CHAPTER TWO

EQUIPMENT

CHOOSING A KAYAK

Of all the questions I get asked about Sea Kayaking, the one that comes my way most often is, 'What kayak do you paddle'? This is closely followed by the question, 'Why'?

The questioner is anxious to spend his or her money on the right kayak. The choice available is bewildering and a fully rigged kayak is not inexpensive.

Let us look at some of the more important features of a kayak before giving any advice. Ideally we would have a 'caddy' full of different kayaks that we would select for a trip rather as a golfer chooses a club to play his next shot.

We would have a narrow long kayak for long trips over open water; a wide shorter kayak for slower coastal-hopping trips and one or two in between in case we wish to combine the two. If you have to decide on one kayak for the sea, you are obviously going to have to choose something between the two extremes.

Invariably we end up with a compromise, -a kayak that is neither too narrow nor too wide; that is reasonably stable and will hold enough expedition gear. It should be comfortable, watertight and soundly constructed. It should contain either bulkheads and/or a pod with hatches on the deck (or in the rear bulkhead which is accessible just behind the seat, - to allow access. Having decided on the bet compromise for your general purpose then get it on the water and paddle. At first you may find it unresponsive or uncomfortable. Persevere. I firmly believe that unless the kayak is totally unsuitable, you will adapt to it. You will learn how to control it, how to make allowances for its' traits and how to become comfortable in it. It may take a little while but soon the kayak will suit you and you it. Then, like the early Innuit, you and your kayak become as one; your kayak is an extension of you.

To help this 'oneness' with your kayak you need to fit it reasonably well. Your feet need to be supported on the foot rest so that your knees are comfortably bent and barely touching the foredeck just in front of the cockpit. In other words, a two point contact with the kayak...backside and feet, a position aimed for by racing paddlers. You need to be secure in your seat, not tight so that you cannot re-adjust your position from time to time; nor too loose so that you slip and slide around the cockpit. Some paddlers use foam blocks strategically placed to keep them firmly in position and fixed to the sea.

You need to be comfortable. You also need to be securely fixed. Comfortable for the easy journey with an agreeable tide and following wind but secure for the overfalls or rough conditions that may lay ahead. 'Extra' security is provided by tensing the legs and pushing the feet against the footrest and the knees against the cockpit front (if you have a large cockpit) or the foredeck just in front of you and the thighs pressed into pads or rigid braces where available. This allows a three point contact with the kayak, - backside, feet and knees/thighs This emphasises your 'oneness' with the kayak and you are ready to use recovery strokes or even roll.

There is a lot to be gained from listening and looking as well as paddling a range of kayaks, but at the end you must make up your own mind and then work at making your choice of kayak come right for you. This final consideration may be your only one if you are offered a kayak at a price you cannot refuse -do not worry -just persevere.

The best shop windows for kayaks and all associated gear are the annual Canoe Exhibitions which are

staged early spring There are two of them a year now. The BCU runs its' International Show with Ordnance Survey Outdoor Exhibition. You could do a lot worse than start your search for kayak and gear at these Exhibitions where you will receive much expert advice.
The choice of kayak is not your only dilemma.
Other important questions about fitting out your kayak are:

*How will you control direction? A rudder (if so, what sort), a skeg, or rely on paddling technique?
*How will you rig the deck-lines, towing hitch, hatches, stowage (nets), etc?
*Will you have a pump, if so, how will it be powered and where will you position it?
*And how about the position of bulk heads, and even how many bulk heads.

CARRYING EQUIPMENT
You are going to have to determine whether you are going to carry anything on the decks at all. Some prefer not to because beam winds or breaking waves can dislodge gear. On the other hand, having to struggle for access to spare paddles or other equipment stowed below the decks can be distressing when waves are breaking or winds are high. You will miss some of your best photograph opportunities if the camera is not easy to reach. Flares must be kept where they are immediately accessible; if you are in trouble the last thing you should be doing is pulling off the spraydeck.
We are talking about compromise. Here, examining other paddlers' deck layouts can be instructive. Talk to paddlers about why they have the compass where it is; why the tow line is attached to wherever and why the pump is located in the kayak in whatever position.

THE KAYAK
HULL SHAPE
This is related to hull width and shape. A 'V' shaped hull, i.e. one that is narrow in the beam, will be initially unstable but as it is leant over its beam will still retain some stability. It will feel 'tippy' but a little skill will keep it upright. On top of this, the kayak will respond better in rough conditions as there is less beam to be affected by the waves; on the other hand, a broad bottomed/fairly flat hull (more 'U' shaped) will feel more stable and consequently more comfortable for the beginner but will, in effect, be less stable in rough conditions. Once the kayak is leant over to a critical point it will continue to roll over and of course it will take that more buffeting by the seas as there is more hull on the water to be knocked about. Again we are seeking a compromise...A racing kayak will get you across the Channel quickly but one strong gust of wind and you are over, in a kayak that is difficult to roll back upright. A broad bottomed 'bath tub' type kayak will be slow moving forward but will not be so easily blown over.

Something in-between is the answer. The overall shape of a hull is difficult to evaluate without going into great detail. You could do worse than refer to Frank Goodman's chapter in the British Canoe Union 'CANOEING HANDBOOK', (Chapter 2 of the 2nd Edition). The chief characteristics that the paddler is looking for are:

SPEED, STABILITY, MANOEUVRABILITY; COMFORT and STRENGTH.

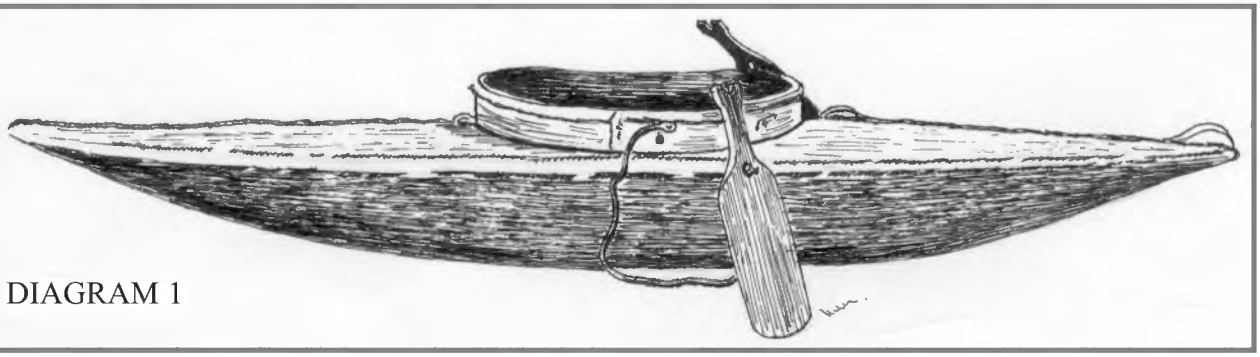


DIAGRAM 1

If a hull is highly rockered, i.e. has a marked curve from bow to stern, See diagram 1, it will turn easily. A strong sweep stroke on one side of the other will have the kayak spin easily. This is fine for

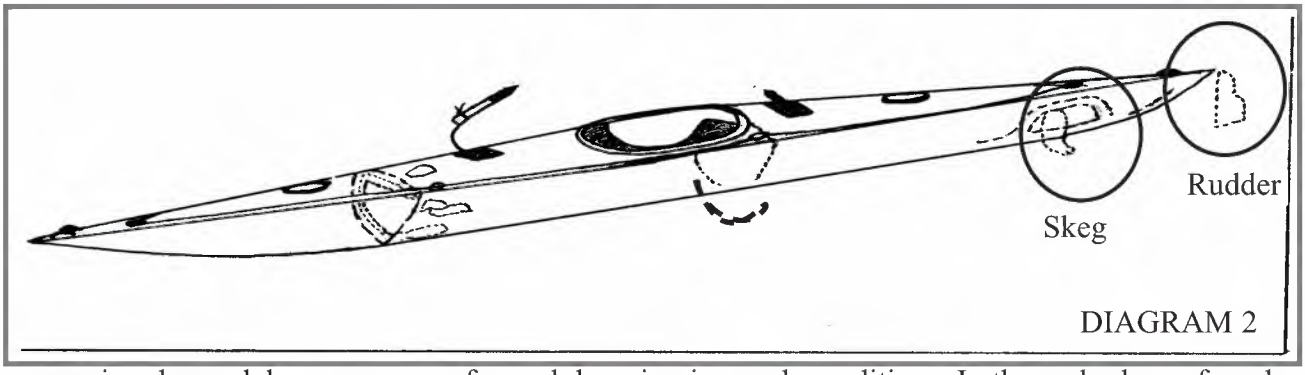


DIAGRAM 2

manoeuvring down slalom courses or for rock hopping in rough conditions. In the early days of modern Sea Kayaking most of us used this type of craft and we countered the rockered hull by fitting a skeg, of which more later. If the hull has little or no rocker the kayak will travel easily in a straight line and may even be difficult to turn, and hence may require a rudder or skeg. See diagram 2.

