PRELIMINARY NOTE ON THE SUPPOSED ABORIGINAL ROCK-CARVINGS AT MERSEY BLUFF, DEVONPORT.

By

E. O. G. Scott,

Assistant Curator, Queen Victoria Museum, Launceston.

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PART 1. INTRODUCTION.

The supposed Tasmanian Aboriginal Rock-Carvings at Mersey Bluff, Devonport, were brought under the notice of this Society by Mr. A. L. Meston, M.A., in a lecture delivered on 20th April, 1931. In conversation, Mr. H. Stuart Dove, F.Z.S., of Devonport, has informed me he has known of the existence of the markings for a number of years, his attention having first been called to them by Mr. Leek about 1914. Mr. Dove has also courteously supplied me with a copy of an article on the subject, illustrated by three figures, contributed by him to *The Australasian* of 15th September, 1923.

As, apart from the present series, no Tasmanian Aboriginal Rock-Carvings, of course, are known, considerable interest was naturally aroused by Mr. Meston's lecture. It was felt that the Queen Victoria Museum, Launceston, being the nearest scientific institution, should acquire, and have available for reference, some first-hand data concerning this important discovery, and I was instructed by the Museum Committee to visit the locality with this object. Accordingly, I spent the afternoon of 24th June, 1931, and the two days following at Devonport, and as a result of my investigation of the supposed carvings formed the opinion that these markings are very probably not of human, but of natural origin.

A paper, based on my Museum Report (which extends to about 100 pages, and includes over 100 figures), and incorporating certain additional data acquired on the occasion of several spare-time visits to Devonport, is in course of preparation and now nearing completion. In view, however, of the considerable length to which this proposed communication has already run, and of the difficulties surrounding the publication of this year's issue of the Society's *Papers and*

Proceedings, I have deemed it advisable—reluctant though I am to forego, in particular, the aid of figures—to submit, at the present juncture, merely a short preliminary note on the subject (to which, in preparation for publication, several items have been added).

It must be clearly understood that the present communication is to be regarded, not as a considered statement of the case for the natural origin of the Devonport rock-markings, but merely as a preliminary indication of the chief general lines along which that viewpoint is developed from a considerable body of evidence set forth in the detailed Paper it is proposed, should circumstances permit, to submit at a later date.

I wish to express my sincere thanks to Mr. A. L. Meston, M.A., and Mr. H. Stuart Dove, F.Z.S., both of Devonport, for much courteous assistance and information in connection with the markings; to Mr. D. Mahoney, D.Sc., Director of the National Museum, Melbourne, and Mr. A. S. Kenyon, M.I.E. Aus., for valuable notes on the character of rock-carvings found on the Mainland; to Mr. V. V. Hickman, B.A., B.Sc., for an estimation of the silica-content of the Devonport diabase; to Mr. V. Wellard, of the Mersey Marine Board, for the history of Quarries at Devonport; to Mr. R. Slater, of Kelso, whose hospitality made it possible for me to visit West Head; and to Mr. H. H. Scott, Curator of the Queen Victoria Museum, Launceston, for appreciated assistance in various ways. To the Chairman of the Museum Committee, His Worship the Mayor of Launceston, Alderman F. Boatwright, I am indebted for permission to incorporate in the present communication material from a Departmental Report.

PART 2. SUMMARY OF ARGUMENTS IN FAVOUR OF HUMAN ORIGIN.

The following summary records the principal considerations that have been, or may be, urged in favour of the human origin of the 75 rock-markings on Mersey Bluff regarded by Mr. Meston as being Aboriginal carvings:—

(1) General shape and character suggestive of human workmanship.

(2) Similar markings found outside Tasmania are of human origin.

(3) Specific imitation claimed for (or names, implying specific and deliberate imitation, bestowed upon) four markings:—(a) Fish; (b) Snake; (c) Haliotis Shell; (d) Bird's Head: to which add here, for convenience, (e) Concentric Circles.

(4) Carvings restricted to upper levels of Mersey Bluff headland. Mr. Meston has stated, "I have made a careful "search of every headland from Cape Grim to West Head, "hoping to find similar work of the aborigines, but have not "been successful in finding anything that appears like the "carvings at the Bluff; lines and deep markings I have found "in plenty, but carvings none."

(5) Carvings restricted to horizontal and subhorizontal rocks.

(6) Difficulty of conceiving any other adequate and available agency.

