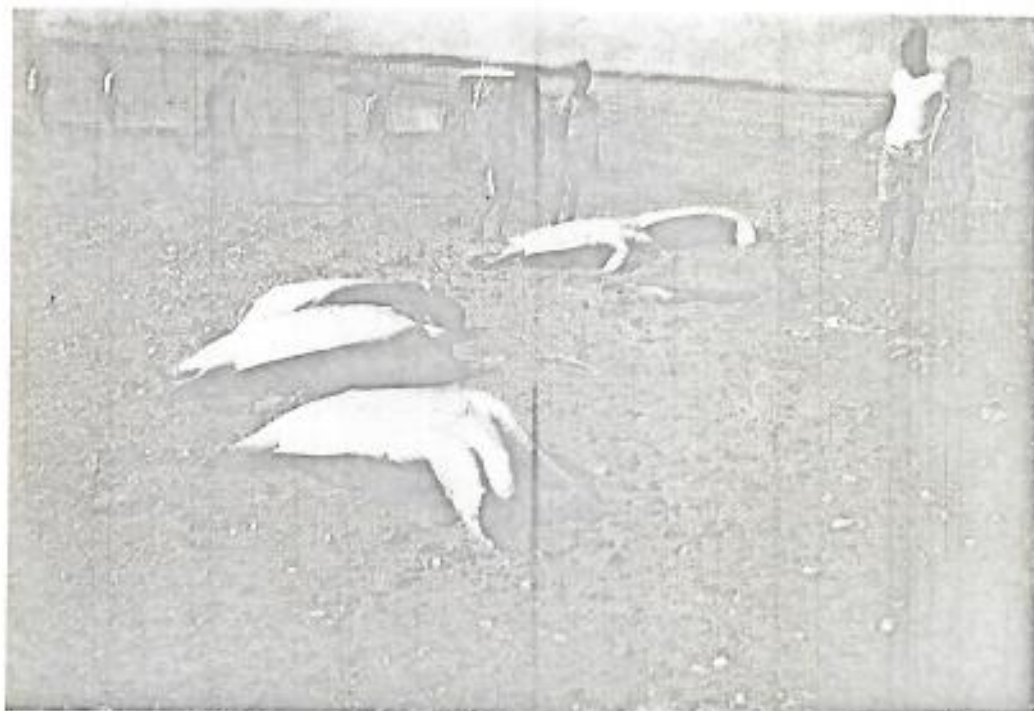


THE GREEN TURTLE IN SOUTH ARABIA

By V. T. Hinds



Freshly caught
turtles on the
beach.

Photo: V. T. Hinds.

WHEN next you have the opportunity of travelling along the beaches outside Aden, keep a sharp eye for signs of the green turtles (*Chelone mydas*) that are moving along the South Arabian coastline through the year. Broad tracks on the sand-dunes show where the female turtle has left the sea at the period of full moon when the tides are high, in search of a suitable site to lay her eggs. Occasionally a dark head may be seen bobbing among the waves off-shore as a turtle comes up to breathe and take its bearings. An estimated quarter of a million turtles are spread along the coastline from Perim Island to the farthest extent of the Mahra coast.

A grass eater

An air-breathing reptile, living in the sea, the green turtle is, however, tied to the land because

the young turtles are hatched from eggs which must be laid ashore in the warm sand. A mature animal may weigh 300lb. depending on its age, and the overall length of the top shell may reach four feet. The male is characterized by a long prehensile tail and a horn-like hook on the leading edge of each of the front flippers. The male very rarely lands on the beaches, but some are occasionally stranded in shallow water during the breeding season. The female has a relatively short tail and after mating emerges from the water to lay her eggs.

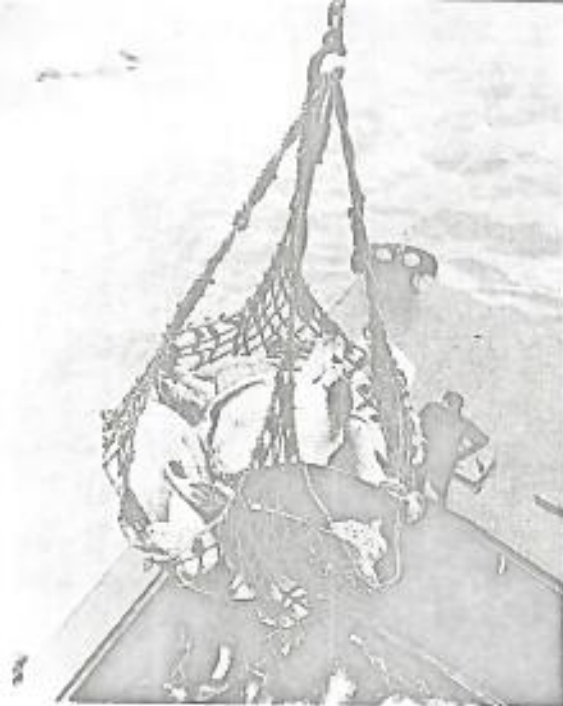
The turtles gather on the turtle pastures where there is a good growth of the grass *Gymodocea sp.*, the main component of the animal's diet. In some areas turtles are found in association with the sea-cow (*Dugong dugong*), an air-breathing mammal which also feeds in shallow water. It is on these pastures that the turtles feed and sleep

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Loading frozen turtles in Aden.

in fair numbers during their continual travels along the coast in search of suitable beaches to lay their eggs.

