Aboriginal Wooden Weapons of Australia: Illustrative of the Collection in the B. P. B. Museum.

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The collection of Australian implements in this Museum has lately been augmented by many choice specimens secured by the Director on his recent tour. Although the collection of such articles in the possession of the Bishop Museum is still not extensive, it is well chosen and includes valuable representative specimens of nearly all the best known forms. The object of this paper is to briefly review the wooden weapons of the native Australians, and to give a description of their manufacture and use, chiefly as a guide to the collection in the Museum. An extensive knowledge of the different forms of weapons in use among the many tribes, founded upon all the specimens in public and private collections, is necessary to a satisfactory description of the Australian weapons, but such a work has unfortunately not yet been accomplished. The vast extent of territory to be covered, and the isolation and sometimes the extinction of tribes greatly increases the difficulty of dealing with this interesting subject.

The writings of many authors have accorded the primitive inhabitants of Australia the lowest rung on the ladder of human progress, and proofs are not lacking to show the general low intelligence of this unfortunate race. Yet in warfare and the search for food the degree of skill and resource evidenced by their weapons is remarkable, and proves that however elementary their efforts in other directions, the Australian aboriginals have in these, obtained results possessed by no other people of historic times. Within the limited sphere of these occupations almost the whole of their ingenuity has been confined, and the keen observation which they have here displayed has furnished them with weapons of peculiar construction which they use with wonderful precision and dexterity. A brief examination of the Australian case in the Museum will reveal at once the unusual design and also the crudity of workmanship employed upon the manufacture of the

specimens, as compared with the achievements of other primitive people. The peculiar bent of the Australian character and also its undeveloped condition are alike illustrated by these two features.

A remarkable similarity of design is found in the weapons of this vast region, due, in great measure, to an extensive system of barter which was established throughout the country in early times. As a rule the manufacture of a specific form of implement was the production of a special tribe or locality, which in some cases was celebrated to great distances for the skill and perfection of its work. Articles displaying the highest finish and best taste in decoration were principally derived from the north and west. No particular class of men was engaged solely in barter, but each man set out as necessity or inclination led, accompanied or alone, and bearing the products of his own industry. Well defined trade routes, upon which the traveller was free from molestation, converged in recognized bartering grounds, where large numbers of natives were often congregated. The usual time for these bartering expeditions was the winter, as dependency on water compelled the journey to be undertaken when this could be obtained. For this reason the routes followed the water holes and river beds, and in some cases they may represent the course of the original distribution of the race, and may have been in use since that early time. The less frequented bartering tracks were often marked by stones or other objects placed at intervals to direct the stranger. A trader would sometimes make his presence known by smoke and fire signals, upon recognizing which others would assemble. One frequent artifice to attract attention was to cover a smoking fire at regular intervals, by means of which an intermittent column of smoke was produced. The hovering of birds over the wayfarer also served as an index to the presence of the trader.

The rare occurrence of the valued quartz quarries, so frequently resorted to by makers of spear heads and cutting instruments, and their jealous possession by local tribes, also tended to confine the production of special articles in individual centres and to stimulate the custom of exchange. The introduction of metal tools and of glass has of recent years depreciated the value of quartz and has also had a detrimental influence on a system once so prevalent. To this must be added the frequent hostility of the white

man which has curtailed and even caused the relinquishment of many old routes.

The articles of most general barter included weapons and tools of all kinds, and the materials for their manufacture and repair. These latter consisted of chips of quartz and other hard rocks, and gum-cement, the best quality of which was obtained from a tree confined to favored districts. Colored pigments for decorating weapons and for mixing with fat to anoint the body at ceremonies, feathers, nets, and occasionally wives were also bartered.

The decoration employed by the Australian upon his implements is elementary in design and often crude, awkward and unfinished in expression. The highest standard of decoration is found in the north and west, where probably Malay and Papuan influence is felt. The ornamentation of the products of these regions is often simple and effective. The general low standard of artistic taste of the whole race is well exemplified by the brutal method of tatuing employed, which consists of ugly parallel cicatrices scored upon the chest and back. The most simple decoration of the weapons consists of a colored design, often not more than parallel bars, painted upon a uniform ground of red or black. Occasionally the ground is omitted, or the ornamentation may merely consist of this alone.

Upon shields, and some boomerangs and clubs, the design is often incised and the interstices filled with ochreous pigments. A common form of such cutting is found chiefly upon certain boomerangs which are completely covered on both sides with roughly parallel grooving, produced by scoring deeply with a bone or quartz chisel. Weapons bearing such decoration are invariably colored entirely red or black, and have a not unpleasing effect. A much narrower instrument is employed to groove the scrolls and other designs upon boomerangs and shields. Another and deeper form of incision, found chiefly upon shields, is produced with a narrow chisel held at right angles to the surface to be cut, and not in the manner as in grooving. By this means an irregular line is produced which gives an effective waving appearance to the design. These three methods of incision will be seen by reference to the shields illustrated in Plate I.

The designs most commonly met with include parallel lines arranged in rectilineals, convergent lines, triangles, squares, the

herring bone and the chevron. Curves and scrolls are more rare, though used with taste on some boomerangs and shields. Crude attempts to represent animals are occasionally suggested, but with little success.

Inter-tribal warfare among the aboriginals was probably always of rare occurrence. Possessing little or no social organization every individual had equal rights, and the carrying of arms was general. When undertaking war the campaign was decided by a council. The plans were deliberated upon with ceremony and secrecy, and on setting out the warriors decorated the head with cockatoo feathers and covered their features with paint. Besides weapons, a wallet was often carried, containing articles for repairs and ochres and tufts of yellow feathers for personal use. Open engagements were rare and attack was delivered if possible from ambush. Early dawn was frequently chosen for assault. As no prisoners were taken the successful party indiscriminately slaughtered all who opposed them. When tracking a single enemy the Australian endeavored to take his man by stealth, and, if opportunity offered, would kill him while he slept.

