

GENERAL NARRATIVE

Stanford Oceanographic Expedition 16 officially commenced in Mazatlan, Sinora, Mexico, on September 18, 1967. From 18-22 September, orientation lectures, demonstrations and pre-cruise meetings were scheduled.

Dr. Thomson lectured on the oceanography and the fishes of the Gulf of California. Dr. Loomis discussed aspects of mid-water and plankton communities, and Dr. Nybakken lectured on benthic communities. The three senior scientists followed these lectures with seminars on the research they would be doing on the expedition. Mr. Malone, the teaching assistant, lectured on primary productivity in the sea. Finally, the technicians discussed the sampling gear, its operation, and various analytical procedures.

The ship sailed from Mazatlan 22 September enroute to La Paz. The first stations were taken from the ship the next day, despite a breakdown in the hydraulic system of the hydrowinch, which necessitated jerry rigging ropes and sail winches to trawl and dredge. During the next day, the students were introduced to the hydrostation and the tucker trawl, and the hydrowinch was repaired.

Baja, California was in sight on the morning of 25 September and the first shore station for all students was made in the afternoon just south of Pta. Coyote. A poison station for fishes was conducted by Dr. Thomson with the entire scientific party participating in the collection of the specimens. Later, after supper, Dr. Thomson lectured on the ecology of the typical inshore fish fauna while standing on the fantail, the day's collection laid out in front of him. With the fading of the sun and the fishes, we arrived at the entrance to La Paz harbor.

The TE VEGA, under guidance of pilorage, entered La Paz harbor the morning of 26 September. The scientific party took advantage of the day's layover for replenishing fresh water and investigated the city, where the coolness was a marked contrast to the wet heat of Mazatlan.

The afternoon of 27 September saw the TE VEGA once again at sea, headed north. Following an otter trawl and several dredges during the evening, morning found the TE VEGA off Isla San Francisco, where another shore station was made. It was here that we suffered our first casualty when Mr. Chartock was stung by a scorpion fish and spent an agonizing day in his bunk.

Isla San Francisco was astern by afternoon as the TE VEGA headed out to deep water, allowing the students with mid-water projects to do some work. Tucker trawls, hydrostations, and plankton tows were made for the next two days while evenings were taken up with student seminars which concerned their research projects.

By the afternoon of 29 September the TE VEGA was anchored off Santa Catalina Island. A shore party put out to investigate the inshore fishes and invertebrates while the TE VEGA moved offshore for a hydrostation. After picking up the shore party the ship went under full power for Loreto as we were behind schedule.

We arrived off Loreto in late morning and a small shore party went in to obtain a package of scientific gear, while another party made a shore station as Isla Coronados. After leaving the Loreto area in early evening, we again proceeded under full power for Mulege, at the entrance to Concepcion Bay, to pick up our technician Mr. Davoll, who flew in to spend a week on the ship working on the productivity of the bay for Dr. Gilmartin. While the plan of work for the next few days was being organized, several members of the scientific party were free to explore Mulege, an oasis along the Santa Rosalia River.

Beginning on 2 October and continuing through 5 October, the TE VEGA made numerous transits up and down Concepcion Bay while Mr. Davoll, Mr. Samuels, and Mr. Norton labored long hours at their work. The rest of the scientific party utilized this time to catch up on analyzing previously collected data. Some new stations, dredges, otter trawls and shore stops were occupied within the bay during this time. An important discovery in this interval was that of the existence of anoxic conditions in the bottom waters at the head of the bay in only 40 meters of water.

Mr. Davoll left the ship 5 October and we immediately set course for Santa Rosalia to obtain fresh water, as our tanks were getting very low. Our course to Santa Rosalia led us over deep waters, and the deep-water group took some Tucker trawls before we arrived at Santa Rosalia the next morning - 6 October.

After the TE VEGA had been safely piloted into a berth just inside the breakwater, most members of the scientific party went ashore for the remainder of the day. A small water delivery line forced a longer stay than expected in Santa Rosalia, and the ship did not leave until 0300.

