and it was not investigated. Since the above mentioned cluster included rock shelters, a possible chicken house, and agricultural enclosures, it formed a fairly typical local household unit which might date from a time after the *ahu* was in use.

Southwest of the *ahu* were two irregular enclosures of rough masonry, one within the other (Fig. 1, E-10). Maximum diameter was about fourteen meters and walls remained to a height of about 40 cm. Purpose was obscure and it was not investigated. Farther southwest two agricultural enclosures (*manavai*) had been incorporated into modern stone fences (Fig. 1, H-12). Though they may have been prehistoric, they appeared to have been much reconstructed in modern times, and were not investigated.

It is noteworthy that nowhere in the environs of the *ahu* was noted evidence of the former presence of boat-shaped, thatched houses with dressed stone block foundations (*hare paenga*). These might have been expected, especially in the area east of the *ahu* plaza. Some may have once existed, however, for two fragmentary dressed blocks with typical pecked cavities were found among the stones of the modern fence bordering the *ahu* on the north.

Vegetation was removed from the *ahu* and its environs. The numerous surface profiles were prepared. A grid was not used for horizontal control. Such evidence was recorded by triangulation from the architecture of the structures. Vertical control was established with a spirit level from an arbitrary elevation of 100 meters at the surface of the restored statue pedestal. (True elevation about 120 meters above mean sea level). Artifacts and other portable evidence recovered were desposited in the Easter Island Museum.

Removal of superficial and displaced stones and earth from the *ahu* platform revealed no evidence of tomb building subsequent to the overthrow of the statue. There was also no evidence that a stone mantle had been piled over or around it, as is frequently present on other local *ahu*. Much of the interior earth and rubble fill had been displaced, especially in the north end. Continued excavation revealed that the platform's north end rested on the rock outcropping, while the south end rested on earth. Some of the earth areas were probably levelled to receive it, while others were artificially filled. The back and lateral walls had been formed of selected slabs or stones presenting one extensive, flat surface and mostly of relatively soft scoria. Some outside surfaces and junctures, mostly on the softer stones, had been prepared by adzing, spalling, or pecking. The walls were imbedded in earth or laid on the outcropping without underlying foundation stones. Construction was mostly of vertically placed slabs or flat surfaced stones extending from base to top with occasional use of superimposed headers. Only about 20% remained in

precise *situ* while about 20% more were reasonably near their original positions (Fig. 3, lower, right). These remains, together with the evident seats of missing stones, were sufficient to determine accurately the form and locations of the original walls. They formed an enclosure 12.4 meters long, 3.6 meters wide, which extended an average of 50 cm. above surrounding surfaces. The front wall, of the same height, had been constructed of a rough, inner wall of crudely placed, selected stones against which was laid a row of precisely joined, surfaced and squared, rectangular, basalt slabs vertically placed. Exposed surfaces were pecked flat, lateral joints squared, and upper edges chamfered on the interior side in the classical manner to receive the edges of paving stones. Interior surfaces were left irregular. Some dressed slabs rested on earth or outcropping, or on a crude foundation of small stones. Others appear to have rested on slender, elongated stones of hard basalt, averaging about 80 cm. in length, transversely placed and with flat areas pecked on their upper surfaces to engage the edges of the superimposed slabs, apparently for precise fitting. Four of these remained (Fig. 3, lower, right) though there may have been more. Of the rectangular, dressed slabs, only three remained where they had been tipped forward in the area under the fallen statue and had apparently been protected from recent vandalism (Fig. 3, lower, right). East of the plaza two more were found where they had apparently been abandoned in the process of being carried away. Another was found in secondary use as a cover over the tomb on the slope north of the *ahu*.

The interior of the platform had been filled with earth and rubble, and its upper surface paved with closely placed, selected, flat stones, to produce a symmetrical, longitudinally and transversely convex surface (Fig. 3, upper; Plate II, lower). Near the south end of the statue pedestal about 15% of this paving remained in place. Just south of the pedestal, at the bottom of this rubble, a sample of wood charcoal apparently deposited with the fill was recovered. It yielded a radio-carbon date of 840±90 B.P. or 1110±90 A.D. (Gak 4506) which probably should be corrected to about 1215±90 A.D. (Stuiver and Suess, 1966, Fig. I). This date probably corresponds to the time of construction of the *ahu* platform.

The upper elements of the pedestal had been completely dismantled, probably in the process of overthrowing the statue, though most of the stones remained nearby. Excavation of the area revealed that it had rested on six large, irregular flat stones, placed on the pre-occupation surface in two parallel, longitudinal rows of three, so as to provide a rectangular base 2.1 by 2.6 meters in extent. Of these, three appeared to remain *in situ* and three were slightly displaced (Fig. 3, upper and lower right; Plate IV, B). Above these, additional irregular stones, which were found nearby, apparently had been fitted together to provide a foundation for three, irregularly shaped, flat slabs which, when fitted together formed most of the upper surface of the pedestal. One side of each of these

