Flagg Report about the Flagg 49
Reed Boat Expedition ABORA III

Stormy voyage across the North Atlantic

Going from one place to another, finding back to the point of departure and arriving... orientation and communication have always been key to our survival. The better we are at it the farther we get.

Today we are seemingly living in a world without distances. The world is called a village because technology makes world trips into short hops. We live in a global village community – but possibly it is much older than we think. Maybe the foundations for the global village were already laid by the people of the Stone Age. Were oceans really the barriers people think they were or have they been bridges between continents for a long time?

With these questions in mind The Abora III, a reed boat, would attempt to cross the supposedly “impossible” the Atlantic’s North Route for the first time in modern times to prove that the people of the Stone Age were possibly quite capable of making this passage. ABORA III was equipped with the flag 49 of the Explorers Club. Its main goal was to achieve entirely new experiences about the deep sea sailing with a prehistoric raft in the North Atlantic.

Construction according to prehistoric examples

Whereas Thor Heyerdahl had his two papyrus rafts RA I & II built exclusively according to Ancient Egyptian temple depictions, the fundamental design of all ABORA boats was based on prehistoric boat representations. The hull was constructed at Lake Titicaca in Bolivia by the famous Aymara Indian family Limachi in 2005. In early spring 2007 the vessel was transported from South America to Liberty Harbor Marina, Jersey City, New Jersey.

For many years the expedition leader had investigated Neolithic petroglyphs all over the Mediterranean to understand how the development of sailing boats with complete rigging must have occurred during prehistoric times. The preserved rock drawings studied convey a realistic impression of the construction of a fully rigged square rigger of the Neolithic Naqada culture. On the front half of the ship, quite close to the centre, a bipod mast was erected on the big hull and a large trapezium-shaped sail, made of hemp or flax, was attached to it. For cargo sailboats that had to cover great distances two huts of woven wicker were put up in front of and behind the mast. They not only provided the crew with shelter but also with storage space for the costly goods. Many depictions show two big freely movable steering oars on the stern. In prehistoric times they were mounted on the hull without a rudder arrest and were controlled from the stern or from the roof of the wicker hut at the back of the boat via long rudder poles. However, the main discovery of the author was the use of the lee board sailing techniques. On the bow and stern there were several pairs of leeboards which were indispensable for navigating the seas. These boards were kept in place by retainers in two positions: higher up between the deck beams and also lower down where the boards were tied with solid ropes running through the hull. In this way the leeboards could be lowered as far as desired. Rigged up in this manner, it was possible to take on the high seas. Yet, the construction of these fixtures is a complicated and difficult matter.

This work was carried out by the members of the “Verein Experimentelle Archäologie und Forschung Chemnitz e.V.” (Association for Experimental Archaeology and Research) just a stone’s throw away from the Statue of Liberty. They were supported by volunteers from America, Norway and Bolivia. All superstructures were made of wood, wicker material and ropes, just as the people could have built in prehistoric times. Laboriously, all parts were tied only with
rope. Allowing a certain amount of flexibility is absolutely essential when building the superstructures. The reed hull itself was very flexible when it is among the waves. Rigid connections or bolted superstructures would unavoidably break. For this reason the construction team took a lot of time to assemble the parts, carefully tying the knots with special techniques.

After eight weeks of building and solving numerous problems such as negotiating American customs, the reed boat was completed with a delay of two weeks. The launch took place on 8 June 2007 with many visitors and media representatives present. Norman Baker, the navigator of all of Thor Heyerdahl’s expeditions, christened the boat ABORA III after an old Canarian deity.

**Sailing experiments in front of the imposing Manhattan skyline**

Before we could set sail for the first time, a number of smaller jobs still had to be done to get the reed boat ready for sailing. Only after the launch of the boat was it possible to complete the superstructures and install the navigation technology. For this purpose alone dozens of metres of data cables for the AIS and GPS equipment as well as the technology for weather transmission had to be drawn. The technology did not only ensure the safety of the expedition, which was a condition of the US Coast Guard, but more importantly also enabled the precise recording of course data. On 12 June 2007 we finally set sail on the Hudson River with its great backdrop. This day was a huge relief for all of the crew because the first sailing attempts showed the boat was easy to steer on a downwind course and did not draw to either side. The aim of the subsequent sailing experiments was to train the boat and its crew for the challenging North Atlantic. The crew, which was made up of both experienced ABORA sailors and newcomers, had to practice making proper use of leeboards, a technique that cannot be learned at a sailing academy. The raising and lowering of the boards have to be synchronised exactly with the setting of the sail, with the timing similar to that of an orchestra. Every crew member had to manage their task and learn about the conditions of each part of the boat. Many trial runs were sailed. We also trained with strong winds of up to 30 knots to prepare the crew for the anticipated rough conditions on the North Atlantic.