Single combat, the usual resort in civil quarrel, was frequent. The proceedure at such legal conflicts was regulated by the tribal council. The encounters took place, as a rule, between individuals, though at times tribal disputes were settled by this arbitrament between picked men. The chief causes of dispute were those relating to ownership, more particularly to that of women. A particular time was appointed for the contests, generally in summer, and several days were spent by the participants in preparation for the encounter. This was begun in various ways, sometimes at a distance with boomerang and spear, and sometimes at close quarters. A usual form of duel was with the unwieldy wooden sword, when blows were deliberately given and received in turn. A form of shield, to be described later, was especially made for these occasions. The object was not to kill the opponent, but only to effectually disable him, and the infliction of mortal wounds was forbidden and punished by the tribe. During the contest the women, who were often no uninterested spectators, stood near gesticulating and screaming wildly. Upon their champion being worsted they frequently threw themselves forward with great energy and fiercely endeavored to beat off the attacking foe. The most

popular combatant was more frequently successful than the best fighter, as his friends and relatives stood ready to assist, and at times precipitated a general conflict.

DEFENSIVE WEAPONS.

Of exclusively defensive weapons, the shield alone was used by the Australians. Specimens of irregular and eccentric shape are met with, but these are to be regarded as isolated examples of individual workmanship, and as a rule the shape conforms more or less strictly to an established pattern. These vary materially, not only on account of their source, but also according to whether their use was in single combat or general fight. The following groups are characteristic:

The Mulga Group.—The Mulga shield is made of the hard heavy wood of a species of Eucalyptus and is widely distributed. Its general length is a little less than three feet, and its breadth and depth are each from four to five inches. It was grasped at the middle, where an aperture for the hand was cut. The slender form of the Australian hand is evidenced by the small opening provided for it. As a rule this is little more than three inches broad—a feature which renders the white man unable to hold these weapons properly. The long and tapering form of the mulga was effective for deflecting missiles and for warding the blows of a single adversary. It was used almost exclusively in single encounters, and could afford little protection in the confusion of a general fight. In rare cases a narrow band of opossum or other skin is found wrapped over the face of the weapon and through the handle, to prevent the knuckles from being chafed. A transverse section of the simpler form in which this shield is made shows a trilateral figure contained by one curved and two straight lines, all of approximately equal length. The former being the concave face of the weapon, and the angle of the two straight lines forming the reverse. The aperture for the hand was cut through the angle formed by the latter lines. A better shape of the mulga has the curved face acutely convex and developing into an angle, thus making the section of the shield quadrilateral, and rendering the apical margin better adapted for deflecting missiles. The decoration of the mulga is found only on the obverse surface. It generally consists of incised lines arranged in rectangles and often filled with colored

earths. The specimen seen in the centre of Plate I is representative of the better made mulga shields. It is shaped from the close grained wood of probably a species of acacia, and the incisions were made with a narrow implement held at right angles to the face in the manner already described. The interstices are accentuated with white filling.

The Goolmarry Group. — The shields of this group are elongate-oval in shape and differ in many respects from the mulga form already described. They are constructed of very light wood—*Erythrina vespertilio* the "bastard cork", or *Acacia mollissima* being preferred—and although these weapons are small and well proportioned they have a bulky and unwieldy appearance. The goolmarry is decorated with curved linear designs, often on both sides, though as a rule the obverse is the more elaborately treated. Crude representations of what has been described as a reptile, though bearing more similarity to a clumsily drawn "herring bone," are also sometimes found on the reverse of the goolmarry shield. A section, taken either longitudinally or transversely, is a bilateral figure contained by a straight line and one convex line—the latter to receive the impact of other weapons. The handle is shaped by cutting into the reverse of the shield. Some specimens of the goolmarry exhibit across the curved face irregular charred incisions which have been produced by the friction of another implement in the process of fire making. In rare cases a central longitudinal groove is cut, into which the dust set free by friction accumulates preparatory to combustion. The use of this kind of shield for such a purpose is due to the softness of its wood, and also to the fact that the goolmarry is not so elaborate and consequently of less value than other forms. The ornamentation of the specimen shown in Plate I, No. 8743, is effected by a pattern of interlaced grooved scrolls. The reverse of the shield bears a vague representation of an animal—probably a reptile—and is also charred, particularly at the extremities and hand aperture.

The Western Group.—The manufacture of these shields is confined to the west, though they are extensively bartered. In general form they consist of an extremely thin sheet of wood, elongate-oblong in shape, rounded at the corners, with a projecting handle shaped from the same piece of wood as the body of the

shield. The tree selected for their construction is the bastard cork or Stuart's bean tree, a species of *Erythrina*. The most usual ornamentation takes the form of parallel longitudinal grooves, as a rule showing a pronounced "fault" across the centre. The ground color of the weapon is often dull red. Other patterns of ornamentation are employed, but the one already described is probably the most characteristic. The whole appearance of the western shield is artistic, and much taste is shown in its symmetrical design and simple decoration. The extreme lightness of the weapon, however, renders it liable to split. In such cases, the crack is neatly mended with kangaroo or emu tendon, which is applied wet, in order to bring the edges closely together whilst drying. Such a device is seen in No. 8749, Plate I. The decoration of the obverse is of the kind described, and the scoring on the reverse is similar to that on many boomerangs. Each alternate groove on the front of this specimen is colored dull red.

The Geeam Group.—The Geeam in general contour more nearly recalls the usual pattern of the South African weapons. It is constructed of bark, and in shape is oval, tapering considerably at each extremity of its longest diameter. The manufacture of this shield is somewhat complicated, requiring considerable skill and manipulative dexterity. Its outline is first cut upon the trunk of a living gum tree, and the contained bark is then carefully removed. The best shields are constructed of one piece with the handle, and in this case it is necessary to leave a part of the wood adhering to the centre of the sheet of bark from which to fashion it. Shields of this kind are of ancient work and are difficult to procure. After removing the bark a mound of compressed earth, of the form the weapon is to take, is constructed. This is covered with hot ashes upon which the bark is firmly held until it has taken the permanent shape required. The shield is completed by shaping the handle and decorating. The usual dimensions of the geeam are approximately 40 in. long, 10 in. wide, and somewhat less than ½ in. in thickness.

OFFENSIVE WEAPONS.

The wooden weapons of offense found among the Australians may be broadly divided into two great divisions represented by the spears and clubs. Centring around these are the weapons either associated with their use, or developed from them.

SPEARS.