Breeding

In the breeding season the male turtles congregate within 100 yards of the beaches and mate with the females in the water. The female turtle presents an unstable platform in the water, but nature has provided the male with two hook-like appendages on the fore-flippers with which he grips the front edge of the top shell of the female turtle. The long prehensile tail is hooked under the female turtle, providing a third point of attachment, thus preventing the male from falling off during the mating process, which takes about twenty minutes. A characteristic of old female turtles is the deep groove to be found on each side of the head where the male hooks have cut into the plates of the top shell.

Egg laying in nest of sand

As the sun sets the female turtle leaves the water and proceeds to crawl across the beach and up into the sand-dunes. A suitable site is chosen and the animal proceeds to scoop out a wide hollow in the sand, using her broad flippers. When this hollow has reached a depth sufficient to hide the animal, and firm sand has been found, the rear flippers only are used to

excavate a pit about eighteen inches deep and a foot in diameter. It is in this hole that the female turtle lays her clutch of approximately 100 soft-shelled eggs. After the eggs have been deposited the turtle fills the hole with moist sand, which she packs down tightly and further covers with loose dry sand to camouflage the nest. Female green turtles may lay up to 600 eggs in a season with intervals of three to four weeks between nests.

Emergence of young turtles

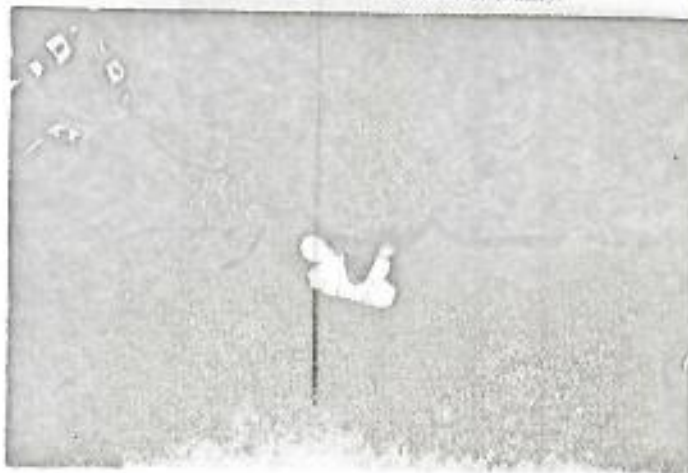
Towards the end of the incubation period, which may extend from fifty to seventy days, the young turtles emerge from their shelter and by concerted movement form a chamber at the bottom of the pit. The continual movement of the small turtles on the top of the pile breaks the roof of the chamber and the sand filters down between the bodies of the young animals and is again packed by the young turtles at the bottom of the pile, increasing the height of the floor. In this way the chamber containing the clutch of turtles moves towards the surface until finally the young animals emerge.

The race to the sea

Nature has ordained that these young turtles should orientate themselves towards the area of greatest light and least obstacles, i.e. the horizon between the sea and the sky. Now the newly hatched group move rapidly down the beach to the sea, running the gauntlet of predatory birds and ghost crabs (*Ocypoda ceratop-*

Turtle laying eggs at night.

Photo: J. Bradley.



thalma), which take the first toll of these baby turtles. It is during the breeding season that the smell of turtles attracts sharks in the shallow water and large numbers of small sharks again cut down the ranks of the survivors. Perhaps three per cent of the hatchlings are left to reach maturity. However, even the large mature turtles are liable to attack by the tiger shark (*Galeocerdo cuvier*) and frequently turtle heads, flippers and pieces of shell are found in the stomachs of these sharks. Female turtles have been observed with stumps of flippers presumably amputated by these fierce predators.

Sucker fish and turtles

A common traveller with the green turtle is the sucker-fish (*Remora remora*), which grows to eighteen inches and has on the back of its head a flat sucker which is in fact a modified fin enabling this fish to adhere to the under shell of the turtle. In this way it obtains free transport and also free food, since when the turtle feeds it is able to pick up fragments left lying about; a large proportion of the food of the sucker-fish consists of the faeces of the turtle. The sucker-fish does not harm the turtle in any way, and consequently it cannot be called a parasite.