(7) Outlines never follow natural lines of weakness in the diabase.

(8) All in positions easily accessible to man.

(9) Carvings recognised as being such by observers familiar with Aboriginal rock-carvings in other countries.

(10) Aboriginal midden nearby, among sand-dunes of beach at Western base of the Bluff. On the strength of the supposed restriction of the carvings to the headland, and of the proximity of this midden, Mr. Meston has ventured to suggest that Mersey Bluff may possibly be of special ceremonial significance, in Walker's words, "a place of "assembly and consultation."

PART 3. SUMMARY OF ARGUMENTS IN FAVOUR OF NATURAL ORIGIN.

Though it involves a certain amount of duplication, I summarise separately below, first, the considerations that afford, to a greater or lesser extent, answers to the ten chief arguments in favour of the human theory; and, secondly, the additional independent considerations in favour of the suggestion of natural origin.

A. Answers to Arguments in Favour of Human Origin.

(1) *General Shape and Character suggestive of Human Workmanship.*

This, of course, is a principal point in debate. I can here only state that the supposed carvings (considered, for the moment, in complete dissociation from any other rock-

markings, either at Devonport, or elsewhere) seem to me to be more or less definitely unsuggestive of Aboriginal workmanship in the following ways:—

(a) *General Shape* (cases of specific imitation are discussed later). Ovate, pyriform, reniform, and other simple curvilinear outlines are certainly superficially suggestive of human endeavour, but, on the other hand, these outlines are common ones in Nature—persistent annular lichen-transfers, for instance, affording very closely comparable figures, not only as regards general shape and general size, but also as regards details of form (e.g., width of band, spurs, abrupt cessation of outline, secondary loops, etc.), and details of proportion (e.g., ratio of length to maximum breadth; in pyriform examples, relative position of point of maximum width; etc.).

(b) *Depth of Groove.* This reaches a maximum of 54 mm. On the other hand, several of carvings have a maximum depth of less than 5 mm.

(c) *Variation in Depth of Groove in Individual Examples.* Maximum depth of 12 carvings = 10, 3, 3.5, 3, 7, 14, 9.5, 18, 26, 19, 54, 15.75 mm. Minimum depth of same examples = virtually zero, zero, virtually zero, 1, 2.25, 5.5, virtually zero, 1, 3, 2, 5, virtually zero, respectively. In individual examples, the depth changes from 18 to 6.75 mm. in the course of about 25 mm.; from 8 to 1.5 mm. in 5 mm.; from 16 to 4.5 mm. in about 20 mm.; from 22 to 10 mm. in about 4 mm.; from 54 to 25 mm. in about 50 mm.; etc.

(d) *Width of Groove.* The groove varies in width from 2 mm. to 45 mm., or more.

(e) *Variation of Width of Groove in Individual Examples.* Selected instances include:—from 11 to 2; from 13 to 3; from 27 to 6; from 45 to 8; from 20 to 8 mm.

(g) *Cross-section.* Various examples give the following associated measurements of depth and width of groove:—18 mm. (depth) and 8 mm. (width); 16.5 and 6 mm.; 26 and 6 mm. (here, an ordinary lead-pencil, about 7.5 mm. in diameter, even when sharpened to a cone 14 mm. high, cannot be made to reach the bottom of the groove, which is, as noted, just over an inch deep); 18 and 7.5 mm.; 16.5 and 7 mm.; 19 and 8 mm.; 11.25 and 6.5 mm.

The wall of the groove is not infrequently sheer, and occasionally overhanging; and at the same point one wall

may be virtually vertical while the other wall presents a very gradual slope.

At one point in the Snake, the groove is somewhat flask-shaped in vertical cross-section, with a constricted neck following on a mouth 7 mm. across: the groove here is 16.5 mm. deep.

(h) *Small Radii of Curvature of Arcs of Deep Grooves.* In one case, in a groove 16-19 mm. deep, and 6-8 mm. wide, the rate of curvature is too rapid for a thin steel blade, 9.75 mm. across, at once to follow the outline and keep evenly in contact with the bottom of the groove.

(i) Groove not infrequently undercut at, or near, bottom.

(j) Frequent sudden complete hiatus in outline. Partial interruptions, involving a marked abrupt change in depth and width of groove, also occur.

(k) Common association of cessation of groove, either as hiatus in outline or as free extremity of linear appendage, with a pronounced distal fanning-out.

