

20,000 Leagues UNDER THE Sea

He wrote about the potential of electricity at a time when city streets were still being illuminated by gaslight.

He forecast the invention of airplanes, helicopters, motion pictures, television, computers, man-made satellites and guided missiles in an era where crude steam engines were the technological state-of-the-art.

His *voyages extraordinaires* placed the literary genre of science fiction on a sound basis and stimulated the development of 20th Century technology.

His name was Jules Verne, and he is regarded by many as the Father of Modern Science Fiction.

A daringly original novelist, a complex, imaginative thinker, Verne created fascinating worlds and grand adventures—stories bursting with energy, action and intelligence. Because his fiction is so vivid, so full of exoticism and excitement, Hollywood has had a field day adapting his works into big, bold extravaganzas.

Many of the films based on Verne's works have been successful: *AROUND THE WORLD IN 80 DAYS*, *JOURNEY TO THE CENTER OF THE EARTH* and *MYSTERIOUS ISLAND*, to name a few.

But there is little doubt, to cineastes and Verne fans alike, that the 1954 Walt Disney production of *20,000 LEAGUES UNDER THE SEA* towers above them all.



THE FILMING OF JULES VERNE'S CLASSIC SCIENCE FICTION NOVEL

Retrospect by Joel Frazier & Harry Hathorne



Above: Walt Disney's production filmed Verne's Nautilus using an intricately detailed 11-foot model in a massive tank built on Stage 3 at Disney's Burbank studios. Far Left: A close-up of the Nautilus model. Middle: Director Richard Fleischer (left, front), Robert Wilke, James Mason and Paul Lukas (back to camera) during a break in filming. Left: Kirk Douglas as harpooner Ned Land confronts the Nautilus in a rear-projected shot cut from the film.

A grand, cinematic masterpiece, a dazzling, full-bodied epic, 20,000 LEAGUES is considered one of the most imaginative and innovative science fiction films of all time. And while the film sports daring and complex special effects sequences, its greatest appeal lies in its straightforward, unpretentious style; it's a simple story well told.

The plotline of 20,000 LEAGUES can be summarized in a nutshell: a mysterious and seemingly misfit inventor, Captain Nemo, who has severed all ties with the civilized world, roams the awesome world beneath the sea in his futuristic, high-tech submarine (the *Nautilus*), with an equally mysterious crew. Driven by a fierce, implacable hatred of society, he uses his invention as a weapon against warships of an unnamed, oppressive nation that has taken everything away from him, including his country and his family.

Also on board are three castaways (Professor Aronnax, Ned Land and Conseil) who have been taken prisoners by the submariners. Confined aboard the *Nautilus* as it travels around the world, they are torn between the urge to escape and the desire to stay aboard and experience the wonders of the deep.

In the early 1950s, Walt Disney was involved in a number of projects, including a series of "true life adventure" nature films, various animated shorts and features, and several live-action costume dramas made in England. But his most important act during this period was his decision to build Disneyland.

Kirk Douglas, as harpooner Ned Land, gets keel-hauled by Nemo for mutiny.

Douglas clings to a mock-up of the dorsal fin of the *Nautilus* in a dump tank at Disney Studios. The background of open sea is rear-projected footage.



Captain Nemo (James Mason) shows Professor Aronnax (Paul Lukas) the wonders of the deep, as they stand before the portal in Nemo's salon, a scene shot at Disney studios (right). Director of photography Franz Planer had extreme difficulty lighting the interior sets of the *Nautilus* because of their cramped space. The grip sitting on the ladder at left passes the branch of coral in front of the lights to cast a shadow on the actors to correspond with the action in a point-of-view shot of what they see.

The idea of a family park had been growing in Disney's imagination since the early '30s, but the heavy investments he had made in his studio and its major productions, plus the intervention of World War II, prevented him from developing the concept. Then, in 1952, he formed what would become WED Enterprises, Inc. (an acronym for Walter Elias Disney) for the purpose of turning his dream into a physical reality. Key members of his animation staff, along with talents from the live-action studios, were recruited to design and plan the park. Among the latter group was designer Harper Goff, who was to conceive the imaginative sets for 20,000 LEAGUES UNDER THE SEA.

Goff entered the film industry in the early '30s as a sketch artist for Warner Bros and worked on such classics as CAPTAIN BLOOD, THE ADVENTURES OF ROBIN HOOD, THE CHARGE OF THE LIGHT BRIGADE, THE SEA HAWK, CASABLANCA and THE FIGHTING 69TH. While working on Disney's theme park in 1952, Goff was also given film assignments to do. Disney asked Goff to visit the marine lab at the California Institute of Technology and see a film made by Dr. McGinnity, the Institute's director.

"Walt wanted me to see if it could fit into an undersea film for the 'true-life adventure' series," explained Goff. "McGinnity had shot some remarkable footage of marine life in a tank—minute fish

and silk-like nudibranch appeared to move in a vacuum because the water was so pure. I thought this film could be fixed to music—a sort of underwater ballet.

"While developing a storyboard for the McGinnity feature, I daydreamed about the silent film version of Verne's 20,000 LEAGUES UNDER THE SEA," continued Goff. "I visualized a sequence for the film in which two divers go down to the ocean floor and explore the wonders of the deep. I went ahead and made a series of sketches for that section of the film."

When Disney found out that Goff's sketches were based on 20,000 LEAGUES UNDER THE SEA, he told the artist that he wanted to make a new film version,

