CEYLON and the UNDERWATER ARCHAEOLOGIST

By ARTHUR C. CLARKE

Ceylon, where I have lived since 1956, is almost virgin territory for the underwater archaeologist. My partner, Mike Wilson, and I first became aware of this when skin-diving off the great harbor of Trincomalee, on the east coast of the island. We were exploring some two hundred yards from a precipitous headland known as Swami Rock, which for three thousand years (according to local legend) had been the site of a Hindu temple. Although we knew nothing of the history of the place at the time of our first visit, we soon became aware that there was something peculiar about the sea-bed over which we were swimming. Huge blocks of stone were scattered in every direction and, though overgrown with weeds and barnacles, many had a curiously artificial appearance. At first we decided that this must be an illusion; the action of the sea can sometimes carve rocks into surprisingly symmetrical patterns. But presently we had unmistakable evidence that beneath us was the work of man, not of nature.

The capital of a stone doorway, badly eroded but perfectly recognizable, lay in the jumbled chaos of rocks. Beside it was a broken column, its square ends bearing on each face a lotus-petal design not unlike the Tudor Rose. As our eyes grew more skilled in interpreting what we saw, other regularities began to make themselves apparent. The ruins of some great building had been scattered along the sea-bed, where they lay in hopeless confusion. The water at the foot of the headland was quite shallow; where we were diving it was nowhere more than fifteen feet deep, and most of the broken masonry lay only about five feet below the surface.

It was not until some weeks later, when we were back in Colombo, that we learned the history of Swami Rock from Dr. W. Balandra, who has been largely responsible for the erection of the modern temple and has made the place a subject of special study.

The destruction of the temple began on the Hindu New Year’s Day, 1624, when Portuguese soldiers disguised as priests mingled with the worshippers and so entered the sacred precincts. They waited until the temple was deserted by the New Year’s Day crowds, who followed a procession down the hill and left only a few priests on Swami Rock. Then the plundering started; probably all those left in the temple were killed, and in a few hours the accumulated treasure of almost two thousand years was looted. The Konnara Temple—to give it its proper name—was one of the richest in Asia. It must have contained a fortune in gold, pearls, and precious stones, and though the Portuguese must have captured most of this wealth, they did not

ARTHUR C. CLARKE is a scientist of note as well as one of Britain’s outstanding science fiction authors, his interests ranging from outer space to underwater exploration. For a paper entitled “Extra-Terrestrial Relays” published eighteen years ago in the journal, Wireless World, he has received the 1963 Stuart Ballantine Medal, the citation reading, “...his soundly-based and prophetic early concept of the application of satellites to the primary human endeavour of communication.” In 1962, he received the Kallana Prize, the annual UNESCO award for the popularization of science. In his first book Interplanetary Flight, he predicted with surprising accuracy events of the next ten years, and this prophetic talent is evident in all of his stories. He is chairman of the British Interplanetary Society and a member of the British Sub-Aqua Club. Since 1954 he has been engaged in underwater exploration and photography, first around the Great Barrier Reef of Australia, later along the coasts of Ceylon.
get it all—as was demonstrated three hundred years later.

In 1950, some workmen were digging a well in Trincomalee when they came across metal artifacts near a bed below the surface. Further excavation revealed the statues of three Hindu gods, which were handed over to the authorities—not, one imagines, without some reluctance, for they comprised more than a hundred pounds' weight of gold and copper alloy. Further inquiries revealed that two other statues had been unearthed some months previously by local residents of the town. The Committee of Survey of the temple authorities were also among the wise. All that Dr. Balendra's brochure Trincomalee Bronze says on this subject is that "Persistent search was made for these finds... and they were ultimately handed over to the Chairman of the Committee appointed to restore the temple. This is a most important statement, one cannot help thinking, leaves a great deal unsaid.

The five statues which now stand in the new temple are among the finest examples of Hindu bronze sculpture known to exist. In particular, the seated figure of Siva, which dates from about the 10th century A.D., is regarded as a masterpiece.

It is easy to guess how these statues escaped the attentions of the Portuguese. The location of the temple, the priests must have sealed the most sacred objects and buried them where they hoped they would not be discovered. They were found, in fact, about five hundred yards from the temple, and one must think that it would be most interesting to go over the rest of Swamib- Rock with a metal detector.