From these two diagrams above you will see that the less rockered has much more hull in the water and this accounts for its' directional stability. In fact, it can have so much directional stability that a rudder or retractable skeg may be necessary to make the kayak go in your intended direction. Boats with a longer waterline length are also faster than those with shorter hulls. Speed is related to square root of waterline length; to go twice as fast the hull must be four times the length at the water line which is just not practical, and those with a semi-circular hull cross section gives the fastest performance although somewhat unstable. See diagram 3.

This is because a boat will displace a volume of water equal to its own weight, but boats of the same weight with different hull shapes will have differing amounts of surface area in contact with the water.

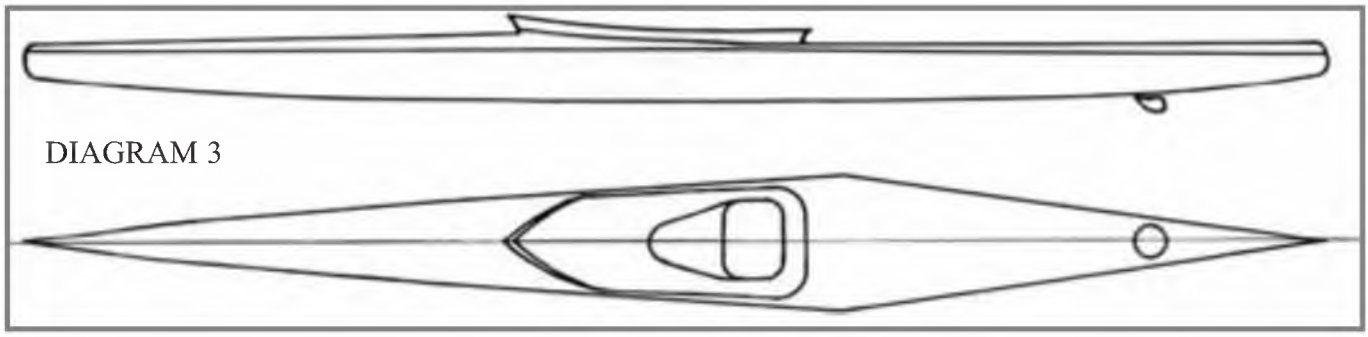


DIAGRAM 3

The less 'wetted' surface area of hull a kayak has, the less resistance there is from the water and the faster the kayak will be to paddle. The semi-
circular cross section has the minimum wetted area and is therefore a fast shape and is the one used, with modifications, in many racing designs. However, this shape is initially unstable.

The 'V' shaped cross section; (see diagram 4) feels even more unstable. It will travel upright when paddled or supported but when at rest with the paddles out of the water it will feel tippy, only feeling less so when tilted to one side.

On the other end of the spectrum is the flattened 'U' shaped hull. This has the maximum breadth and this flattened 'bath tub' shape has good initial stability but is barge-like in operation. Like a barge it has plenty of storage capacity but tends to sit high in the water, especially when unloaded, so is more

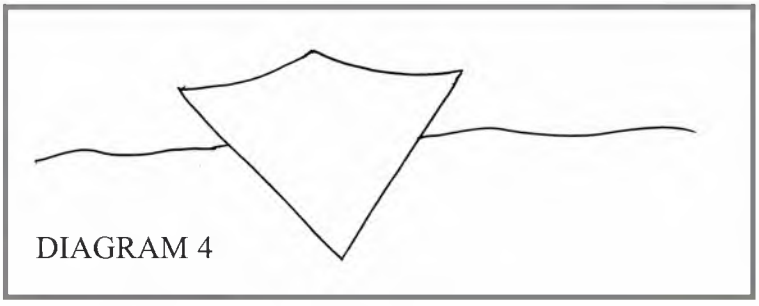


DIAGRAM 4

readily effected by cross winds. Having a larger wetter surface area, it is a much slower craft to paddle. See diagram 5

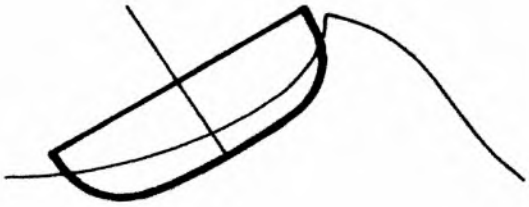


DIAGRAM 5

More importantly, when taking such a craft on rough seas, steep waves will effect the boat in that the hull follows the wave slope, making it difficult for the paddler to sit upright which can be tiring on a long journey. The semi-circular or 'U' shaped hulls allow the paddler to lean the kayak into the waves whilst bracing with his paddle into them. See diagram 6.
Hulls may also have chines. A chine is an angle between two surfaces and therefore a chined hull is made up of a series of flat surfaces. If there is a dis-

DIAGRAM 6

tinct angle between the bottom and the sides of the hull, it is said to be 'hard-chined'.
See diagram 7.

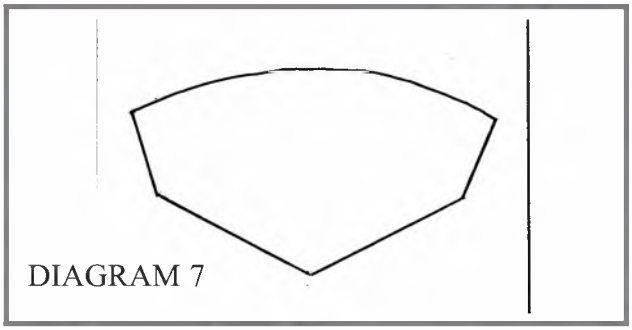


DIAGRAM 7

The same principles applying to flat-bottomed or semi-circular shaped hulls also applies to chined hulls with the exception that these hulls tend to provide more stability about the points of the chines. A semi-circular hull with chines also has a greater wetted surface area and is therefore a slower craft, but it may be that the extra stability could outweigh this disadvantage. Some hard-chined hulls have a tendency to plane on the flat surface when paddled fast which makes them difficult to 'push' through the water. A 'soft-chined' hull i.e. one that has less abrupt angles at the chines, gives a smoother flow of water past the hull which reduces turbulence and so increases speed.

There is a problem with trying to judge a hull's performance by merely examining its hull cross section at anyone point. This obviously changes along the length of the kayak. Indeed, a single kayak may have elements of all the above-mentioned characteristics built into its hull.

BOW SHAPE

The buoyancy of a kayak's bow, together with the shape and volume of that bow, will affect the way it will tackle oncoming waves. The ideal sea kayak will not submerge at the bow as it plunges into head waves. The rate at which the bows rise to a head sea is also affected by the buoyancy of the stern which, if great, will resist the stern downward movement consequent upon the bows rising. Long raking kayak bows are designed to allow the Inuit hunter to sprint and rise on to ice which is closing in and threatening to crush his kayak and himself. If you expect never to meet sea ice, and few do around Britain, do you need it? Style sometimes adversely affects efficient paddling. Long raking bows shorten potential waterline length which reduces speed through the water.

FOOT RESTS

Not only is it important to be comfortable in a kayak, you must also fit the kayak snugly. This ensures good control of the kayak which is vitally important in rough seas or when rolling. When the going is rough, thrust your thighs firmly into the thigh braces. This requires a firm toe-hold on the foot rest.

Under normal cruising conditions you should be able to adjust your position in the seat from time to time (i.e.. not be too tightly secure) and have the balls of your feet resting comfortably on the footrest so that your knees are bent. This effects a two point contact with the kayak, viz. backside and feet. The legs should be relaxed so that your knees are not quite making contact with the kayak. Under rough conditions or when trying to paddle fast you should be able to flex the feet and legs so that you achieve a three point contact in that your knees press against the front cockpit area to give you a really secure hold on the kayak.

You can see that the position of the footrest is most important. It is normally readily adjustable (unless stuck with rust and salt!) and you should adjust it to fit you before embarking on even a short trip. A recent trip to the Needles off the Isle of Wight had an interesting interlude when my fellow paddler capsized and was being washed up and down against the base of one of the stacks. It turned out that he did not have a footrest and so slipped off his seat to lose control of his kayak and over he went. Unable to secure a firm grip on the kayak using his feet and knees, he failed to roll.