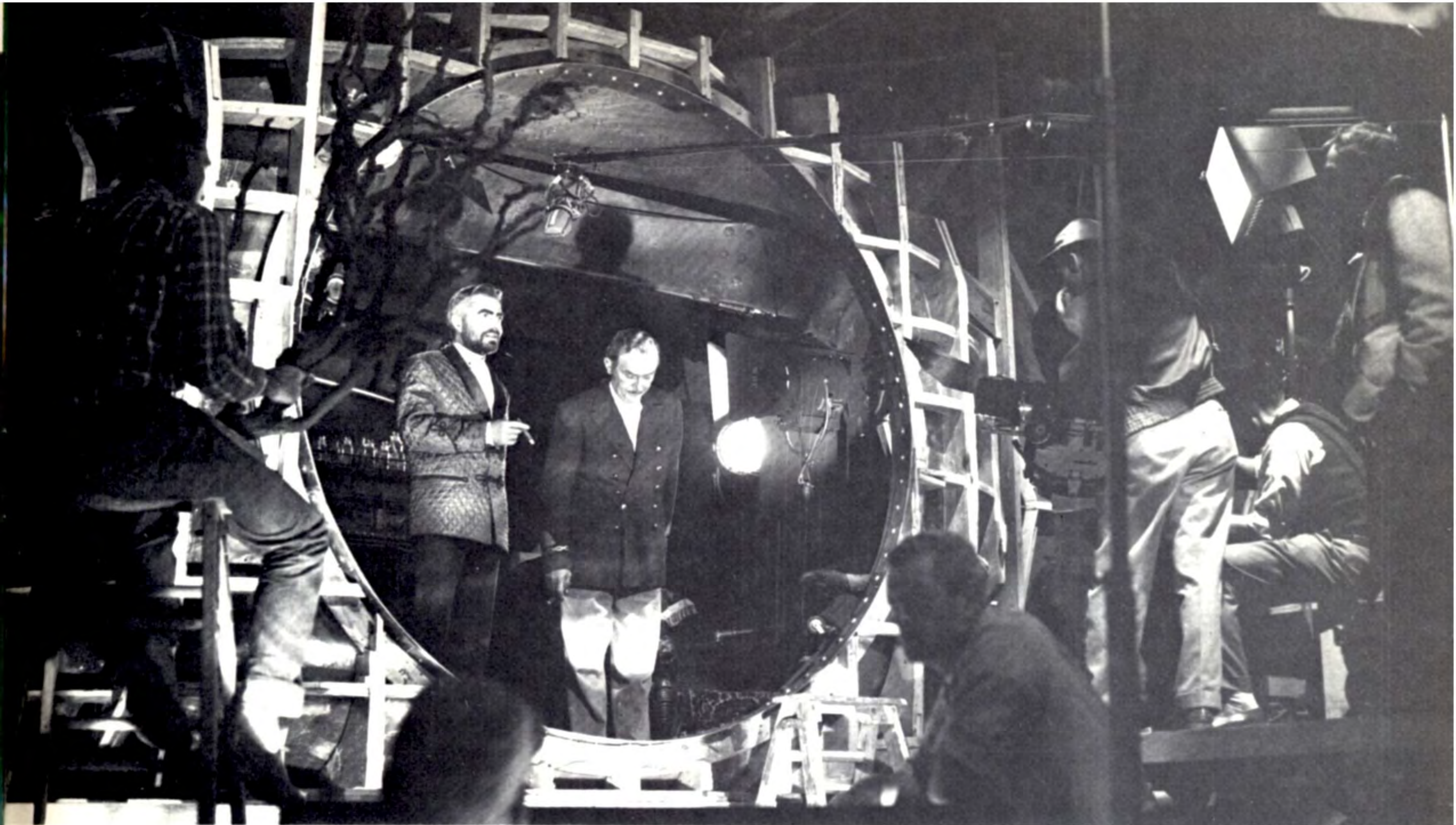
but MGM owned the rights. However, after some investigating, Disney learned that MGM sold the rights to the King Brothers, who sold it to a small company that failed to do anything with it. Impressed by Goff's storyboards and wanting to take on the challenge, Disney decided to buy the rights.

During the late summer of 1952, preparation got underway for a full-length animated version of 20,000 LEAGUES UNDER THE SEA. Goff was placed in charge of project development, and his first task was to design Verne's fantastic submarine, the *Nautilus*.

Goff believed that Verne's story, without the mechanical marvels of the submarine, would have been simply another standard adventure

Production designer Harper Goff poses 30 years later with a replica of the prototype model of the *Nautilus* he constructed over a Labor Day weekend in 1952.





tale. Although the story is set in the mid-19th Century, the *Nautilus*—the movie's super-powerful underwater vessel headed by Captain Nemo—is capable of acts that are even impossible for a modern submarine, like ramming ships at tremendous speeds without suffering irreparable damage to its hull. In other words, Goff's *Nautilus* has to be extremely unconventional in terms of design and operation.

Goff's first challenge was to create a submarine that had the outward appearance of a sea monster. "The book said that the *Nautilus* was mistaken by observers to be a terrifying sea creature," Goff said. "I always thought that the shark and alligator were quite deadly-looking in the water, so I based my design on their physical characteristics. The submarine's streamlined body, dorsal fin and prominent tail simulated the traits of the shark. The heavy rivet patterns on the surface plates represented the rough skin on the alligator, while the forward viewports and top searchlights represented its menacing eyes.

"Verne's *Nautilus* could go through the hull of an enemy ship like a needle through cloth," continued Goff. "I designed four saw-toothed ridges that started at the prow and ran along the hull to the stern. Besides being capable of cutting through the hull of a ship, these projecting ridges also protected the submarine's viewports, lights, diving planes and helical propeller from the ship's wreckage."

Utilizing these ideas, Goff built the first prototype model over the Labor Day weekend, and presented the 18-inch model to Disney, who was less than pleased with the design.

"Walt thought it was too cluttered," remembered Goff. "He showed me an aluminum cigar capsule and said, 'That's what I think the *Nautilus* should look like.' He wanted a sleek, cylindrical craft with a bullet nose. Even though Verne's submarine in the story was similar to this, I felt that 20,000 LEAGUES would have been the dulllest picture in the world if Walt had used it. You look at it once, and you've seen it."

Since Nemo possessed knowledge of advanced technology, Disney thought the *Nautilus* should have a futuristic design, including a smooth-surfaced body. Goff totally disagreed.

"I told Walt that the *Nautilus* was built hastily and roughly at Nemo's secret base," the designer explained. "The only available material was the rough iron that was salvaged from wrecks. Nemo didn't have a big drop-forge to smooth out the iron plates or dies to shape and curve them. At the time our story took place, the iron-riveted ship was considered the finest example of marine construction. I thought Nemo had no choice but to use flat iron plates, heavily riveted by hand, to build his submarine."

The only feature Walt Disney liked about Goff's model was the skiff which fitted into its own berth on the afterdeck. "It was always

locked in place," said Goff. "The crew didn't have to lift it from a cradle or shoot it up from below-decks (as was the case in the book). All they had to do was slide back the protective covers that sealed the inside, climb in and row away. Walt liked that idea, but wouldn't buy anything else."

Despite their differences, Goff managed to convince Disney of his concept and went on to design the submarine's interior structure.

In the late fall of 1952, after months of preliminary work, Disney decided to abandon the animated format and make 20,000 LEAGUES a live-action feature. His British-produced costume dramas, such as TREASURE ISLAND and ROBIN HOOD, performed well at the box office and were less costly and time consuming than the animated features. Modestly budgeted, these films brought in handsome profits and convinced Disney of the important role live-action would play in the financial future of his studio.

In 1953, activity at the studio changed from the quiet of an all-animation studio to the bustle of construction of new shops and sound stage facilities that were needed to accommodate live-action filming. Also built was a special tank stage (now called Stage 3), which was used in the shooting of many of the film's "water effects" sequences, including the dazzling fight with the giant squid and the filming of all the underwater miniatures. This indoor tank, which measured 60 by 125 feet and ranged

Cast & Credits

A Buena Vista release. 12/54. 127 mins. *Directed by* Richard Fleischer. *Produced by* Walt Disney. *Screenplay by* Earl Felton, based on the novel by Jules Verne. *Music by* Paul Smith. *Cinematographer, Franz Planer. Edited by* Elmo Williams. *Sound director, C. O. Slyfield. Sound recording, Robert O. Cook. Production manager, Fred Leahy. Effects photographer, Ralph Hammeras. Second Unit director, James Havens. Underwater photographer, Till Gabbani. Special processes, Ub Iwerks. Technicolor consultant, Morgan Padelford. Assistant directors, Tom Connors Jr., Russ Haverick. Diving master, Fred Zendar. Production developed by Harper Goff. Art director, John Meehan. Set decorator, Emile Kuri. Special effects, John Hench, Josh Meador. Matte artist, Peter Ellenshaw. Sketch artist, Bruce Bushman. Make-up and hairdressing, Lou Hippe. Costumer, Norman Martien. Stunt diver, Norm Bishop. Expert for Bahama locations, Howard Lightbourn. Special mechanical effects, Robert A. Matthey. Sculptor for squid sequence, Chris Mueller. Consultants, Howard and Theodore Lydecker.*

Ned Land Kirk Douglas
Capt. Nemo James Mason
Prof. Aronnax Paul Lukas
Conseil Peter Lorre
Mate Robert J. Wilke
John Howard Carleton Young
Captain Farragut ... Ted De Corsia
Diver Percy Helton
Mate on Lincoln Ted Cooper
Shipping agent Edward Marr
Casey Moore Fred Graham

from three to 18 feet in depth, cost Disney \$300,000.