(2) *Similar Markings Found Outside Tasmania are of Human Origin.*

(a) The markings at Devonport certainly present considerable general resemblance in shape to other rock-markings definitely known to be of Aboriginal origin. They exhibit, however, several characteristic features of outline that are probably, as far as I can ascertain, not duplicated in carvings of, at any rate, Australian workmanship. Unfortunately, I have no first-hand knowledge of the well-known mainland series. Mr. A. S. Kenyon, M.I.E. Aus., however, has very kindly supplied me with much detailed information in answer to a lengthy questionnaire. From this I select the following items that serve to illustrate the marked differences between the Australian Aboriginal carvings and the rock-markings at Mersey Buff:—

(b) Question. (1) Any recorded examples in diabase? (2) In basalt? (3) If "no" to either or both above, any reason, apart from hardness—e.g., lack of rocks?

Answer. "(1) None. (2) None—if [in both cases] "the query be confined to incised lines: but "scratched designs have been found on diorite, "S. Aus., and scratched lines on cylindro-conical

"stones of hard sandstone in a single case. The "case of these cylindro-conical stones is typical: "all those of soft stone, sandstone, limestone, "or slate are incised, those of hard sandstone, "etc., are without incisions save the instance "above. Stone churingas are all of soft slates."

It may be noted that in a Paper, "Aboriginal Rock-Carv-"ings in South Australia," read before the Australasian Association for the Advancement of Science, at the 1928 Session, Mr. C. P. Mountford records a group of circles and "cup-"and-ring" carvings, found on the bank of the Rocky River, about 4 miles south-west from Huddlestone, on a boulder described as being of quartzite. Concerning this boulder, Mr. Mountford says, "It is very likely that a stone of this descrip-"tion would have special ceremonial value." More than 200 carvings, from 14 localities, are described in this Paper, all of them, with the single exception noted, being executed in slate or in "soft Miocene limestone."

(c) Question. Average depth of outlining groove?

Answer. "One centimetre. I have never measured "them accurately. Very often with weathering "or wearing they are very shallow—2 or 3 mm. "or less."

(d) Question. Maximum depth of groove?

Answer. "I do not recollect any two centimetres "deep."

(e) Question. Usual form of ogroove in vertical section?

Answer. "The groove may be roughly described as "an equilateral triangle in section with a some-"what rounded apex." (Sketch attached.)

(f) Question. Anything like this met with—a groove 26 mm. deep and 6 mm. wide?

Answer. "Not to my knowledge. I have seen many "around Port Jackson, the Hawkesbury, in "North-West N.S.W., S.W. Queensland, and "Northern South Australia."

(g) Question. Ever undercut?

Answer. "No. Decidedly not."

(h) Question. Ever anything like this (sketch of flask-shaped groove-section attached) in vertical section?

Answer. "No."

The marked differences in the character of the groove in the Australian rock-carvings and the markings at Devonport—an aspect I conceive to be of primary importance—will be realised on comparing the notes above with the data recorded in the preceding section.

(3) *Examples of Supposed Specific Imitation.*

In so far as they can readily be summarised, the chief points of criticism of the examples of supposed specific imitation are as follows:—

A. *Fish.*

(a) Unconvincing outline—called by other observers "Leaf" and "Owl."

(b) No fins.

(c) Two large irregular series of pits (max. d = 16 mm.) in head region apparently not representatively significant.

(d) Inwardly projecting spur (l = 72 mm.) in head region apparently not representatively significant.

(e) "Tail," unlike rest of body, not outlined by a groove, but is itself a single depression.

(f) Variation in depth of groove. Depth at 37 points (successive, but not equidistant) = 18, 6.75, 8, 1, 6, 5, 7, 1, 5, 5, 0.5, 0, 3, 1, 2, 3, 1, 2.5, 3.5, 1, 9, 5, 8.25, 5, 9, 8, 5, 13.5, 18, 10, 11, 6, 8, 2, 3.5, 1.5, 8 mm. The depth changes from 18 to 6.75 mm. in about 25 mm., and from 8 to 1.5 mm. in 5 mm.

(g) Variation in width of groove. Width at the 37 points whose depth-measurements are noted above = 21, 16, 24, 20, 20, 18, 24, 14, 22, 17, 10, 0, 18, 7, 10, 16, 6, 18, 15, 13, 26, 24, 25, 27, 25, 22, 21, 23, 23, 24, 23, 19, 16, 10, 15, 8, 17 mm. The width changes from 18 to 7 mm. in about 20 mm., and from 17 to 8 mm. in 5 mm.

