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EXCAVATION OF THE GREEN GULLY BURIAL

By D. A. Casey
Honorary Associate in Anthropology
and T. A. Darragh
Curator of Fossils

Abstract

The discovery and excavation of human remains found in an ancient river terrace of the Maribyrnong R. near Keilor, Victoria, are described. The remains were in a shallow grave sealed by three feet of undisturbed soil. Radiocarbon analysis indicates that the bones are about 6460 years old.

Introduction

In August 1965 fossil human bones were found in a pit (from which garden soil is excavated for sale) near Keilor, about 10 m NW. of Melbourne. The pit is on a farm property belonging to Mr H. Dodds on the right bank of the Maribyrnong R. about one mile S. of the township of Keilor. It is immediately downstream from the point where Taylor Ck, which flows down Green Gully, joins the river (Lat. 37° 44′S., long. 144° 50′E. Military Map 1 in. = 1 mile, Sunbury Sheet 871464).

The site had been visited previously on several occasions by Mr E. D. Gill, Assistant Director of the National Museum of Victoria, and he had asked the proprietor of the pit, Mr Donald Mahon, to let him know of any fossil bones or stone implements found during excavation. When the bones were first noticed, Mr Mahon, realizing that they were probably of interest and importance, left them undisturbed and notified the Museum of their discovery. The site was immediately visited by Mr T. A. Darragh, Curator of Fossils at the Museum.

Occurrence

The soil pit was about nine feet deep where the bones were found, and they were visible in position in the more or less vertical face of the pit, at a depth of about 3 ft 6 in. from the surface. The present surface of the ground is here the original natural surface, and it has not been disturbed by the removal of soil. The bones appeared to be lying on a slightly concave surface. A cranium could be seen on the right-hand side as viewed in the face of the pit, and other bones extended to the left. The whole covered about three feet laterally. Apart from the cranium, the various bones visible could not be clearly identified. Some had been disturbed and broken away when they were uncovered by the front-end loader used for excavating the soil. Some of the dislodged bones and fragments were recovered from the loose earth at the foot of the face, and amongst these there was a fragment of a frontal bone with part of the margin of one orbit and part of the supra-orbital ridge, and this was clearly human. Other fragments, and two teeth, were recovered later, but no doubt some were lost in soil removed from the pit. It was assumed that the bones were the remains of a human skeleton.

There was evidence of some disturbance of the soil immediately above the bones, but apart from this there was no sign of a grave. An examination of the soil face showed that the bones were covered by about three feet of apparently undisturbed soil and alluvial sediment. This deposit is part of a river terrace, the

surface of which is about 36 ft above the level of the river. This terrace is the third highest of a series of four terraces in this locality. It is the same terrace (the Keilor Terrace) as that in which a human cranium was found in 1940 in a sand pit four miles further up the valley of the Maribyrnong R. and two miles away in a straight line. About three feet below the bones there was visible in the face of the pit a large area of oxidized earth with a considerable amount of charcoal and ash. This extended for several feet laterally, and at one place for at least two feet vertically. In the vicinity of the bones there was some burnt earth distributed through the soil in the form of pink granules. However, the relationship of the main mass of burnt material to the bones, or if there was in fact any relationship between them at all, was not clear. The discovery was obviously of considerable importance, and it was clear that the bones should be properly excavated without delay. They were exposed to the weather and were liable to be damaged by rain or storm, and they were also liable to be disturbed or damaged through the curiosity of casual visitors.

With the ready permission of the owner of the land, and of the proprietor of the soil pit, the Director of the National Museum of Victoria, Mr John McNally, immediately took steps to arrange for the excavation of the bones and for the investigation of their stratigraphy and environment. T. A. Darragh was placed in charge of the excavation, assisted and advised by D. A. Casey, Honorary Associate in Anthropology at the Museum. J. M. Bowler, of the Department of Geology, University of Melbourne, and later of the Department of Geography, Australian National University, undertook the investigation of the geomorphology at the site. Later, D. J. Mulvaney, of the Department of Anthropology, Australian National University, joined in the conduct of the excavation. Until a permanent camp could be established and the excavation started, it was arranged that a constant watch should be maintained in order to prevent any unauthorized interference with the bones, and for several days the Victoria Police co-operated in maintaining this watch.