Because Disney did not have a live-action staff, he recruited many of the artists and craftsmen from other studios, mainly Fox, Paramount and RKO. John Meehan was brought in from Paramount as art director.

"The words 'art director' and 'production designer' are union [IATSE—International Alliance of Theatrical Stage Employees] terms," said Harper Goff. "I was not allowed screen credit for my art direction because I was not a member of the union-affiliated Society of Motion Picture Art Directors. If I had received credit, the union projectionists would have refused to run the picture.

"Disney and other members of the Independent Producers Association were negotiating with the union at the time," continued Goff. "They were trying to stay out of union affiliates and remain independent. When the sets were being constructed, Emile Kuri, our set decorator, told me to get a union card because he believed my art direction would win an Academy Award. I plagued Walt, who seemed to make an effort, but his attorney, Gunther Lessing, advised him to refrain from helping me because he was still trying to come to terms with the union. He'd be contradicting himself. Later, after the picture was completed, I got myself a union card, but I still could not be recognized as the production designer or art director on 20,000 LEAGUES, because I wasn't a union member when I worked on the picture. It was a very traumatic experience, believe me.

"Obviously, it became necessary, in order to continue work on 20,000 LEAGUES to hire a union art director," said Goff. "John Meehan was brought in as the art director of record to carry out my designs and supervise the final drafting and construction of the sets. John followed my drawings exactly. Since I was not involved with the *Abraham Lincoln* [the armed fri-



James Mason and Paul Lukas film the scene where Nemo shows Aronnax the slave labor camp at Rorapandi. The exterior set is built at 20th Century-Fox, on the shores of "Chicago Lake," so called because the town in the background was built for the filming of *IN OLD CHICAGO* in 1938. The scaffolding behind the town supports the sky backing for the Sersen effects tank.

gate assigned to track down and destroy the *Nautilus*] or the San Francisco interiors. John was given responsibility for designing those sets."

However, the *Nautilus* was entirely Goff's design. "The definitive model was made a long time before John came on the picture," he said. "There were a lot of things he wanted to do to the *Nautilus*, but his hands were tied because Walt was satisfied with my designs."

Goff's initial model of the *Nautilus* was different from the one that appears in the picture, though. "For example, each blade on the ram could be removed and replaced when it was damaged, like the

blade on a plowshare," said Goff. "Also, the original model lacked the bubble lights and dorsal fin. The wheelhouse's viewports were supposed to have been the glowing eyes of the monster. After completing the model, I realized that Nemo could not see outside the windows because of the glare produced by the inside lights. So, I tacked on lights above the forward viewports, and I found that these lights, positioned above and behind the menacing saw-toothed ram, gave the *Nautilus* an even deadlier appearance.

"The dorsal fin was added later as an afterthought," continued Goff. "The full-scale afterdeck of the *Nautilus* was attached to an actual submarine for a scene in which Aronnax and his comrades are left on deck while the submarine submerges. The Navy told us that the stunt people had to hang on to a periscope or some other projection while the sub was in operation. I didn't want a periscope because it would have made the *Nautilus* look too modern. So, I decided to add a saw-toothed dorsal fin which, also, would complement the forward ram."

Continuing his design work on the *Nautilus*, Goff moved to its interior, first creating a functional tubular one that was based on one of the world's classic examples of structural engineering, the Forth railway bridge in Scotland. "I always loved the look of this cantilever bridge," Goff said. "It was made of giant tubular columns and

trusses." Although lightweight, the tubular members were rigid enough to withstand heavy wind action.

"When it came time to design the interior framework, I asked myself: what kind of system did Nemo use to pressurize and stabilize the hull?" continued Goff. "I came up with the idea that he built a tubular system to pump both air and water through the boat. The air was stored in the upper tubes in the structural frame while the ballast filled the lower tubes."

As for the submarine's interior chambers, Goff was inspired by the battleship *Oregon*, which was built in the 1890s. "The ship had a nice profile, however, it was below-decks where she was the most impressive," Goff said. "The cabins had been fitted with finely-crafted, built-in beds, lockers and chart tables—all designed to fit neatly and cleanly between the ship's struts and braces. The highly varnished woodwork and polished brass railings conformed with the curves and contours of the ship. I tried to carry this impressive style throughout the interiors of the *Nautilus*.