A quick release footrest is recommended. This is secured at one side, usually with a wing nut and bolt, but only slipped under a lip on the other so that should your feet get beyond it, the footrest will slip out of its lip as it moves backward to free your feet. Another system involves small footplates secured in a channel on each side of the hull so that they hinge rearward to adjust but lock in position when pushed forwards. I do not like these very much as your feet have to be continually slightly splayed outwards and it is all too easy to slip off them so ending up in the water, like my friend in the above illustration. Ideally the kayak is made just for you so that the front bulkhead acts as your footrest. This maximises the forward compartment space but the bulkhead itself must be strong and well secured. A block for the feet to brace against can be a waterproof bag of clothing rolled tight against the bulkhead.

COCKPIT

Kayak cockpits vary in size. A large cockpit is easy to get in and out of but has the disadvantage of needing a large spray deck, easily imploded under the force of a heavy wave. A small cockpit goes someway to ensuring you are part of your kayak in that you are usually firmly located in your seat. This can make rolling easier because you are less likely to fall out in the event of a capsize. This can also present a psychological problem for those people who like the idea of be able to fall easily out of the cockpit. The original Eskimo kayaks usually had a small cockpit.

These Kayakers had no wish to part company with their kayak under any circumstances; 'roll or die' was probably their maxim. If fact many Europeans who used Greenland kayaks (e.g. Gino Watkins and Uffa Fox) had their cockpits enlarged.

Whilst writing about cockpits, it is worth mentioning the seat. Comfort is all important on any long trip so make sure the contour of the seat fits your own contour. Sharp raised edges digging into the small of your back or into the back of your thighs can be quite uncomfortable after a few hours. Sort this out before a long trip. Many paddlers use a back rest to prevent bruising caused by contact with the rear of

the cockpit, or to simply provide a much needed support. Many manufacturers provide 2" wide webbing straps (like car seat belts) which are adjustable and attached to the seat mountings.

HATCHES

The Valley Canoe Products (VCP) is probably one of the most popular hatches. It consists of a raised PVC lip around the rim over which fits a rubberised lid, the overlapping rims being secured by a band and clip. The Henderson (TCL4) hatch screws into place, a seal is affected by a threaded compression spring. These are usually very effective but can be difficult to undo with cold wet hands. Many paddlers use a piece of wood which fits over the hatch so that it grips the protrusions around the lid. When I have used these hatches I hand tighten when closing and use the piece of wood to assist with unscrewing it open. Your piece of wood can double up for other purposes, - hold fishing line for example.

Some manufacturers, both here and in the USA, are favouring the large Glass Reinforced Plastic (GRP) hatch which has a pronounced lip sealing onto a neoprene or solid rubber rim. A webbing strap provides the securing pressure to hold the cover in place. Certainly these large hatches make for easier stowage and unpacking and my experience is that they rarely leak. To be on the safe side I always pack everything that must remain dry in waterproof sacks.

One point worth mentioning; a totally airproof compartment will react to changing temperatures. Warm it up and the air expands, cool it down and the trapped air will contract. This can blow a seal, be it a bulkhead or hatch, or it can suck water in. It is possible to overcome this problem by drilling the smallest hole at the highest point of your bulkheads. Whatever hatch cover you use, make sure it is tied to the kayak. It is not a good idea to undo them on the water in the first place but if you have to then the last thing you need is to lose it overboard. Once I accessed a friend's hatch to reach him his pullover and the hatch fell from my hand and sank. Now we are no longer friends!! It was a difficult paddle home with water swamping his deck and filling the compartment.

Finally, before embarking always make a habit of checking your hatch, ensuring it is squarely in place (if it is the screw on type) and securely located. A good days paddle can be ruined if you open a hatch to find wet gear. On one occasion we left a beach in South Australia to bash through some surf. The wind and tide soon whisked us away along the coast before we realised one of our party was sinking at the rear; he had left his hatch cover on the beach. We had to sponge his bulkhead out and then wrap tape right round the kayak in order to protect the hatch and allow us to continue our trip.

BULKHEADS

A bulkhead is usually made of the same material as the kayak. Bulkheads help give the kayak some rigidity which is good news. The 'not so good news' is that any impact caused, for example, by landing on rocks can loosen the join between bulkhead and hull. For this reason and to provide a little extra buoyancy, polyethylene foam blocks are sometimes used for bulkheads. For my money I prefer the solid bulkhead which is well glassed or moulded into position.

You may want to consider the position of the bulkheads. The rear one, fitted just behind the seat, gives more space in the rear compartment and therefore less room in the cockpit area for water to collect in the event of a capsize. Nonetheless, I prefer to have the rear bulkhead set back by about a foot so that I can store things too bulky to fit through the hatch and anything I may want handy on the journey, like sandwiches and thermos, extra clothing, marine radio (suitably waterproofed) and extra flares.

I have already suggested that the front bulkhead may be used as a footrest so long as it is critically positioned. This allows room to stretch your legs and to store gear. On long crossings I have used this space to store a sealed pan of meat and vegetable stew, together with a cooker. On landing I reach for both from behind the footrest and within moments I have supper cooking whilst I get changed and shove up the tent.

PUMPS

A pump is needed to remove water from your or a companion's kayak in any event of a serious ingress of sea. With an effective spray deck (skirt), even a roll should not allow much water to get into your cockpit. If it does, then a quick sponge out will suffice. In all my years of kayaking I can only think of very few occasions when I have had to use my pump 'in anger'. Usually the pump is employed during capsize and rolling practices. The thing is, when you need your pump, your really need it and to not have one aboard is folly. Let us check out what pumps are available and what might be right for you.

The Inuit use a simple plunger in a tube inserted between spraydeck and body to suck up a litre of water and expel it outside. The cheap and portable (in that it is not a fixture to the kayak) pump most favoured is that made by Whale. The picture above shows a double sea kayak being pumped out following a capsize drill using hand held Whale pumps.

The hand operated Chimp Pump is the one you will usually find built into your kayak. It can have a fixed handle which can be fitted on the front or rear deck or a removable handle which gives you a clear deck. Of course the handle must be well secured and be handy when you need it. These pumps are effective but requires that the paddle be put down while it is in use. The paddle is essential to maintain balance in a running sea. Some have adapted a 'Chimp' or similar pump to work by pressure on a foot pedal. Again I wonder at just how often a foot operated pump is going to be used in anger. They can be difficult to fix and should you find yourself swimming alongside your kayak which suffers from a flooded cockpit, then a foot pump is as much use as a chocolate teapot, unless you can clamber aboard and reach it with your feet. I have to say that this is a technique that is practiced and just about practical, but, I would venture to suggest, not in a biggish sea. If your fixed pump is going to be of any use to another kayak coming along side for a pump out, then the tube needs to be long enough to reach from your cockpit to the cockpit of the kayak being pumped; an important consideration if you are ever going to be looking after groups on the sea. Recently I was asked for advice by a big concern that takes young people kayaking regarding the choice of kayaks and ancillary equipment. It was tempting to save them money by suggesting that only leaders kayaks have fixed pumps and everyone carries the Whale pumps; but in this age of litigation this may not be a view shared by an investigating tribunal. Hey Ho!!

The Lendal pump is a simple plastic tube running across the footrest so that the alternating pressure of the feet keep the inlet and outlet valves working all the time. Tiny amounts of water are shifted on each stroke but overall it keeps a slow leak under control. That is usually for K1 competitive craft. That way the hands are on the paddle all the time. If all else fails, a sponge can be used.

An efficient electric pump operated from a remote switch either by the by the footrest or within reach in the cockpit in the event of a capsize is a good 'bit of gear' if, like me, you like gadgets. Provided that the battery is fully charged on every voyage and they do not get damaged by sea water (a definite problem as sea air and electrics are not comfortable together) they can be an easy way of expelling water. Whilst operating you can be handling your paddles and/or securing the spray deck (skirt). Just one point here, an effective tight fitting spray deck can resist the expelling of water due to the vacuum

created. I think that if I had an electrically operated pump fixed I would also want to carry a Whale pump, - belt and braces and better safe than sorry.