Although we have dived in this area on many occasions since 1956, we have never carried out a full-scale investigation, which would be impossible without such expert guidance. In any event, our attention was diverted elsewhere in 1958, when Mike Wilson started operations on a remote and dangerous reef some seven miles from the south coast of Ceylon. The Great Basses reef, as it is called (Basses is a corruption of the Portuguese Basses, meaning shoal) consists of a line of rocks several miles long which lie just below the surface of the water. One larger rock, approximately the size of a tennis court, is about a yard above the waterline and is surrounded by a fine lighthouse built by the British in 1870. While he was exploring this area in March 1961 with two young American boys, Mark Smith and Bobby Krieger, I discovered a small bronze gun lying on the sea-bed, which indicated the presence of a nearby wreck. A larger cannon, partially buried in coral, was then discovered, and another immediately adjacent to it with silver coins scattered all around the area. Although they had no suitable tools, they were able to chip out about 120 pounds of silver from the sea-bed and bring this back to shore, together with two small bronze guns.

The coins were identified by Commander Maudell Peterson of the U.S. National Museum, and were Surat rupees. Most appeared to be in mint condition. All bore the same date, A.H. 1113 (A.D. 1702) and most of them were in lumps of 1000, still in the shape of the bags into which they had been counted and packed (later we were able to discover fragments of sacks of these bags). Owing to various vicissitudes, it was two years before we could return to the site, but in late 1963 Mike Wilson, Rodney Jonklaas and I were able to organize a more elaborate expedition. We were exceedingly fortunate in having with us Peter Throckmorton, who flew out from Greece to join us. Despite many difficulties and considerable dangers, not the least those caused by the tremendous surge over the reef which often tore the divers from their positions, a survey of the site was carried out and a good deal of material recovered. Throckmorton was able to make quite an accurate plan of the wreck, and we obtained sample material which is now being studied, and which we hope will eventually identify the wreck.

So far, we have salvaged about 350 pounds of coins, but Peter Throckmorton estimates that at least a ton still remains on the site. (We have found records indicating that ships of this period carried up to five tons of silver on trading missions!)

The efforts of our small-scale expedition, limited by troubles with our boat and the short diving period between the monsoons, barely scratched this fascinating site. We are now taking steps, in cooperation with the Ceylon Archaeological Department, to safeguard this site legally so that only authorized expeditions can operate on it.

From its geographical position it is obvious that Ceylon must be surrounded by thousands of wrecks, accumulated over centuries of seafaring; we have visited about forty of modern times. Of course, most of the ancient ones will have disintegrated and will be completely buried beneath coral and debris, beyond the hope of recovery. It is only by an extraordinary series of coincidences that we stumbled upon the Great Basses wreck.

I would like to end by mentioning one other fascinating prospect. In 1885 the P&O liner INDUS, steaming south from Madras to Colombo, its course marked by the lighthouse known as Mullaituvattu, fifty miles north of Trincomalee, there was no loss of life, but none of the cargo could be salvaged—and among that cargo was a collection of the finest works of art from the stupas of Bharatpur (2nd century B.C.). This was later sold by a jeweler who had bought it from the owner, and was found in a chest at the old Custom House. In 1901, a large silver vessel, the Skrubbe, was discovered off the coast, and this was thought to be the wreck of the 1885 INDUS. However, we know that salvage operations were conducted on the wreck at the time and it is possible that these statues were recovered. Until this is cleared up, it is obviously not worth making any plans for investigation of the INDUS. If anybody has any information on this matter, we would be glad to hear it.

SUGGESTED READING

Accounts, illustrated with photographs, of the diving off Swami Rock will be found in The Reefs of Tiranibone (1957) and Boy Beneath the Sea (1958). A preliminary report of the discovery of the Great Basses wreck is in the Appendix to Indian Ocean Adventure (1963). The full story of the 1963 expedition will appear in The Treasure of the Great Reef (Spring 1964) and Indian Ocean Treasure (Fall 1964). All these books are by Arthur C. Clarke and are published by Harper and Row.

The GREAT BASSES WRECK

By PETER THROCKMORTON

When I arrived in Ceylon, a great deal of preliminary research had been done by Arthur Clarke and Mike Wilson on the problem of identifying the Great Basses shipwreck. With the help of Major R. Raven-Hart, an expert on the history of Ceylon, they had established that the Dutch East India Company had used Surat rupees like the ones found on the wreck and subsequently identified by Commander Peterson as standard coinage in Southeast Asia. Major Raven-Hart searched the government records which had survived from that period, and turned up some fascinating references, one of which indicated that the Overness, a fluyt owned by the Dutch East India Company, had been wrecked on the Basses reef in 1704 on her way from Batavia.