Set a fish to catch a turtle

Fishermen of the Bajun Islands, off the Kenya coast, make use of the sucker-fish to catch turtles. First they catch the fish by using a baited hook and keep them alive in a section of the canoe where fresh sea water is contained between

wooden partitions forming a small tank. The fish are regularly fed and frequently exercised by making them stick to the side of the boat and gently, but with increasing effort as the days go by, pulling the tail, and consequently strengthening the back muscles of the fish. In this way the fish are strengthened and handled and treated as valuable pets. When the fisherman considers that his protégé is sufficiently strong a small iron ring is fitted over the narrow part of the tail and to this a line is attached.

The fish is then released into the water over a turtle pasture. The natural instinct of the sucker-fish drives him to find a turtle and this he does, in due course fixing himself to the large animal by means of the sucker on the back of his head, thus making contact between the fisherman in the canoe and the turtle on the sea floor.

At this stage the fisherman clips on to the line holding the sucker-fish another small iron ring containing a miniature grapnel iron. This ring, attached to a second line, is allowed to slide down the first line leading to the turtle. As the grapnel swings beneath the turtle the fisherman strikes with a strong pull, driving the hooks into the under shell of the turtle, and in this way ensures the catch. This is a skilled operation peculiar to the Bajun Islands and was shown in detail in the film "West of Zanzibar."

Other methods of capture

Other methods of catching turtles include the use of floating walls of large-mesh nets in which the creatures become entangled, but because these nets have no weights attached to the bottom the turtles can surface in order to breathe and consequently can be collected alive.

The more common method used to capture turtles in South Arabia is the beach seine net. One end of the net is anchored to the beach, the main portion being shot around a section of the turtle pasture, and the other end is then brought back to the beach again. The fishermen then haul both ends of the net, pulling it ashore with the trapped turtles. An advance on the beach seine is the encircling net which is shot around groups of turtles swimming off-shore and hauled aboard the motor fishing boat. In the Seychelle Islands a specialized harpoon is used to capture turtles, the head being designed to lock between the plates of the top shell of the turtle without penetrating the fleshy parts, which would cause pain to the animal and possible serious damage.

Female (top) and male turtles, showing longer tail of the male. Photo: V. T. Hinds.





Turtles mating (photograph taken under water).

The turning of female turtles on the beaches during the breeding season is not popular along the coast of South Arabia due to the fact that the animals come ashore in isolated areas where it is difficult to obtain transport to carry the animals to processing stations. This is in itself an economical control limiting this deplorable method. Capture by nets is far more efficient and selective.

Live storage

The care of turtles after capture and prior to processing is an operation developed from long experience in this industry. As the rib cage of turtles is not designed to support the weight of the body for long periods and the danger of suffocation would arise, the animals must be stored on their backs. The head must be supported by a wooden pillow at the correct level to allow for free respiration when the animal is stored in this manner. Since turtles are prone to pneumonia and sun-burn they must be stored in the shade, sheltered from draughts, and must not have water thrown on them. When correctly handled in this way the animals are still quite fit after fourteen days. Alternatively, a turtle kraal may be built for holding the turtles, surrounding an area of clean water and covered by a roof of matting for shade.

Turtle products of commerce

The commercial products obtained from the green turtle are channelled to a luxury retail trade. Turtle soup, made basically from beef bones and stock, contains a certain amount of turtle meat, similar to the piece of pork in a can of beans. The glutinous consistency of turtle soup is assured by the use of a dried resinous substance extracted from between the

plates and bones of the shell and skeleton; this is called calipash, and calipee, the dried flesh of the flippers and neck, is reconstituted and added to the basic soup.

The green turtle fat, from which the animal obtains its name, is rendered down and the oil obtained is used in the preparation of unguent, lotions, turtle creams, and shaving and toilet soaps. The oil is also used medicinally.

Turtle eggs can be processed to obtain a very fine quality oil which is required for certain intricate machinery. The shell of the green turtle has no commercial value as the plates are reputed to be too thin.

Conservation measures

The conservation aspect of the green turtle industry is always uppermost in the minds of those concerned. The annual uptake of the market for turtle produce in Europe is not large and can be easily flooded. Since the market is supplied by several producing areas, each in competition with the others, excessive production is not feasible; the economic control is therefore quite effective.

Assistance is being sought from overseas by the Department of Fisheries of the Federal Government to carry out research into the life history and migration of the green turtle, and also advice on the establishment of turtle farms and hatcheries where the young turtles can be protected from their natural enemies until such time as they are able to fend for themselves. These methods of husbandry within the industry are just as essential as reforestation in the timber industry of other countries.



With these points in mind the traveller along the beaches near Aden may keep a watch for young turtles, or mature turtles stranded in shallow water and helpless on the beach, and guide them back to their natural element. The purchase of baby turtles and turtle eggs offered for sale should be avoided. Very few of the people living on the coast of South Arabia eat turtle meat for religious reasons; poor fishing communities, however, earn badly needed money by the capture of mature turtles for processing. This increased prosperity can be reasonably ensured if measures are taken to protect the eggs and the young.