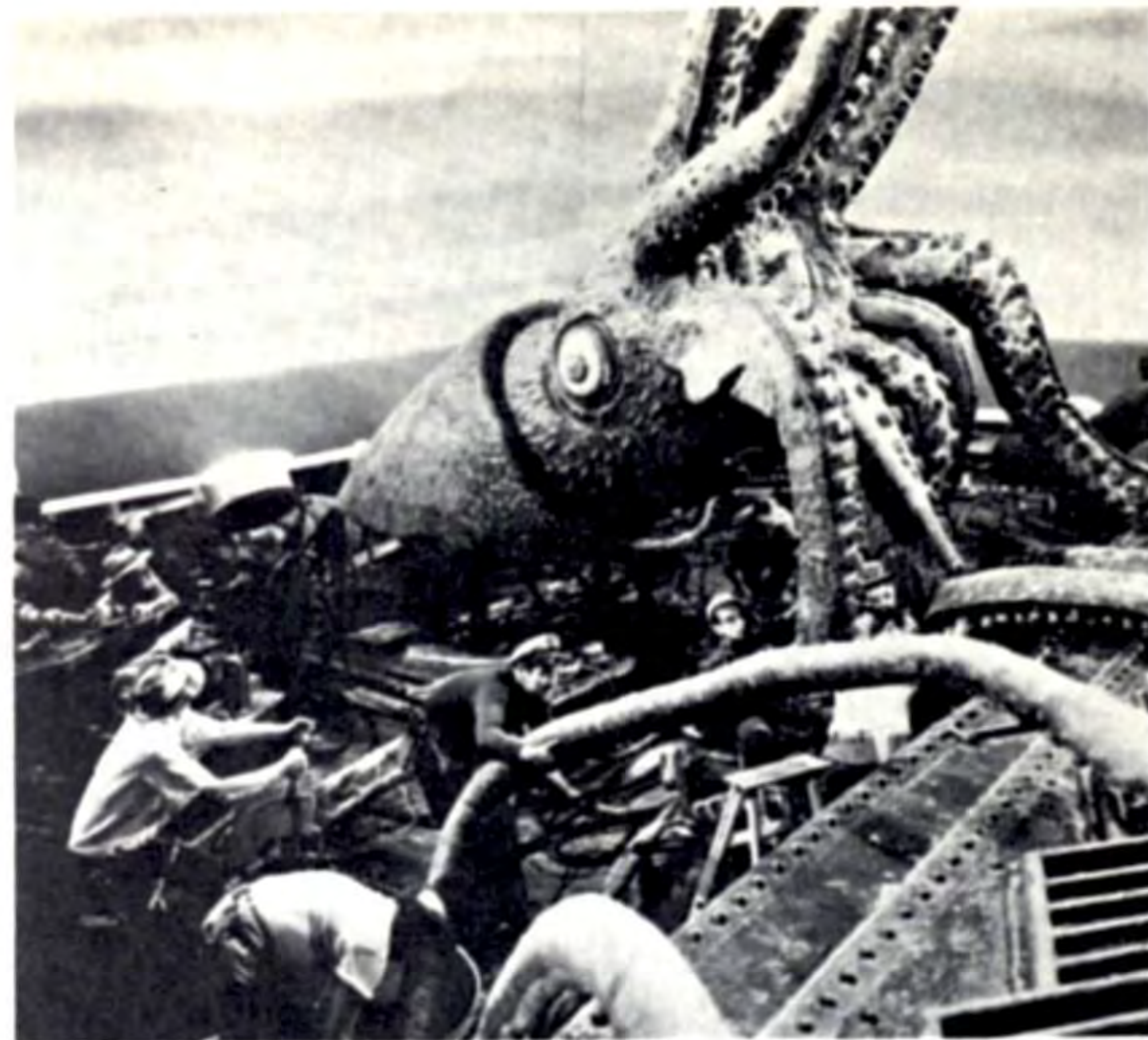
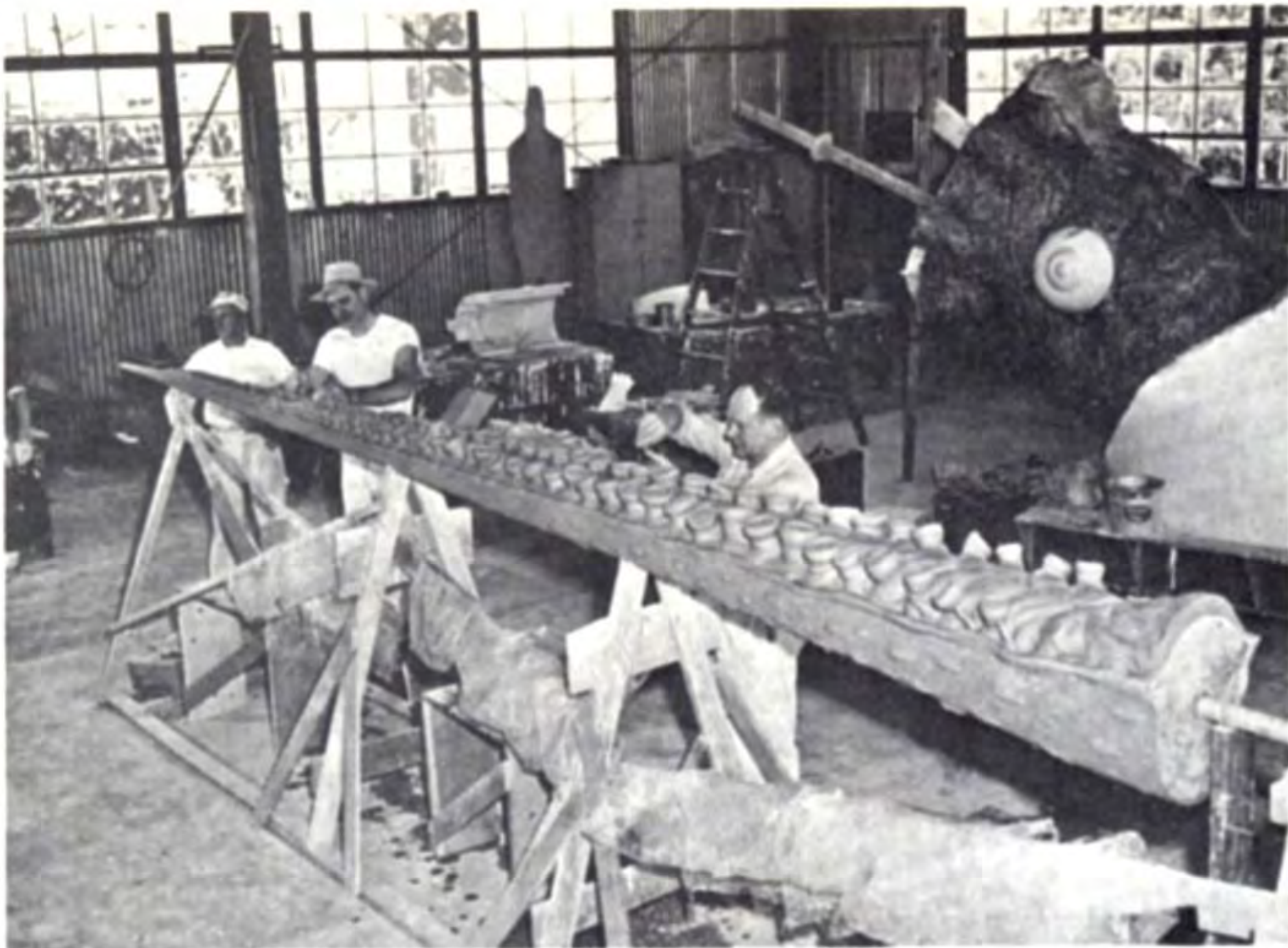
Goff's interiors successfully combined futuristic, piston-driven machinery with 19-century culture. In Goff's imaginative recreation of Nemo's salon, elegant furnishings blended tastefully with the surrounding tubular iron framework and jewel-like nautical instruments.

"Nothing looks so attractive as a

Walt Disney greets animation pioneer Max Fleischer (center) and son Richard, after Fleischer Jr. had finished directing the filming of 20,000 LEAGUES.



THE GIANT SQUID was sculpted in the Disney prop shop by a team headed by Chris Mueller, shown (left, center) sculpting one of the squid's sessile arms. The partially completed body sits in the background. The squid was rigged with mechanics for filming by an effects team (right) headed by Robert Matthey, and is shown here being set-up to film the first, abandoned "pink sky" squid sequence (shown facing page). Lighting for the sequence was too bright and made the wire-work show.



combination of rough iron and elegant luxury," said Goff. "Although the *Nautilus* was a machine of the future, its inventor would have been uncomfortable living in a high-tech, ultra-modern STAR WARS interior.

"Nemo got everything for his submarine—building materials, furniture, objects of art, and even a pipe organ adorned in filigree—from the wrecks he found on the ocean floor," continued Goff. "The excitement of the submarine's functionalism, combined

with Nemo's love to be surrounded by objects of beauty, that's what made the art direction a success."

While Goff was working on his designs, Walt Disney was busy picking a director and writer. After rejecting a few scripts by John Tucker Battle, he finally decided on screenwriter Earl Felton and director Richard Fleischer, who had worked together on some successful B movies at RKO.