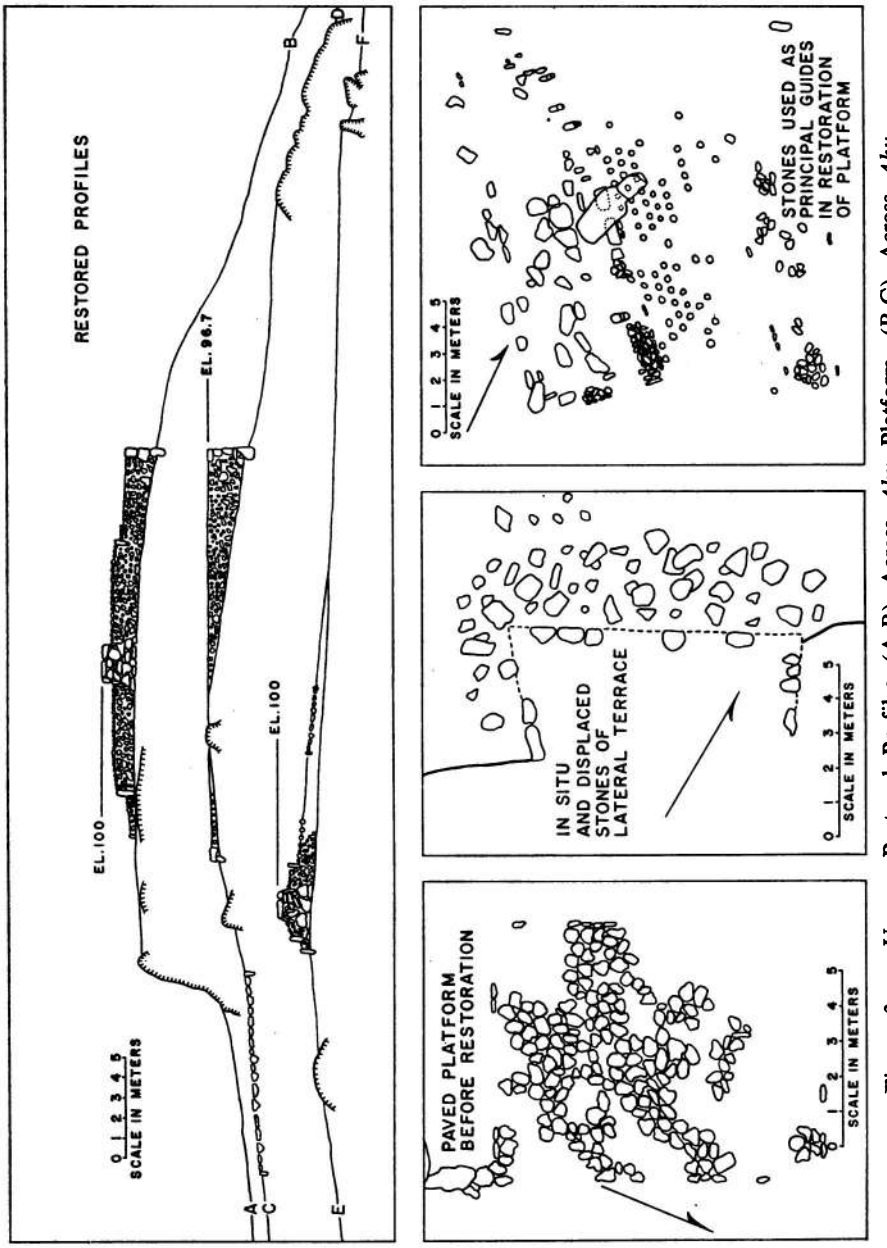

Figure 3. — Upper: Restored Profiles (A-B) Across *Ahu* Platform, (B-C) Across *Ahu* Plaza, and (E-F) Longitudinally Across *Ahu* Platform and Plaza. Lower Left: Paved Platform before Restoration. Lower Centre: Lateral Terrace before Restoration. Lower Right: *Ahu* Platform and Ramp before Restoration.

had been pecked flat. No evidence revealed the exact original height of the pedestal above the level of the platform pavement. The number and size of the remaining stones that appeared originally to have formed the feature, together with observation of the form of better preserved pedestals on other *ahu*, led to the judgment that it had probably been elevated about 50 cm. above the platform surface (Fig. 3, upper; Plate II).

The pedestal was the first feature restored. This was accomplished by building a solid, tapered, elliptical block of fitted stones from the *in situ* foundation to the platform pavement level and filling the interstices with concrete. From this point upward it was continued nearly vertically and in a form adapted to that of the surface slabs. The interior interstices were similarly filled with concrete, and the exterior stones pecked or spalled so as to fit closely and leave no concrete showing. No evidence remained to reveal the original relationship in which the three slabs forming the surface of the pedestal had been placed, though there was no doubt about which had been their upper surfaces. Their placement was a judgment based on the requirements of the statue base. Several small stones were required to fill the upper surface junctures. These were pecked to fit. The restoration was probably similar to the original, except for the concrete which was added for greater stability (Fig. 3, upper; Plate II).

The platform was restored around the restored pedestal by rebuilding its back and ends in accord with *in situ* stones, by realigning displaced ones, and completing it with replacement stones. The six extant, squared and surfaced slabs were reseated. The three that remained near their seats were probably precisely replaced while the others were not. Of the fourteen additional slabs required to complete the wall, eight were suitable specimens obtained from abandoned modern house foundations in *Hanga Roa* where they had been secondarily used. The six others were newly made, the pecking being done with an air hammer. The interior was refilled with earth and rubble, and the pavement of the upper surface restored in accord with *in situ* remnants, of which all had to be removed and refitted (Fig. 2, M-21; Fig. 3, upper; Plate II, lower).

