

GROUP A
Floats, Rafts and Kindred Craft



CHAPTER I. SWIMMING FLOATS & RIDING FLOATS

USING the term ‘Floats’ in a restricted sense the group may be divided into two sections, (*a*) Swimming Floats, and (*b*) Riding Floats.

Swimming Floats are accessory devices designed to assist in supporting the body while swimming, whereas *Riding Floats* are simple means of transport which are bestriden by fishermen and travellers who propel the rude craft paddlewise, with their hands.

Swimming floats form a fairly compact and well-defined class, but it is difficult to draw any definite line dividing riding floats from the simplest descriptions of true rafts, for floats of this type are undoubtedly the precursors of rafts; a complete evolutionary series can be built up to show the graduated steps by which the riding float, formed of a single unit—a log or a reed bundle—has developed into a true raft consisting of a platform capable of bearing a load and of being propelled by one or more paddlers standing or sitting on the deck or, occasionally, by means of sail.

In the same way skin, gourd and pot floats have evolved in some areas into true rafts buoyed by a number of floats, which may be inflated animal skins, or empty gourds, or even empty earthenware jars and metal containers.

As some artificial division has to be made, I propose to restrict the term ‘Riding Float’ to (*a*) single-unit logs and reed bundles ridden astride, and to (*b*) those where two floats arranged a short distance apart, tandemwise, are ridden astride upon a connecting saddle.

When several logs or reed bundles are lashed together, side by side, these, even if ridden astride, are here classified arbitrarily as rafts; the *caballito* of Peru is a good example of how the reed raft came into being by the multiplication of an originally single unit.

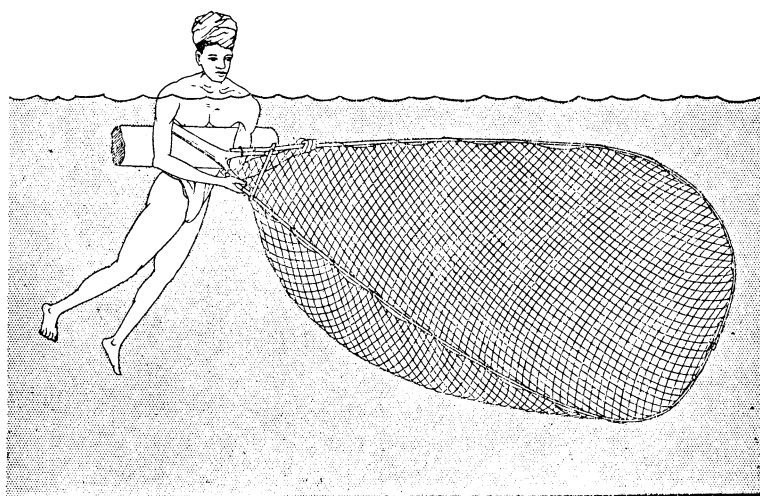
SWIMMING FLOATS

It is doubtful if early man became acquainted with the art of swimming prior to the utilization or invention of some form of buoyant appliance capable of supporting his body when he ventured beyond his depth in river or lake. The tree trunk floating downstream with the current, with some denizen of the forest marooned in its branches, probably gave the first stimulus to man’s inventiveness in this direction. Clinging to a log it would

not be long before he found that by kicking out with his legs he could increase the speed of his novel vehicle and, to some extent, control the direction of travel. With the discovery that leg movement was of use in the water as well as on land, an astute fisherman would soon find that a short block of light wood was more manageable than an untrimmed tree trunk; it permitted of more freedom of movement and enabled his arms to come into play in effective combination with his legs.