A graduate of Brown University

and the Yale School of Drama, Fleischer began his film career with newsreels and short subjects for RKO during the early '40s. Graduating to feature films, he collaborated with writer Earl Felton on several low-budget, but well-made crime melodramas, including *ARMORED CAR ROBBERY* and *THE NARROW MARGIN*. In 1952, Felton and Fleischer teamed again to make *THE HAPPY TIME*, a Disney-like situation comedy about the daily ups and downs of an eccentric family

headed by Charles Boyer. Its excellent script and direction attracted Disney's attention.

"I was chosen to direct 20,000 LEAGUES by a committee at Disney Studios after they had reviewed my earlier films," recalled Fleischer. "At our first meeting, I asked Walt why he had selected me. He answered, 'I saw *HAPPY TIME*, which featured Bobby Driscoll, one of our contract players. If anybody can make an actor out of that kid, he's got to be a good director.'"

Before accepting the assignment, however, Fleischer discussed the offer with his father, animation pioneer Max Fleischer, who had been Disney's rival for many years. "I didn't want my father to feel I was being disloyal," said Fleischer. "If he didn't want me to work for Walt, I wouldn't. His reply was positive, though: 'Oh, God! Yes! Take the job. I think it's wonderful. Tell Walt he's got very good taste.' A couple of years later, when my father visited me in California, Walt honored him with a big luncheon at the studio and a special tour through Disneyland. They became good friends. It was heartwarming to see these two men, who had been bitter enemies for so many years, come together."

Fleischer's first task was to get a workable script, collaborating with scenarist Earl Felton. "While breaking down the novel, Earl and I became acutely aware that there was no real story, only a series of incidents," said Fleischer. "The standard American translation of Verne is a very poor one. The original French work has a real story, but it's lost in translation.

"Our first step was to find out the origin and goals of the principal character, Captain Nemo," continued Fleischer. "We did it like a piece of detective work. There are a few hints scattered around in the novel—for example, there is a portrait of a young woman and a child in Nemo's stateroom. Who are they? And why is Nemo wandering the seas alone? We figured the portrait was that of Nemo's dead wife and child, and then we invented his



Shooting the cannibal attack on the Nautilus, as Captain Nemo repels the natives by electrifying the ship's hull. Filming is taking place in the Sersen Tank on the lot of 20th Century-Fox. The camera on a tripod (lower right) is shooting the action, which is backed-up by a sky backdrop at the other end of the tank (inset). A second effects camera, bolted down, films another angle for use by the Disney animation department to add the electrical effect.



background and why he was on his own."

The screen image of Nemo differs from Verne's original, who was a misguided anarchist who seeks world revolution. He was also contemptuous of society, vowing never again to hold any communication with the civilized world. However, the celluloid Nemo is a militant pacifist, a man who believes in world reformation not revolution. He is willing to share his scientific knowledge with all nations if they will lay down their arms and end aggression. Such pacifism would have infuriated Verne.

The philosophy that is proposed and expounded in the film is very sympathetic to Nemo. "Although Nemo is demonic, he is a force of good fighting the forces of evil," said Fleischer. "He lost his wife and child. He was captured and spent years in a slave camp. He sinks ships that carry munitions and tools of war. He never sinks anything that is innocent."

Though the Disney version of Nemo is a more sympathetic character, he is, ironically, more cold-blooded than the original. He deliberately hunts and destroys warships without remorse; he always takes the offensive. On the other hand, Verne's Nemo always takes the defensive; he sinks ships only when provoked into doing so. Verne did not let his character kill for the sake of killing. He believed Nemo to be a compassionate man whose actions were created by the repressive environment around him.

"Personally, I don't agree with Verne," said Fleischer. "Because Nemo built that kind of destructive machine, I don't think he'd play by fair rules and wait for somebody to attack him."

After developing Nemo's background and philosophy, Felton's next step was to devise a plot which would give the audience the promise of an exciting adventure.

"In the novel, Aronnax, Conseil and Ned [the three men assigned to find and destroy the evil "sea monster," which happens to be Nemo's *Nautilus*] simply go along as observers," the director said. "You can't do that for a long time on the screen. There has to be another story other than Nemo's. Earl [Felton] came up with a wonderful solution. He decided that the only way to tell this story and make it work as far as suspense was concerned was to make it about a prison break. Earl said, 'This is really a story about three men who are prisoners in a submarine. Aronnax does not want to escape, but the others are always plotting and scheming and trying to take advantage of the situation to get out.' Once Earl hit on that idea, and we knew who Nemo was and what motivated him, these two concepts meshed together into a workable



Captain Nemo's encounter with the squid was originally staged on a placid sea at sunset. These shots of Nemo (James Mason) in the grip of the squid (top) and his stunt double (right) being hoisted on high by a wire-rigged tentacle, show a reddish cast to the lighting and sky backdrop. After a week of shooting under director Richard Fleischer, the sequence was halted because its static quality and the bright lighting revealed the squid to be an obvious mechanical prop. The setting was later altered to a raging storm, and the scene was successfully refilmed by a second unit.



screenplay.

"Since we couldn't use all the incidents that were in the novel, we took what we felt were the most memorable scenes and put them in the script," continued Fleischer. "Everybody remembers the underwater burial, the cannibal attack, and the fight with the giant squid, so we had to include those incidents. We didn't use them in the same continuity nor in the same way because we counted on the fact that nobody ever really read the book very carefully. We felt they would be perfectly willing to accept our version, and they did. As a matter of fact, the story that is known today by most young people is the one we invented for the screen."

In Felton's adaptation, the *Nautilus* is powered by atomic energy—a far cry from Verne's electric submarine. "We had to modernize the story in order to give it a feeling of things to come. The challenge of our story was to keep the science fiction ambience to something that is no longer science fiction. We had to take a familiar object—the submarine—and make

it an object of wonder and fantasy. Our aim was to put the audience into the position of never having seen or heard of a submarine before, and to lead them through the wonders of this craft for the first time."

A lot of violence punctuates the screenplay—numerous fist fights, the destruction of several ships, the implied drowning of many sailors and an atomic holocaust which takes the lives of hundreds of people. This was unusual material for Disney, and most unusual of all was Felton's idea of Captain Nemo and his crew forming a suicide pact. But it must be remembered that the screenplay was written long before the Disney organization became restricted in the kind of material it was willing to handle.