The single statue of *Rano Raraku* tuff, found lying prone and immediately east of its pedestal, was of classic form (Fig. 3, lower, right; Plate IV, B). Santiago Pakarati said that it had been called *A Puna Huru Renga* which appeared to be a phrase not understood today. Perhaps it was a proper name. It probably had been overthrown by prying supporting stones from under the front side of the pedestal. It was broken transversely across the lower part of the face, though whether deliberately, by placement of a vertical slab or stone under it, could not be determined. It lay with the left side considerably higher than the right and had been deliberately wedged in this position by a stone under the forehead and another under the chin. This treatment may have been preparatory to building a tomb under the body, though no other evidence in-

dicated such an attempt. A small, triangular fragment broken from the left side of the top of the head was missing. Height was 3.34 meters, maximum breadth across the shoulders was 1.45 meters, and weight was about 10 tons. Although the exposed back of the statue, especially in the vicinity of the base, was deeply eroded, the protected front was in remarkably good condition with many areas of smoothed, nearly original surface remaining. The ears had been almost completely eroded away. The relatively slender form and sharpness of features of the figure were characteristic of a style variation usually regarded as late in the local stylistic evolution (Plate II). The hands and breech cloth (*hami*) had first been carved, undoubtedly in the quarry, so that the top of the breech cloth was about 40 cm. above the base, and considerably displaced toward the left side. Apparently to correct this asymmetry, they were recarved in a central position with the top of the breech cloth about 49 cm. above the base. The evidence of the first essay had been only partly pecked away, and much of it was still visible, causing the statue, upon casual observation, to appear to have four hands (Fig. 4, A. left). It seems likely that this modification was made after the statue had been erected, and the initial asymmetry could be clearly observed. The possibility is interesting in view of the frequently repeated assertion by islanders that no carving was done on the statues after they were erected except for the excavation of the eyes. The base was badly eroded and had been carved at an angle of about 85° with the statue axis so that, to enable the statue to stand erect, wedging, probably with stones, under the front of the base had been almost certainly required. The base of the statue bore two pecked petroglyphs, one being two intersecting sets of concentric circles and the other a full human face (Fig. 4, B). Both were of forms frequently identified by islanders as representing the God *Make Make.* The concentric circles appeared somewhat less patinated and perhaps of more recent workmanship than the other figure. They could only have been carved after the overthrow of the statue as the original erection process and wedging with stones otherwise would surely have defaced them. Similar figures were carved on several statue bases at *Ahu a Kivi* (Mulloy and Figueroa, manuscript), and others appear similarly located on a good many other *ahu.* Since the God *Make Make* appears to have been associated with the cult of the *Manutara,* which is said to have been of considerable importance during the period of statue destruction, the possibility exists that the petroglyphs may have been carved by the people who overthrew the statue.

The most convenient way to have brought this statue from the quarry at *Rano Raraku* would have been westward along the south coast road — a distance of about thirteen kilometers. No evidence indicated that the original method of erection of the statue had been different from that previously described (Mulloy, 1970).