At the instigation of Professor E. S. Hills, archaeologists and other scientists likely to be interested in the discovery were invited to view the bones *in situ* before excavation was started, and Dr D. E. Thomas of the Victorian Department of Mines, and J. N. Jennings and J. Golson of the Australian National University, visited the site. Mr Golson arranged for R. Lampert, Field Officer of the Department of Anthropology, A.N.U. to assist in the excavation; he was present during most of the excavation, and gave much expert assistance. Dr Thomas arranged for J. Knight and R. Williams of the Geological Survey of Victoria to survey the site. Mr J. A. Blackburn, Licenced Surveyor, undertook the surveying necessary to fix the position of the burial precisely (Fig. 1), and to determine the exact relative positions of the several separate excavations that were carried out at the soil pit. Mr Blackburn also determined the height of the excavation datum point in relation to the Melbourne and Metropolitan Board of Works datum. All heights mentioned in this report are referred to as Reduced Levels (R.L.) above the M.M.B.W. datum (Low water at Hobson Bay).

During the excavation, members of the staff of the National Museum of Victoria gave much assistance with the work and also helped in maintaining a night watch. Miss Anne Bermingham of the Institute of Applied Science assisted in collecting charcoal samples for the purpose of C14 dating, and selected samples were dated by her in the laboratory at the Institute.

Excavation of the Bones

The excavation was carried out by digging down from the surface of the terrace. There was no apparent stratification of the soil, and it was removed in horizontal spits, each of a few inches in depth. The excavation showed that the