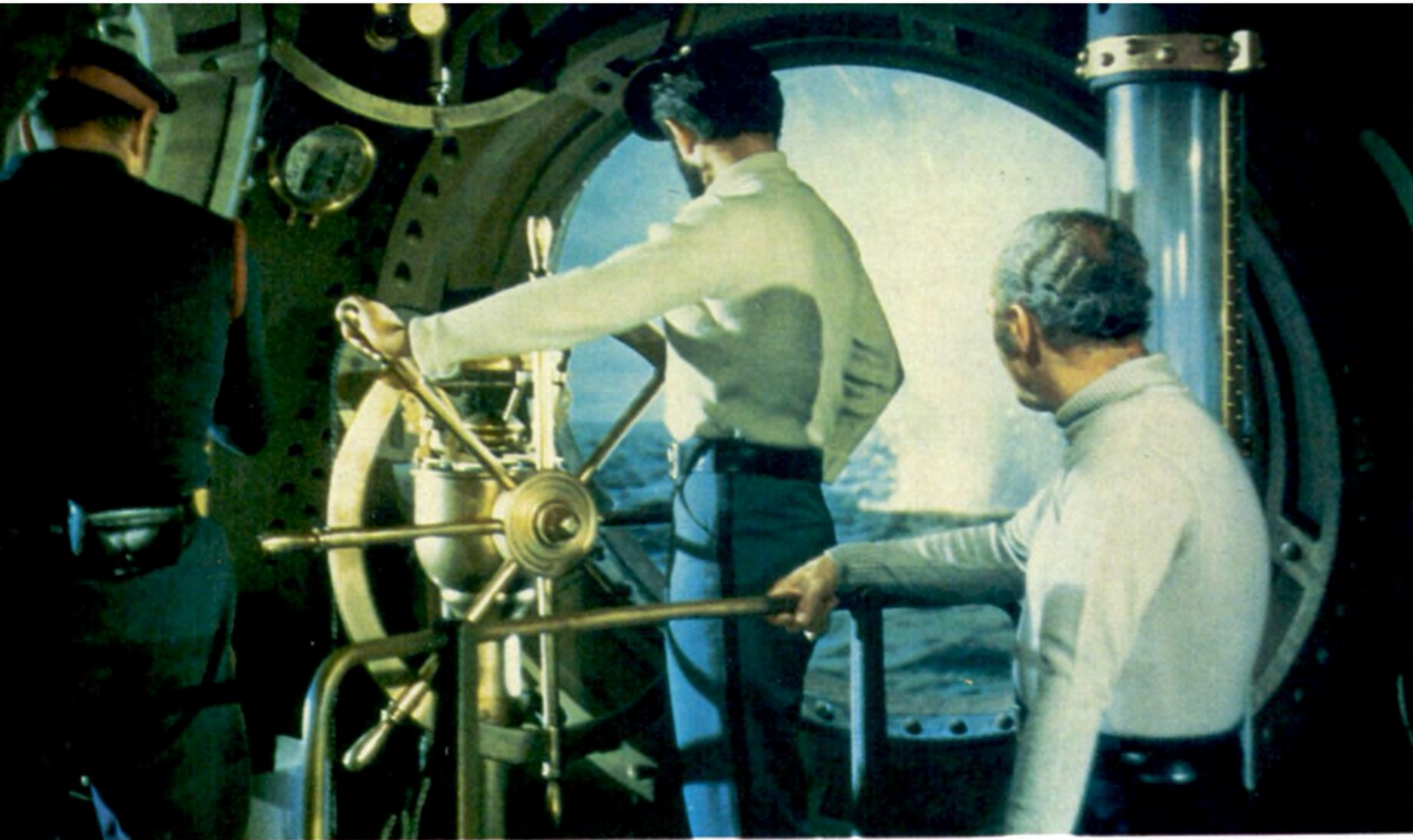
"If Disney studios made the picture today, they would not use the same storyline, and I don't think 20,000 LEAGUES would be as good a picture because they have an established pattern to their films now," said Fleischer.

"Walt had a marvelous instinct," he continued. "He had his

say in the formation of the story and made suggestions and contributions to the script. For example, the inclusion of the pet seal was his idea—the Disney touch. The script reflects his taste and a lot of his personality."

Another Disney touch was the injection of humorous material into the script to counterbalance the tense dramatic moments—scenes such as Ned's encounter with the cannibals and his interplay with the worrisome Conseil.

Felton's screenplay for 20,000 LEAGUES was not the first treatment the Disney production company commissioned. In 1952, while Goff was busy on the film's designs, Walt Disney hired scriptwriter John Tucker Battle, who wrote INVADERS FROM MARS (1953), to turn Verne's novel into a screenplay. Submitted in February 1953, a few months before Fleischer and Felton joined the project, Battle's script was a literal translation of every incident in the book, nearly 300 pages worth that would run more than four hours on the screen. Creative differences between Battle and Walt Disney led to the



Captain Nemo (James Mason) at the helm in the wheelhouse of the Nautilus, as it comes under enemy fire. The exploding shell eyed by Nemo and his first mate (Robert Wilke) through the starboard viewport is rear-projected effects footage.

commissioning of Felton's script at the recommendation of Fleischer.

Battle's first script had a few problems: his dialogue was flowery and long-winded, and it took more than 45 minutes of screen time just to get Aronnax and his party on board the *Nautilus*.

Disney sent Battle back to his typewriter and by September of 1953 he produced a second draft. Cut down to almost 200 pages, this draft was still faithful to the Verne novel and contained references to the preproduction art Harper Goff and his art department had been turning out all summer. The interior scenes followed Goff's early designs including a double air lock diving chamber. Goff later dropped the separate air lock as unnecessary, since the diving chamber could be pressurized.

Battle's second draft did have several interesting character developments, most outstanding of which was a claustrophobic Ned Land. At one point while the *Nautilus* traverses through a tunnel from the Red Sea to the Mediterranean, Land goes wild, screaming that he can't breathe. He bursts into the wheelhouse, seizes control and careens the submarine into a tunnel wall, starting a rock slide that partially buries the *Nautilus*. Nemo frees the sub, rams through the collapsed portion of the tunnel and makes for the surface just as everyone begins passing out from lack of air.

The sequence neatly combines two elements from Verne's novel, the Arabian Tunnel and the trapping of the *Nautilus* at the South Pole, but such a character flaw would never do for a role that Disney thought of as the hero of the story.

Both of Battle's screenplays end with Aronnax and company mak-

ing their escape from the *Nautilus* as Nemo, overcome with grief and remorse, plunges the submarine into a Maelstrom, wildly playing his organ. It's an arousing climax, but unlike the Fleischer-Felton collaboration, Nemo has no motivation in Battle's script and remains a mystery to the end.

About the same time Battle turned in his second version, Felton completed his final draft, in late September. However, it would go through a total of nine revisions during the six months of principal shooting.

In its first steps toward filming, Felton's screenplay was first turned over to Disney's artists, and *20,000 LEAGUES* became the first film to have storyboards done for every line of dialogue. Over 1300 draw-

ings were made to visualize the story, and Harper Goff rendered more than 60 sketches of the giant squid sequence alone.

After his director and screenplay were secured, Disney moved on to casting, selecting four actors who combined expert craftsmanship with wide popular appeal. For the role of the red-blooded, muscle-flexing Ned Land, Disney chose Kirk Douglas. It was quite a change of pace for Douglas who usually played unscrupulous, high-strung characters; the part of the fun-loving harpooner gave him a chance to display a lighter side of his talent.

Hungarian-born Paul Lukas, who won an Academy Award for

his performance in *WATCH ON THE RHINE*, was selected to play the erudite French scientist, Professor Aronnax. Originally Charles Boyer, whom Disney had admired in Fleischer's *THE HAPPY TIME*, was slated to play the part, but he ultimately withdrew.

For the meek and mild-mannered Conseil, the professor's apprentice, Disney chose Peter Lorre, who, until this film, had long been identified as one of the scene's top heavies. The role of Conseil gave him the opportunity to show his comedic talents.