Australia exhibits a great variety of form in its spears, rendering a simple and satisfactory classification difficult. This is increased by the fact that the same form of weapon may not only, among different tribes, be thrown either with or without the wummera—an instrument to be described later—but also that in various districts it may be used for such distinct purposes as that of warfare or the chase. Before the advent of the white man the Australian possessed no fish hooks, and conducted his fishing operations entirely with the use of the spear. This custom has given many forms of this weapon, some of which are at times used in warfare, but find no place in this paper. Although the method of propulsion of a spear may at first seem unimportant, it necessitates a slight modification in the form of those thrown with the wummera, and in fact constitutes the difference between a true spear and an arrow. A classification of the Australian spears founded upon the different uses, or on the variety of form, is for the above reasons not satisfactory unless confined to the weapons of a particular tribe. Speaking generally, these weapons fall into two well marked divisions, the hand spears and those propelled by the aid of the wummera. A spear intended for one or other of these two uses is readily distinguished; but the division, though true of individual specimens, is often arbitrary when applied to the various forms.

HAND SPEARS, TAPERING BUTT.

The hand spears are characterized by their tapering butt, which renders them unsuited for use with the wummera. They are also generally made of only one piece of wood.

Unbarbed Hand Spears.—In its simplest form the hand spear consists of a long cylindrical shaft of a single piece of wood, from 8 ft. to 10 ft. in length, and sharpened to a point at the distal extremity. Occasionally a ring of gum-cement is placed towards the point in which to imbed jagged flakes of quartz or similar cutting material. A close inspection of a specimen may reveal where such a ring has once been. In order to throw the hand spear it is held over the shoulder resting upon the palm of the hand and the thumb, which latter is extended below the shaft of

the weapon pointing towards the butt. A common variety of the unbarbed hand spear exhibits a broadened spatulate-shaped point.

Barbed Hand Spears.—Another well distributed form of the hand spear possesses barbs. The "Nandum," from 8 to 11 ft. long, is the simplest variety. It is shaped from a single piece of hard wood, into which the barbs are cut. These consist of a single row of deep serrations, situated on one side of the weapon, and requiring both skill and patience in cutting. A variety of the barbed hand spears has a double row of serrations arranged oppositely. Several short specimens of the barbed hand spear are in this Museum. They were probably not intended for throwing, but were gripped in the hand for thrusting at close quarters.

WUMMERA SPEARS, CONCAVE BUTT.

The distinguishing feature of these spears lies in the small concave depression found at the proximal end of the weapon into which the peg of the wummera is inserted. These weapons may be constructed of one, two, or three pieces of wood.

Spears Constructed of One Piece.—Quartz-tipped spears are made of a single slender shaft, bearing the characteristic hollow at the butt end, and grooved at the other extremity for the insertion of a row of flakes of quartz, or black or white basalt. The chips and gum into which the former are imbedded are frequent objects of barter. The quartz spear is capable of inflicting terrible lacerated wounds. Two opposite rows of flakes are probably more frequent than only one.

Spears Constructed of Two Pieces of Wood.—The Tirrer or reed spear generally consists of two pieces. The shaft is made of a slender reed, *Typha augustifolia*, into which is fitted a tip of poisonous mulga wood. Towards the point, bound with kangaroo or other tendon, is placed a barb of wood or bone. The extreme length of the tirrer, which may be as much as 12 ft., requires the use of both hands in trajecting it, one being employed with the wummera, and the other stretched forward to direct the spear.

Spears Constructed of Three Pieces of Wood.—The "Koanie" form of spear is formed of three separate pieces representing respectively the butt, shaft and tip. Of these, the shaft is firmly fixed to the butt, but more loosely to the tip which is spatu-

late in shape, broader at the free end, and often provided with a barb of wood, bone, glass or wire bound firmly to its face. The object of the loose tip is to allow the shaft to break away from the head when the enemy is transfixed, thus rendering the weapon more difficult to extract. The shaft of the koanie is often well ornamented with grooving, and proved weapons are elaborately finished, highly valued, and difficult to obtain.

Many other forms of spear are found, but are not so well known and general as the ones already described. Stone-headed spears, the product of the north, are much prized. The trigonal flaked head is fastened with resin covered with kaolin and the haft is generally freely ornamented. Fishing spears, bident or trident in form, are sometimes carried for use in war and the chase, but should not be classified among the weapons of this paper. Various specimens of the above forms of spears will be found in or near cases 16 and 17.

WUMMERAS.

Closely associated with the use of the concave-butted spears is the Wummera, a device for increasing the velocity and range of the latter weapons by lengthening the arm leverage, on the same principle as that employed with the better known sling. The wummera consists in general of a wooden haft of varying length, upon which the spear lies before trajection. At the distal end of the weapon a small projecting peg is situated to engage the hollow depression at the extremity of the missile. To throw the spear, the native stands sideways, holding the handle of the wummera firmly with the three smallest fingers of the right hand—the arm being directed backwards over the shoulder. Upon this support the spear rests, adjusted to the peg, and retained in position with the finger and thumb of the same hand. One hand only is employed with most spears, but the length of the tirrer or reed spear renders the use of the left hand also necessary to support this form of weapon. Great dexterity is shown in fitting the spear to the wummera, a feat which the native readily accomplishes without removing his gaze from the object of attack. The velocity imparted to the missile by the wummera is great, and an effective range of 100 yds. is obtained.

The possession of this weapon by the Australians is sometimes regarded as rendering the use of any other device of trajection

unnecessary, and thus sufficiently accounting for the ignorance of this people of the bow and arrow. The occurrence of implements similar to the wummera in other regions, particularly among some American tribes at the time of the discovery, and also among European palæolithic remains, is well supported. In these instances the wummera antedated the bow and was supplemented by it. Modern investigation points to the antiquity of the Australian race and its isolation from the Asiatic continent in remote ages. The use of the wummera in this case may therefore be regarded as the survival of a primitive weapon among a race which has progressed little or not at all since its separation from the rest of mankind, rather than affording evidence of high intelligence. The boomerang and wummera were unknown to the Tasmanian aboriginals, which suggests their emigration from the primitive stock before the discovery of these weapons.