I have found a transcript of the minutes of the Governing Council of Ceylon of 11 February, 1704. At the meeting it was discussed "whether or not to hold up the Yachtlet De Pool any longer..." Since, to the surprise of the Governor and council, there had been not the least news from Surat since the previous November, the implication was that the annual pay ship for the Dutch garrison of Ceylon, carrying silver from the Surat mint, had been lost in 1703 or 1704. Yet if the silver had belonged to the East India Company, one would expect it to have been marked with the VOC mark. These coins were not so marked. Another disquieting factor was Commander Peterson's identification of the two small cannon on the Basses reef discovered in 1961. These, he felt, were almost certainly of Eastern manufacture.

The purpose of our small expedition was to identify the ship. If she proved to be European, there was a good chance that we might find records describing what had been on board when the ship sank. My previous experience with shipwrecks had led me to believe that even smashed wrecks on rocky bottoms should have bits of the hull which might enable us to determine where the ship had been built, and that, lacking concrete evidence from the wood, there would certainly be glass and pottery which might identify the wreck.
We were given permission to set up our camp at the base of the Imperial Lighthouse Service at Kirinda, ten miles to the west, through the kindness of Mr. F. E. Rees, MBE, Superintendent of the Service in Ceylon. There were we greatly assisted by the lighthouse superintendent, Tuan M’Amade Buhar Hamin, and the lighthouse crew, who allowed us to camp in their boathouse and use other facilities of the base.

Our crew consisted of Michael Wilson, Arthur Clarke, Rodney Jenkins, theirSingalese assistants, and myself. We had a 25-stone motor launch especially prepared by Wilson for the expedition, and the usual diving equipment. Two rubber dinghies were particularly useful for working over the wreck site.

Although this was the calmest season of the year, big seas still broke on the reef just outside the wreck area, and we had to find sheltered approaches from the sheltered side, swimming nearly a hundred yards through a gap in the reef. This was impractical, and so we then anchored the launch several hundred yards outside the reef with a good length of chain, and dived from the rubber dinghies which could be safely handled even at the beginning of the season.

The first task was to make a rough survey of the site. This was difficult because breaking seas set up such a powerful current that an unwary diver, unless tied to the bottom, could be swept thirty or forty feet in either direction. Even in the thirty feet of water at the deepest end of the wreck area it was difficult to remain in one place. An accurate triangulation of the kind carried out on the Methone wrecks (Expedition, Winter 1963) was impossible. The only workable method was to measure the conspicuous objects in the wreck area, measure the distances between them, and make overlay photographs to consolidate the measurement.

Little was visible through the heavy growth of coral which had formed over the remains of the wreck, which lay in a channel between 15 and 20 feet wide, formed by two ridges of coral reef running east and west. Four anchors, standard equipment on the forecastle of a ship of the period, were lying together at the east end of the galley. They were at least 13 feet long by slightly under 13 feet across the flukes, and lay 120 feet from the bronze gun at the west end of the gunport, and the silver had been found. Among the anchors were two bronze cannons, much overgrown. Between the anchors and the bronze cannon were two groups of iron cannon. One group was of three cannons and the second, 15 feet east of the bronze gun, contained 14 cannons. Slightly to the north of the large group, lay a larger gun. The short guns were dim and faint, four inches in diameter, and the length of ten feet of the large gun seems long even for an eight-pounder, though the shorter guns can well have been six- or eight-pounders.

Once a rough sketch plan had been made, we had a fair idea of what had happened to the ship. Assuming the anchor was left in bad weather towards the land, she would have been close to the breakers before her lookouts saw anything. Perhaps there was time for an attempt to come about, and she missed stays, to go broadside onto the reef. The breakers lifted her over the first line of reef, to lodge in the valley between reefs. The pounding surf must have smashed the wooden hull to pieces in a very short time. The heavy cannon and anchors fell through the disintegrating decks to lodge in the ravine, which was only large enough to contain the sunken ship. The upper works washed onto the inner reef, where the small swivel guns were found, and bits of wreckage probably washed over the reef. The material from the after cabin and from the gun room and library under the cabin, lashed links of the bronze cannon and the masses of coins. Much of this material was held in place by the bags of silver.