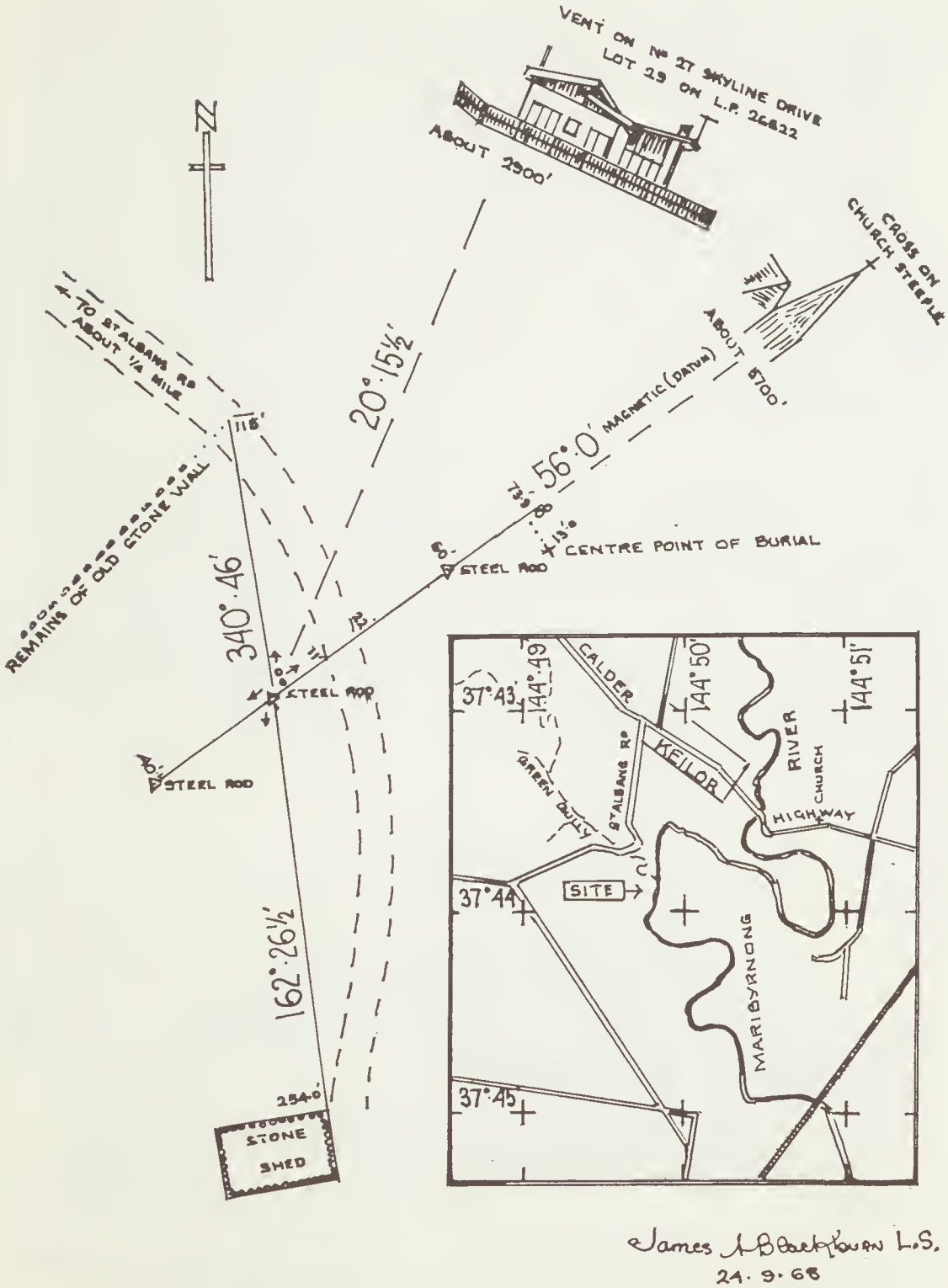

Fig. 1—Survey data fixing position of burial. Additional information is filed in the Museum archives.

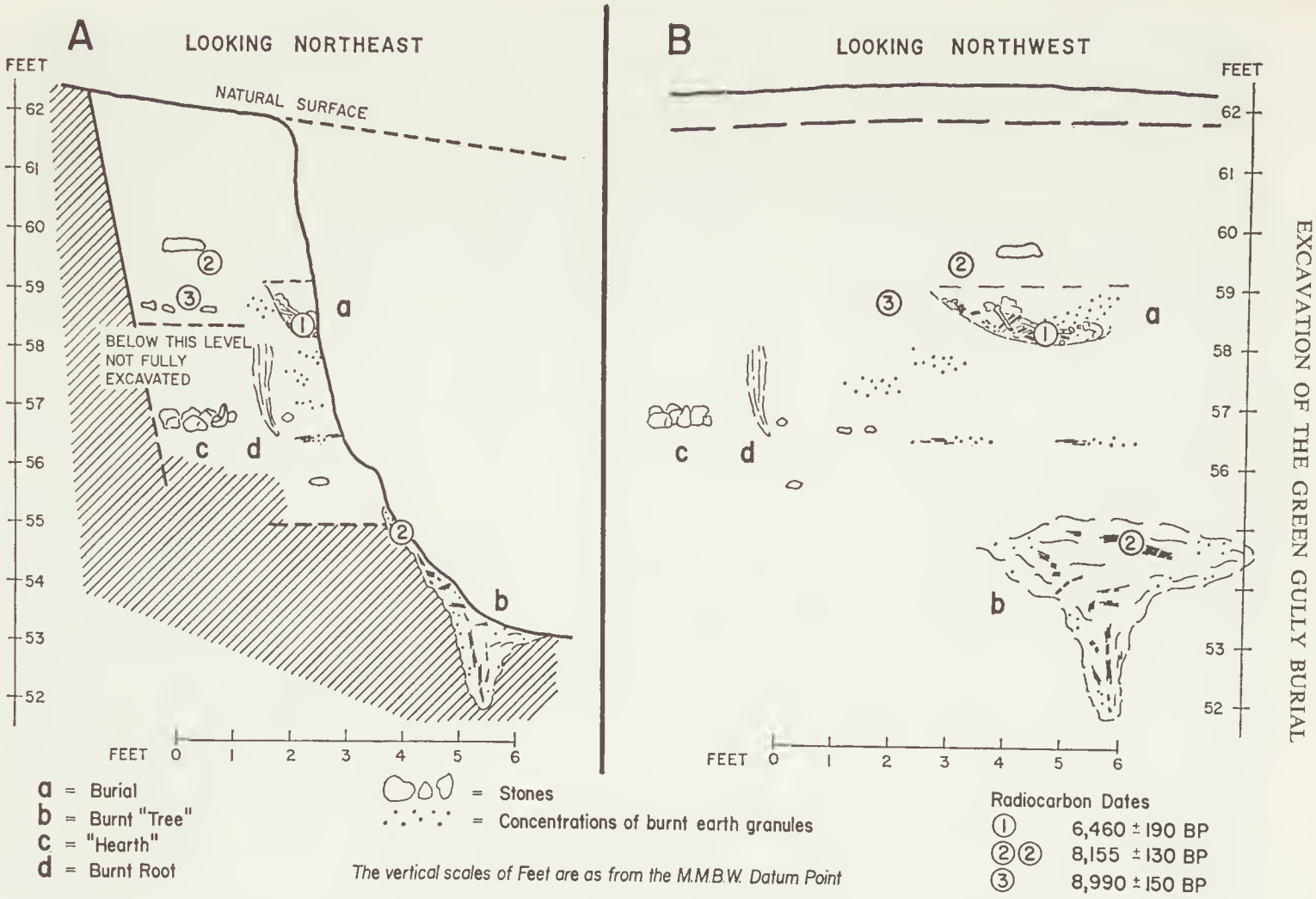

FIG. 3 A, B—Vertical sections of burial site. Objects in these drawings are shown as if projected on vertical planes at right angles to each other. The relative spatial positions of the objects may thus be seen by comparing the two drawings.