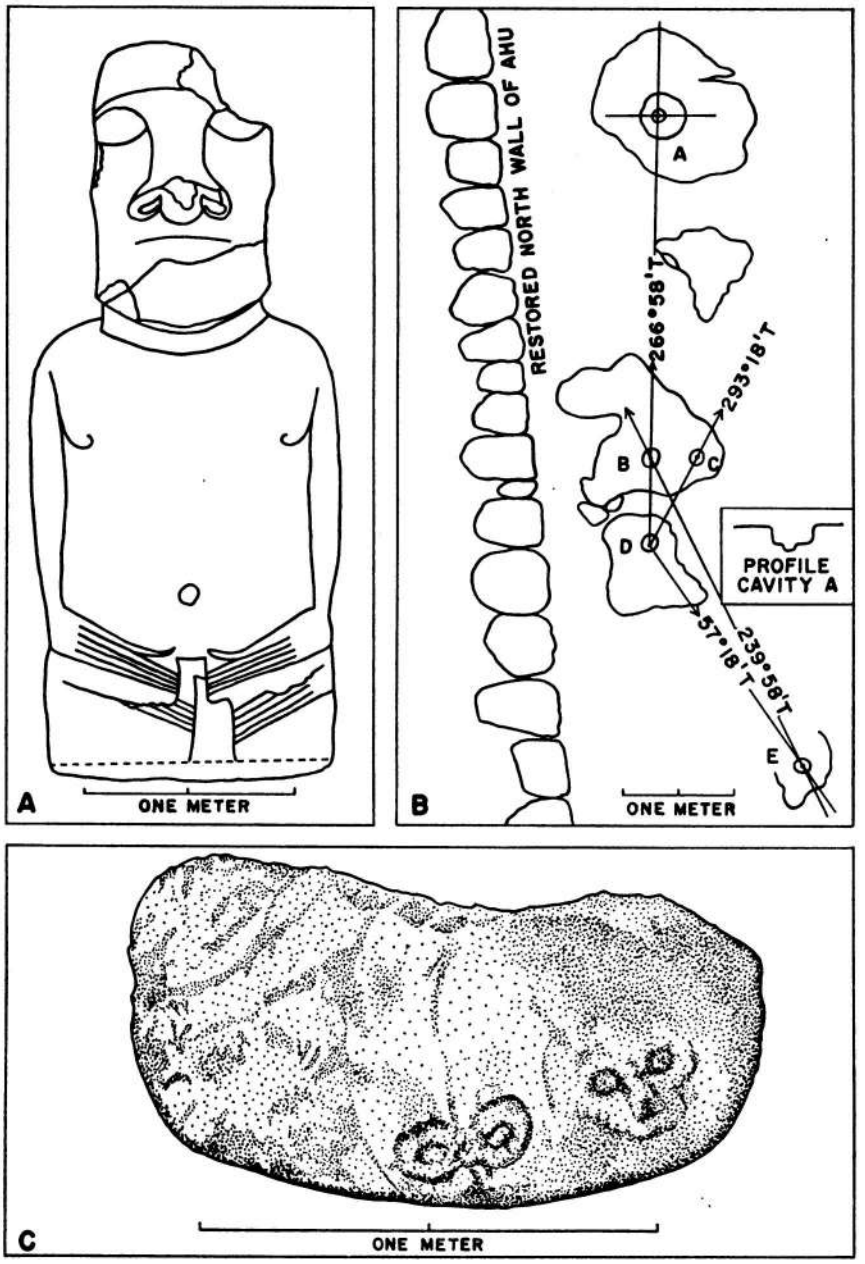

Figure 4. — Upper Left: Statue. Upper Right: Ranging Device. Lower: Base of Statue showing Petroglyphs.

The statue was re-erected by assembling a rectangular armature of eucalyptus logs under its body, levering it into position adjacent to its pedestal, elevating it horizontally to pedestal level by levering and simultaneously building a platform of stones under it, and adjusting its base to precise alignment with the pedestal edge. Because of the eroded and decomposed condition of the base, it had to be recarved to a slightly concave surface, calculated to be in the proper plane to permit the statue to stand vertically. About 10 cm. was removed from it, thus destroying the two above mentioned petroglyphs. The body was then re-erected by centering a crane in front of the pedestal, attaching a cable to the armature, and turning the statue to a vertical position. During this operation the body was restrained by fore and aft and lateral cables. A thin layer of concrete was introduced between the base and pedestal. Edges of the juncture were caulked with concrete. About one-fourth of the dorsal side of the statue base and the adjacent back had been eroded away as a result of its exposed position while the statue had lain prone. Insufficient base area remained to permit the statue to stand securely. This frequently recurring problem was solved by temporarily supporting the body in position with a posterior, inclined post. Decomposed material was then pecked away from the lower back of the statue. Projecting steel pins were inserted in this surface and to these were attached a grid of reinforcing wire. Concrete was then added to this area by successive stuccoed layers. The surface was pecked to conform with that of the statue. The supporting concrete wedge was about 80 cm. in maximum height, and added about 30 cm. to the back of the base (Plate IV, A, right).

The problem of reattaching the head was easier in this case than with many other similarly broken statues. The fracture was nearly horizontal and transversely concave allowing the head to rest firmly with its centre of gravity well within the area of the fracture. It was elevated with the crane and secured with a single, vertical steel dowel 40 cm. long and 4 cm. in diameter. This dowel was first cemented into the head and then allowed to descend into a large hole in the body filled with moist concrete. This measure permitted the head to be aligned precisely. The considerably eroded juncture was caulked with concrete pecked to conform with the statue surface.

The platform was out of alignment with the plaza by about 30°, and no evidence remained to reveal whether the statue had originally been oriented toward the centre of the plaza or had been faced transverse to the platform axis. Its placement with the latter orientation consequently was arbitrary.

As with previous restorations the colour of the repairs contrasted sharply with the original stone. The writer does not find it objectionable, and the contrast has the value of indicating clearly to the visitor which parts of the statue have been restored. The concrete was made with crushed basalt aggregate which has been demonstrated in other restorations to darken markedly with time.

However, if the colour contrast should be found unsightly in the future, the concrete may be coloured with any of several available penetrating dyes.

The thin stratum of naturally deposited, post-occupation earth was removed from the ramp area and the zone surrounding the platform. Remnants of a level, bordering pavement along the front and around the ends of the platform were revealed. This pavement was interrupted for a short distance at the northeast corner by an elevated portion of the natural outcropping. Construction was of closely placed, flat, selected stones with exterior bordering stones vertically placed. Lateral portions averaged about 70 cm. and the front portion about 95 cm. in width. About 30% of these stones remained in place, mostly near the south end, and restoration was accomplished with replacements by using these as guides (Fig. 3, lower, right).

In the area immediately north of the platform and partly above the afore mentioned peripheral pavement, naturally deposited post-occupation earth reached a depth of about 70 cm. Here an elongated pit had been excavated immediately to the north of and parallel to the north wall of the platform. It had been excavated from or near the exposed surface at the time of excavation and penetrated to the surface of the peripheral pavement. It contained the much decomposed remains of a young, male adult lying extended and supine with the head to the east and the arms extended along the sides. Though no objects of historic origin were encountered, the burial appeared to have been made long after the abandonment of the *ahu* and perhaps within the present century. To the north of the burial and beyond the north wall of the plaza were two small pits, each containing about a litre of finely broken, burned, human bones. They appeared to be deposited remains of cremations. The surface level from which these pits had been excavated could not be determined.