Tom Trump from the States wrote to the ASKC: *"I installed a RULE 400 Pump in my Mariner Kayak -a high volume Greenland style kayak. For power I installed a 12V 6 amp/hr gel cell battery in the bow of my kayak. I selected the gel cell over a motorcycle battery because the gel cell will not leak if over-turned and for its electrical qualities; although it cost three times that of a motorcycle battery. In tests the RULE 400 system pumped out my flooded Mariner in 15 minutes. With paddler and gear in position this time will be obviously reduced. I estimate the 6 amp/hr battery to be good for at least 8 to 10 complete bale outs of the Mariners. Right now I am working on a waterproof switch system which will incorporate a 2 amp fuse so that I can eliminate a separate toggle switch and fuse bottle. My rationale for going electric is simple. After watching people pump their kayaks by hand during self rescue demonstrations, it occurred to me that in rough seas it would take both hands on the paddle just to keep the kayak upright"*

DECK FITTINGS

If you are buying new or making your own kayak you are going to be faced with decisions about deck fittings. Before making any decisions let us look at some of the considerations.

Are you wanting to carry anything on the decks at all? There is a case for not doing so as heavy seas can dislodge gear and side (beam) winds can affect steerage. Pulling a kayak with a loaded deck over another kayak during rescue can both dislodge gear and make the rescue that more difficult. Having said this, most do not want to use the deck space. In fact, there are some fairly essential items that should be fitted to the foredeck like compass and chart, although even these can be alternatively carried.

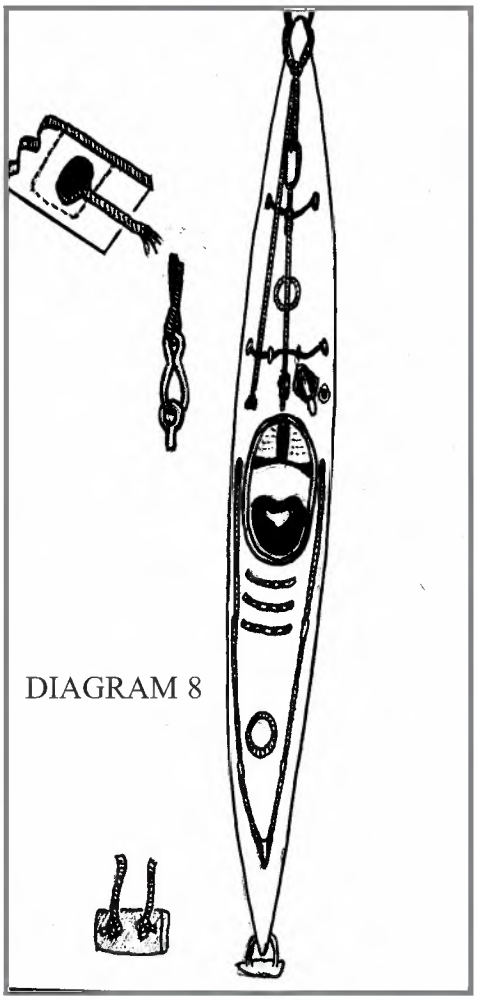


DIAGRAM 8

Let us look at what can be carried quite correctly on the decks. I have mentioned chart and compass. Spare paddles are usually carried on the rear deck and there are those who like to have a variety of items to hand by tucking them under deck elastics such as flares, cagoule, camera, sandwiches, watch. Personally, I limit my decks to compass, chart and spare paddles -and if you want to know a secret, I sometimes tuck my buoyancy jacket under the spare paddles during warm, calm conditions.
Diagram 8 shows a deck layout that I favour.

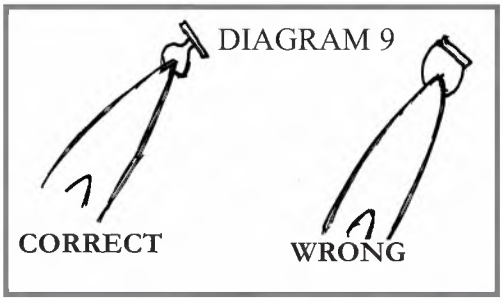


DIAGRAM 9

Whilst on the subject of deck fittings it is worth mentioning toggles. These are grab handles located at bow and stem and can be very useful to hold on to if you are in the water and likely to become parted from your kayak. Always hold on to the opposite end to the direction of travel, this will help avoid a 'face full of kayak' as the waves or surf carry it along. Toggles should be firmly attached by the cord actually going through the end of the kayak and forming a 'T' piece with the toggle handle certainly not a loop. (See Diagram 9).

Put your hand through the loop as you are being pushed through the surf and as the kayak twists around,

so your fingers get cruelly pinched.

There are a couple of points; first, ensure the entry of the toggle lines into the ends of the kayak are not sources of leaks and second, never use the toggles to carry the kayak. You will probably be aware of the way a paddle may be used to assist entry and exit from the kayak. If this is likely to over-stress the paddle, then find another way. A fractured paddle shaft or kayak hull half-way through an extended expedition can cause a lot of problems.

BUOYANCY

A well made sea kayak will have a little fixed buoyancy at the bow and stern. The two-part polyurethane foam is easy to install and might mean all the difference if the kayak is completely swamped. This foam is permeable and when soaked adds weight to the ends of the kayak which reduces its' ability to ride the waves or to turn easily. It is hard to imagine how a sea kayak can ever end up completely swamped. With bulkheads a kayak has three independent chambers, bow, cockpit and stern and it will taken an extraordinary incident to puncture all three chambers simultaneously.

Getting one chamber swamped can cause problems and there is a case for using waterproof bags to store gear as these also trap air. If one hold is flooded the kayak rides low at the end. If that hold has no internal buoyancy it can sink and go in to a vertical state known as a 'Cleopatras Needle'.

I once tried to paddle across the North Sea. Five hours out with a Force 5 wind blowing across us, I noticed my friends' rear deck was below the waterline!! His rudder arrangement was leaking. Fortunately his rear bulkhead was holding up and the gear packed in waterproof bags prevented the stern from sinking completely to present the classic 'Cleopatra's Needle'. How we extracted ourselves from this situation is quite a story. Suffice to say my friend had to take a swim and it took a freak wave to assist his kayak over mine to enable removal of the hatch cover in order to drain the rear bulkhead compartment. We then had to navigate a reciprocal course to head into the increasing wind, stopping every twenty minutes to sponge the rear bulkhead before the hatch cover got too close to the waterline. We were not a pretty sight when we eventually made land.

RUDDER/SKEG

I have always resisted relying on these as they can go wrong when you are needing them most, but I was forced to change my mind since taking a group of young people to paddle for six weeks along the Arctic coast of Norway one summer. More of this when I am sure you understand the difference between a rudder and skeg.

A rudder is a moveable plate either at the very end of the kayak or fixed under the stern. It is moved (steered) by the feet which act on wires to operate the rudder. Under-stern rudders are definitely not favoured by sea kayakers as landings and launching swill soon ensure its' destruction. Even over-stern rudders are vulnerable. The C- Trim Rudder from VCP has the three important features, viz. durability, reliability and an arrangement to swing the rudder itself up and over the rear deck. A jammed rudder at an inopportune time can spell a real problem.

A skeg, on the other hand, can be part of the rear hull shape in that the stern is flattened to form a wedge shape or it can be detachable. The Viking long ships (Roskilde, Oslo) have a rudder rigged on the 'steer-board' side (starboard side). It is pivoted approximately 10% to 15% of hull length overall fore of the stern. This permits the rudder blade to obtain some purchase in the water even when the stern is heaving up on the very crest of a wave. A stern hung rudder can lose grip on the water on the crest when steering power is most needed. The wind blows more strongly on the crest and is less powerful in the troughs of the waves. When in place on a kayak it is held in position by various means, usually shock cords. Some kayaks are produced with retractable skegs. These are housed within the rear compartment to be lowered by a line operated from the cockpit once underway. Why have a skeg or a rudder in the first place? Well,

a kayak, particularly a loaded one, can be pushed up or down wind by a beam wind meaning the paddler having to exert paddling effort on one side of the kayak to compensate. By using paddling technique and the action of the waves and your hips it is possible to lean the kayak one way or the other, effectively using the kayak itself as a rudder, in order to stay on course despite the wind action and without too many energetic compensating strokes. Energy spent in keeping course drains the body resources. It is much better to have the kayak automatically balanced for the prevailing conditions.
To digress: Scott's attempt on the south Pole failed about eleven miles from a supply dump. They died because they had run out of fuel for their stoves. They had used their fuel, not only for cooking, but to melt snow, keep warm and to shave with. Perhaps if they had allowed their beards to grow they might have survived. It is the same with human energy: Reduce the need to expend it and you may live longer.