(h) In deeper head-region, outer wall of groove comparatively sheer, inner wall very gradually sloping.

(i) Anteriorly, outer wall slightly undercut.

(j) Outline barely traceable for a stretch of about 43 mm.

(k) Outline duplicated by crustaceous lichens.

(l) Fish-like intaglio (l = 162; b = 38; max. d = 12 mm.) in recently worked diabase quarry at West Devonport.

(m) Fish-like intaglio (l = 170; b = 70; max. d = 16.5 mm.) in diabase on right bank of Mersey, some 2 or 3 miles from Bluff.

(n) Fish-like outline (l= 232; b = 112; max. d = 8.5 mm.) in diabase near West Tamar Road, Launceston.

(o) Small size of carving (l, between parallels = 328; w = 160 mm.); outlined representations of fish in Australian Aboriginal carvings usually being very large (up to 30 feet long).

(p) Ratio of length to breadth in carving is 328 to 160 mm. (i.e., 2.05), and in example mentioned in note (n) is 232 to 112 mm. (i.e., 2.07).

B. *Snake.*

(a) Unconvincing outline (head outlined by groove; tail itself a groove; one large and three small internal independent elements).

(b) Numerous scattered shallow depressions to immediate left of carving, and two isolated shallow arcs, one outside upper right, other outside and subparallel with lower right, corner.

(c) Variation in depth of groove. Thirteen measurements of depth (at non-equidistant intervals) = 3, 2, 10, 18, 18.5, 19, 16.5, 11.25, 4.5, 9, 14.5, 9.5, 7 mm.

(d) Variation in width of groove. Width at the 13 points whose depth-measurements are noted above = 6, 5, 6, 7.5, 11, 8, 7, 6.5, 7, 8, 11, 7, 15 mm.

(f) A depth of 16.5 mm. associated with a width of only 7 mm., and a depth of 18 mm. associated with a width of only 7.5 mm.

(g) Groove undercut in 5 separate regions, one of which is 35 mm. long.

(h) Walls of groove often comparatively sheer.

(i) Vertical cross-section of groove, at lower left corner, flask-shaped (7 mm. wide at "mouth"; 16.5 mm. high).

(j) Groove in diabase at Cataract Hill, Launceston, forming only 3 sides of a rectangle, is 92 mm. long (in carving, l = 112 mm.); has completely formed "head," 25 mm. wide (width of "head" in carving = 26 mm.); width of groove varies from 7.5 to about 16 mm.; depth varies from 4 to 16.5 mm.

(k) Groove below hightide-line at Mersey Bluff presents an outline of same generic character as Snake. Depth at 6 points = 8, 15, 19, 10, 5.5, 3.5 mm. Width of groove at 4 points = 5, 18, 15, 7.5 mm.

(l) Ratio of length to breadth in carving is 112 to 90 mm. (i.e., 1.24), in example mentioned in note (k) is 95.5 to 70 mm. (i.e., 1.36).

C. *Haliotis Shell.*

(a) Name applied to one portion only of large, otherwise innominate marking.

(b) Resemblance is remote (general outline unsatisfactory; presence of spur; etc.).

(c) From middle of floor of groove, here 40 mm. wide and 35 mm. deep, a large boss rises to a height of 23 mm.

(d) May possibly be connected with spiral growth-lines in lichens.

(e) Remainder of carving presents a number of features difficult to reconcile with human theory, e.g., max. d. of groove = 54 mm.; d. of groove changes, in course of about two inches, from 25 to 54 mm.; large basal loops; interruption of outline; large and small independent external elements; large internal spur with distal expansion; three large independent internal elements; etc.

(f) On same rock are "non-carvings," including a rounded marking, with scalloped outline (l = 220; b = 200; max. d. = 14.5 mm.); an intaglio (l = 121; b = 120; max. d. = 27 mm.); an irregular groove (l = 730; max. d = 30 mm.); an intaglio (l = 310; b = 56; max. d. = 33 mm.); a groove (l = about 900 mm.; b = about 51 mm.; this groove, observed on a wet day, contained water to a depth of 97 mm.); etc.

D. *Bird's Head.*

(a) Resemblance very remote.

(b) "Eye" apparently a naturally weathered depression, with part of periphery raised as a rim.

(c) No "eye" in other carvings of generically similar outline.