Removal of superficial earth from the ramp area revealed fragments of a pavement of rows of separated, smooth, beach boulders (*poro*) of classic form (Fig. 3, lower, right). About 25% of these remained *in situ*. Their configuration permitted the original southern border to be determined with reasonable reliability. On the north the pavement was assumed to have extended to the adjacent outcropping. In all, ten longitudinal rows could be identified. The presence of a different kind of paving to the east of the last row indicated that there had been no more. Between the boulders appeared remnants of what had been a thin layer of smooth beach pebbles (*kikiri*) averaging about 3 cm. in diameter — a feature present on many but not all *ahu* with similar boulder pavements. Paucity of these suggested that many had been cannibalized for other uses — probably in prehistoric times. Those remaining were collected as the excavation progressed. Approximately an additional 20% of the beach boulders were found displaced but in the vicinity, some at distances up to 200 meters. Undoubtedly many also had been cannibalized in prehistoric times — probably to make exterior platforms for thatched, boat-shaped houses (*hare*

paenga). Restoration was accomplished by using these and replacements to project row remnants (Fig. 2, M-19). The small, beach pebbles were too few to be replaced in the restoration. A layer of such replacements could easily be added in the future should it seem desirable. In all, the pavement included 271 boulders. These averaged about 35 cm. in diameter and weighed about 12 kilograms each with a total weight of about 3,252 kilograms. As these had to be selected and hand carried from shores at least two kilometers away and in most cases probably much more, they represented a significant amount of labor. The accomplishment was minor alongside that represented by similar features at many other local *ahu*.

Immediately east of the boulder pavement, excavation of a thin post-occupation deposit revealed the much destroyed remains of an apparently trapezoidal pavement of closely placed, selected, flat stones (Fig. 3, lower, right). While many stones remained, most were displaced and probably less than 10% remained precisely *in situ*. A few vertically placed stones identified borders. Restoration, accomplished by resetting the original stones and adding replacements, was not entirely sure. The east and west borders were probably correct or nearly so, while the south border was placed largely by judgment based on the positions of displaced stones (Fig. 2, E-16).

Investigation of the plaza, which was constructed along the crest of the eastwardly declining ridge, indicated that its prepared surface had lain approximately at the pre-occupation elevation of the ridge crest, and that the destruction of the lateral walls had released almost all of its artificially deposited earth and rubble fill down the lateral slopes. As the extant surface thus had been reduced below that of the prepared plaza, except for a narrow longitudinal band formed of the ridge crest and a few more lateral projecting outcroppings, no evidence remained of most features that might have been on it.

The area about the base of the surrounding retaining wall was excavated and stones, entirely of the base course, were located. Although less than 15% of these remained precisely in their original positions, enough were only slightly displaced to reveal reliably the original location of the wall on the east, west, and south sides. On the north side only two *in situ* stones revealed the former wall location. The placement of the south and east walls took maximum advantage of outcroppings and large, pre-existing stones, which were incorporated in it. Construction appeared to have been principally of a first course of vertical slabs or irregular stones demonstrating large, flat surfaces with headers and irregular stones fortuitously fitted. Many of the displaced stones found on the south exterior slope, especially the softer scoria ones, revealed evidence of pecked, adzed, or spalled surfaces and former junctures. Few of the displaced stones of the north wall remained. Martin Rapu said that these had been removed in recent times to build the modern stone fence bordering the site on the north.

The retaining wall was restored, using the displaced stones and replacements where necessary. Height of the west wall was determined by *in situ* vertical slabs. The north and south walls were elevated to the height of the crest of the ridge within the plaza, and the east wall elevated to conform with these. The highest portion was near the southeast corner where it reached 2 meters. Near the southwest corner the wall reached 1.6 meters. The north wall was highest near its centre where it reached 85 cm. The east and west walls decreased in height toward the north to 30 and 25 cm. respectively. The plaza fill was replaced with earth and rubble and levelled (Plate I). The plaza so restored declined eastward in two defined planes. From the platform to about the middle of the plaza the decline was about 11° from the horizontal. Farther east the slope decreased to about 4° (Fig. 3, upper).

Several outcroppings projected slightly above the plaza surface. On one of these were two cup-shaped, pecked depressions each about 12 cm. in diameter and about 7 cm deep. They were about 40 cm. apart and aligned in a true azimuth of 288°55'. (Fig. 2, L-9). It is possible that these may represent part of or a complete ranging device of undetermined referent.

The orientation of the long axis of the plaza was clearly determined by the ridge on which it lay. Its relationship to the platform was strikingly asymmetrical, being about 30° out of perpendicular (Fig. 2). No terrain feature would have prohibited the symmetrical placement of the platform and it would have been equally easy to so build it. The possibility thus is introduced that its curious orientation may have been deliberate. Western perpendiculars to the restored front and back walls of the platform were oriented respectively to true azimuths of about 243° and 244°. These bracket the true azimuth (243°27') of the setting sun at the summer solstice. Since the western sea horizon is visible from the *ahu*, the platform may have been deliberately oriented to face the setting sun on that day. It also follows that a perpendicular to the front side of the platform was oriented to the rising sun at the winter solstice and, if the statue originally faced transverse to the axis of the platform, it also faced the same azimuth. The sea horizon was also visible in this direction. It should be remembered that the above mentioned observations were made on largely restored walls after the restoration was complete.

The peculiar asymmetry of the platform orientation produced a curious geometrical problem that the builders apparently found difficult to solve or did not foresee until construction had progressed too far to correct it. The back wall of the platform was nearly symmetrically placed, being only slightly displaced to the north. This was likely to have been the part of the structure where building began. The platform was constructed in a more or less rectangular form, following the pattern of most local *ahu* platforms and by the time its front wall was completed, the displacement of the structure to the north was clearly evident. When the parallel boulder pavement was added, the additional projection made it necessary to jam it into the north wall of the plaza, while leaving a large, unpaved

area at the south end. The flaring of the south end of the boulder pavement may have been an attempt to correct this developing disconformity. The trapezoidal form of the easternmost paved area suggests a final attempt to draw the ramp back into an appearance of alignment with its plaza.