Many forms of the wummera are in use throughout the country, the shape varying greatly according to the district of manufacture. The origin of each individual specimen is of great interest and importance, and a systematic description of all the weapons of this region arranged with reference to their source would be of great value. The earliest form of the weapon under consideration consisted of an ordinary straight branch, with a projecting twig at one end shaped to furnish the necessary peg. The breaking of the latter would render the primitive form of weapon useless, and an advance would be made by the substitution of a separate peg of wood or bone attached with tendon and gum. Roughly fashioned implements of this description are common. A new feature in the wummera is seen in No. 1913, Plate II, consisting of a well defined broadening of the middle part of the haft. This was of use for carrying the colored pigments used at initiation and other rites. The peg of this weapon is a piece of shell, part of which has been broken away. The wummera, No. 1910, Plate II, is an extremely light and well made specimen in which the entire haft is adapted for carrying. It is constructed of hard red wood, and the peg is neatly shaped from a piece of light yellow wood. Weapons possessing the broadened haft are known by the name "Amera." They are made in the west and are ornamented on neither side. The handle, formed by a knob of gum, appears to be characteristic of these

weapons. The resistance of the wide surface of the amera to the air must impair the efficacy of these weapons as instruments of propulsion. In some cases the haft is even further developed by hollowing a somewhat thicker piece of wood to the shape of a shallow trough in order to contain blood and other fluids at the ceremonies alluded to. In fastening the peg to the amera holes were pierced at the distal end through which to pass the binding tendon. Instances of boring among the Australians, who possessed no pierced stone weapons, are rare. The edge of the amera is sometimes used in the process of fire-making by drawing it across the anterior face of the goolmarry shield in the manner already described.

The wummera seen in Plate II, No. 1911, has the tray development entirely eliminated. This well balanced weapon is constructed of light wood, and its great leverage should render it very effective. The wooden peg is held in place by the usual gum-cement. The handle is shaped from and forms one piece with the haft. By referring to the specimens in Plate II, three stages in the development of the handle are noticeable. Wummeras constructed of only one piece of wood and elaborately ornamented are also found, but this Museum is as yet unfortunately without a specimen. Other weapons have the peg fitted to the edge of a lathe-shaped haft instead of to the face as in the weapons considered. A not unusual feature of some wummeras is a piece of shell fastened to the proximal end of the haft for use as a scraper or chisel. Besides the materials already mentioned as furnishing the peg, the tooth of a kangaroo or slain enemy was sometimes used. The tendon employed for binding the peg was furnished either by kangaroo or emu leg, or by the neck of a snake.

The natives of New Caledonia possess a device for throwing spears consisting of a cord and loop. It is identical in principle with the ancient *amentum*. The kotaha, or sling-stick of the Maoris, formed of a wooden handle and a knotted dogskin thong, is also worthy of attention here. The arrow to be propelled with this implement was first loosely stuck in the ground, point upwards behind the thrower, towards whom it inclined at an angle of 30 or 40 degrees, and to this the thong was then looped in a manner to disengage readily directly the impetus of flight was imparted.

CLUBS AND THEIR DEVELOPMENTS.

The order of arrangement of the following weapons shows the line of development by which the more advanced may have been produced from those of primitive form.

Straight Hand Clubs.—The simplest form of these weapons is the straight, heavy pole of hard wood, uniform in girth through most of its length, but tapering abruptly at each end, and often grooved at one extremity to allow a good purchase to the hands. This somewhat cumbersome weapon could only be used at close quarters and was never thrown. A good specimen is shown in Plate III, No. 7443. These weapons are more or less cylindrical in form, and their weight and size rendered the use of two hands necessary to wield them. To deliver a blow the club was grasped by both hands at one end, and swung forward from over the head. In guarding, the adversary grasped his weapon with a hand at each end, holding it either horizontally above the head, or vertically to left or right to protect the part attacked. The two-handed club was also used by the "gins" who stood ready to assist or rescue in the civil combats already described.

The Waddy is a common form of hand club for use with one hand only. It is much shorter than the above form and possesses a well developed head, more or less diamond-shaped, which is generally decorated with the usual incisions. The waddy was frequently chosen together with the mulga shield in the single encounters, when the head was the only permissible object of attack. Although this club was often thrown, its true place was among the hand clubs. An endless variety of form is found among these weapons, often due to the natural shape of the wood from which they are made. Some of the lighter are pointed at the end in order to turn over in flight and pierce the body of the enemy when thrown at close range. Specimens in this collection can be seen in cases 16 and 17.

A tendency to lighten the two-handed club by flattening it—a device which gave a more wieldy and at the same time a more effective weapon, is seen in No. 8761, Plate III. This formidable paddle-shaped weapon is a splendid example of Australian workmanship. It is fashioned from dark close-grained wood, probably *Erythrophleum laboucheria*, and bears a pattern in white painted

at the distal end which has become indistinct through use. The thickening of the handle to prevent slipping is noteworthy, as is also the depression at the end. A cross section of this fine club reveals one face more convex than the other—a characteristic feature, not only of all boomerangs but of many other Australian weapons. A splendid example of the so-called native sword is also shown in Plate III, No. 8745, which exhibits a full development to the spatulate form from the early cylindrical type. Specimens of such weapons are rare and generally of ancient workmanship. The handle of the specimen considered is covered with gum-cement, and the remains of a few irregular red bars are seen at the distal end. A more modern form of sword, which is said to owe its shape to white influence, though unconscious imitation of the boomerang may also have assisted, is shown in Plate III, No. 7444. The unusual size of this weapon must have greatly lessened its value. Ornate sword-shaped clubs are also found, the use of which was probably ceremonial or executional.

Bent Hand Clubs.—The earliest form of this weapon was the simple crook afforded by the natural bend of the branch from which it was shaped. Its use at first was probably little more than for reaching a body which had fallen in battle, in order to drag it from the fight. Such a primitive implement is seen on the ceiling of the Australian alcove, No. 8751. Soon, however, the efficacy of this weapon as a means of attack was appreciated, and the invention of the "Leonile"—the most dangerous of Australian close combat weapons—resulted. The deadly quality of this club is due to its shape, which allows the attacker to reach over the guard of the enemy with a blow almost impossible to parry. Another feature, and one which probably greatly enhanced its value to the native, was that the kidneys of the enemy, the seat of life, were exposed to the attack of the leonile. The weapon is similar to the simple hook club in general shape, but it is flattened and the distal end is acutely pointed. To construct this weapon advantage is taken of a suitable growth in the branches or roots of a hard wood tree such as the *Eucalyptus exurata*. A far more formidable weapon of the same kind and of enormous reach is seen on the ceiling among the Solomon Island weapons in the alcove devoted to that region. Of such weapons the Museum possesses several specimens

of excellent finish, contrasting strongly with the crude execution of the Australian implements. Similar weapons may also be seen in case 9 among the Niuë specimens.