WOODEN BLOCKS

Supposing this to have been the origin of swimming floats, we find a survival of this extremely primitive appliance in Southern India, where it is employed by Tamil fishermen in the River Kaveri in the reaches below the irrigation



TEXT-FIG. 1. A fisherman using a wooden swimming float, River Kaveri, South India. (*Original.*)

dam known as the Lower Anicut. Here, at the season when the Indian shad (*Hilsa ilisha*), a near relative of the herring, migrates in incredible multitudes up the river from the sea in order to spawn, scores of fishermen may be seen floating downstream, each supported upon a thick block of light wood about $2\frac{1}{2}$ feet in length. With his chest resting on this, the fisherman holds extended obliquely downwards in the water a short-handled dip net, the wide mouth (6 feet by 4 feet) held open on a light ovoid frame (Text-fig. 1). The butt of the net handle rests under the swimmer's armpit and upon the wooden float, which thus serves as a fulcrum when the net is raised in order to extract the catch, whenever a fish blunders headlong into

LOG SWIMMING-FLOATS

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it. The fisherman kills the fish by biting its head, thereafter threading it on a string tied around his waist. Having floated a mile or as far as he thinks fit, the swimmer lands and walks back to his starting-point to repeat the operation time and again.

Farther north, on the River Godaveri, a curved wooden float, carefully trimmed to a definite and slightly crescentic form, is used by the primitive tribe called Koi when crossing the river. According to a personal communication from Mr L. A. Cammiade, who was for long stationed in this district, the float used is about 4 feet in length. The swimmer rests his breast on the fore part of the concave side of the float and propels himself by kicking frogwise with his legs on either side of the hinder part; the float takes an oblique position in the water and has sufficient buoyancy to raise the head and shoulders of the user well out of the water. Usually he has one arm free to assist him in swimming.

Lower down the same river a similar device is extensively employed by fishermen during the annual floods to retrieve drifting wood, consisting mainly of large logs of timber washed away by early freshets from the timber depots higher up the river, where they had been stacked to await transport to Rajamundry. This kind of float is more efficient than that used on the Coleroon, for the user is able to work it across the current of the river in full flood even when dragging behind him a log of timber.

This simple aid to the swimmer is of high antiquity in India, for on the western gateway of the Buddhist stupa at Sanchi, built about A.D. 50, in a delightful boat scene sculptured on the left pillar, we see a number of men sporting among the lotus flowers of a sacred tank (Pl. I, fig. A); several support themselves on inflated skins, but others use swimming logs just as the Godaveri fishermen do at the present day (Maisey, 1892, 58 and Pl. XXI, fig. 2).

A similar log-float device is found as far afield as Lake Chad in Central Africa. Here every household of the Buduma tribe owns one or more ambatch floats—trunks of the extremely buoyant wood of *Herminiera elaphroxylon*, so light that a child can carry several, each heavy enough in appearance to form a man's full load (Talbot, 1911, 246).

In America the only instance of the use of a wooden swimming float is the practice of some of the tribes in the Gulf of California to rest their breasts when swimming upon two pieces of light wood 'lashed to a vine' (Mason, 1895, 334).

Passing to Australia we find numerous records of the use by the aborigines of log floats. These are most frequently met with on the shores of North Australia, where the coastal natives are enabled to make long journeys between the islands and the mainland by supporting themselves while swimming by means of a short log or piece of wood placed across the chest (Stokes, 1846, II, 15–16).

Farther east, on the western side of Cape York Peninsula, natives cross rivers half lying on logs, 5 to 6 feet long, after the fashion of the log riders of the Godaverī in India; they propel them butt end forward (Roth, 1910, 3-4).

This section would be incomplete without notice of the surf board of Hawaii. This specialized form of float, in the days when chief and commoner, men and women, all equally indulged in surf riding, was a broad flat plank, hewn out of the hard *koa* wood (*Acacia heterophylla*). The minimum length equalled that of the person who rode it, the width, 14 to 16 inches; the most expert used much longer ones and the Bishop Museum, Honolulu, possesses one measuring 16 feet in length, a size that would require great skill to manage. Those who could not obtain a *koa* board had to be content with narrower ones made from the wood of the *wiliwili*, a light cork-like wood considered the most suitable for the floats of outrigger canoes and of nets (Malo, 1903, 293).

Taking their surf boards with them, the surf riders swim out beyond the surf into the region where the rollers begin to rear their heads; here the riders await the oncoming of a wave, paddling with their hands till a swelling breaker begins to lift them forward and with surging impetus to carry them shorewards on its crest. The usual attitude of Hawaiians is to lie face downwards on the board, with one or both arms folded under the chest. The more skilful sit or even stand erect on their wildly bounding platforms.