The next morning the TE VEGA anchored off Tortuga Island where another shore station was occupied. The shore station was finished before noon and the ship left Tortuga moving north into deep waters where Tucker trawls, hydrostations, and plankton tows were made by the mid-water group.

The ship remained in deep water near San Pedro Martir Island for the next two days to allow the mid-water group to complete an extensive series of samples at the southern approaches to the Ballenas Channel. One of the Tucker trawls taken during this time delivered 1100 myctophids, much to the delight of Dr. Loomis. Mr. Chartock and Dr. Nybakken attempted dredging in 800 meters and were rewarded with a completely torn dredge net, ruined by an unanticipated rocky bottom. Apparently strong currents swept the bottom clean of sediment in this area, leaving only rock exposed. Also observed in this area was some very turbid water, apparently the result of a high standing crop of plankton, and the surface water temperatures were ca. 23°C, where they had been 29-30°, indicating the presence of upwelling.

On the morning of 10 October the TE VEGA arrived in San Francisquito Bay. Part of the scientific party went by small boat to a little bay which bulged out to the south from the bay proper. This bay was infested with sting rays and the small boat scared up hundreds of them as it slowly moved through the calm waters. It was a magnificent sight which

delighted all the occupants of the boat. At the far end of the small bay among huge piles of pearl shell, isolated turtle skeletons, and smaller piles of dried shark carcasses, was an abandoned fishing camp. This camp was the center of exploration and souvenir hunting (mainly for sharks' teeth) by the scientific party for a few hours. Later, two poison stations were occupied and in the afternoon the TE VEGA left San Francisquito Bay to enter the Ballenas Channel. Enroute to Bahia Los Angeles, Dr. Loomis and his group were able to do some mid-water work in the Ballenas Channel.

The Ballenas Channel is an interesting area of the Gulf. It is a deep, narrow trench extending to depths of 2000 meters and guarded at both northern and southern ends by sills of very shallow depth. The currents are strong through the Channel and the water column is well mixed right down to the bottom.

We arrived in Bahia Los Angeles on 11 October, taking an otter trawl as we approached it. The evening afforded liberty to the scientific party in the small settlement.

The TE VEGA departed Bahia Los Angeles the afternoon of 12 October for further work in the Ballenas Channel. In the evening we attempted a dredge in 950 meters and again the rocks ripped the net into shreds.

Friday the 13th dawned overcast and windy - - the first foul weather on the cruise - - and portended a day which lived up to its reputation. In the early hours of the morning (0000 to 0500), the mid-water trawlers worked through a series of mishaps; power on the winch failed once, a net refused to close, and Mr. Dunlap sustained an injury to his toe. Later in the morning Mr. Malone lost a Nansen bottle during a vertical plankton tow. The final blow was dealt in the evening when Dr. Thomson cast the otter trawl on a presumably soft bottom and barely retrieved it upon finding it to be rock. The net was badly torn. The evening passed in a somewhat better fashion, and once again the Tucker trawlers stayed up all night to sample a deep basin north of Angel de la Guarda Island.

We anchored before breakfast in Puerto Refugio the next day. After breakfast the scientific party split into three groups, each taking a Boston Whaler and exploring a different area of the bay. Doctors Nybakken and Loomis discovered large numbers of sea lions (Zalophus Californicus) on one of the outer islands of the bay and photographed them. Mr. Kerstitch later filmed the lions' activities.

In late afternoon the wind picked up and by evening the TE VEGA was rolling in the incoming swell. An attempt to move the ship to a more protected anchorage failed and only made the roll worse. Several 30° rolls were recorded. This condition prevailed all night.

The TE VEGA finally left Puerto Refugio early on the 16th, headed south for Tiburon Island. The sea rose to approximately 8-foot swells and a strong wind was at our stern as the TE VEGA, sails set for the first time, swiftly proceeded southward. Heavy seas prevented our taking any stations.