Throwing Clubs.—These weapons differ from those already considered in the fact that they are generally lighter in weight and are essentially missiles. At first little more than a sapling, with the adhering wood shaped to form a head, the Nulla-nulla in time assumed a more definite and well recognized pattern. In general shape it consists of a cylindrical piece of wood some 2 ft. long, sharply pointed at each extremity. Its diameter is little more than an inch, which gradually increases a few inches from the distal end to form a head and to weight the weapon. Specimens of the nulla-nulla are seen on the wall of case P. 16. These weapons were commonly in use throughout the country.

A well marked step in the development of the boomerang, or at least a witness to the fact that the curiosity of the Australian was directed to investigating the possibility of extending the range of missiles beyond that imparted by the impetus of the unaided human arm is seen in the Weet-weet. This primitive device, although used as a toy, was capable of inflicting severe wounds. Its form closely resembled an attenuated nulla-nulla, and its similarity in flight to the rat-kangaroo has sometimes given it the name of that animal. The weet-weet consists of a small cylinder of wood, two or three inches long, pointed at the ends, and bearing at one extremity a tail of flexible wood some 20 in. long. It was thrown closely parallel to the earth, upon which it continually ricochetted in its flight. Its range has been measured at 220 yds. Although no specimen of this curious device has been examined by the writer it appears to owe its great flight to acceleration imparted by the vibrations of the flexible tail, set up by its frequent impact with the ground.

BOOMERANGS.

The boomerang is undoubtedly derived from the clubs already described, although to which group, if to any exclusively, its evolution may be ascribed, is difficult to determine. It appears to possess the greatest affinity to the bent hand clubs, which, as has been said, were, on occasion, thrown; and it is certainly credible that the first boomerangs were modifications of the leonile. Inter-

mediate forms of the latter, and also of other weapons and the boomerang, have been met with. In this reference it is interesting to note the frequent occurrence among the Australian weapons of specimens whose section shows one surface distinctly more convex than the other—an invariable attribute of all boomerangs. It must be remembered that the war boomerang did not return to the point of trajection, and the development of this weapon to the conventional pattern was more probably due to a slow process of experiment and improvement than to accidental discovery, to which the returning boomerang probably owes its origin.

The occurrence of the boomerang among the ancient Assyrians and the Egyptians, whose sculpture occasionally represents weapons of apparently similar construction, is often advanced, as is also reference to such a weapon in ancient literature. Whatever former people were familiar with its properties, it appears conclusive that all authentic record of such knowledge has been lost.

One of the most characteristic impulses of the Australian was to throw at his quarry or adversary, and every weapon was, on occasion, used in this manner. Following the same line of improvement as had already produced the spatulate sword from the primitive cylindrical club, the Australian was not long in learning that a flat missile cleaves the air more easily and has a greater effective range than a round one. At the same time he unconsciously took advantage of the fact that the suspension of a thin plane moving horizontally with the earth is assisted by atmospheric resistance. The gradual evolution of the boomerang was the result.

The war form of this weapon differs from the returning variety chiefly in its angle of curvature, which is more obtuse, and in the fact that it lies in one plane and is not twisted, to which latter device the return boomerang owes its elliptical trajectory. All boomerangs, however, have the surface, which in flight lies upper, more convex than the lower, and the convex or outer margin sharply edged. The war boomerang is an effective and dangerous weapon, having a range of 150 yds., and having been known to pass completely through an adversary when the body was first struck by the point of the weapon. Boomerangs were often manufactured and bartered in pairs, being cut together from one piece of suitably shaped wood. The possessor of a good pair would not readily dispose of them separately.

The chief differences exhibited in the various forms of war boomerang are those of ornamentation, size and angle measurement. These characteristics are chiefly of local significance. As a rule the north and west produce the most interesting specimens, those of the best decoration being made by the former; and the Kylie, a keen, effective little weapon weighing often only a few ounces, and possessing two angles, coming from the latter. The manufacture of boomerangs is, however, general and their barter extensive. The wood most generally used is a species of acacia. The following forms of war boomerangs, based upon their ornamentation, are noteworthy:

Fluted.—Boomerangs of this kind were invariably ornamented on both sides and uniformly colored red or black. The weapon shown in Plate IV, No. 8737, is representative, except in its extreme size, which reaches 49 in. It was used by the extinct Dieyeri tribe of Central Australia, and was obtained at Coolya water-hole. The color of this weapon is a dull red, and the irregularly parallel flutings have been scored with a flint chisel.

Colored.—Boomerangs of this class are either colored red throughout or are marked with broad transverse red bands. The specimen No. 1369, Plate IV, is from the Albany tribe of West Australia. It is chiefly remarkable for its lightness and for its peculiar shape, which approximates to that of the sickle and furnishes the weapon with two distinct angles.

Carved.—These weapons are characteristic of the northeast. They are incised with neatly made curved lines upon their upper surface only. Two specimens are illustrated in Plate IV. Of these No. 7030 bears representations of what may be reptiles. No. 1367, from Queensland, is somewhat similar to the last specimen in design; the compound line running throughout its whole length is effective.

Plain.—Weapons bearing no ornamentation, either of incision or coloring, are common. Specimens of these will be seen in the Australian cases.