(d) Rock-surface flaked away for some distance round anterior portion to a depth comparable with that of the groove.

(e) Outline closely repeated by lines of pneumatological differentiation and weakness in diabase.

E. *Concentric Circles.*

(a) Not concentric circles. Consists of the following elements:—(1) a very nearly circular element, interrupted (grooves expanding distally) near "three o'clock," and giving rise to (2) a pointed, outwardly projecting spur near "twelve o'clock"; (3) a less accurately circular element, taking its origin as a pointed groove practically in contact with the end of the spur arising from the inner element, and, apart from a semi-interruption towards "four o'clock," following a course for some distance approximately concentric with that of the inner element, but swinging out noticeably from it towards "ten o'clock," and terminating in a free extremity just before "twelve o'clock"; (4) an inwardly projecting spur arising from the inner element near "eight "o'clock"; (5) an outwardly projecting spur arising from the inner element near "ten "o'clock"; and (6) a short detached external element at "three o'clock."

(b) Remarkable combination of skill and inexpertness.

(c) Near "two o'clock," where outer groove is 8.5 and inner groove is 9.5 mm. below general rock-surface, the narrow region between them is 7.5 mm. below general rock-surface.

(d) On same rock with this carving, 78 mm. from it, occurs a rectangular marking with secondary rectangular appendage. This marking, which is, so far as I am aware, not regarded as a carving,

is slightly greater in area than the concentric circles, and has a max. d. of 16.5 mm. (max. d. of circles = 15.75 mm.).

(e) Below high tide line at Bluff occur concentric ovate grooves—outer groove, l = 62, b = 45, w = 2-3, d = 1 mm.; inner groove, l = 40, b = 25, w = 2-3, d = 2.5 mm.

(f) On headland occur among the "non-carvings" two concentric arcs forming about 1-3 of a broad ellipse; width of groove = 4-5 mm.; d = 5 mm.; chord of inner arc = 85 mm.

(g) Lichens at Cataract Hill, Launceston, observed forming conspicuous but very shallow concentric circles of erosion. Spurs, projecting inward and outward, present as in carving. Difference between maximum and minimum diameters of carving = 7.2 %; ditto, in the case of 8 lichens (on neighbouring rocks, Cataract Hill) = 3.8, 0.9, 4.1, 6.8, 4.5, 4.1, 10.3, 3.1 %; av. = 4.7 %.

4. *Supposed Restriction to Upper Levels of Bluff.*

(a) A carving (l = 265; b = 195; max. d. = 49 mm.), more striking than 90 % of those at the Bluff, occurs on a rock (below high tide-line) about 11 yards southward from the retaining wall at the Western end of Devonport Bridge, some 2 miles from the Bluff.

(b) Other examples (up to 30 mm. deep) occur on both banks of the Mersey above the Bridge.

(c) At, and below, high tide-line at Mersey Bluff (particularly on N.W. aspect) are numerous grooves of ovate, pyriform, reniform, and other outlines. Dimensions of 6 examples (l and b = external length and breadth; w = average width of groove; d = maximum depth):—(1) ovate, with curved terminal appendage, l (with appendage) = 115, b = 54, w = 6, d = 25 mm.; (2) ovate, with transverse internal groove, 5.5 mm. deep, l = 50, b = 43, w = 9, d = 5.5 mm.; (3) pyriform, l = 60, b = 35, w = 6, d = 24 mm.; (4) reniform, l = 95, b = 59, w = 5, d = 24 mm.; (5) rectangular, l = 196, b = 196, w = 40, d = 56 mm. (or more); (6) pyriform, with subsidiary internal loop, l = 92.5, b = 68, w = 2, d = 4 mm.

These markings are closely comparable in size and general shape with corresponding members of the carving-series, and exhibit similar characteristic curved appendages,

transverse internal grooves, internal subsidiary loops, detached elements, bosses rising from floor of groove, interrupted sections, and so on.

In some cases the groove, particularly apically in ovate examples, has formed (up to a depth of 22 mm.) immediately beneath an overhanging hood-like lamina of diabase, which, on being removed (readily enough) by the fingers, exposes the groove.