![Fig.1: Sailing with a prehistoric square rigger with Manhattan as the backdrop was a very special experience. Still, these experiments had an important purpose. The expeditionary team had to learn on the Hudson River how to sail into the wind on the Atlantic Ocean.](image)

Of course, sailing on a Stone Age raft with the skyline of Manhattan and the Statue of Liberty in the background was a great experience. The contrast could hardly have been bigger: a prehistoric reed sailboat and modern high-tech ships in front of the glittering skyscrapers of Manhattan. After the sailing trials there was time for some necessary improvements to be made on the rigging and for other preparations for the expedition. Repeatedly heavy rainfall interrupted the preparations, which eventually led to the postponement of the start of the expedition.
With a prehistoric square rigger across the North Atlantic

On 11 July 2007 we started our adventurous sea voyage with the hope that ABORA III would be the first boat of its kind in modern times to cross the Atlantic from West to East. The team on board was made up of eleven people from three countries. Together, their goal was to sail from New York to the Iberian Peninsula via the Azores. After the start, the first task was to sail away from the American coastal shelf with its tidal currents and to reach the Gulf Stream. After initially enjoying favourable southern winds, which allowed ABORA III to cover more than 350 miles in just five days, the expedition was caught in a calm for almost nine days. As such ABORA III only reached the Gulf Stream, which promised to speed up the voyage, at the end of July. Unlike other sea currents the Gulf Stream is a meandering current which flows along inconsistent patterns and at different speeds. Its sides are flanked with big swirls called ‘warm water eddies’ if they turn clockwise or ‘cold water eddies’ if they go counter-clockwise. Depending on the direction of the current the sailboat is accelerated or slowed down. Still, according to sailing experts the cold water eddies, too, should have an overall eastward motion.

![ABORA III with a billowing sail on the North Atlantic.](image)

Our sailing courses show that these currents influenced the expedition most heavily. When assisted by the currents, ABORA III attained speeds of 6.2 knots and covered distances of up to 102 nautical miles per day. On the other hand several cold water eddies slowed the pace or forced us to sail abnormal courses. In the middle of August we were pushed off course so badly that we drifted north despite rare but favourable western winds. In July the weather was predominantly fair. Several calms caused us to lose a number of days with a course in an eastern direction. But in August the weather conditions changed dramatically. The further east we came, the closer we actually should have come to the Azores High, which was still positioned at 65 degrees north of the equator at the end of July. But the Azores High started to literally evaporate from the beginning of August. Even after we had passed 50 degrees west the climatic conditions did not change. That was probably due to the unusually bad summer in 2007. Every two to three days the reed boat had to endure troughs of low pressure on 41 degrees north. During the course of the month ABORA III was hit by two heavy storms with a wind force of up to 10. Though the sail suffered minor damages during the first storm, ABORA III survived all other storms with no further damages to speak of. The reed boat proved to be fully seaworthy and safe. Big 6 to 8
metre waves were no problem for the vessel as it went over them. In the first big storm with wind force about 10 the flag suffered and must be taken down to protect it.

Figs. 3: ABORA III proved to be fully seaworthy even in storms with winds of up to 50 knots. With a lowered sail she overcame towering waves without suffering notable damages. This photograph was taken about six hours after the second heavy storm on 22 August 2007.

On 24 August 2007, only 850 nautical miles removed from the Azores, a gigantic cyclone which covered almost the entire Central North Atlantic finally closed in on us. Storm warnings by the German meteorological service advised us to evade it by sailing southwards from 41 degrees north down to 37 degrees. ABORA III was able to reach the southern side of the low-pressure system in time before the hurricane set in and in this way 'only' had to endure wind force 8. But because the low persisted for three days, a heavy swell arose. That is what led to massive damage on the stern during the second night of the storm. In the days that followed, the stern was removed by the crew and the boat continued sailing without a rear end.

Reconstructing the boat in the middle of the Ocean

For one week after the big storm the ABORA III crew worked on the damaged raft to make it into a proper sailboat again. The shortening of the boat led to strong weather helm (tendency of the boat to turn into the wind). To minimise this deficiency the leader of the expedition made use of all of his knowledge about ancient Egyptian depictions and ship paintings on Greek vases to get the reed boat ready for sailing again. We compensated for the missing stern by the introduction of a rudder arrest for the steering gear, new board retainers had to be made for four leeboards on the stern and the mast was trimmed forwards by 15 degrees.