The feat of throwing the boomerang is difficult to any but a native. The peculiarities of each weapon have to be considered

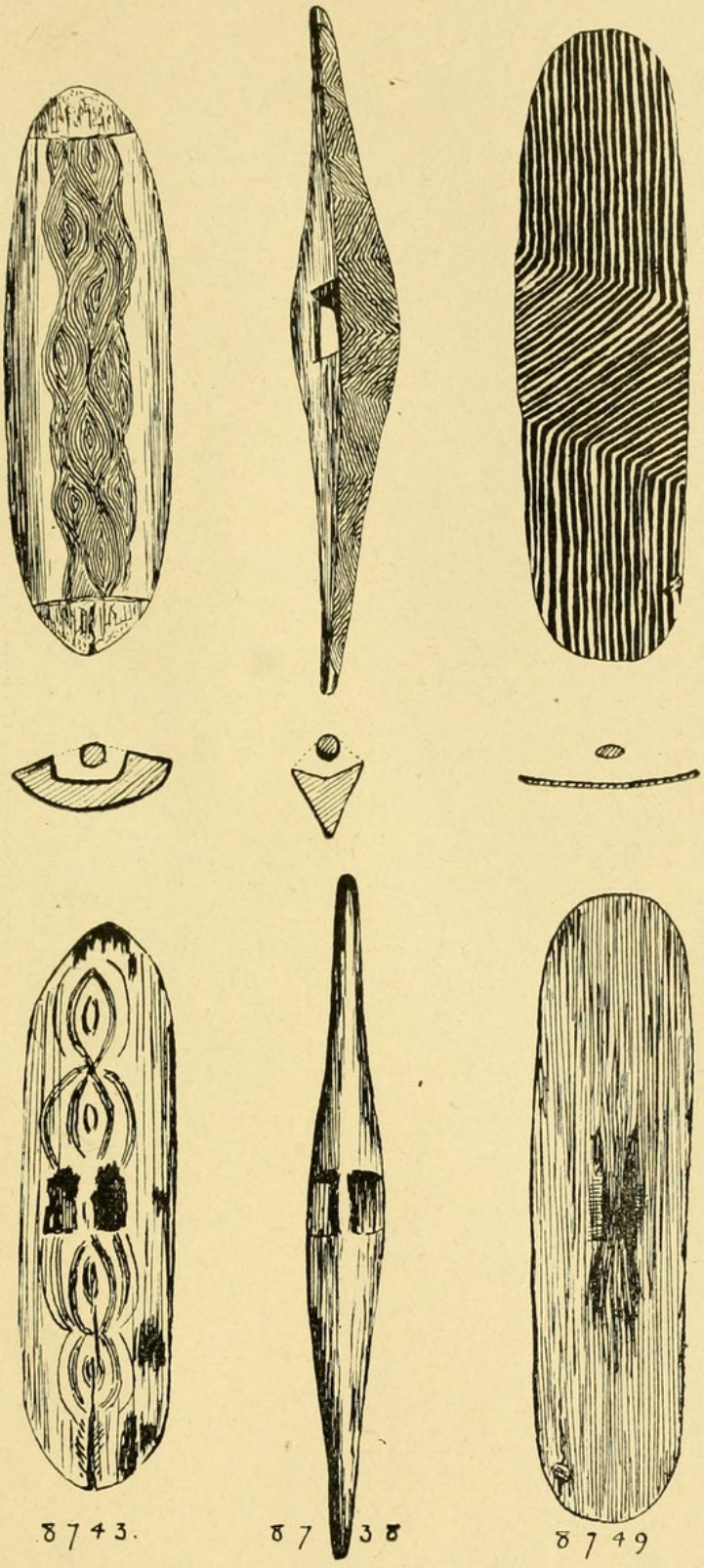
and the owner of a good boomerang, by frequent practice, can use it much more efficiently than a stranger. Before throwing his weapon the native carefully observes the condition of the atmosphere, and holding the boomerang much as a sickle is grasped essays two or three preliminary passes in the air and then discharges it in a position nearly vertical with the ground. The bias imparted to the weapon by the arm movement at the moment of release causes it to quickly assume a horizontal position which is retained during flight.

The final step in the development of the war boomerang is reached in the specimen shown in Plate IV, No. 8748. The "swan-necked" or "hooked" boomerang resembles an ordinary one with a well developed horn borne upon the convex margin of the distal end. This remarkable form of weapon is rare. In some weapons the horn is itself curved, its concave edge lying nearest to the convex margin of the main shaft. The object of the horn is to swing the weapon round upon the guarding club of an enemy, the horn engaging with the latter and revolving upon impact. Some ordinary boomerangs have a hook of this kind attached to them, and occasionally a weapon of ordinary form shows a mark where such a hook has been broken off. The hooked boomerang could also be used effectively in close combat in the same way as the leonile. The specimen figured is from North Australia. It is entirely covered with the fluting ornamentation, and is colored red throughout.

A description of the returning boomerang, called by the natives "Come back", is not within the scope of this paper. The implement was not of use in war and is merely referred to here as marking the culminating point of Australian invention. The discovery of this weapon was undoubtedly accidental, and the flight of the first returning boomerang most probably resulted from the peculiar twist of a specimen of the ordinary form. That such an accident should have been inquired into, and the cause of its return not only appreciated but applied to similar weapons is significant of the acute observation of the people. The occurrence of the returning boomerang is confined to Australia, and evidences of its use elsewhere are unreliable. In the first weapons of this kind the return

motion was probably not much more than a distinct curve from the line of original impetus. A good thrower is said not only to be able to make a come-back complete three gyrations, but also to be able to throw any ordinary boomerang in such a way as to make it return to his vicinity. It is needless to say that the aim of a weapon thrown in order to return is erratic, and its range is far more limited than when propelled in a direct course.