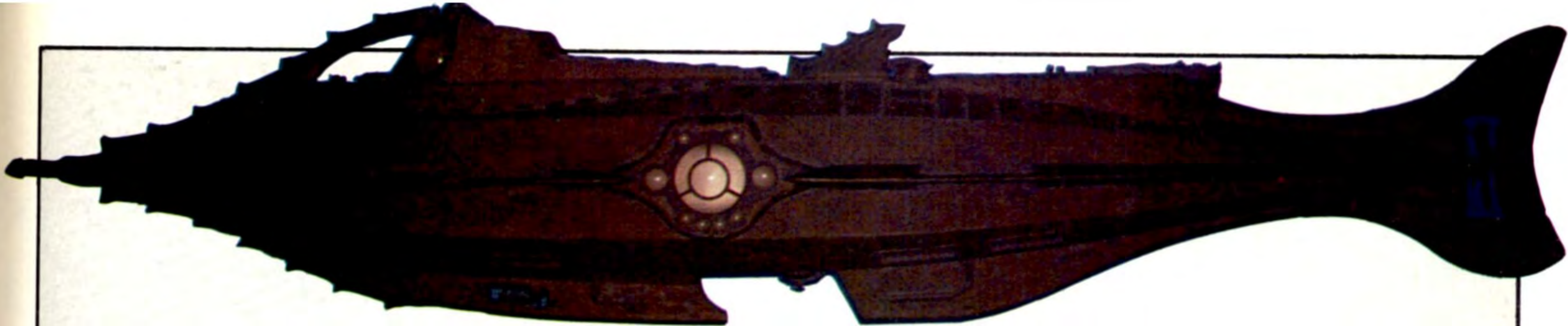
To portray the complex and mysterious Captain Nemo, the pivotal character in the story, Disney chose James Mason. The choice could not have been a better one. Although noted actors like Lionel Barrymore, Herbert Lom, Robert Ryan and Omar Sharif have portrayed the enigmatic captain in other films, both fans and critics agree that Mason's interpretation is the definitive one. The subtle shadings and marked intelligence of his performance gave depth and dimension to a character that might have been merely a villain in less capable hands.

"To tell you the truth, I never read *20,000 LEAGUES UNDER THE SEA*," said Mason, who now lives in Switzerland.

"I refused to do the film a couple of times," continued Mason. "It was presented to me by my agent at the time, Ray Stark, who tried to coax me into playing the character of Captain Nemo. But I was afraid *20,000 LEAGUES* was going to be a children's film, and I didn't like the idea of Captain Nemo being played down to a juvenile level. However, I couldn't help but think that the script was very good. Then Stark attacked me on the subject of the director, Richard Fleischer, who had recently made a

The salon of the Nautilus, looking aft, an example of the kind of work that won set decorator Emile Kuri an Oscar for the film.





The Nautilus

Harper Goff designed Nemo's submarine and set decorator Emile Kuri furnished it with style.

For the job of decorating the *Nautilus*, Walt Disney recruited Emile Kuri as set decorator from Paramount Pictures. Kuri, who was recommended for the job by art director John Meehan (they worked together on William Wyler's *THE HEIRESS*), ended up staying at Disney Studios for 20 years, winning Oscar nominations for his work in *THE ABSENT-MINDED PROFESSOR* and *MARY POPPINS*.

Kuri scoured marine hardware shops all over the Los Angeles harbor area, looking for the various nautical dials and gauges to be placed in the wheelhouse and throughout the submarine. Most of the furnishings were loaned out from the Paramount and MGM prop shops.

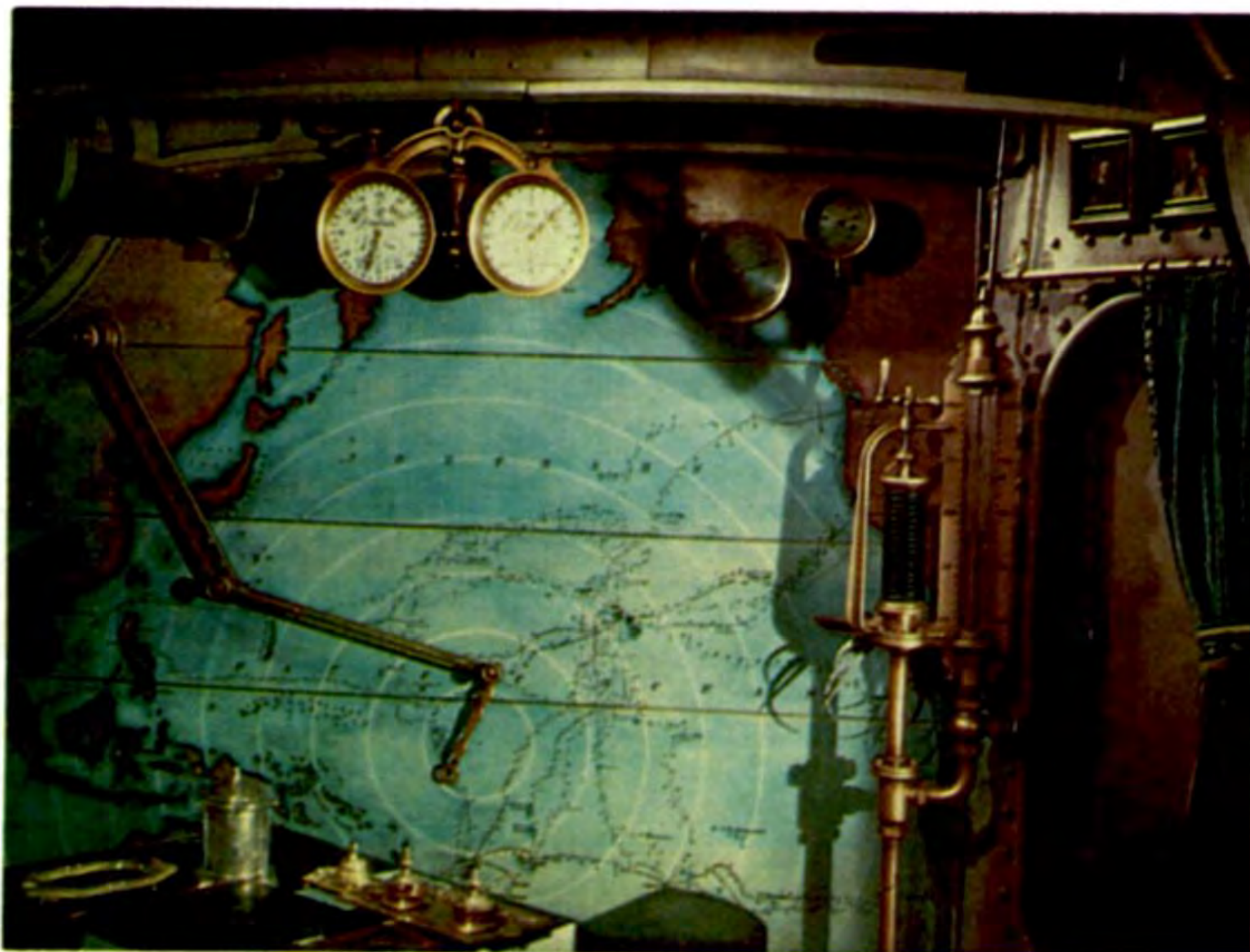
Recalled Kuri, "I remember looking in the empty salon just after construction was finished, and my first reaction was 'This place looks like a cave!' and then 'How am I going to make this look Victorian.'"