bones were indeed human, and confirmed the fact that there was at least three feet of quite undisturbed soil and sediment above them, and that there was no deep grave. The bones were clearly not an insertion into the terrace and were truly fossil. However, as the soil was removed from immediately above and around the bones, it became clear that they were resting in a shallow grave, and the outline of this could be seen in plan, marked by a zone of darker soil. This was most clearly seen around the NE. end of the grave. Much of the filling of the grave at this end had a considerable mixture of burnt earth of a pink colour, and was consequently lighter in tone than the adjacent earth. The limits of the grave were not so well marked at the other end, but its existence here was clearly indicated by the fact that the soil around the bones was very much darker than the adjacent terrace material. The zone of dark soil around the bones was quite clear, although its limits were nowhere sharply or precisely marked (Fig. 2). These facts would seem to indicate that it was a grave dug into comparatively loose soil and filled in shortly afterwards, and that it was not merely a natural hollow. If a natural hollow had been utilized as a grave, it might be expected that the junction between the undisturbed sides of the hollow and the grave filling would have been distinct and precisely noticeable.

The surviving part of the grave extended back about nine or ten inches from the face of the cut as left by the front-end loader. Vertically, the grave extended upwards for about twelve inches from the lowest point of the surface upon which the bones lay (Fig. 3). On the face of the cut, above the NE. end of the burial, there was visible a tip of burnt earth oxidized to a pinkish orange colour, which had not been burnt *in situ*. It sloped down in such a way as to suggest that it had been tipped down, or had fallen down over the bones. Excavation revealed that this inference was correct. The burnt material sloped down from a point above and beyond the cranium, and spread out so as to cover the whole of the cranium and thorax. It passed over the cranium but was not around the sides of it. It must be supposed that the bones were deliberately and intentionally buried.

The remains were lying on their left side, with the knees drawn up. The burial

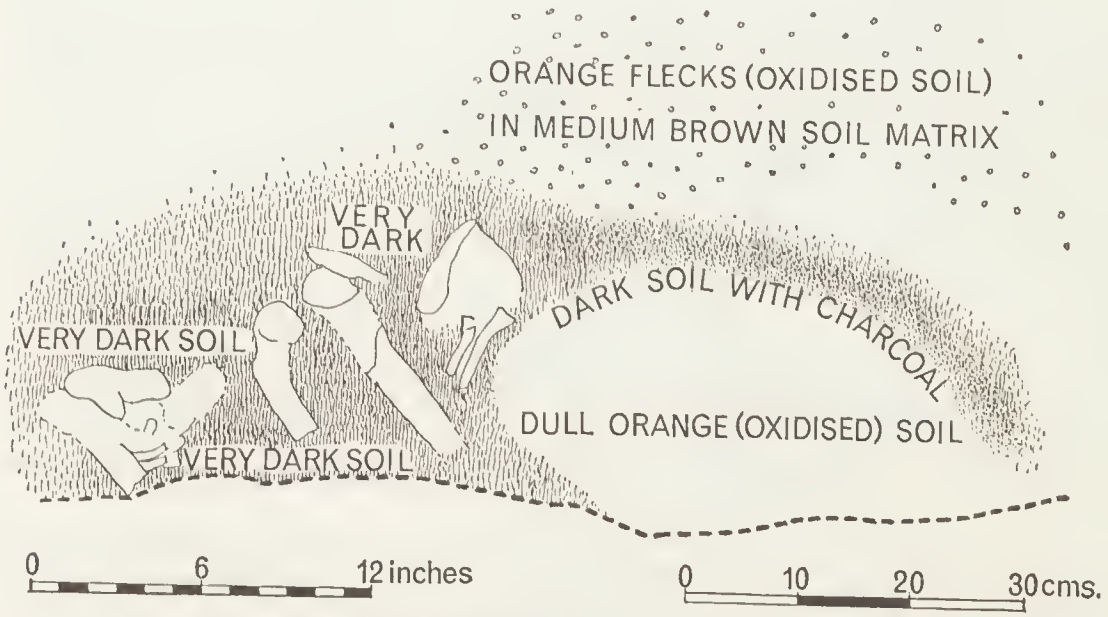

FIG. 2—Plan of the burial, partly excavated, showing outline of grave.

was oriented in about a NE.-SW. direction, with the skull towards the NE. The skull end of the burial was lying several inches lower than the feet end. The facial bones had been broken away and damaged when uncovered by the front-end loader, as had also the knee joints and the adjacent parts of the long bones of the legs. (Pl. 1 and Fig. 4). The bones of the feet, legs, and the pelvic region were darker in colour and were in a more fragile condition than those of the thorax, arms, and cranium, presumably because of a difference in the filling of the two parts of the grave. None of the bones could have been lifted without some danger of being damaged and they were all either fragile or considerably fractured.