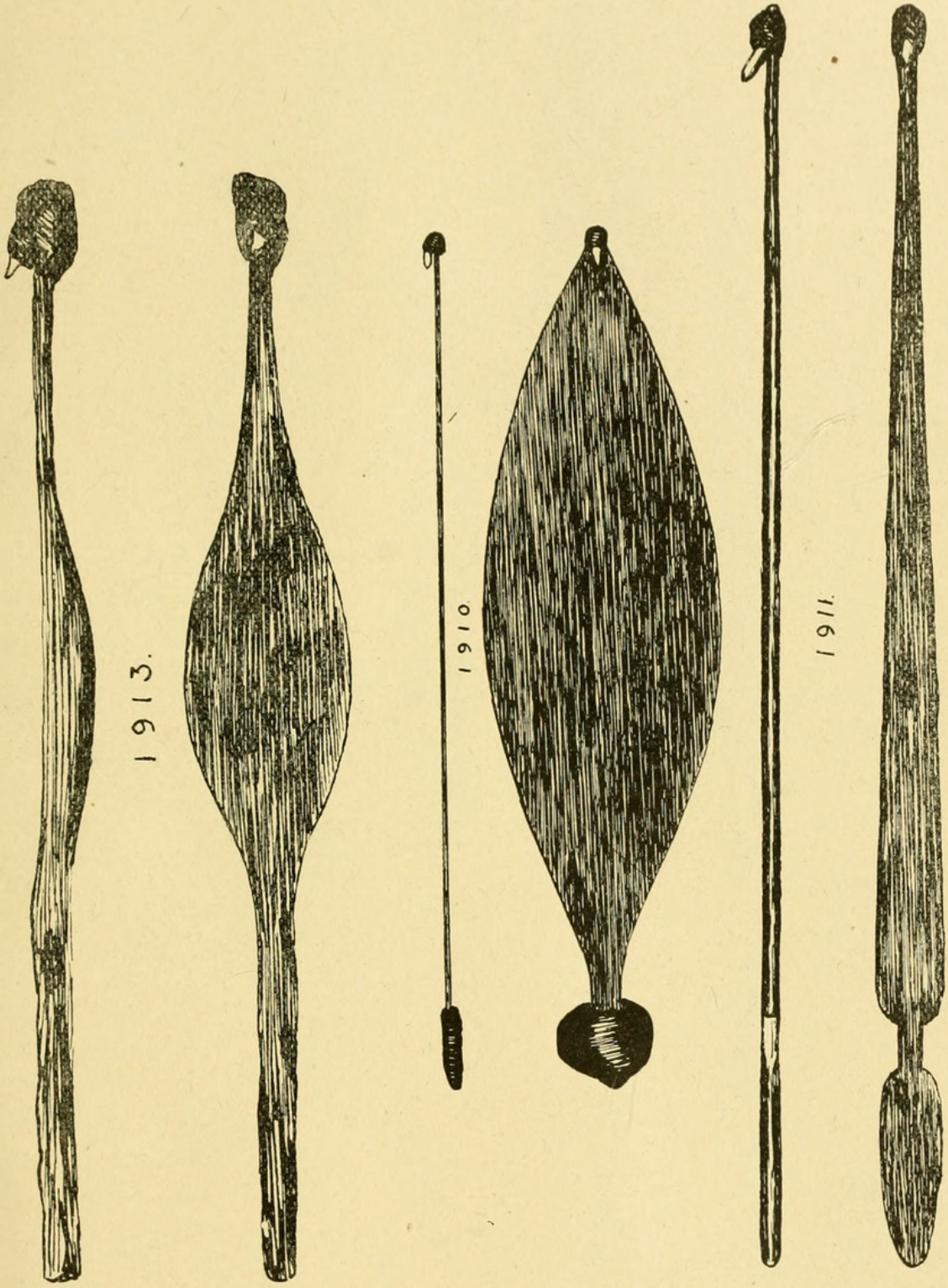
[191]



8743. Goolmarry Shield. Length, 24.75 in.; width, 7 in.; thickness, 2.75 in.; weight, 4.25 lbs. Eucalyptus wood(?).

8738. Mulga Shield from Victoria. Length, 31 in.; width, 3 in.; thickness, 4 in.; weight, 1.25 lbs. Acacia wood(?).

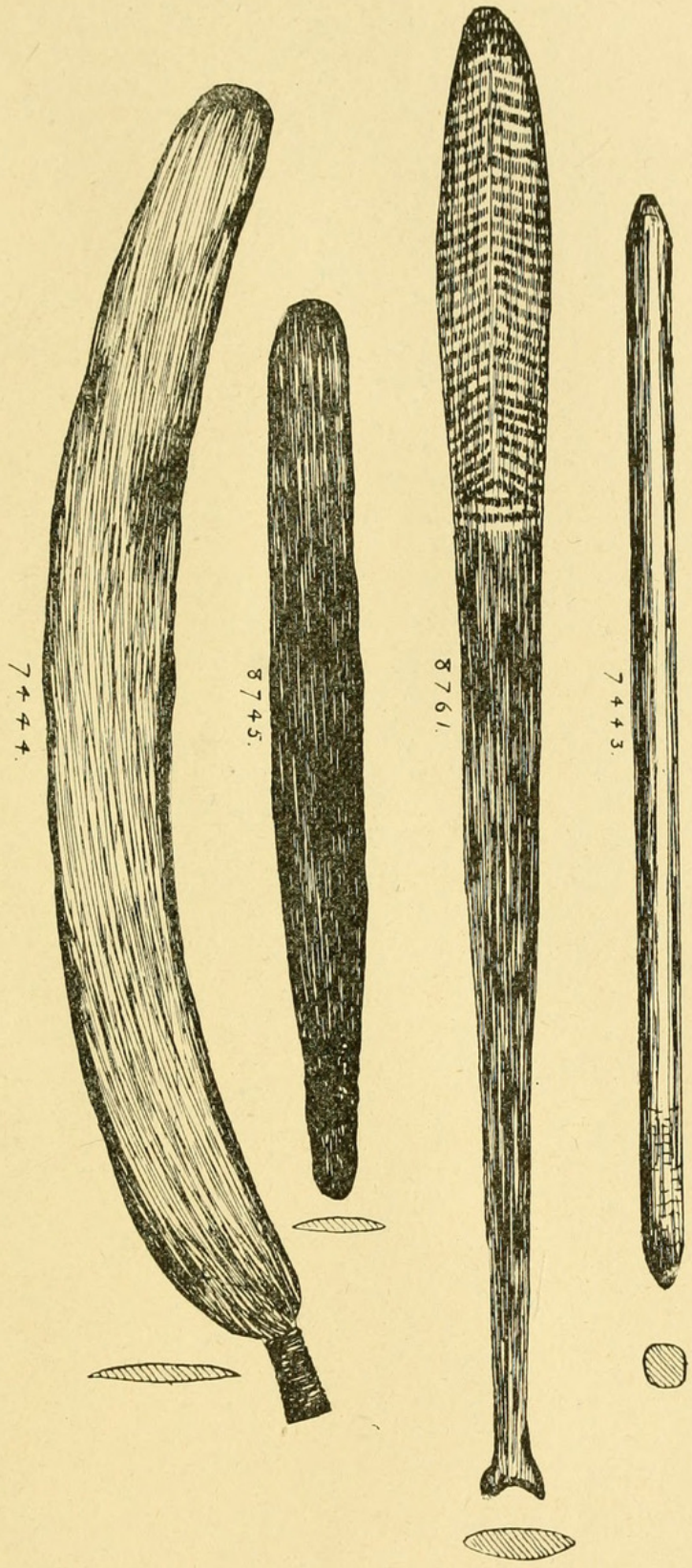
8749. West Australian Shield from Kimberly. Length, 28 in.; width, 7.25 in.; thickness, 0.25 in.; weight, 1.5 lbs. Erythrina wood(?).