Returning to my trip to Norway, we used kayaks with retractable skegs. On a six week expedition with only three re-supply schedules, we had to carry a lot of gear and I was initially concerned about the space being taken up in the rear compartment for the skeg housing. We managed to pack everything and it was worth the struggle in that the skegs proved a real asset for the young paddlers. They soon learn when to let them down completely, partially, and when to retract them in order to compensate for side winds. On starting off, to gauge the effect of a beam wind on the directional balance of the kayak, that day, in that breeze, in those waves, with a load you are carrying, set off with the skeg retracted. Lay the kayak beam on to the breeze. Note the drift. Almost always the stern leads the drift. That is resisted by lowering the skeg (aft) until the kayak drifts sideways parallel to its starting alignment.

Enough about kayaks, I am now going to move on to all the associated equipment, starting with paddles.

PADDLES or LINKING THE RING OF POWER

Without a paddle the kayaker cannot move very far, manouver, signal or return to land, so whatever you do out at sea, don't let go of it. Some novices start in a swimming pool using hands only before the complication of a paddle is introduced. The paddle is a primarily a lever acting at a fulcrum, the blade in the water. Aboriginal paddlers in Australia in their bark canoes stand and use their spears as paddles. The spear has a slim round shaft without a blade, yet they make good progress. A paddle can be a punt pole in shallows but few can stand the strain without damage. The paddle is often used as a stabilising beam when entering a kayak. Plonk the body weight in the wrong place and see the paddle shaft bend beyond its elastic limit. A paddle holds up the line from the tent on which clothes are drying. I have often used them to make 'bivvies'. Sheets of tarpaulin, paddles and lots of deck line are all you need. The uses and abuses of paddles are many. Look after them, particularly when miles from home.

LENGTH

Novices are told... "choose a suitable paddle" The problem about being a novice is that informed choice is impossible without information. The first choice is length. Stand without shoes (shoe heel height can affect this measurement) and reach straight up high as possible with one arm. Curl the fingers over. The overall length of the paddle you need is measured from the hollow of the curled fingers vertically to the ground.

PURPOSE

If you intend to travel miles in a day on deep water, to keep on keeping on, you need a paddle that is energy efficient, not power efficient. More on this later.

PADDLING ACTION.

A perfect action would be where each blade in turn travelled along the centre line of the keel, but that is not possible because the kayak is in the way. Each stroke is made to one side or the other. The further away the blade is from the centre line, the more the kayak will turn away from the paddle. (See Diagram 10). Every turn has a sideways component. On a long day's paddle spend as little effort as possible going sideways. Watch the stern of the kayak of the chap who is using a low paddling action with the blades in the water well out from the kayak. The stern wags this way and that. That wag reveals wasted energy. Wagging is wearying. Keep your paddling action close to the kayak, but take care, a low action will scrub your knuckles on the gunwales and bruise your thumbs.

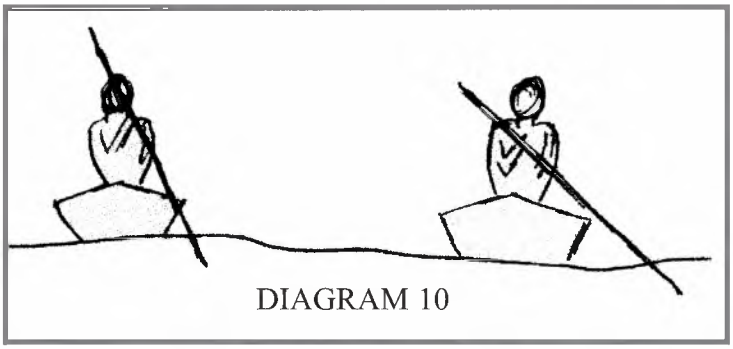


DIAGRAM 10

The better action is very like a racing stroke, body upright or leaning forward, with the arms fairly straight throughout the action. The shaft is as near vertical as possible so that the upper hand reaches across almost vertically above the lower hand. The power is derived not from the arm action but from the powerful trunk muscles. An imaginary line through the shoulder points oscillates through 90 degrees.

If you ever cycled with a club, and received advice on pedalling it would be, lift the knees high on every upward stroke of the cranks, so that the forward foot pressing down has less work to do. Instantly your ease of action is improved. It is the same with paddling. Forget about putting the forward blade in the water, concentrate on clipping the lower after blade out of the water without lifting water. The forward blade drops in neatly all on its own.

SPADE BLADES

Learn the lessons of history or be doomed to repeat it, faults and all. The spade or spoon blade is conventionally the paddle of choice because the average paddler had only one paddle way back in the fifties. The majority of paddlers started on rivers which in general are shallow, so paddles suitable for shallow water were made. These have spade blades because the power applied is maximised with the blade of the paddle only just immersed in the water. The apparently easiest thing to do is to plonk in the paddle only as far as the neck of the blade. That implies a low action with the blade well away from the side and the aft end of the kayak wags.

Spade or spooned blades take the pressure of the paddling action efficiently by slowing the rate at which water spills around the blade. They are power efficient. That is good. If the action is taken too far back, well behind the paddler's hips, unless the paddle is rotated smartly to flick water off it, it will lift water. That is bad. Say you lift 10 grams of water on every stroke, paddling at 60 strokes a minute, 50 minutes in the hour, 6 hours in the day, an easy sea kayaking journey, you will lift, to no useful purpose, 180 kg.

INUIT PADDLES. (SKINNY BLADES)

These are typically the same length as the Europeans use but the blade is narrow, about 3 inches or 75 mms wide at the tip. They are energy efficient. The blade area is about 75% of a spade blade. It is like a low gear on a bicycle. It is easy to put the blade in close to the kayak. The lower hand reaches down, touches water. Deep water is more solid than foaming surface water.

Grasp this thought firmly. Sea kayaks are almost all built on Inuit design lines. Designers revere the excellence of Inuit kayak design. The justly famed "Nordkapp" is based on the west Greenland kayak design which is found on Ubekendt Ejlandt. So why do paddle designers and makers not produce the Inuit paddle, which is an indispensable part of the ring of power? The same respect is due to it. It is better for its purpose because it works for those who risked their lives to make it so. Those who failed did not promote their designs. You can't from the bottom of the Arctic ocean.

The Aran curragh fishermen use a pair of oars which are ten feet long, made from 3 inch square ash for preference. The blades start near the bull or pivot block and taper away to the tip, about a quarter inch thick. The blade is 3 inches , or 75mm wide along its length. They go out onto deep waters and risk their lives there too. Flaherty's film "Man of Aran" offers graphic detail of the wild Atlantic seas around Inishmore, Inishmaan and Inishere. They could have spade blades like the University rowing crew use but they prefer the best for their purpose which are skinny blades. The Ironbridge coracle man uses a spade blade because his river is shallow but the Towy coracle fisherman uses a skinny single blade paddle, the width of the blade being 3 inches or 75 mms.

FEATHERED PADDLES

The plane of one blade is at right angles to that of the other. The advantage is that as the lower blade transmits power to the water, the upper blade is slicing edgeways through the air. That's fine so long as the air is not hurtling from the windward side with venomous force when it can tweak the paddle right

over and away to the leeward. On the rare occasions when that happens, let go with the upper hand but grasp with the lower hand as if your life depended on it, as indeed it might. Retain hold on the paddle and return to as normal an action as is possible in high side winds. The feathered spade blade paddle is a legacy from the times when paddling took place on calm days on sunny rivers. Sea kayaking demands all that you can do and then some. As a method for expanding horizons little can beat it.

The feathered paddle action requires either right or left hand to be in control. The other hand is a socket in which the shaft turns. If the average paddling rate is one per second, the control wrist is flexing through almost 90 degrees every two seconds. If you paddle for 50 minutes in the hour, and 6 hours in the day (an easy day at sea) your control wrist has flexed 30 x 50 x 6 = 9,000 times. This is an awful lot of punishment. Racing sprinters paddle at great speed for a thousand metres and then stop. Their needs and their paddles have little relevance to those of the sea kayaker. They use beautiful wooden "Liminat' or carbon fibre asymmetric paddles that weigh a lot less than 2kgs. They do not as a rule suffer from teno-synovitis. (This is what you get if you overdo the feathering action. It hurts with serious pain and pain reduces safety margins. The incapacity endures for many days. E.g. a clerk cannot operate a key-board or a pen, because the dominant hand is the control hand and that's the one that fails.)They are usually not paddling long enough for the synovial fluid to dry out around the tendons which is the basic cause of this condition.