A cluster of low, partly earth covered outcroppings was located immediately north of the north wall of the plaza and centered about 13 meters west of its east end (Fig. 2, H-9). Pecked into these was a configuration of five cup-shaped cavities (Fig. 3, upper, right; Plate III, B). Four of these cavities (B, C, D, E,) were small, averaging about 10 cm. in diameter and about 7 cm. deep. The other (A) was about 38 cm. in diameter and 12 cm. deep with a distinct smaller cavity about 9 cm. in diameter and 5 cm. deep, pecked slightly south of the centre of its bottom. The general similarity of the configuration to the previously described solar ranging device recorded by Ferdon at *Orongo* (Ferdon, 1961, p. 228). made it more than usually interesting although puzzling. Cavities D, B, and the small cavity within A established a nearly perfect line oriented to a true azimuth of 266°58' (86°58') or about 3° south of that of the setting sun or north of that of the rising sun at the equinox. The line established by Cavities C and D was oriented to a true azimuth of 293°18' (113°18'), or about 3° south of that of the setting sun or north of that of the rising sun at the winter solstice. It is noteworthy that angle ADC is 26°20', or nearly that between the setting sun at the equinox and the solstice. The line established by Cavities D and E was oriented to a true azimuth of 57°18' (237°18'), which is north of the winter solstice position of the rising sun, and thus would not appear capable of use as a solar ranging device. Its referent, if any, is obscure. A further apparently significant relationship that was not recognised in the field and therefore was measured only on the map and not on the terrain, involved the line established by Cavities E and B, which appear to be oriented to a true azimuth of about 27° south of Line A-D or 239°58' (59°58'). It thus bore about 3° south of the position of the setting sun at the summer solstice. The orientation of this line must be rechecked in the future with a theodolite. The consistant 3° displacement of the equinox and both solstice ranges suggests an error in recording, which may be the case as all azimuths were based on the compass bearing of the back wall of the *ahu* platform. Magnetic anomalies are common on Easter Island and may have affected the accuracy of this initial azimuth. The back and front walls of the *ahu*, all the lines of the ranging device except Line B-E, and the line formed by the two cavities on the *ahu* plaza were all connected in a series of triangles and checked twice with a theodolite. Final confirmation must be made in the future by checking actual rising and setting sun positions on solstice and equinox days which was impossible during the field work period because of cloud cover at the horizon.

Ferdon suggested (1961, p. 228) that the ranging device discovered by him might have been operated by placing a vertical pole in the appropriate cavity, and allowing its shadow to fall across the corresponding cavity. A possibly more

accurate method might have been to use a pole weighted with a stone at the lower end and held suspended freely in the cavity. It would seem that Line A-D could be used equally well for observing either the rising or setting sun at the horizon at the equinox. Along line D-C the sea horizon is visible to the west, and the line could be used for observing sunset at the winter solstice. To the east the horizon is slightly masked, but the line might have been used for observing sunrise at the summer solstice because the sun rises almost vertically at Easter Island on the summer solstice day (S. Lat. 27°9'). Along line B-E the rising sun could be observed on the winter solstice day at the sea horizon, while the setting sun on the summer solstice day would have been masked by the *ahu* to a high angle. The line might, however, still have been used for this observation, again because the sun sets almost vertically at the summer solstice.

Projecting from the northward declining slope of the outcropping and about twelve meters north of the *ahu* platform, were the almost completely destroyed remains of a nearly rectangular terrace (Fig. 2, C-20). Excavation revealed that about half of the base course stones remained *in situ* (Fig. 3, lower, centre). Construction appeared to have been of vertical slabs or irregular stones, with superimposed headers, and rubble and earth fill. There appeared to have been little dressing or other modification of the stones. The walls were restored to the height permitted by replacing the extant displaced stones, and the fill was replaced. Resulting maximum height was about 1.1 meters (Plate IV, upper). Little evidence revealed the purpose of the terrace or the nature of any features that may have rested on it. Somewhat similar features at other local *ahu* and the presence of a small quantity of finely divided, burned, human bones among its debris suggested that it might have supported a crematorium (*avanga*).

Centred about 10 meters north of the eastern side of the plaza on a surface declining slightly to the north were the much destroyed remains of a rectangular pavement about 9.6 by 7.4 meters in original extent (Fig. 3, lower, left). Martin Rapu said that many stones had been removed from it in recent times to build the stone fence to the north. About half the stones remained in place. The feature had been constructed of unusually well selected, flat surfaced, large stones, unusually carefully fitted with a border of vertically placed stones. Enough of the latter remained to determine reliably its original extent. Centred about 20 cm. outside the centre of its south side, buried in a vertical position with its top about level with the pavement surface was the stone pillow described in the artifact section. The feature was restored, principally with stones recovered from the stone fence to the north (Plate III, A). No evidence revealed its purpose. Similar pavements are frequently found associated with local *ahu*. A somewhat similar paved area at *Vinapu* was identified in 1960 by Isiah Fati as a platform on which cadavers were dried (Mulloy, 1961, p. 100).