(d) On vertical faces of diabase-quarries (6-15 feet above general ground level) at East and West Devonport, worked recently, certainly within the last 20 years, occur, among others, the following well-marked grooves:—(1) ovate, l = 60, b = 49, w = 10, d = 4 mm.; (2) pyriform, l = 190, b = 89, w at 5 points = 14, 27, 11, 18, 30 mm.; d at same points = 3.25, 7.5, 5.25, 3.5, 7.75 mm.; (3) ovate, l = 88, b = 75, w = 10-20, d = 8 mm.; (4) reniform, l = 105, b = 53, w = about 8, d = 6 mm.; (5) fish-like intaglio, l = 162, b = 38, d = 12 mm.; (6) ovate, l = 40, b = 30, d = 6 mm. Examples (2), (5), and (6) occur in much-weathered diabase in the Mersey Marine Board's Quarry, first worked, Mr. V. Wellard informs me, in 1912. Examples (1), (3), and (4) are from Mr. Coulter's Quarry at East Devonport, and occur on a face almost certainly opened up during the present century.

(e) Wherever I have been able to examine diabase formations, I have found grooves in the shape of closed curves. These are at once much rarer, and, on the average, much shallower than the Devonport examples. It is, I think, a matter of considerable importance to observe that the unclosed curves, or "non-carvings" are correspondingly rarer and correspondingly shallower than the non-carvings on the Bluff (see section (6)). Notes on 6 selected examples:—(1) Cataract Gorge; ovate with terminal appendage; l = 88, b = 70, w = 9-15, d = 8 mm.; (2) Cataract Gorge; pyriform; l = 115, b = 72, w = 11-14, d = 4 mm.; (3) Ravenswood; pyriform with rectangular appendage; l = about 145, b = 74, w = 4-11, d = 6.5 mm.; (4) West Head; pyriform; l = 136, b = 64.5, w = 5-9, d = 2 mm.; (5) West Head; pyriform; l = 48, b = 24.5, w = 5.5-10, d = 5 mm.; (6) Waverley, Launceston; ovate with interrupted outline; l = 60, b = 43, w = 4.5-12, d = 5.5 mm. (This last example is more clearly and boldly cut, and decidedly more striking than several of the poorer, small supposed carvings of similar character.)

(5) *Supposed Restriction to Horizontal and Subhorizontal Surfaces.*

(a) Area on headland of Mersey Bluff on which the carving-series occurs consists chiefly of horizontal and subhorizontal rocks.

(b) Both carvings and non-carvings are in general restricted to these.

(c) At least one carving does occur partly on a sloping and partly on a subvertical face. Further investigation is needed.

(d) The place of both the carvings and non-carvings at Devonport is apparently taken on vertical rock-faces by pronounced exfoliations of comparable size and shape.

(e) In localities other than Devonport the grooves in the diabase are usually, but not exclusively, on the horizontal, and the exfoliations chiefly on the vertical faces.

(6) *Difficulty of Conceiving any other Adequate and Available Agency.*

(a) *As regards shape.* The characteristic shapes of the supposed carvings are duplicated in whole or in part by numerous small outlines scratched on the rock-surface at Devonport and elsewhere as finely as if incised by a needle; by the grooves found below the tide-line at Devonport (section 4 (c)); by grooves in recently worked quarry-faces at Devonport (section 4 (d)); by grooves in diabase in localities other than Devonport (section 4 (e)); by extensive exfoliations on vertical diabase-faces at Devonport and elsewhere; and in many cases with great fidelity by rock-lichens.

(b) *As regards depth and character of the groove.* Scattered about the area on the Bluff headland in which the carvings occur, and often on the same rocks with them, are numerous other well-defined grooves, usually with unclosed outlines, and intaglios. As Mr. Meston's restriction of his list of carvings to 75 examples indicates, these markings are not regarded by him as being of Aboriginal origin. For convenience, I designate them non-carvings. Some measurements of non-carvings appear below.

(c) *Length.* From a few mm. to, e.g., about 900, 950, 730, 430, 240, 310 mm.

(d) *Depth of groove.* Measurements of maximum depth include:—33, about 100, 38, 27, 40, 33, 24.5, 31.5 mm.

(e) *Variation of Depth of Groove in Individual Examples*:—(1) from 4.5 to 1 mm.; (2) from 21 to 6 mm.; (3) from 11 to 3.5 mm.; (4) from 20 to 5.5 mm.; (5) from 18.75 to 2 mm.; (6) from 14.5 to 0 mm.; etc. Often abrupt changes in depth, e.g., from 10 to 0 mm., from 13.75 to 3.5 mm., from 5.5 to 3 mm., from 31.5 to 6 mm., in the course of a few mm.