EASTER ISLAND. There is good reason to believe that the Hawaiian surf board, now used only for sport, is derived from a true swimming float originally of direct material advantage to the islanders in fishing and in swimming from place to place along the coast. This inference is based upon its similarity to the swimming boards and 'mats' once possessed by the natives of Easter Island. Unfortunately our knowledge of them is slight, confined to a few casual references. Of these the most important are those of Lisiansky (1814, 121) and D'Urville (1842, III, 162 and 387). Lisiansky, who visited the island in 1804, saw no canoes there, but of the many natives who visited the ship, every one swam off supporting himself on what Lisiansky terms a 'rush mat'. The wind during his stay off the island was boisterous, and he mentions that the islanders had to swim through a tremendously heavy surf.

D'Urville recounts how Capt. Rugg of the English schooner *The Friends* informed him that he had lain off Easter Island without being able to land, because of the south-east wind, and that 'nine natives had come aboard his ship with single planks (*simples planches*) which served to sustain them in the water even to a distance of four or five miles'. Roquemaurel, a member of D'Urville's staff, adds that each of these men was stretched out on a single plank, a description which tallies with that of the Hawaiian surf board when used for business and not sport.

EARTHEN JARS AND GOURDS

In Sind, a dry, scorched region where suitable light wood is difficult or impossible to obtain and where the Indian shad or hilsa, here called *palla*, is immensely more abundant in the Lower Indus than in the Kaveri, the wooden log employed in South India is replaced in one method of fishing by a huge neckless, round-bottomed earthenware jar. This, called a *palla-chatti*, is made expressly for the purpose by the village potters. It is used mouth upward and open and is a somewhat flattened spheroid in shape. Lying upon this, balanced in an apparently dangerous position, the fisherman, striking out with his feet, frog-like, and guiding himself with his hands, directs his course towards the middle of the river where the current is strongest. When he reaches midstream, he lowers a great dip net vertically into the water and floats downstream. The net, nearly similar in form to that used in South India, is furnished with a longer handle. As the laden chatty travels with the speed of the surface water, the resistance of the slower bottom water causes the net to bag upstream, ready to arrest the vehement rush of fish eager to reach the spawning beds. Each fish signals its arrival by a slight jerk upon the net. Before it has time to retreat, a sharp twist of the net handle closes the mouth against escape; the fisherman cautiously shortens his hold, extracts and kills the fish and consigns it to the bottom of the pot (Day, 1883, 127).

According to Sir Alex Burnes (1834, III, 40) chatties of smaller dimensions and without any orifice are occasionally employed; on these the fishermen float downstream in a sitting posture.

An alternative to the *palla-chatti* is a netful of dried gourds strapped to the fisherman's body in such a way as to float him high above the surface of the water. The *palla-chatti* method, considered the more killing of the two, is used where the cast or reach fished be short; gourd bundles are used mostly where the cast is long—sometimes several miles—for the fisherman finds the long walk back to the starting-point very wearisome if he must carry a heavy pot containing his catch, balanced upon his head.

Another vehicle occasionally employed by the *palla* fisherman is a bundle of dried reeds. This has the advantage of costing nothing but the labour of collection; only the poorest men use this kind of support, for it quickly becomes waterlogged and so has to be renewed every trip (Wood, 1841, 45).

Single gourds are used in Africa in the Lake Chad area by fishermen to float hooks and as fishing receptacles (Monod, 1928, 265); in India they are sometimes used as floats to buoy up the head rope of nets (Hornell, 1924, 223). From this it is a short step to the practice of the Korean women divers of Chyoi-jyn Island on the west side of Tsushima Strait, who employ a large gourd, 2 feet in diameter, and 10 to 18 inches high, to support themselves during the rest period between dives; this gourd float is held within a cord

lacing and connected by a light rope to a large net bag in which the diver places her catch (Nishimura, 1936, 152).