On the same slope, centred about seven meters north of the centre of the north

wall of the *ahu* plaza (Fig. 2, F-14), were the remains of a problematical structure. Here a semi-lunar cavity 2.8 meters long, 1.2 meters wide and 1.2 meters deep, which tapered to a small flat area at the bottom, had been prepared and lined on the north side with a semi-lunar wall of selected masonry, adjoining the steeply sloping side of an outcropping forming the south side. Though it may have been constructed initially for use as a tomb, its shape made this purpose seem unlikely. Its form and location against the outcropping suggest the possibility that it may have been built around a former seep to be used for a water source. After about 15 cm. of earth and stones had been deposited in it, probably by natural agencies, a supine adult or adolescent burial with legs laterally flexed, arms across chest, and head to the east had been made in it. It was badly decomposed when investigated. That this interment dated from after the destruction of the *ahu* is suggested by the fact that, placed over it, within the cavity, as a cover, was a rectangular slab with one surface pecked flat. One long edge was chamfered and the two short ones squared as if for junctures. It was undoubtedly one of the slabs from the front wall of the *ahu* and was replaced there in the restoration. The slab had been covered with earth and rubble to conform with the ground surface (Fig. 2, inset; Plate VI, B). A few stones from the top of the wall were replaced and the feature was left open.

Centred 24.65 meters west of the *ahu* platform on the crest of the ridge was a line of four vertical slabs averaging about 80 cm. in height (Fig. 1, D-9). Investigation of the surrounding ground surface disclosed evidence of seats of other slabs and stones, indicating that the extant slabs had been part of and had lain at the southwestern corner of a rectangular enclosure about 3.6 by 21 meters in extent. Many slabs and stones that could have been displaced elements of this structure remained in the vicinity. At or near the surface of the area were found a few small fragments of burned human bone and a few small beach pebbles. Because the location of the structure was typical for *ahu* crematoria (*avanga*), and because the remaining evidence was consistent with this kind of feature, a largely speculative restoration, based on characteristics of similar features at other local *ahu*, was made. The enclosure was restored to the height of the extant stones and the interior rubble filled. On the upper surface was constructed, entirely speculatively, a rectangular enclosure of small stone slabs projecting about 10 cm. above the upper surface of the platform and about 1 by 2.2 meters in extent. This was filled with small beach pebbles in the manner typical of such structures (Plate V, B).

A barbed wire fence was constructed about 35 meters south of the *ahu*, and connected to existing stone fences to isolate the site and its immediate environs from adjacent agricultural fields. The stone fence to the north of the site was dismantled so as to permit access by stock from the road (Fig. 1). Permitting such access has been determined to be the most satisfactory available method under existing con-

ditions to prevent the growth of vegetation and maintain sufficient visibility of features for exhibition.

Artifacts

Fewer artifacts were recovered than might normally have been expected at an *ahu* site. This may have resulted from the small size of the site and its location in a relatively sparsely populated area. On the other hand a somewhat higher proportion than usual were found in significant contexts, which may have resulted from the unusual simplicity of the site. It involved only a single building period, with minimal and easily isolated modifications post-dating the overthrow of the statue.

Mataa: Typically the most frequently recovered item was the large, crude, tanged percussion flaked blade of obsidian locally called *mataa.* (At present the word "*mataa*" is used to refer to this artifact and also, in a broader sense, to obsidian in general.) The present islanders unanimously refer to these as spear heads and considerable ethnological evidence supports this view (Mètraux, 1940. p. 167). Many may have been used for several other purposes. Considerable earlier investigation has suggested that they were associated with the period after the overthrow of the statues, and the fifty-two complete and eighteen fragmentary examples recovered at this site proved no exception, because all were either without context or in contexts dating after the overthrow of the statue. All but two formed an assemblage in every respect similar to others previously analyzed (Mulloy, 1961, pp. 151-153), and will not be described here. Length of whole specimens varied from 4.5 to 12.1 cm., width from 3.6 to 8.8 cm., and thickness from 1.2 to 2.6 cm.

Contexts:

41 complete and 14 fragmentary from surface of *ahu* and environs.
3 complete in deposits over boulder pavement of *ahu.*
2 complete and 1 fragmentary in fill of tomb.
2 complete in deposits over stones of paved platform.
1 complete and 1 fragmentary in superficial deposits in restored *manavai.*
1 complete and 1 fragmentary in deposits above stones of easternmost pavement of *ahu* ramp.
1 complete in deposits over peripheral platform pavement at north end of *ahu.*

One complete (Fig. 6, No. 11) and one fragmentary specimen were distinctive. Both had relatively long and heavy tangs smoothed by pecking as if to hold in the hand. Cutting edges were transverse. They would have been effective as knives and may represent a special kind of tool. Lengths were 8.5 and 9.2 cm., width of the unbroken specimen was 6.9 cm., and thicknesses were 2. and 2.2 cm.