As the earth was gradually removed from around and about the bones, each bone as it was revealed was painted with a strengthening solution (a dilute solution of Bedacryl in acetone). No attempt was made to remove the bones separately, but it was decided to lift them as they lay, in three blocks: the cranium, the thorax, arms and pelvic region, and the feet, so that they could be carefully and deliberately examined in the laboratory. When the bones had been strengthened as far as was practicable with the Bedacryl solution, each block was covered with several layers of paper, pasted on in small pieces, to protect the bones from the plaster to be used for reinforcement. Each block was then reinforced with plaster of Paris bandages, and after undercutting was lifted and removed.

It is of course not possible to know how far the grave extended on the side that was removed by the front-end loader, and the possibility that the burial might have been inserted from this side, down a sloping grave shaft, has to be considered, but is remote. The grave as revealed by the excavation was shallow, and was open at the top, and the inner side and lip were clearly, if not precisely, defined. There was no sign of undercutting. As well as this, the filling at the skull end, as previously described, had evidently been tipped down from above. These facts would preclude the possibility of the burial having been made through a lateral sloping shaft.

In recent times the natural surface of the ground sloped down, from about the vicinity of the burial site, towards the river for a short distance. This slope apparently represented the margin of the terrace. This part of the terrace no longer exists, having been removed in the process of digging out the soil from the pit. Nevertheless the position and extent of the recent sloping surface and its angle of slope are known fairly accurately. From a plan and a series of levels which were made for the owner of the land prior to the development of the site as a soil pit, it has been possible to deduce the approximate contours of the recent surface. The direction of its slope was towards the E., i.e. towards the river, and its maximum gradient was only about eight degrees. Moreover, according to Mr Mahon, there was no large hole or irregularity in the surface hereabouts, and it was a gentle unbroken slope. This is confirmed also by air photos of the site taken before the soil pit was started. The maximum probable slope of the surface is marked on the drawing of the vertical section of the site by a dotted line (Fig. 3A). It will be seen that it is extremely unlikely that a grave shaft could have extended down from anywhere near this surface. The distance is too great.

A grave shaft could conceivably have reached down to the position of the burial at some earlier time, when the surface of the ground here was considerably lower, perhaps when it was some two feet lower. However, if it were necessary to doubt the validity of the evidence in regard to the grave provided by the excavation and to consider this further possibility, the burial would still, in this hypothetical case, have to be considered as ancient and not recent, as it would have been sealed by the upper two feet of the terrace sediments.

The Human Remains

Professor N. W. G. Macintosh has indicated that the Green Gully human remains may perhaps consist of parts of two individuals, but there is not yet sufficient

evidence to show that this was certainly so and it is still to be regarded as a possibility only (See N.W.G.M. this *Memoir*, and *Aust. J. Sci.* 30: 86-98). However, if further examination and study of the bones should confirm this supposition, the burial would indeed be a very remarkable one, and it may be as well to consider here what the significance of such a burial would be and some of the deductions that would have to be drawn from it.

The burial may well have been a delayed one, as Professor Macintosh has suggested, but as may be seen from Plate 1 and Figure 4 the remains were far from being completely disarticulated. Although they were somewhat collapsed, as all burials become in the course of time, the bones were, as far as could be seen, in approximately their correct natural order and in approximately their correct relative positions. It is thus apparent that the delay between death and burial could not have been very long. It would be quite possible, of course, for parts of two desiccated bodies to have become mixed by mistake when the time came to take them up for burial. But in this case it does not seem very likely that an error of this sort was made. It must be supposed that a people whose practice it was to delay the burial of their dead, and to eventually bury their remains in prepared graves, must have cared considerably about their dead and about the proper disposal of their remains. This being so, it would seem most unlikely that errors would be made in the identification of the remains of individuals, and this would be particularly so when a burial took place not long after death. Such errors may undoubtedly have occurred sometimes, but it is highly improbable that they would be anything but rare (or even very rare) occurrences. It is hardly credible therefore that the first burial of great age to be discovered and excavated in Australia should be the result of such a rare occurrence. If it was not the result of an error, such a dual burial might perhaps have occurred through mere carelessness or heedlessness in the disposal of the remains, but this does not seem to be a likely explanation in this case. If the burial was indeed a dual one, it is clear that considerable care was taken in positioning the several parts in the grave so that they simulated a normal burial of a single individual. Also, although many of the bones had disintegrated, none of the surviving bones had been duplicated and there were no indications of any bones having been missing at the time of burial. It is evident that there could not have been any lack of care or any heedlessness in the carrying out of the burial.