There can have been few survivors, since life is not possible on that savage reef which lies ten miles from the nearest land and is continually swept by great seas. If, however, she was the Oceanwalm, we are told to provide the information about her sinking which is in the report of the Governor’s Council. We then began to work in the area around the bronze cannon. The bottom was a solid mass of concreted material held together by sand, coral growth, and diffused corrosion products of copper, which were as hard as cement. It was full of bollast stones, silver coins, silver and silver-plated planks of several sizes, some probably ship’s planking and others perhaps boxes which held the sacks. The area was full of the remains of iron ship fittings, cannon balls, iron nails, and pigstil and musket barrels. The cast iron cannon balls were charred, although greatly oxidized, sometimes so much so that they were feather light. There were grenades with their wooden stoppers still in place, although the iron was fragile as pottery.

The ship had been iron fastened with two centimetre square and four centimetre (diameter) rings. The water had reduced them to a black mass, and they were surrounded by a spreading mound of sea growth. The corroding iron had stained the whole mass black, and it smelled strongly of pitch and gunpowder when raised. The general effect was very similar to that of the Cape Geldermaa wreck which, although nearly three thousand years older, lay on the same sort of bottom. The technique of jacking up lumps of concreted material proved as effective as it had at Cape Geldermaa. When we had removed a good deal of the overburden of concreted material from the cannon, the piece of timber free, then raised it with the help of a plastic balloon. On shore we found its wooden tripod was still in place. The gun measured 4" 7" long, and was marked 2 3 / 23 8" on its breech.

Freeing the cannon loosened other material, and we broke out hundreds of pounds of lead. These contained a fair sampling of material from what must have been the after end of the ship: a pair of matched flintlock pistols with brass barrels, the stocks in good condition and the barrels badly corroded; the forearm of a musket, a pecker wood; bits of broken blue and white china and other sherds; a bronze pestle; one gold-washed brass earring with green glass pendants; a bit of a green glass bottle; a piece of bone too small to be identified; the brass butt-plate of a musket, pistol and musket balls; and a silver-plated copper collar. Mixed in with the mass, like straw in bricks, were pieces of the coconut fibre bags in which the silver had been carried, pieces of overalls, of the bags to the bags, and fragments of bamboo mats. Every lump was full of silver coins, always rubbies and half rubbies of Aurangzeb, which had scattered through the wreck when their bags were cut. It was remarkable how much material had remained in approximate archaeological context after the wreck broke up, as if it had been displaced directly under monsoon waves for the better part of every year.

After two weeks we left the site, having raised a good sampling of material in order to identify the wreck, together with several hundred pounds of silver. We concluded that the intrinsic value of the treasure, though not of great deal of it on the wreck site, would not justify the cost of excavating it. The wreck is, however, of considerable historical interest and ought to be further explored.

On returning to Athens I began a correspondence with various experts in an effort to identify the wreck. Commander Mendel Peterson of the United States National Museum wrote that the brass cannon was probably English. The marks on the breech iron indicated a four, five, six hundredweights, and individual pounds. The National Museum’s firearms experts, Mr. C. G.
Goins, examined the pistol stocks and concluded that they were characteristically English or German.

Dr. N. M. Japikse, archivist at the Algemeen Rijksarchief in Holland, wrote that there had been three ships named *Overness* in the service of the Dutch East India Company between 1697 and 1776, and that there was no mention of the loss of any of them. We turned to the list of British East India Company ships lost between 1702 and 1719 and found that there had been 14, all about the right size, but none lost near the Basses and none with 22 guns. The sites of loss of two of these ships were unknown. One was sailing east from Bengal and could not have gone near the Basses. The other, the *Gloucester Frigate*, 350 tons with 70 men and 30 guns, commanded by Phil Browne, sailed from Plymouth consigned to Batavians on 30 September, 1702, and apparently went missing. Another possibility was the *Albemarle*, 330 tons, 66 men, 30 guns, commanded by William Beavins. She sailed on 31 January, 1704, with a cargo worth 20,386 pounds 9 shillings, and was said to have been lost at “Balnunu.”