Contexts:

1 complete in superficial deposits in restored *manavai.*
1 fragmentary on surface of environs of *ahu.*

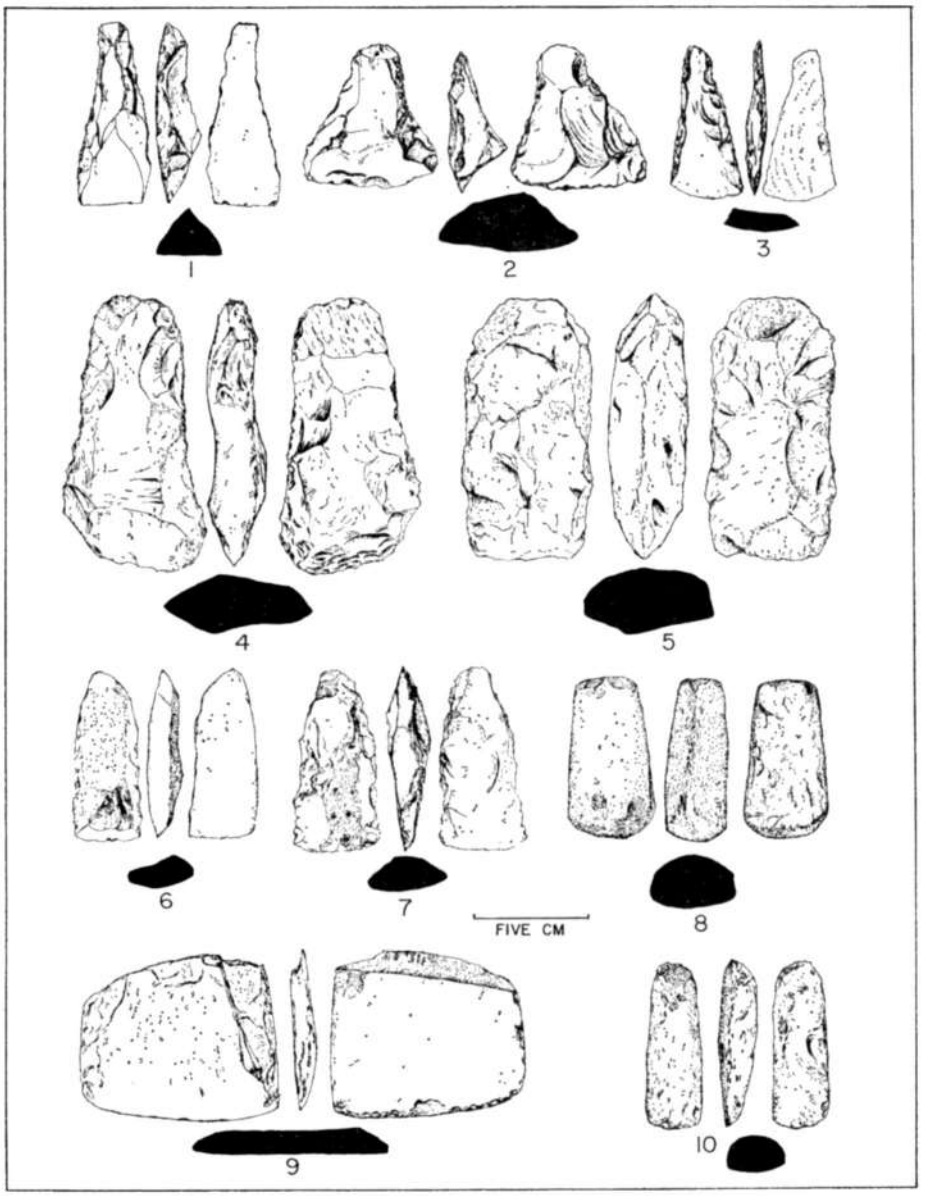

Figure 5. — Adzes from *Ahu Huri a Urenga.*

Adzes: In all sixty-seven complete or fragmentary adzes were recovered. They are described below according to the Figueroa and Sanchez classification (1965, pp. 169-223).

Thirteen complete and fifteen fragmentary adzes were obsidian. They were made of elongated flakes or cores with percussion flaking ranging from well controlled and extensive to irregular, erratic and so slight that little modification of the original flake resulted. Frequently the bevel was a single flake scar. Sides tended to taper with bits wider than polls. All were tangless with no lateral constructions, grooves, or other hafting devices. Only one was slightly modified by pecking. All appeared to have been suitable for use on wood and similar materials. None revealed evidence of having been used on stone.

Of these, ten whole and twelve fragmentary specimens were of Type 2-A with fronts wider than backs. Flaking was predominantly from the front with scars passing across sides and back.

Of Type 2-A adzes four complete and five fragmentary specimens had triangular cross sections. Sides were straight or slightly incurved. Lengths of complete specimens varied from 5.8 to 9.2 cm., widths from 2.6 to 3.5 cm., and thickness from 1.4 to 2.5 cm. (Fig. 5, No. 1).

Contexts:

2 complete and 2 fragmentary from surface of *ahu* and environs.
2 complete in fill of central platform of *ahu*.
1 fragmentary under surface of boulder pavement of *ahu*.
1 fragmentary on peripheral pavement at southeast corner of *ahu*.
1 fragmentary under stone of dismantled statue pedestal on *ahu* platform.

Of Type 2-A adzes, five complete and four fragmentary specimens had roughly trapezoidal cross sections. Sides varied from straight to markedly incurving. Lengths of complete specimens varied from 6.5 to 10.6 cm., widths from 3.1 to 5.4 cm., and thicknesses from 1.4 to 2.3 cm. (Fig. 5, No. 2).

Contexts:

3 complete and 1 fragmentary from surface of *ahu* and environs.
1 complete in superficial deposits of restored *manavai*.
1 complete in fill of tomb.
1 fragmentary buried among displaced stones of south wall of *ahu* plaza. Probably originally in plaza fill.
1 fragmentary in fill of central platform of *ahu*.
1 among displaced stones of terrace north of *ahu* platform. Probably originally in terrace fill.

Of Type 2-A adzes two complete and one fragmentary specimen had irregular, plano-convex cross sections. Sides varied from straight to markedly incurving.