If it is eventually shown that the burial was in fact a dual one, it will have to be assumed that it was either the result of an error or mistake, or perhaps of carelessness, or that it was the result of a deliberate and purposeful act. There is no other possible way in which it could have occurred, and extraordinary though it may seem, the latter explanation would have to be accepted as the most probable one.

Burnt Tree, and other Signs of Burning

After the removal of the bones, the excavation was continued downwards in order to examine the large mass of burnt material, and to determine whether this had any connection with the burial. The burnt earth, ash, and charcoal proved to extend down at one place to R.L. 51 ft 9 in., i.e., it extended vertically for 3 ft 6 in. overall. The lower two feet included burnt-out roots in position of growth. They were confined within a fairly narrow vertically tapering space, and in this there were many large pieces of charcoal, all positioned with the grain of the wood more or less vertical (Fig. 3). The main mass of burnt material was immediately above this, and had a depth of about 1 ft 6 in. There were in this many very large pieces of charcoal arranged irregularly. The whole mass was presumably the remains of the roots, and perhaps the fallen branches of a burnt tree. It was evident that the

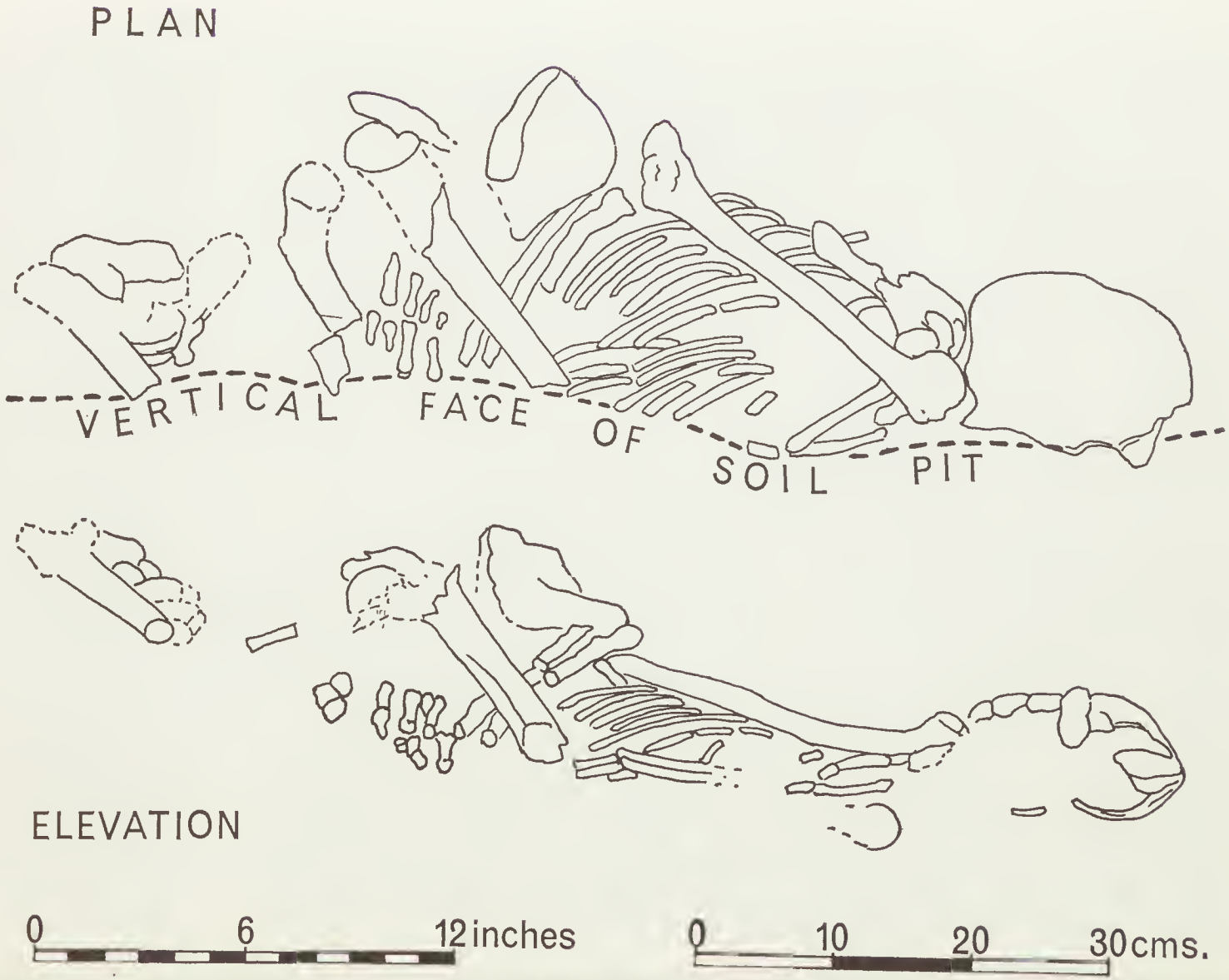

FIG. 4—Plan and elevation of burial.

whole had been burnt *in situ* as the soil immediately adjacent to the burnt material was burnt, and oxidized to a pink or red colour. Unfortunately much of the upper part of the burnt material had been removed in the process of taking soil from the pit, and what remained was only a few inches thick. It was not possible to determine just where the surface of the ground had been upon which the tree had grown, but it could not have been higher than the upper limit of the burnt material, and it could hardly have been much lower than this.

The top of the grave was at R.L. 59 ft 1 in., and the top of the burnt material was at R.L. 55 ft 3 in.; they were thus 3 ft 10 in. apart vertically. There was no evident connection between them, and the proximity of the two in plan was apparently quite fortuitous. However, from about the level of the top of the grave to about R.L. 56 ft 6 in. there were in places granules of burnt earth distributed through the soil, and subsequent excavation (See D.J.M.'s report) showed that there was a fairly large burnt root in position of growth, some three feet beyond the foot of the grave to the SW., and between R.L. 56 ft 6 in. and 58 ft (Fig. 3). As well as these evidences of burning there was (as previously mentioned) burnt earth in the filling of the grave, and this presumably came from some burnt