Samples of wood from the wreck were sent to U.S.D.A. Forest Products Laboratory, where they were studied by Mr. J. Francis Kukachka. His analysis of this material suggests that the ship was fitted out in Southeast Asia, possibly even built there. The stopper from the brass cannon muzzle was tea, as were stoppers from the iron grenades, fragments of broken chests, and the musket forearm. Not surprisingly, the pistol stocks were of European walnut. A fragment that might have been part of the ship’s planking was also Asiatic wood. This makes it unlikely that our ship was a British Indianman, for these vessels were almost always built and fitted out in England.

Mr. M. P. H. Roessingh, who has undertaken the task of searching through the hundreds of manuscript pages of the Dutch East India Company’s records, suggests that the ship might be a Moorish vessel from Surat, which would explain the lack of a VOC (Dutch East India Company) mark on the coins, the oriental guns, and the evidence that the ship was fitted out in the East. Yet if the Basses wreck was a local ship, why the European matched pistols, the pewter decanter, the bottles and china? It seems also unlikely that a Surat trader of the period should have the typical armament of an Indianman. At this writing the origin of the ship remains a mystery which will probably be solved through further research.

Another kind of research on material from the Basses wreck has been done by Mr. Richard Russell, a chemist who examined some of the lumps of coins and the black “cement” which held the larger lumps together, at the laboratory of the Geological Institute in Athens. His microscopic examination of the encrustation revealed that sand particles cemented together with calcium carbonate. The sand was made of particles of quartz, rose quartz, garnet, and a few that resembled rubies, all water worn. Some of the lumps contained a few very small bits of obsidian, with conoidal fractures and razor-sharp edges. He proposes that they might have been laid down when Krakatoa exploded in 1883. This sand made up 22% by weight of the encrustation.

The black stains were from hydrated iron oxide, and the silver had been blackened by a coating of silver sulfide. He concluded that metallic iron in a wreck does not simply oxidize as it would on land, and that the wreck area was infected with sulfate reducing bacteria whose action led to the production of quantities of iron sulfide in the lumps. Mr. Russell is now at work on a large lump of material from the wreck, and his research should result in extremely useful information about chemical processes which occur in a shipwreck, particularly relevant to problems of preservation.

Some interesting conclusions can be drawn from the Basses wreck. Although it lies in a very exposed position, enough organic material survived so that analysis of it is possible, and, as at Gelidonya, many small objects survived intact. Although the ship must have been smashed to pieces immediately after sinking, some information about her construction was obtained and a full scale excavation would certainly reveal more constructional details as well as more material to identify the ship.

Whether she was Dutch, British, or Moorish, the wreck yields the kind of information seldom preserved in archives. Further work on her will throw new light on one of the most exciting periods of modern history, those years when European merchant adventurers were opening the closed gates of the East to European thought and trade.

**SUGGESTED READING**

The Great Bazaar reef, consisting of several miles of rocks just below the surface of the water, lies about seven miles from the south coast of Ceylon which can be seen in the background in the top picture. The site of the wreck on Swami Rock could be approached only by rubber rafts.

Architectural fragments from some great building recovered at Swami Rock in 1962 are examined under water, cleaned, then floated to the surface with the aid of empty oil drums.
Peter Throckmorton, wearing a boiler suit to protect him from the sharp coral, chipping out growth which covered the larger bronze gun, as he saw to his right. The area to right and left of the gun is a solid mass of concreted material from the ship.

Silver treasure to the weight of 120 pounds was recovered in 1961. (Upper left) The 1000-coin mass at the moment of recovery. (Upper right) Mark Smith (right) and Bobby Kriegel at the lighthouse on the same day. (Left center) Of the masses of coins, the one at the top right of the picture is now in the Smithsonian Institution in Washington, (Bottom left) The coins in the Smithsonian. (Bottom right) Mike Wilson and Peter Throckmorton examining the coin masses.
(Left, top to bottom) Pewter cap for a decanter. The walnut stock of one of the pistols, part of its breech, lead pistol and musket balls. The toy tamper of the large bronze gun. Blue and white china. (Right, top to bottom) The butt plate of a musket. Toy tamper for a grenade or shell. Bronze pestle. Remnants of the bags which held the coins.

Top) The two small cannons (ordnance) raised when Mike Wilson found the wreck. The upper gun uncleaned. The lower gun's shiny surface, polished by sand, led Wilson to the wreck. "An Historical Relation of the Island Ceylon" published in 1681 in London, flanked by necks of silver and miscellaneous coins. (Lower left) Mike Wilson working to raise silver lumps. (Lower right) Raising the bronze gun which weighed 331 pounds cleaned.