(f) *Width of Groove.* Varies from 1 or 2 mm. to 82 mm. or more.

(g) *Variation of Width of Groove in Individual Examples*:—(1) from 18 to 8 mm.; (2) from 26 to 11 mm.; (3) from 35, or more, to 6 mm.; (4) from 51 to about 8 mm.; (5) from 82 to 35 mm.; (6) from 56 to 40 mm.

(h) *Cross-Section.* Various examples give the following associated measurements of depth and width of groove:—(1) 14.5 (depth) and 10 mm. (width); (2) 31.5 and 11 mm.; (3) 22 and 13 mm.; (4) 40 and 17 mm.; (5) 19 and 8 mm.; (6) 19.5 and 5 mm. Wall may be sheer, overhanging, or gradually sloping. One example, 31.5 mm. deep, 11 mm. wide, is somewhat flask-shaped in vertical cross-section.

(i) Some deep grooves have a comparatively small radius of curvature.

(j) Undercut in a number of cases.

(k) Complete and partial interruptions in outline occur.

(l) Common association of cessation of groove, either as hiatus in outline or as free extremity, with a pronounced distal fanning-out.

(m) These grooves are not, nor, I think, plausibly can be, claimed as being of Aboriginal origin. The agency responsible for their incision would be capable, in so far as depth and general character of the groove are concerned, of incising the grooves of the supposed carvings.

(n) Lichens, which are sometimes very long-lived, have been known to eat into rock to a depth of 30 mm. Lichens have been known to eat into glass, and a determination kindly made for me by Mr. V. V. Hickman, B.A., B.Sc., shows that the Devonport diabase has a silica-content of 46 %. On the other hand, it is to be noted that a much higher percentage of silica occurs in other of our igneous rocks.

(7) *Outlines Never Follow Natural Lines of Weakness in the Diabase.*

(a) It would be somewhat remarkable, from the viewpoint of human theory, if this were so. I have notes and

sketches of lines of weakness forming portions of, and extensions of, the main outline.

(b) In some cases cracks or furrows run on to, or right across, the carving, maintaining their own integrity while traversing the groove. If the supposed carvings are of human origin, these cracks must be of subsequent formation. It is of interest to observe that similar furrows maintain their integrity in depressions and grooves formed by crustaceous lichens.

(8) *All in Positions Easily Accessible to Man.*

(a) All the markings recognised as carvings are accessible to man. (Further investigation on this point is desirable.)

(b) Some examples are in decidedly awkward situations.

(c) Of the markings here noted from below the tide-line at Mersey Bluff, some (e.g., those with large lamellar hoods overhanging the groove) are not accessible by Aboriginal implements.

(d) Grooves here noted from quarry-faces at Devonport, opened up within the last 20 years or so, are not accessible to Tasmanian Aboriginals.

(9) *Carvings Recognised as Being Such by Observers Familiar with Aboriginal Rock-Carvings in Other Countries.*

In a summary such as the present, it can merely be said that other observers, similarly qualified, hold an opposite opinion.

(10) *Aboriginal Midden nearby, among Sand-dunes of Beach at Western Base of Bluff.*

(a) Aboriginal middens found at frequent intervals along practically the whole Northern Coast of the Island.

(b) Carvings not restricted to Mersey Bluff.

B. Additional Arguments in Favour of Natural Origin.

In the preceding sections (Part 3; A; Nos. 1-10) a general answer to the chief arguments in favour of the human theory has been outlined. The formulation of this reply has naturally involved the general statement of a large part of the case for the natural origin of the markings; and the opportunity has been taken to draw attention to several points (e.g., occurrence of deep curvilinear grooves in diabase below the tide-line and in quarries) that may perhaps best be regarded not merely as answers to arguments for the Aboriginal theory, but as independent considerations in favour of the suggestion of natural origin.

Additional independent considerations — of varying evidential weight—in favour of the theory of natural origin include the following:—

(11) In many of the ovate examples below the tide-line at Mersey Bluff the whole area enclosed by the groove is elevated into a knob (a structure, I presume, probably allied to that of orbicular Websterite), usually rising a few mm., but at times as much as 800 mm., above the general surrounding surface. On re-examining the ovate carvings on the headland, I found that in a number of instances a ruler balanced on the central portion of the area enclosed by the groove rode quite clear of (in marking on same rock with snake 3-4 mm. above) the general surrounding surface.