UNFEATHERED PADDLES.

The Inuit seal hunters, the caribou hunters too, use unfeathered skinny blade paddles. They do not suffer weak wrists, they paddle sixty miles in a day, hunting as they go. They drag one to four seal carcasses back to the village if they are successful that day, after all that. Whose methods do I respect for working on the sea? The hunter, for he and his ancestors through the ages developed the best gear for the purpose.

Howling side winds, that is winds around force six Beaufort and above, cause a lot of self doubt and anxiety in those to whom it happens for the first and even the tenth time. The unfeathered paddle blade is edge on to that force of nature. The tweaking effect on the upper blade is nowhere near as great as on a feathered spade blade. The wind gets under the feathered blade and whacks it sideways and upwards. The spoon blade especially develops aerodynamic lift as well. Alarming!

Do I come across a bit strong on the subject of feathered spade blades versus unfeathered skinny blades? Yes? No apologies for that, for I've been there, done that.

PADDLE MATERIAL.

Wood for choice, it is kind to the hands, it has the right amount of spring to it and with TLC it lasts for years. Plastic sheathed alloy shafts are fine for basic work but they feel dead, without give. Carbon fibre paddles are superb, very light, but very expensive and not necessarily durable. The edge of a resin laminated blade can be rather sharp.

COMPETITORS' PADDLES.

Sea kayakers also compete. I did myself for many years. None the less this book is not going to fulfil your research needs when choosing a competition racing/slalom paddle. There is guidance on this elsewhere. See my bibliography at the back of this book. Suffice to realise that there are such and that there is nothing to prevent you from using them on the ocean when sea kayaking, other than you may find them a little short.

WING PADDLES.

These are half way between a spade blade and a skinny blade. They have an 'aerofoil' chord or cross section. The New Zealanders who use them for preference on the sea prefer them to any other paddle. Until recently these specialised paddles were being used solely for competition paddling, having first

made their appearance at the 1985 Spring World Championships. Now they are being increasingly used for sea kayak touring.

When the blade is pulled through the water a lifting force is created directed forward, to keep the blade (fulcrum) still in its piece of water so that the kayak can be pushed past it. The movement of the blade out sideways during the stroke allows the paddler to use the more effective back muscles rather than the arms at the end of the stroke.

The arms are held straight with the hands high and power coming from a wide swinging of the shoulders and back. At the end of the stroke the top hand finishes upright across the body -a position that would be seen as poor technique when using traditional paddles. It pays to persevere with wing paddles as they take a little getting used to as precise paddling technique is more important than with conventional paddles. This action is almost the same as that for skinny blades. .

Wing paddles will not work effectively when used with a conventional paddling style. The blade may slice under your kayak if you pull hard directly back rather than allowing them to 'drift' out sideways. Aerofoil paddles are tricky to handle in rough water.

SPLIT PADDLES

These are joined by a ferrule in the middle of the shaft. They are usually carried on the rear deck under elastics in case the paddles in use break or are lost. The ferrule must be firm when shut yet separate without too much effort when taken apart. Later models have locking rings.

PADDLE PARK AND TETHER.

When not paddling at sea, as when eating, photographing or pumping out, be certain the paddle is attached to the kayak in reach of your hands at all times. Do not rest it unsecured on the deck, a small wave can wash it away out of reach. Some use an elastic on the foredeck, some a clip like a tool clip fitted to the side deck, some have the paddles on a permanent tether, one end to the centre of the paddle, one to the kayak or personal buoyancy. If a roll is necessary, the tether can interfere with the action and prevent it. Make up your own mind.

TOW LINE

Do not underestimate the need for an efficient towing system. I used to joke (still do!) that the only tow line I needed was a short one attached to my bows!! Not long ago I was leading a group of inexperienced paddlers along a fairly hostile coast, - lots of cliffs and rocks. Where we were looking for a suitable beach to land and make camp. We had passed one during the afternoon but we wanted to make a good distance so we had carried on hoping to find another one further on around the

distant headland. The map seemed to suggest we would be lucky. Lucky we were not. The wind and waves increased as we rounded the headland. No beaches came in sight and one or two, one in particular, of the group was struggling. I decided we had best turn and head back for the campsite we had passed earlier. It was a hard slog and without doubt we would have been in for serious trouble if we had not the means to effect a tow for our struggling paddler. The waves were pounding the rocks, there was no way off the water and our paddler was losing ground (or is it water?). I will not contemplate the situation should we not have been able to provide an effective tow. For the sake of a length of line we could have been in dead trouble.

So you are convinced! Let us look at some different systems. Like a lot of things in sea kayaking there is no one perfect system. Ideally we would tow from immediately behind the cockpit, rather as a tug tows from just aft of the midway point of its' length. The problem of towing from behind the cockpit is that the tow line will foul any gear you have strapped to the rear deck. Some run the tow line through a loop at the stern which effectively means the towing point is at the stem. The problem of towing from the stern is that every time the kayak being towed veers off course it pulls your stern round pulling you off course so that half your strength goes in paddling forward whilst the remainder goes in steering strokes to keep you on the right heading. Life is made easier if you have a rudder but this can cause obstruction to, and even be damaged by, the tow line.

So where is the best practical position to tow from? You could try from the rear and to one side of the cockpit. From here it is possible to effect a quick release and if you can keep the kayak being towed to the same side then your rear deck should remain intact. This is usually a forlorn hope as it is only a matter of time before the towed kayak swings to the wrong side, disturbing gear on your rear deck. The distance between the two kayaks during a tow is fairly critical. If the tow line is too long the veering action of the towed kayak will cause the towing kayak steering problems as described above. If the line is too short then you will have difficulty in reaching the end in order to secure it to a kayak, apart from which a following choppy sea can lift the towed kayak forward to collide with the stern of the towing kayak.

One method of towing which overcomes many of the problems described, is that of a line from the paddler's body to the towed kayak. A wide strap secured with a quick release fastening around the body of the paddler so that the line is free to move around the strap is the bet way to attach the line to the towing paddler. This is the system I use and it works well enough.

Essentially, a towing system has several requirements. It needs to be strong enough. The strain on a tow line, particularly if the towed kayak has water aboard and the paddler offers little assistance, is considerable. The line should float or it should have a small float attached. Braided polypropylene line floats and does not soak up water and is preferred. If you are using a small float have it at the fastening end so that if you drop or throw it, it is readily retrievable. In rough and cold conditions tying a line to another kayak can be hit and miss. It is extremely frustrating to have the knot keep coming undone as you are both being swept out to sea! You need a substantial karabiner made from brass or stainless steel which is well secured to the end of your tow line. If you are towing from your kayak rather than from body, then quick release is made possible by using a jam cleat, but these alone cannot be relied upon as any upward action will release the line and jam cleats get worn and can allow the line to slip

through during a long and difficult tow. A straight forward cleat over which the line is wrapped is less likely to come loose and yet it can be readily undone. Perhaps a jam cleat and cleat are a bit 'belt and braces' but I do not think so.

Modern buoyancy jackets have built in tow lines with a quick release mechanism which calls for towing from the body. No problem with this method I favour it myself. You are in control and more than once I have had to release the line smartly when circumstances require, - I would never admit to taking an involuntary roll!!

It is a good idea to build a length of shock cord, using 5 or 7mm marine shock cord (heavy duty elasticated cord), into your tow line. This goes a long way to smooth out the snatching action of a tow which puts an even greater strain on the system. Some recommend whip lashing one end of a short (+/- 60 cms) length of shock cord close to the far end of the tow line, winding the towline loosely round the shock cord before whip lashing the other end of the cord to the line. I prefer to simply leave the tow line slack between the two lashed ends of the shock cords as in Diagram 11, so that when the tow line is fully stretched out the shock cord is not at its limit of stretch. I shall be saying more about towing techniques later in the book.

To summarise; do not underestimate the need for a tow line, ensure it is strong, it floats, it detaches and attaches readily at either end. In case you are wondering why it needs to be readily detachable at both ends, I can think of several situations demanding this. The classic is taking a capsize during a tow and then finding your paddle or body is fouled up with the tow line. Finally, it is a good idea to check that all the kayaks in your group have a toggle or deck line suitable as an attachment point for your tow line -just in case!