To return to the pot float. Besides its principal function in fishing operations, a large sub-globular pot is employed on occasion upon the Lower Indus to effect a crossing from bank to bank. The user lies on top of the pot, kicking out with his legs and paddling with his hands. What is now rare was in former days of common occurrence. The *Illustrated London News* of 13 February 1864 has a sketch of 'A party of Wuzurees crossing the Indus on Water Jars'. These men are the frontier tribesmen we now term Waziris, inhabiting the mountain valleys of the Tochi range. As much practice is necessary to prevent the rounded pots from capsizing, it follows that at the time the sketch was made this method of crossing the river must have been in ordinary and general use.

Single pots are similarly used in some districts in Bengal to cross water channels too deep to be forded. They are also commonly employed when fishing with the seine net in tanks in Bengal. After the net has been shot in a semicircle, the headman of the party is accustomed to station himself at the centre of the net where the bunt or bag is, in order to signal directions to the haulers ashore; as the water towards the middle of the tank is deep, he supports himself on a large chatty, paddling as necessary with his hands (Hornell, 1924, 224).

From Bhakkar near Dera Ismail Khan, and thence northwards up the Indus, the skin float supersedes the palla-chatti for river journeying; from Mittun-Kote upwards nearly every man living near the river has one, whilst the children are given elongated dried gourds as swimming floats (Wood, 1841, 104).

INFLATED SKINS

Far more numerous and widely distributed are swimming floats made from the skins of various animals, goats and oxen most commonly. Although a great advance upon the solid wood float and the chatty float, the inflated skin float has a historical record of greater antiquity. Assyrian bas-reliefs frequently depict the skin float; the oldest and most notable of such sculptures are those brought by Sir Henry Layard from Nimrud, the ancient Calah, where they had decorated the palace of Ashur-nasir-pal III, King of Assyria from 883 to 859 B.C.; they are now among the chief treasures of the British Museum. In these, Assyrian soldiers are depicted as swimming rivers supported on small inflated skins, presumably those of goats (Nimrud Gallery, Nos. 7*b* and 8*b*); the soldiers of the defeated enemy employ the same device in their attempts to escape (*ibid.* No. 6*a*). See Pl. 1, fig. B.

In later panels of the time of Sennacherib (705–681 B.C.), from his palace at Nineveh, men are again frequently seen upon inflated skins. In some scenes the men are seen swimming while lying prone upon these floats;

in others, notably in that showing a great four-man quffa (Mansell Collection, 430), two men fishing with hand lines are floating leisurely downstream, each balanced precariously astride of an inflated skin. One skin is small, presumably that of a goat; the other is that of an animal of larger size.

In the earlier figures, of Ashur-nasir-pal's time, the skins are smaller than those of Sennacherib's period, reaching barely to the swimmer's groin. The man holds the end of one leg in his mouth and appears to be blowing into it; L.W. King (1910) has suggested that this is a convention adopted by the sculptor, who wishes to indicate thereby that the skins are hollow and not solid.

The explanation is ingenious, but such an artistic device would be unnecessary in a land where everybody was familiar with the use of inflated skins for swimming; other considerations also disprove it. Under ordinary circumstances, when haste is not imperative, the inflating orifice may be closed securely with cord lashing to prevent leakage. This is seen, for example, in the peace-time scenes of the Nineveh panels. In certain of these, fishermen calmly bestride inflated skins shown with all orifices lashed up; they show no concern for possible leaks. In other scenes, swimmers who are neither soldiers in flight nor in pursuit, instead of holding the open-ended leg of their inflated skin to their mouth, grasp it firmly in the left hand. It is also noteworthy that these peace-time swimmers use skins considerably larger than the soldier swimmers of Ashur-nasir-pal's time, for the hinder end of the skin comes up between the men's thighs.

An observation which I made at the second Nile cataract in 1936 furnishes a satisfactory explanation of the difference in treatment noted above, and incidentally it clears the Nimrud sculptor of departure from realism. The men and boys who swim the rapids on skins use ordinary water skins of small size for the purpose; these they inflate only when required. When they do this, instead of tightly lashing up the aperture, they merely give the leg left open a deft twist that effectually closes it so long as the grip of their fingers continues (Pl. II, fig. B). The picturing of some Assyrian soldiers, each with one leg of a skin in his mouth, is an alternative to the Nubian practice; instead of a hand grip the swimmer is probably employing his teeth to keep the orifice closed, with the advantage perhaps of giving him a better grip on the skin with his left arm.