area adjacent to the grave and upon the surface into which the grave was dug. It cannot be supposed that all this burning, at various levels over a vertical range of seven feet, took place over such a great period of time as might be suggested by this considerable range of depths. The most likely explanation would be that the burning was all on or about the sloping margin of the terrace, and that it was the result of a bushfire or perhaps several fires which all took place at about the same time. Evidence of burning was noted in many places elsewhere in the soil pit, and all of this may well have been on or about the same stratigraphical horizon. It was not possible to confirm this because of the varied extent and range of the soil digging operations in the pit.

From the alignment of the terrace margin (as evident in adjacent parts of the soil pit) it is clear that it must have passed either through or just E. of the burial position, and the grave must have been either on or close to this slope. The excavation at the burial site did not however reveal any sign of such a sloping surface, or any sloping bedding lines in the soil. Presumably the grave was at or near the top of the slope and the whole of the actual margin of the terrace was removed in the process of digging the soil from the pit. There was little chance of this sloping surface being revealed by the excavation, as not only had the soil been entirely removed from the SE. side of the burial, and part of the grave itself, but beyond both ends of the grave only a few feet of soil remained undisturbed by the front-end loader. This problem is discussed further in Bowler's contribution to this *Memoir*.

Stratification of the Burial Site

The surface soil to a depth of about 1 ft 6 in. or 2 ft from the surface was of a dark colour, but at this depth the colour gradually changed to a lighter tone of grey. At a depth of about 6 or 7 ft, i.e. at about R.L. 57 ft to 55 ft, the soil again changed gradually to a lighter tone and became somewhat yellowish or brownish in colour. These changes are however inherent in the sediment of the terrace and bear no relationship to human occupation. Apart from these changes of colour, the material appeared to be of an even consistency from the surface right down to the full extent of the excavation.

In the course of the excavation a number of stone artifacts was found, as well as some bones, bone fragments, and charcoal, and the disposition of these revealed a definite stratification. The artifacts, incorporated with subsequent finds, are described and analysed by D. J. Mulvaney elsewhere in this *Memoir*. The charcoal

was collected, and some samples have been used for radiocarbon analyses. It is only necessary here to record the stratification.