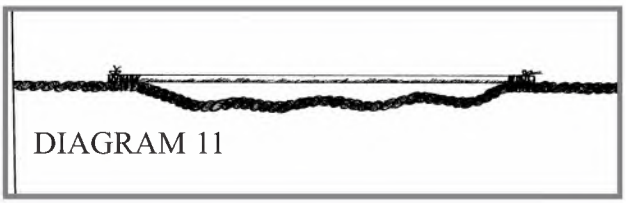


DIAGRAM 11

SPRAY DECKS

A spray deck is an essential item of equipment without which the sea kayak could not be used in rough water. The early Aleuts used KAMLEIKAS or rain garment which were made from the lining of intestines from whale, seal, birds or even bear. Once cured these almost translucent skins were artfully sewn to form a one piece hood, jacket and spray deck which gave the paddler protection from the wind and water. Even the modem synthetic GORTEX has not improved on the breathable and protective properties of these skin garments. Modern paddlers use neoprene or nylon, the neoprene being the most expensive but the most effective. At one time you could get a neoprene vest cum spray deck which had straps over the shoulders secured down by Velcro. Known as the TYPHOON spray deck, it was very effective in keeping one dry. In warm and calm conditions the straps were released and the body sleeve rolled down to keep cool. In any event, your spray deck should really have some sort of body tube if it is to be effective in keeping you dry. A good tight-fitting spray deck (or anti-splash skirt as they are sometimes called in the States) does actually mean a dry kayak, but be sure you can readily release it. A release strap fixed to the underside of the front of the spray deck should protrude outside the spray deck when it is fixed in position around the cockpit rim so that a grab and pull releases it from the cockpit coaming.

BUOYANCY AIDS/LIFE JACKETS

The vast majority of paddlers prefer the buoyancy jacket of which more after I have discussed the merits and de-merit of the Life Jacket. The Life Jacket fits over the head so that buoyancy is provided around the neck and over the chest. Straps secure the buoyancy firmly to the paddler which can be undone with a quick release buckle at the waist. These jackets are made to a British Standards specification which means they are not likely to wear out in a hurry, unless they get excessive abuse. They are filled with a closed cell plastic foam which provides 6kg of buoyancy. These can be inflated by blowing into a mouth

piece and once so inflated will provide 16 kg of buoyancy.

The only time a Life Jacket should be inflated is when you are in the sea awaiting rescue. An inflated Life Jacket should keep your face up and clear of the water. Hopefully a blown up Life Jacket will remain a very rare occurrence. Capsize with an inflated Life Jacket and it is possible you could become trapped as the jacket forces you against the up-turned deck. You can get Life Jackets that have a gas (Co2) cylinder attached. Pulling the cord releases the gas into the jacket and up it inflates. I do not recommend these. They are expensive, have a shelf life and are not useful to kayakers. Having said this, I store a collapsed Life Jacket with no inherent buoyancy in the large pocket at the back of my buoyancy jacket. This does have a gas bottle fitted. I figure that if I am ever in need of this extra buoyancy, I am unlikely to have the 'puff' to inflate a totally empty jacket. Should the gas release spontaneously whilst stored in the back pocket of my buoyancy aid, this would hardly be a catastrophe.

The main advantage of a buoyancy jacket is the all-round thermal protection it offers. It is comfortable to wear, easy to take on and off, whether it has a zip up the front or slides over the head like a vest. They are not bulky and sewing pockets for flares, sun glasses, chocolate, etc. is simple enough. Indeed, you can buy these buoyancy jackets already made up with pockets. One advantage of having a zip up the front of your buoyancy jacket is not only that it is easy to put on, but unzipped and lain flat it makes an ideal camping mattress. I am not sure the manufacturers would agree but after years of using mine in this way, it is none the worse for wear. Do remember to remove flares etc. from the pockets unless you are prepared for an uncomfortable night!! On one occasion I had not removed a couple of Mars Bars and once snug in my bag decided to leave them be with inevitable results -I still eat them!! Before leaving the subject, let me touch on the decision by some not to wear buoyancy at all but instead have it handy under deck elastics ready to don when conditions deteriorate. I admit that I often do this, but only when conditions are clearly favourable and I am with a strong group. The exception comes when I am leading or coaching a group. Under these circumstances I have much more responsibility for the safety of the group and no matter how hot and calm the conditions, we ALL wear buoyancy.

CLOTHING

After a while you will work out for yourself what is best for you. Much depends on the prevailing conditions, the length of your expedition and what you find most comfortable. Whatever you choose, clearly it needs to keep you warm or cool enough and not be restrictive. I once tried paddling around Anglesey with Keith and Robin. We had been going all day and come the early hours of the morning I had to pull out with badly chafed under-arms through wearing a rugby shirt that was too tight. The discomfort was acute as the salt burnt into the breaking skin. The lesson has to be, make sure your clothing is not only adequate but fits comfortably. Let me be more specific. If you are going surfing or intend spending time in the water practising rescue drills, etc. then you could well use neoprene wet suits or go for dry suits worn over fibre-pile or thermal wear. Surfing and dry suits do not always go too well together, as the energy used soon generates condensation within the dry suit so that your internal clothing gets quite wet. So long as the dry suit protects you from the wind, this is not a real burden. Neoprene suits can come in trousers, jackets with arms, vest or as a one piece with or without arms and these are available in several thicknesses from 2mm to 6mm. The 2 or 3mm are best for kayaking purposes. Paddlers often wear waterproof jackets (cagoules) and/or over-trousers which give a measure of protection. The wet suit works on the principle that the water trapped between skin and wet suit acts as another insulating layer. Once out of the water this trapped warm water escapes and the wind whistles through the neoprene.

For sea kayaking trips where you have no intention of entering the water, wet and dry suits are not the answer. Fibre pile long johns worn over a pair of trunks and a lightweight thermal vest is my choice of clothing. If the going gets warm, you can always unzip the front of the long johns and even remove the vest. If you start to feel chilled then a heavy woollen sweater or a more substantial thermal shirt, in turn covered by your waterproof jacket and buoyancy jacket should suffice. This is the 'layer principle'; that

is, layers of clothing removed or donned as the conditions change. If the conditions look like being cool from the outset then I will wear a pair of long thermal underpants beneath the fibre pile long johns with a pair of waterproof trousers over the top. It has got to be really cold to penetrate this lot. One point, if paddling in cold seas, then do make sure your lower body is well protected. Even on a warm day the cold will penetrate; nothing like having chilled knee caps and cold feet. I wear an old pair of trainers over any old pair of socks, unless staying warm and dry is important, (and it usually is), when I wear a pair of substantial woollen socks and a pair of 'bog-trotters', i.e. short wellington boots.

To top the lot, wear a hat. If it is cold a woollen hat, if it is bright, I favour a baseball type hat with a long peak. Often paddlers wear hats with an all-round wide brim, usually made of plastic to remain waterproof. These protect the neck from drips of sea water and the eyes from the sun. You would be surprised at the amount of body heat you can lose from an unprotected head. The early Innuit had the right idea. They wore elaborate hats with a long over-hanging front so that when heading into waves and wind with the head bent forward the spray was deflected. These were ornate, carved from one piece of wood and relatively valuable (worth one to three slaves!). Finally a cravat, better still a thin strip of towelling worn round the neck aids comfort in that a tight fitting cagoule can sometime chafe and unwanted drops of water are less likely to find their way through.

Finally finally, consider having a pair of paddle mitts permanently stowed in a pocket. The thin light-weight proofed nylon ones take little space in a cagoule pocket but they can be 'worth their weight in sheep-dip' when a cold wind and spray starts to cool your hands. Mitts are wrapped around the paddle shaft and held together with Velcro, you then tuck your hands through the cuff and grip the paddle shaft directly. This immediate contact with the hands on the paddle is important and is prevented should you choose to wear gloves. The paddle is an extension of you and your fine control over them, particularly in difficult conditions should not be impaired by any material coming between your hands and the paddles as would be the case if you used gloves. Apart from which gloves really do not always guarantee warm hands. Wet fabric (woollen in particular) will cause an even grater cooling effect and they are slippery so control is lost. A paddler on the Devizes/Westminster Canoe Race (125 miles of canal and river running west to east across the English country ending in London) used rubber gloves - boy! were his hands a mess at the race end, probably due to lack of circulation. In fact, your hands are unlikely to feel cold once you are underway and your circulation is going. Winter kayak racing is a good example. I recall getting quite chilled waiting at the start line with only a thin vest and maybe a cagoule. Once the race was underway it was only minutes before everything was well heated up hands included.

TENTS AND SLEEPING BAGS

TENTS

Most lightweight tents are designed with an inner tent and flysheet, combined; others come as two separate items. Either way it is important that space is maintained between the two when the tent is erected. One of the major problems with lightweight tents is condensation caused, by your moisture laden breath.