1913. Wummera from South Australia. Length, 21.75 in.; width of tray, 2.5 in. Peg of shell imbedded in gum.

1910. Wummera from West Australia. Length, 23 in.; breadth, 6.25 in.; thickness, 0.2 in. Wooden peg, gum handle.

1911. Wummera from North Queensland. Length, 38 in.; greatest width, 1.75 in.; thickness, 0.5 in. Wooden peg.

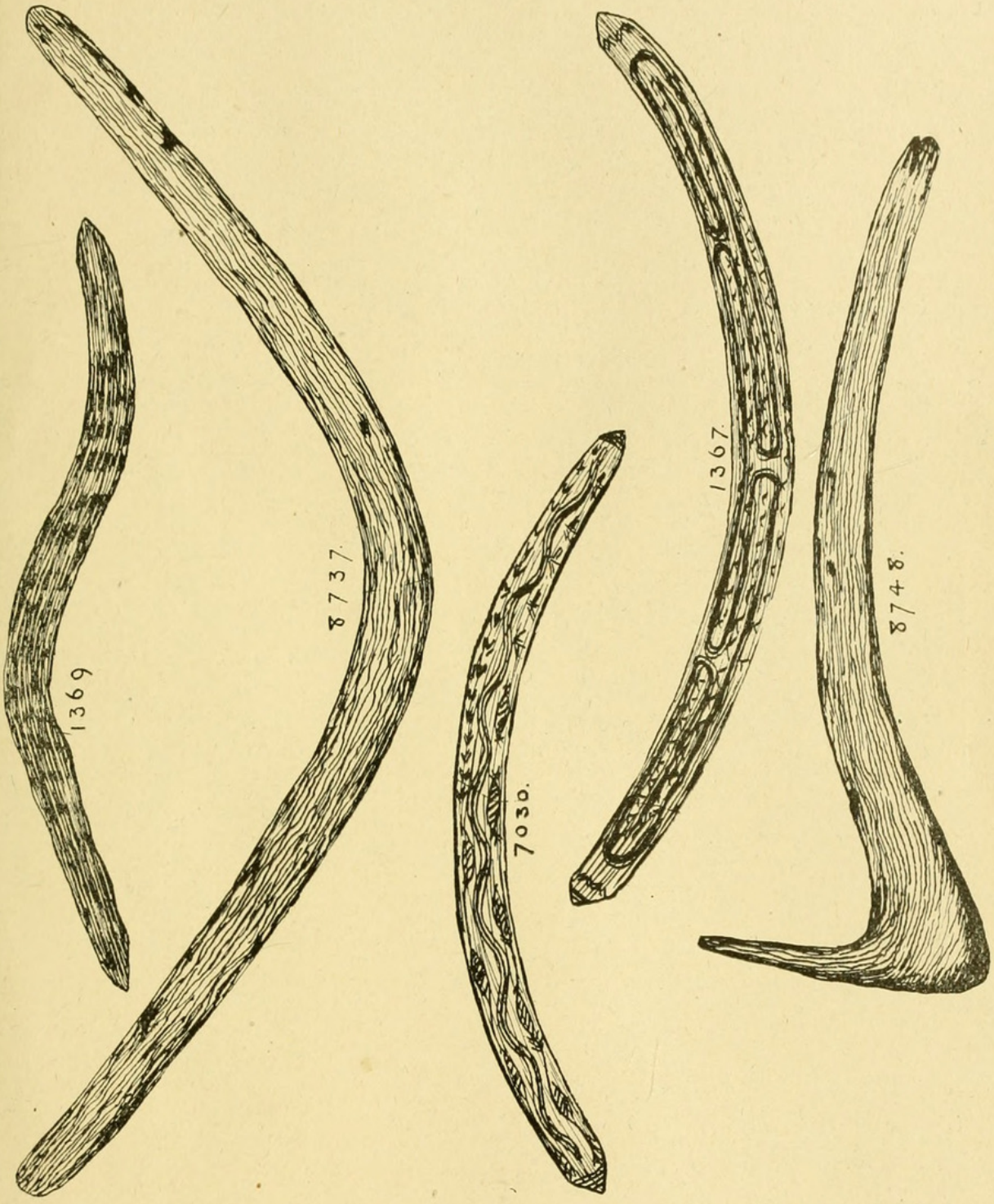


7443. Two-handed Club. Length, 42 in.; diameter, 1.75 in.; weight, 3.6 lbs. North Australia (probably Queensland).

8761. Paddle-shaped Club, or "Meyarroll," with fishtail handle. Length, 52 in.; width, 3.75 in.; thickness, 1.25 in.; weight, 4.2 lbs. Port Essington, North Australia.

8745. Ancient Sword Club. Length, 34 in.; width, 3.25 in.; thickness, 0.6 in.; weight, 1.75 lbs.

7444. Curved Sword Club. Length, 49.5 in.; width, 5 in.; thickness, 0.6 in.; weight, 3.6 lbs. Queensland.



1369. Colored Boomerang. Length, 24 in.; width, 1.75 in.; angle, 135°; weight, 4.75 oz. Albany tribe. West Australia.

8737. Fluted Boomerang. Length, 49 in.; width, 2.5 in.; angle, 120°; weight, 23 oz. Dieyeri tribe. Central Australia.

7030. Carved Boomerang. Length, 30 in.; width, 2.125 in.; angle, 145°; weight, 9 oz. Queensland(?).

1367. Carved Boomerang. Length, 33.5 in.; width, 2.125 in.; angle, 150°; weight, 10.5 oz. Queensland.

8748. Horned Boomerang. Length of main arm, 28 in.; width, 2 in.; angle, 150°; angle of horn, 70°; outside length of horn, 9 in.; weight, 15.5 oz. North Australia.