Calm seas prevailed when we arrived in the lee of Tiburon Island early on the morning of the 17th. The day was spent taking several otter trawls in shallow water. Sampling operations were suspended in the early evening and we set course for Isla San Pedro Nolasco, arriving there at 1430 the next afternoon. A poison station was occupied here and as soon as it was finished the TE VEGA headed south for deep water to afford the Tucker trawlers a chance to collect material. Operations were suspended later in the night to allow the ship to proceed at full speed to Deer Island, just off the mainland north of Guaymas, for a morning arrival on the 19th.

Two groups made shore stations on Deer Island - - one a poison station for fish by Mr. Kerstitch and company, the other for invertebrates by Dr. Nybakken, Messrs. Vega and Chartock. In the afternoon the scientific party split, with Doctors Nybakken and Loomis, and Messrs. Sherbine and Chartock taking one boat around to San Carlos Bay for Conus collecting and the remaining members working Deer Island for fish. The TE VEGA moved to the entrance of Guaymas Harbor in the evening.

On 20 October the ship was piloted into Guaymas Harbor where we were met by Captain Simpson, who brought three new crew members with him. These men were to replace two seamen who left in Bahia Los Angeles and a Mexican mess boy who was scheduled to leave in Guaymas. Commander Don Ferrin, a NAUI instructor joined the cruise at this juncture. Messrs. Vega and Norton and Dr. Thomson left the ship in Guaymas, and Dr. Nybakken succeeded Dr. Thomson as Chief Scientist for the remainder of the expedition.

Guaymas was a major stop for provisioning and the TE VEGA was scheduled to stay for three days. During this time the scientific party was privileged to have a guided tour by Dr. Suarez of the beautiful new marine science facility, Escuela de Ciencias Marinas y Tecnologia de Alimentio, located on Bocohibampo Bay just north of Guaymas. The scientific party of the TE VEGA reciprocated by hosting tours of the TE VEGA and by conducting a poison station for fishes for the benefit of the station. The TE VEGA also was privileged to entertain a visiting party comprised of three staff members from the Mexican Government's marine laboratory.

The scientific party threw a farewell party for Dr. Thomson on the evening of 21 October. Our departure from Guaymas was delayed until late on 24 October for circumstantial reasons. As soon as we cleared the harbor we took two otter trawls. Mr. Malone initiated a series of student progress reports between trawls. Upon completion of the otter trawls, we proceeded under full power toward the deeper waters of the Guaymas Basin, where we anticipated spending several days.

We came on station over the Guaymas Basin at 0600 on 25 October and immediately began work with a hydrocast. The scientific party worked 18-20 hour days for the ensuing five days, splitting into sub-groups for sampling purposes. Dr. Loomis, Messrs. Robison and Dunlap took charge of the Tucker trawls while Mr. Malone, Misses Tilly and Weck concentrated on the hydrocast. Mr. Samuels ensured a smooth, over-all operation in addition to assisting Mr. Malone in his verticle plankton tows. During this intensive sampling period ship time was allocated

very precisely to maximize the number of stations made. Also in this interval, progress reports were given by Messrs. Sherbine, Dunlap, Robison, Chartock, Burnett, and Miss Tilly. These short reports were scheduled following supper in the evening when there was a lull in the work.

October 28 was a very clear, warm and calm day. The water looked inviting to a work-weary scientific party, and when Cmdr. Ferrin took his diving class members into the water while the ship was stopped for a vertical plankton tow, many others took advantage of the opportunity for a refreshing swim. The swim became more interesting when a pod of pilot whales (Globicephala) came near the starboard side and two fin-back whales appeared on the port side. Some students were fortunate enough to observe these mammals underwater. The day concluded with a series of Tucker trawls. Perhaps it should be noted here that the emergence of a Tucker trawl on deck never failed to bring the scientific party around, for each one remained a mystery until poured out into the pans, and the potential for discovering an exciting new organism was often realized, particularly in the deep hauls of 800-1500 meters.

On the evening of 29 October, as we finished work in the Guaymas Basin and turned to return to Guaymas, we ran into some very heavy seas which continued throughout the night, and, with the consequent roll of the ship few people were able to sleep.