From the record preserved for us in these Assyrian sculptures it is clear that all Mesopotamian soldiers of old time, whether Assyrian, Babylonian or Elamite, carried as an essential part of their field equipment, a deflated goat skin, ready for inflation and use whenever a river crossing had to be negotiated. That a similar military equipment had a wide distribution in ancient times is shown by the reference in Caesar's account of his campaign in Spain (Bk. I, chap. XLVIII) to the use of 'bladders' by the Lusitanians and

lightly-armed soldiers of Hither Spain embodied in the opposing forces fighting in Pompey's cause. These forces, according to Caesar, were enabled by the use of bladders to cross the River Segre, near the modern city of Lerida, and harass Caesar's foraging parties. 'These men', he says, 'could readily swim across the river, because it is the custom of all these people not to join their armies without bladders', the exact counterpart, as we have just seen, of what prevailed in Mesopotamian campaigns of an earlier period.

At the other end of the Old World the same custom prevailed, for when Genghis Khan's Mongol troops were on the march in China in the early part of the thirteenth century, they carried, as one item of their field equipment, a change of clothing in a watertight skin bag which could be inflated and used as a float in crossing rivers (Fox, 1936, 145). This device was, indeed, a recognized item of equipment of Mongol armies, for its employment enabled the 'Golden Horde', under Batu Khan, grandson of Genghis Khan, to cross the Volga, the Don, the Vistula and the Danube without check in that hurricane onslaught upon Europe that culminated in the capture of Pesth in 1241.¹ Some three centuries earlier the Turko-Mongol Petzinaks had utilized the same method to ferry their soldiers and families across the rivers of South Russia (Karamsin, 1819, I, 180).

It is certain that no more practical device than this was available to an army commander in former times for the emergent transport of a body of troops across an obstructive river, seeing how buoyant an inflated skin float is and what a small space it would occupy in a soldier's kit when deflated. During a desert march it might even subserve another purpose—that of a water skin; this reverse custom prevails in Nubia. There, when a man has need to cross the Nile, the skin sometimes used is not primarily designed for this purpose; it is just one of those ordinarily employed to carry water or grain which has been emptied of its contents and inflated with air for temporary use as a swimming float. It is significant of this interchangeability of function that both the water-carrier's skin bag and the true swimming float are both commonly termed *mashak* (*massak*) by Hindustani-speaking Indians, though specific terms for the float are also used in certain localities.

¹ Purchas in his *Pilgrimes* (1906 edn., XI, 178), quoting R. Wendover, describes these floats as 'sewed skins artificially (ingeniously) made'. From this and from our knowledge of the wide extent of the use of inflated skins at the present day in many parts of Central Asia, as well as in Albania, it is clear that Gibbon (1791, XI, 215) was in error when he wrote of the 'Golden Horde' crossing rivers in 'leather boats which followed the army and transported their waggons and artillery'. Actually the soldiers would either swim their horses over or cross upon single skins, while the waggons and artillery would be transported across upon kelleks formed of a framework of tent poles buoyed up by numbers of inflated skins, or possibly the transport consisted of tent covers sewn up after being filled with straw or dry grass after the example set by Alexander in his Persian campaign. Several of these tied together and framed with tent poles would be adequate for the transport of considerable weights.

An analogous instance of improvising a swimming float out of an article designed for another purpose is seen when the Eastern Eskimo rides ashore upon his seal-skin harpoon float when compelled by some accident to abandon his kayak (Mason, 1895, 334). The largest floats are those used by the Aht or Nutka whalers off Vancouver Island. Each is made from the skin of a seal taken off entire and turned hair side within; the size is about 3 feet by 2 feet (Mason, 1902, 206 and 229).

I have also seen Spanish fishermen at Malaga using inflated goat skins as floats for their nets; these may possibly be the modern representatives of those bladders used by Lusitanian soldiers to which Caesar makes reference.

IRAQ. In modern Iraq skin floats continue in use whenever there is occasion to cross any of the larger or swifter rivers otherwise than by means of boats. Herdsmen employ them regularly when their cattle or flocks graze on pastures across the river from the men's homes; river thieves, as on the Nile, find them invaluable for stealthy approach to a laden cargo boat anchored for the night well out from the bank.