From the surface down to a depth of about 4-8 in. according to the slope of the surface, i.e. to about R.L. 61 ft 6 in., the artifacts recovered were small flakes and cores and a number of small blades and fragments of blades of the type used only for the making of microlithic implements, although no actual microliths were found. For a further three inches below this, at one place, there was a number of quartz fragments, somewhat flake-like in form, but these may have been part of the microlithic assemblage. From about R.L. 61 ft 3 in. to 60 ft there was a sterile zone with no artifacts or any other sign of occupation. Below this to at least R.L. 55 ft, which was about the greatest depth reached in this excavation, there was a rather crude flake industry. The artifacts were distributed through the soil indiscriminately, except that at R.L. 56 ft 5 in. there was a slight occupation horizon containing some flakes, charcoal, and granules of burnt earth.

The artifacts included flakes of various sorts and sizes, none of them very large, two definite trimmed flake implements, and several flakes with some secondary trimming. The material used was mostly quartzite of a variety of colours, textures, and grain sizes. Together with the flakes and flake implements there was a number of broken pieces of small basalt pebbles. These were 2-3 in. in length and about 1·5 in. thick. Each had some cortex surface and one or more fracture surfaces. They were in sufficient numbers, and were sufficiently even in size and shape to constitute a distinct group. There is no obvious natural process which could result in such fragments, and they are considered to be artifacts, or at least the result of some human activity, although no function or purpose can be assigned to them. At one place five such pieces, rather larger than most of the others, were found lying together. These fit together to make about three quarters of a complete pebble which would have measured about 11 in. × 8 in. × 3 in. The only explanation of this would seem to be that the pebble was broken *in situ*, presumably on purpose. The missing piece may have been removed, or lain laterally and was removed by the front-end loader.

From below the sterile zone, i.e. R.L. 60 ft, occasional small bones and fragments of bones, and also some charcoal, occurred throughout the deposit. The charcoal was distributed through the soil in small fragments, or it occurred in small concentrations. Nowhere did it seem to have been burnt *in situ* (except in the burnt tree), and there were no definite fireplaces or hearths.

The microlithic flakes and cores, and the association of the flake industry, the basalt fragments, the small bones, and the charcoal, indicates the existence of human occupation at this site for a considerable length of time. However, from the level of the grave downwards, only about half a cubic yard of earth was excavated during the September excavation, and artifacts found below the level of the grave may not be truly representative of these levels.

Calcium Carbonate Encrustation

Below the level of the burial, i.e. from about R.L. 58 ft 3 in., virtually all the stone flakes and fragments, and the small bones and fragments of bone, were covered with a calcium carbonate deposit, or at least were partially covered. This incrustation did not occur at all at levels higher than this. Such incrustation results merely from the presence of calcium carbonate in the soil, and bears no relationship to human occupation. It should be noted that the flake industry persisted well above the upper limit of the calcium carbonate. The fact that the level of the bottom of the grave coincided with the upper limit of the calcium carbonate in the soil would appear to have no particular significance and to be quite fortuitous. This matter is discussed further by J. M. Bowler in his contribution.

Radiocarbon Age Estimations

The age of the burial has been determined from a sample of bone collagen:
N.Z., 6460 ± 190 B.P. (Fig. 3, 1).
Estimations of age have also been made from samples of charcoal found in the vicinity of the grave:
V-63, 8155 ± 130 B.P. (Fig. 3, 2). Redistributed charcoal (not burnt *in situ*) from about 3·5 in. above the top of the grave, R.L. 59 ft 4 in., and about 1 ft 9 in. W. of the foot of it.
V-65, 8155 ± 130 B.P. (Fig. 3, 2). Charcoal collected from a large mass of wood burnt *in situ*, apparently tree roots, at R.L. 54 ft 9 in., about 4 ft 3 in. below the top of the grave and 2 ft E. of it.
V-64, 8990 ± 150 B.P. (Fig. 3, 3). Redistributed charcoal from about 4 in. below the top of the grave, R.L. 58 ft 9 in. and about 2 ft W. of it.
Sample V-64 was stratigraphically earlier than the grave, and indicates the age of the upper part of the deposit into which the grave was dug.
The identity of the dates of samples V-63 and V-65, although they were from positions 4 ft 9 in. apart vertically, confirms the supposition that the grave was on or adjacent to the sloping margin of the terrace. Presumably the tree from which sample V-65 came, grew upon this slope, and sample V-63 came from a position further up the same sloping surface. The date 8155 ± 130 B.P. is thus the date of the burning which took place on this sloping surface. That the burning was prior to the burial is confirmed by the fact that burnt earthy material was used in the filling of the grave. For further radiocarbon dates, see paper by Bowler (This *Memoir*).

Explanation of Plate

PLATE 1

The Green Gully burial as excavated. Upper photo—view from above. Lower photo—view from side.