Cooking within the tent adds to the problem as most fuels give off water vapour when burnt as does steam given off when cooking. In the event of heavy rain on the fly sheet the temperature over the flysheet will drop to a few degrees above freezing as this is the temperature of rain and condensation may even give the impression of a leaking tent. I usually keep my gear stowed in weatherproof bags in the tent until I have finished cooking and am fully ready to get into the horizontal position. The exception to this occurs when the weather is good and then the sleeping bag can well be draped over a bush to air so long as the dew has not started to fall.

The purpose of the inner tent is to provide shelter under the fly sheet which will remain dry. The floor of the inner tent should be sewn in so that the edges are raised to form a substantial lip or tray. This floor is made from lightweight, completely waterproof, material.

The inner tent material is usually very lightweight close woven and may have been shower proofed to discourage any drips of condensation from the fly sheet. The function of the inner and fly sheet are combined in the single walled tent by using a breathable and waterpoof material such as Goretex.

On its' own.....

Goretex tent fabric is a three layer construction, rough woven, very absorbent material, which acts to spread any moisture on the inside layer over a large area which speeds up its evaporation through the fabric. Goretex tent membrane is different from that of clothing in that is has a higher air and moisture vapour permeability and is more readily contaminated and damaged so care is required when handling. It relies on the temperature and humidity difference between the air on. either side of the fabric in order for it to "breathe'. It works best when the air inside the tent is warm and damp relative to the air outside.

Such 'breathability' reduces in cold weather when you are snug in a good sleeping bag and the temperature difference between in and outside the tent is reduced. Consequently, Goretex tents are at their best when used in dry cold conditions as opposed to moist foggy conditions. The interior volume of Goretex tent has a significant effect on 'breathability'. Goretex bivvy bags are more efficient as the fabric, being close to the body is close to the heat source which emphasises this point. Double skin tents are always warmer due to the layer of air between the inner and outer walls.

.....or as a group, a tent can be home from home

I always carry a Goretex bivvy bag and have had many occasions to be thankful I did. A Goretex bivvy bag combined with the use of a tarpaulin stretched over between trees to allow cooking and shelter from the weather is, for my money, much better than a tent any day -or night. When choosing a tent do make sure it is going to be big enough. Allow a minimum width per person of 55 cm plus an extra 5 cm each side to avoid touching the tent sides, allow 15 cm each side of the tent walls slope downwards.

When considering the **LENGTH** of your tent add at least 15 cm to your height to allow for clothes and allow 35 cm if the end wall of the tent slopes. Some manufacturers (Saunders for example) will make a tent to a specified size should you be a particularly tall individual.

When considering the **HEIGHT** of your tent you need to remember that you need to be able to at least sit upright, -this determines the absolute minimum height for a dome tent. Allow an extra 10 cm for a ridge tent.

Most tents do have an entrance or porch area which is useful for wet kayaking gear and for cooking under. There is a variety of tent shapes to suit all whims and purposes. I like the simple dome shape

which is supported by flexible poles which are pushed through sleeves to actually erect the tent. The tent can then be placed over the best site and pegged down. High winds can distort those tents considerably which is a little nerve racking. Given that you have correctly pegged it down, your poles should withstand the severest gale, as the guy lines take the strain.

The Geodesic Dome tents are so designed that all the poles do not cross at the centre but at different places throughout the structure so reducing the length of unsupported poles and dividing the tent into smaller panels. Some dome tents can be difficult to erect in windy conditions so do watch this point when purchasing.

One or two tips. I always carry one of those large orange polythene survival bags and I make use of it by laying it over the ground sheet. Apart from adding protection from wet ground it also provides another layer of insulation. Before laying out the polybag I will often use it to off load all my gear from the kayak in order to transport it up the beach to the tent. With the kayak now virtually empty I am able to then carry the kayak up the beach to my tent.

Once the kayak is by the tent I like to lay it along the 'weather-side' of the tent so that it is up-side-down with the hull facing the weather. This adds considerably to the security of the tent. In particularly windy conditions it may be worth weighing down the kayak with rocks or even roping it down. Lines from the bow and stem of the kayak can also be secured to the tent to add further security or just to hang out the washing.

Finally I recommend you treat the seams of your new tent with seam sealant if they have not been tape sealed during manufacture.

And finally, finally, it goes without saying that before storing your tent you must ensure that it is clean and thoroughly dry. I spoilt a tent a few years ago because I left it crated ready for shipping home in a damp condition only to find that a few months later when I collected it the mildew had ruined it.

SLEEPING BAGS

The best substance for preventing heat loss as you sleep is air. To be effective the air around your body needs to be static. The purpose of your sleeping bag is to therefore trap air and hold it in a layer around you whilst at the same time allowing the small amounts of moisture (sweat) to escape. Various types of filling are used to trap the air and a fabric shell holds this filling to give an even insulation over the whole sleeping bag.

The effectiveness of a sleeping bag is consequently dependent on the amount of air trapped which in turn is dependent on the quantity and the loft of the filling. The 'loft' is the amount by which the material expands to trap air. The method of rating a sleeping-bags' warmth is the SEASONS RATING.
A 1 Season bag is suitable for a UK summer night; a 2 Season for late spring to early autumn in the UK when overnight temperatures do not go below freezing. A 3 Season bag is for use in all but winter conditions when quite heavy frosts occur and a 4 Season bag is for all-year round use.

In many places of the world temperatures vary considerably between night and day and when turning in it can still be fairly warm, but come the early hours of the morning it can be extremely cold. Of course you can always sleep in your clothes or don thermal underwear which effectively upgrades a low rated bag. Personally I hate wearing clothes and prefer to use them a a pillow at night. An inner sheet can also provide some warmth as well as it being a hygienic way to use a sleeping bag.

If you intend using a 3 or 4 Season bag in warm climates it is certainly advisable to have a bag with a full length zip which not only allows easy access and egress but can also be zipped down at night when you get too hot. As to fillings of a sleeping bag the best is the most expensive, which is usually the way

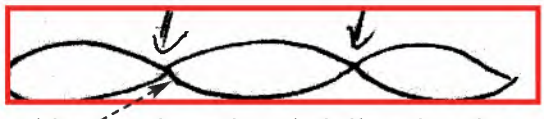
of course. The best loft is obtained from natural fillings which also give the best warmth to weight ratio, as well as packing down to the smallest volume and though expensive initially these fillings do have a better life expectancy than synthetic materials.

The big problem with natural fillings is that once wet they lose their capacity to provide warmth much more than do synthetic fillets and they also take a lot of drying out. A good waterproof stuff sack is a must when using a bag with natural fillings. The natural fillings of choice are feathers or down, the sort that keeps ducks and geese warm. The cheapest (cheep-est!!) are curled chicken feathers, then duck feathers, duck down and finally the high performance goose down.

Various blends of these fillings account for the wide choice of bags and the wide difference in prices. As for synthetic fillings, these are usually made from different types of polyester fibres which are graded into six varieties, starting with basic polyester fibres and going up to Meidhart Wadding, a top quality polyester wadding.

The most common material in use to make the shell fabric are plain weave nylon, Pertex, Veratech or Goretex. All the fabrics are made to prevent leakage of the fillings. Heavier fabrics are cheaper but are not as effective as the lighter bags in allowing the filling to loft to its full extent.

The method of construction is important. The sewn through bags are mainly used in the 1 or 2 Season bags.



The offset layers eliminates the cold spots along the stitch lines but they are rather heavy.

The boxed walled channels allow the filling to achieve a deep loft and eliminate cold spots.

Finally, if camping in temperatures less then 5 degree C then a hood is advisable which can be drawn tight around the head. A cold head will lead to a considerable loss of body heat.

SLEEPING MATS

When lying down the filling beneath you is obviously squashed and consequently ineffective in trapping the air. It is therefore essential to provide some form of additional insulation. The commonly available closed cell foam mattress, which is light weight and rolls up tightly, is cheap and efficient.

I prefer the THERMAREST mattress. These are self-inflating airbeds with a durable yet light weight shell which is filled with a soft sponge-like foam. When a valve in the shell is opened the foam expands sucking in air. I usually undo the valve and throw the mattress in the tent. A few minutes later I screw down the valve, maybe adding a few lungs of air to the mattress first.

You will find a comprehensive list of equipment as an annex at the back of this book which hopefully you will find useful when it comes to assembling your gear prior to any sort of expedition.