Inflated-skin transport has its natural home on the hill streams of Southern Asia, but has been developed to the greatest extent on the Tigris and Euphrates; adopted from the Babylonians by intrusive Arabs, the waves of conquest that spread Arab domination far and wide through Africa and Europe had as one result the diffusion of the inflated skin far to the west of its original home. From Mesopotamia the Arabs carried it with them to Palestine, Nubia, Egypt, Albania, Hungary and perhaps as far afield as Morocco. Probably the same agency introduced it to other lands, but of these all memory has been lost.

PERSIA, CENTRAL ASIA AND NORTHERN INDIA. The skin float is in more general use in Persia, Central Asia and Northern India than anywhere else at the present day. It is valued in particular for the passage of rivers where the current is exceptionally rapid owing to the narrowness of the defiles traversed or the violence of the floods occasioned by the melting of the snows on the high mountain ranges during the hot weather; such conditions are wholly unsuitable for the employment of built boats.

The skins are generally those of goats and bullocks. Before commencing to skin the body of a goat, the head, feet and part of the tail are cut off; this enables an expert worker to detach the skin from the body by working backwards from the neck without having to make a slit along the abdomen. When freed, the skin is turned inside out after all apertures, except the cut end of one fore leg, have been sewn up or securely tied and closed with cord or with hide thongs. When required for use the skin is blown out tight through the one leg left open, which is then closed with a lashing of cord.

A different procedure is necessary when flaying a bullock, for here the skin of the head is required to form part of the eventual inflated float.

Moorcroft (1841, I, 40), who spent several years upon a trade survey extending from Hindustan to Bokhara, has described the method as he saw it employed in the Punjab in 1820. The skin having been cut through around each knee, a long incision is made in the back part of a hind leg, extending down to the knee; through this the skin is gradually flayed off. When detached the skin is doubled up and buried for a few days to allow decomposition to proceed sufficiently to allow the hair to be rubbed off by hand or a blunt wooden knife. Turned inside out, the natural openings, mouth, eyes, etc., are then stitched up. Finally it is turned back again and the main incision is sewn up with thongs of raw hide. The open ends of three legs are now tied up, the fourth being left open to serve as a tube for inflating the skin. Thin tar from the deodar or other pine is then poured into the skin and shaken about until the interior surface is thoroughly impregnated with it. The exterior in turn is tanned by steeping in an infusion of pomegranate husks.

When inflated, a bullock's skin looks absurdly like a huge, hairless bear; a dog not used to the sight will often growl and show signs of uneasiness. Equally strange is the sight of a man carrying on his back what appears to be an animal three or four times his own weight and bulk (Pl. II, fig. A).

These skins float with the shortened legs uppermost, the owner lying across the body with his feet in the water. Sculling with a short-handled, broad-bladed paddle and splashing with his feet, he makes fairly good progress across a river if the current be moderate; even so, his course is so oblique that he lands on the opposite bank some way downstream from his starting-point, and this leeway has to be allowed for if he is to land at any specified place. As the skins are kept dry when not in frequent use, when wanted again they require a preliminary soaking in water in order to render them sufficiently soft and supple to be blown out. Usually a reed tube is inserted into the leg opening for the inflator to blow through.

PERSIA. On the Karun River in Western Persia, where large rafts supported upon inflated skins are, or were till recently, used for crossing by the Bakhtiari tribe in the course of their marvellous half-yearly migration between their summer and their winter pasturages, each of the swimmers who guides the herds across the furiously running river employs a float made of two inflated goat skins, tied together at each end. Flinging the skins into the water, the man throws himself upon them and balances himself by putting one knee between the skins (Cooper, 1925, 229). The addition of a second skin appears to be necessary in order to raise the swimmer higher out of the water than would be the case if only one were used, and so to enable him the better to control and guide the terror-stricken animals which he has to pilot across the raging torrent. Another advantage is the lessened liability to cramp resulting from his body being lifted above the icy cold current.

Layard (1887, II, 60), who voyaged down the same river during his early