(12) Absence from the known range of Tasmanian Aboriginal implements of a tool capable of incising grooves of such character. (See details of depth, width, and cross-section of groove in section (1).) It may be observed that a neatly scratched modern design at the Bluff (comprising an approximately equilateral triangle, two initials, and the figures 66), in which the tool-marks are visible, has a maximum depth of 1.75 mm., and an average depth of 1 mm. or less.

(13) Though there is no constant ratio between size of outline and depth of groove, the deeper grooves occur in general in the larger markings. The largest marking of the series is notably the deepest.

(14) The deeper grooves, among both the carvings and the non-carvings on the headland, are found on the Northern and North-Western (i.e., the most exposed) aspects of the Bluff.

(15) Though personally I attach little weight, from an evidential point of view, to such a negative consideration, it appears, on the face of it, surprising that the refractory igneous diabase should be selected for the incision of carvings to the complete neglect, as far as is known, of the readily accessible softer sedimentary rocks (e.g., slates, and the Midland sandstones).

(16) Some evidence is available of the formation of fairly pronounced curvilinear grooves in concrete, cement, and dressed freestone. Further investigation is needed.

(17) The Tasmanian diabase exhibits in great number curves of pneumatological differentiation closely comparable in area and outline with the typical carvings, the resemblance extending even to the minor features of proportion and form.

These areas of differentiation may manifest themselves as (a) mere superficial outlines of segregation, or, after being acted upon by weathering agencies, as (b) grooves, (c) exfoliations and intaglios, (d) lines or curves in relief.

(a) Example. Dimensions of regular pyriform carving, with corresponding dimensions of regular pyriform superficial segregation—outline (Cataract Hill, Launceston) in brackets for comparison (all measurements internal):—l = 140 mm. (196 mm.); b = 75 mm. (114 mm.); max. breadth expressed as a percentage of length = 54 % (58 %); vertical distance of max. breadth from top (i.e., broader end) expressed as a percentage of length = 25 % (26 %).

(b) Grooves. See Part 3; section 6.

(c) Exfoliations. I possess specimens from Devonport and elsewhere, all detached by the finger-tip. Dimensions of an ovate example (Trevallyn, Launceston):—l = 189 mm.; b = 117 mm.; max. d. = 33mm.; wt = 2 lbs. 2¼ oz.: larger specimens are obtainable.

These exfoliation-flakes *in situ* and the intaglios formed by their weathering-out are exceedingly common, particularly on vertical and subvertical faces. It may be of interest to mention here that while on a visit to West Head, M. Landgraff, Mr. T. Slater, and myself discovered in the Cambrian or Pre-Cambrian schists, between Kelso and West Head, an extraordinary series of deep and very clearly defined water-worn intaglios, the smaller and more numerous members of which exhibit a striking resemblance to a human footprint.

(d) At, and below, the hightide-line on the N.W. of Mersey Bluff, outlines comparable in shape and size with those of the common carvings are raised in appreciable, sometimes in high, relief. Occasional curves in relief occur also on the headland itself.

(18) Complete absence at Devonport, so far as I am aware, of the track-marks that form such an important element in the great majority of extensive series of Australian Aboriginal rock-carvings.

(19) In conversation, Mr. Meston has informed me that in the period of less than three years during which he has observed the markings five examples of his original list of eighty have weathered out. Mr. Dove tells me also that of the three examples figured by him in *The Australasian* in 1923 one is now nearly indecipherable.

PART 4. CONCLUSION.

As a personal opinion, based on the evidence available, I have very little doubt indeed that the 75 rock-markings at Mersey Bluff claimed by Mr. Meston to be carvings are not of Aboriginal origin. I regard them as being striking, but somewhat arbitrarily selected, items in an extensive series of natural erosions.

As regards the mode of formation, the data collected would seem to show that the erosion has in general occurred along lines of inherent pneumatological weakness in the Mesozoic diabase. There is some reason to believe that, in addition to inorganic weathering-agencies, rock-lichens have played a not unimportant part in the process of erosion of the grooves, and in some cases it is possible they have initiated the groove.

It has already been observed that the present communication does no more than form an outline of the general trend and scope of the chief objections to the theory that these rock-markings are of Aboriginal workmanship. It is proposed, should it prove expedient, to make a detailed examination of the problem the subject of a later paper. In the meantime, the case for the natural origin of the supposed carvings merits, I think, serious consideration.