We arrived in Guaymas for the second time on 30 October and left on 31 October setting course for the Carmen Basin for further deep water work. On 2 November, the TE VEGA returned to Guaymas. We stayed in the outer harbor long enough to pick up some repair parts and then left for the Carmen Basin. An accident with some sea water in the laboratory put one of our Beckman DU spectrophotometers out of working condition. Fortunately there were two, but this necessitated a double work load on the remaining one.

November 3 saw the TE VEGA back on station in the Carmen Basin and Tucker trawling was again undertaken in earnest. The trawls emerged, bearing rich hauls in this basin, and included some beautiful specimens of deep water fishes (Argyropelacus, Diplophos, Melanyhaes, Bathytractes) and several Gigantacypris for the first time. Mr. Chartock took many of the invertebrates for his oxygen studies. Trawling was suspended in the evening to allow time for us to travel to Monserrate Island, the next stop on the itinerary. The TE VEGA anchored off the southern tip of Monserrate Island on the morning of 4 November. Part of the scientific party went ashore where Messrs. Kerstitch, Robison, Malone and Burnett worked a poison station while Dr. Nybakken searched for Conus.

We left Monserrate early in the afternoon and made a quick run to the Aqua Verde Bay on the Baja mainland where Mr. Sherbine took an otter trawl. The trawl was unique in several ways, but especially in the paucity of organisms caught and in the prevalence of porcupine fish (Diodon hystrix).

The morning of 5 November found the TE VEGA at anchor off the island of Santa Cruz where another shallow water poison station was occupied.

The highlight of Santa Cruz, however, was undoubtedly the Manta rays (Manta hamiltoni). Several large manta rays persisted in swimming around very close to the shore, enabling the divers to take numerous photographs and those in the boats to have the thrill of chasing them on the surface. We reluctantly left Santa Cruz and the Manta rays in the afternoon and struck out again for deep water to satiate the demands of the mid-water contingency of the scientific party. Tucker trawling commenced in the evening and continued uninterrupted throughout the night and into mid afternoon of the following day. Following cessation of Tucker trawling in the afternoon of 6 November, Mr. Malone, Misses Tilly and Weck took over with work on a hydrocast. Tucker trawling resumed after the hydrocast and continued all night until mid-morning of 7 November. These trawls again brought up some beautifully preserved mid-water fishes (Stomias atriventer), as well as Gigantocypris, pelagic nemerteans, and many shrimp, copepods, mysids, and amphipods.

A near disaster with the Tucker trawl occurred during the night of 7 November when a mix-up in orders allowed 3500 meters of line out in water only 1800 meters deep. Fortunately the trawl was recovered before it had a chance to act as a dredge. Mr. Malone finished the day with a vertical plankton tow after which all operations ceased and course was set for Espiritu Santo Island. Tucker trawling was inhibited as the timing mechanism of the opening-closing device had broken subsequent to the last trawl.

Our arrival at Espiritu Santo Island on 8 November was delayed because of a temporary engine failure. In order to save time while the engine was secured for repair, the sails were raised once again and the TE VEGA moved slowly and silently toward the island. The engine was repaired in later morning and, under both sails and power the TE VEGA arrived off Bonanza Point on the east side of Espiritu Santo in early afternoon. Another poison station was occupied, and Dr. Nybakken collected a large number of Conus.

We left the shore station in late afternoon and headed through the San Lorenzo Channel into La Paz Bay. After supper, Cmdr. Ferrin lectured on repetitive dive tables. Following this, an otter trawl was taken along the west side of Espiritu Santo Island. We spent the night under anchor in La Paz Bay.

On the morning of 9 November, two additional otter trawls were taken in La Paz Bay, following which the TE VEGA suspended scientific work and went into La Paz harbor for final reprovisioning. The scientific party thus had a last chance to enjoy themselves and to purchase souvenirs, a chance which none failed to utilize. Cmdr. Ferrin left the ship in La Paz due to urgent business in the States and we managed to have the opening-closing device for the Tucker trawl repaired.