Fig. 4: The repaired and reconstructed ABORA III b. The successful repair job was an important experience for the expeditionary team and demonstrates that prehistoric people were not necessarily completely at the sea’s mercy, even after considerable damage was suffered. At this point in time there was still hope the Azores could be reached.
The sailing results after the repair work exceeded all of our expectations. We were able to set full sail again despite having a shortened hull and sail with wind abeam. With better weather we hoped to at least reach the Azores, after all. Our mending work on the reed hull prevented the loss of more totora reeds and ensured that we still had stable buoyancy. Only the wicker hut at the back was a skew and hanging down into the water. For safety reasons we had asked for another boat to come from the Azores to accompany us even before we had started with the reconstruction. This boat would then be able to come to our aid quickly in case of severe danger. Only three days after the repair and reconstruction work on the storm-tested ABORA III was completed, another strong low-pressure system was forecast. We already knew that all new installations were only provisional solutions which would surely be able to endure wind force 4. But any conditions heavier than that were new territory which we tried to prepare for as best as possible. At wind force 5 all installations withstood the pressure of the waves. But when the wind speed picked up from 19 knots to 26 knots and higher, a high and short wave built up within two hours time, so that the new Egyptian steering installation gave way to the forces and broke on the windward side.

Because we had already been able to cover an additional 220 nautical miles after the incident with the stern, and the ‘Azores High’ which we had been anxiously waiting for four weeks did not come, I decided to break off the experiment 550 nautical miles short from the Azores on the morning of 5 September 2007.

It was improbable the weather conditions would considerably improve in the remaining two to three weeks to the Azores. It was far more likely that more low-pressure troughs would approach. Up to that point ABORA III had been a safe home and had carried us 1,500 nautical miles linear distance in the direction of the Old World. In the afternoon, after we had dismantled all functioning parts and transferred our personal belongings to the accompanying yacht we abandoned the still floating raft.

Findings of a scientific adventure

On board ABORA III we had the privilege and unique experience of learning about the sailing capabilities of a prehistoric reed boat on the North Atlantic. We were able to see how well a reed boat overcomes high waves and storms. The experience gathered during our 2,410 mile sea voyage provides new and so far unknown findings about the capabilities of this sea-going vessel. According to the observations and technical records of ABORA III we come to the conclusion that it was possible for cultures of Early Ancient History to cross the North Atlantic with reed boats.

We have also been able to establish with a fair amount of certainty why the stern end broke off. Still, this unexpected event gave us the opportunity to rebuild a damaged boat whose manoeuvrability was severely constricted in the middle of the Atlantic Ocean without any help from outside, allowing us to continue the journey.

The geographical destination could unfortunately not be reached with ABORA III. But for me as a scientist the great number of new findings is what is most important. We are currently at the beginning of a long learning process which may not be put in doubt by the premature end of our journey. That we did not arrive at the coast of Spain is by no means proof that it is or was impossible to make transatlantic sea voyages. Long ago journeys across the Atlantic plausibly were not undertaken by a single reed boat but rather in small groups of vessels. Exact numbers of how many boats started and indeed how many arrived at their destination are not available.
Fig. 5: The leeboard sailing technique has worked again. With favourable currents ABORA III was capable of sailing at 78 degrees into the wind.

Whereas ABORA I and II were particularly dependent on wind conditions on the Mediterranean, we learned that on the North Atlantic Ocean reed boats are particularly dependent on currents. Still, the recorded courses show that ABORA III was always capable of staying on a course to the east. And that is true even though winds blew from all directions, causing the bulk of the miles to be covered by sailing with wind abeam or slightly into the wind. If the average speed is calculated for the entire duration of the 56 day expedition, one comes to a mean speed of 2 knots. But this figure is deceiving because of the many calms in the month of July. With favourable winds and currents we often calculated speeds of 5 knots over ground. The record was 6.2 knots, where the Gulf Stream flowed at approximately 3.5 knots.

Fig. 6: ABORA III as a hiker between different cultures and ages. Her voyage has principally shown transatlantic travel was possible.

The ABORA III expedition was able to answer the main question asked; if the Atlantic Ocean could have been crossed in both directions during the Early Ancient Period. The miles ABORA III did not cover on its mission provide a reason to make another attempt in a few years time, drawing from the gathered experiences and findings. With even more support and an improved ABORA IV the passage across the North Atlantic should be successful. In addition, this modern endeavour shows how human beings’ appetite for adventure and travel, the explorer’s drive, team spirit, science and sailing can enter a formidable symbiosis to answer unsolved questions of archaeology.

Dominique Görlitz
www.abora.eu