Provisioning was accomplished by early afternoon on the 10th and the TE VEGA immediately set sail for Ventana Bay, just opposite Cerralvo Island. Engine trouble began to plague us just a few hours out of port and the Captain felt that it might be necessary to operate the engine at a level somewhat below our top speed for the remainder of

the expedition. Hence, it was necessary to move up our sampling schedule so as to leave a few days earlier for Long Beach. Miss Weck gave her progress report in the evening, and later, under a full moon, we moved in close to shore where Mr. Sherbine took another otter trawl. Following the otter trawl, we set course directly for our next sampling station at Point Arena.

November 11 found the TE VEGA on station on Arena Bank, but our inability to travel at slow speeds (resulting from engine trouble) prevented us from taking the anticipated dredging and otter trawl stations on Arena Bank. To salvage something and to give the engineers time to repair the engine, a shore station was occupied at a rocky outcrop just south of Arena Point. It was not very successful because of heavy seas which had built up during the day. The engine was repaired by evening and the TE VEGA headed out to deep water for the Tucker trawlers. We had hoped to return north of Arena Point to dredge and otter trawl, but the very rough seas made it too dangerous to move in close enough to do the trawls so course was set for deeper waters. Despite the rough seas however, the Tucker trawlers were able to work through the evening. Trawling was suspended early in the morning and a course set to bring the ship back to Pulmo Bay where we hoped to sample the famous coral reefs. The very rough seas precluded entry into Pulmo Bay, which is exposed, and the TE VEGA was forced to shelter instead at Los Frailes just to the south. Here another shore station was occupied and Mr. Kerstitch was able to make a fine fish collection at the poison station.

We left Los Frailes in the evening bound for Gorda Bank. The seas began to diminish somewhat, and were fairly calm by the time we were situated over Gorda Banks later in the evening. We decided to do an otter trawl here. About 30 minutes into the trawl, however, the cable became taut indicating a snagged net. Nothing that the ship did freed the trawl. Ultimately, the cable snapped near the net and we lost the net. Since it was not possible to do any further sampling from the ship until a new eye was spliced into the cable, we suspended operations and went to Cabo San Lucas.

Cabo San Lucas, the last shore station of the expedition, proved to be an excellent one. Mr. Kerstitch conducted a particularly productive poison station and Dr. Nybakken was enthused at finding a species of CONUS which hitherto had not been collected on this cruise. The poison station was finished just past 1200, and the TE VEGA left Cabo San Lucas shortly afterwards. By this time the new eye had been spliced into the trawling cable and since the clock mechanism of the opening and closing device had been repaired in La Paz we could place the Tucker trawl in use once again. The course was set for deep waters southwest of the cape, where the Tucker trawlers wished to make their last station. The first trawl was less than successful as the cod end of the meter net and hence the sample was lost. Trawling was continued, more successfully, all night and throughout the next day. On the evening of 14 November Dr. Nybakken gave a talk on the preparation of scientific papers with respect to the written reports of the projects from this cruise that were expected.

Scientific work was suspended on the evening of the 14th to allow time for the ship to make the run up to Magdalena Bay, the last stop of the expedition. The morning of the 15th saw the TE VEGA off Point Tosca at the southern entrance to Magdalena Bay. The day was spent dredging in the area, much to the delight of Dr. Nybakken, who obtained another species of Conus.

Dredging operations were suspended in the afternoon and when the ship headed toward the northern entrance to the bay, another dredge was taken but contained very little of interest. Operations were then suspended for the evening.

The next morning we took our last scientific station of the expedition - an otter trawl with our reserve 16-foot trawl. The haul was very large and noisy, as it included a great number of grunts (Haemulidae). After a few hours during which the vessel was washed, the TE VEGA left Magdalena Bay bound for Long Beach.

During the next six days as the ship moved steadily northward, the scientific party occupied themselves with completing their research and with preparation of rough drafts of their preliminary reports. We arrived in Long Beach mid-morning on the 22nd, completing the ocean-going phase of the expedition.

Robert Loomis
· James Nybakken
... Donald Thomson

GENERAL CRUISE TRACK
R/V TE VEGA EXPEDITION 16
September - November, 1967
GULF OF CALIFORNIA