Kuri borrowed a Greek Amphora from a museum and rare volumes of books from the Library of Congress. His gold-on-red color scheme offset the salon interior and its plush fittings, velvet settees and drapes, persian rugs and other rococo decorations.

Built for nearly \$250,000 out of a full production budget of \$4.5 million, the sets of the *Nautilus* were constructed mainly of wood, plywood, masonite and a 20,000 LEAGUES UNDER THE SEA innovation, fiberglass.

Most of the film's live action takes place in the submarine's Chartroom-Salon, which has a host of interest-

Above: The 11-foot model of the Nautilus as it was displayed at Walt Disney World in Florida until 1980, when it was put into storage. Below: A cutaway view, showing the layout of Harper Goff's submarine design.



ing props and set pieces: complex-looking gauges, the magnificent pipe organ and an unusual-looking iris shutter on Nemo's window to the sea.

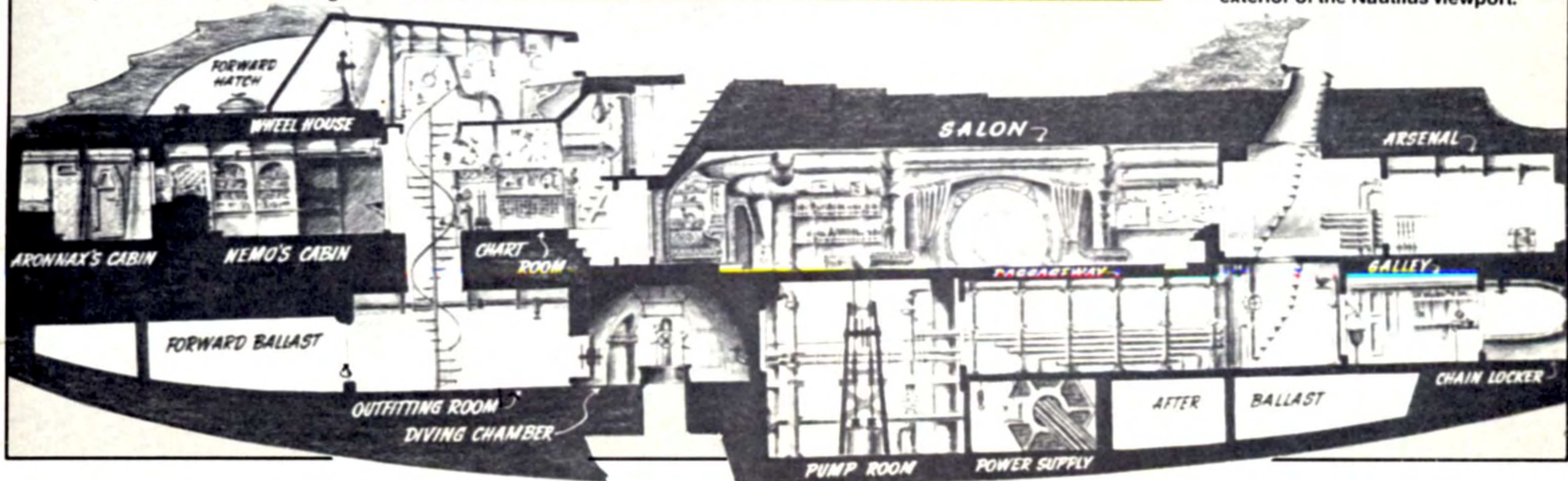
The film's designer, Harper Goff, recalled the development of the iris. "I wanted the iris to be an effective visual device which could either open a scene up or close it down," he said. "I took a lens from a camera and showed it to Bob Matthey, who was in charge of the picture's mechanical effects. 'How large can you make the iris?' I asked. Bob answered, 'As big as your damn window, if that's what you're thinking about.' He built the shutter and it worked perfectly the first time we tried it."

Other exceptional sets included the pump room and the submarine's power supply room. Built of masonite, fiberglass and wood, the pump room was rigged with practical effects (the pounding pumps, the prop shaft and a collapsing beam). The set was located on tank stage three so that it could be flooded.

The power supply room presented a novel design problem for Harper Goff, who needed to provide a modern nuclear reactor with an antique look. Goff designed a functional *looking* chamber fitted with cooling pipes. To give the room added visual excitement, Goff set a number of transparent salad bowls on its back wall and placed flashing, colored lights behind them.

Emile Kuri's rich set decorations dove-tailed perfectly with Goff's designs and were largely responsible for the success of 20,000 LEAGUES UNDER THE SEA.

Top Left: Nemo's chartroom, with the Pacific Ocean measured off in concentric circles emanating from Vulcania, his base. Left: Emile Kuri's Salon set, as viewed through the exterior of the Nautilus viewport.





The San Francisco docks, where the film opens, was an elaborate glass matte painted by Peter Ellenshaw (inset) and filmed on the backlot at Universal. The sign on the live action building was actually a painted element of Ellenshaw's matte.



film (*THE HAPPY TIME*) which had turned out well. Stark had no doubt that Fleischer would have an adult point of view; he believed the film had a good chance of being a 'grown-up' picture which coincidentally would hit the juvenile market. So, I was convinced.

"20,000 LEAGUES was a producer's film and a spectators' film," continued Mason. "It was conceived by Disney as a story that could be translated into one exciting sequence after another. It was a challenge for the set designer and special effects people, but for the director and actors it was routine. I do not believe that the acting parts were written at any great depth. Many sophisticates pooh-poo 20,000 LEAGUES. However, it's still a popular film today because it's a good story well told. Disney insisted upon perfection. And I definitely share the fans' enthusiasm for the film. Not long ago I saw it dubbed into German. It was still terrific."

Later, Mason was offered—but declined—to reprise the role of Nemo in both versions of *MYSTEROUS ISLAND*.

Director Fleischer disagreed with Mason's statement about the film being routine for the director and actors. "I'm surprised James said that," Fleischer responded. "He couldn't be more wrong. It's just that Walt had a powerful personality. When you make a Disney picture, it's a *Disney* picture. Everyone else gets washed out—the direc-

tor, the actors, the writer. Until recent years, I got very little credit for directing 20,000 LEAGUES UNDER THE SEA. Walt's personality overpowered the picture and the public thought it was *his* movie."

The film's casting and preliminary design work completed, 20,000 LEAGUES was ready to begin preproduction, focusing on the logistical problems of filming the underwater scenes. Although his studio built a tank expressly for the film, Disney thought it was necessary, in the interests of realism, to film the diving sequences on location, and thus limit dry-for-wet techniques and tank shots. In fact only one sequence, in which two divers discover a treasure chest inside a sunken galleon, was completely filmed in the indoor tank.

To supervise all diving operations, Disney chose Fred Zendar, a former U.S. Navy master diver and a veteran of scores of sea pictures, including *THE CREATURE FROM THE BLACK LAGOON*, *THE OLD MAN AND THE SEA*, *VOYAGE TO THE BOTTOM OF THE SEA* and *JAWS*. Working closely with designer Goff, Zendar's first task was to develop a special diving rig: Victorian-looking in appearance, yet practical and self-contained.

There were only two methods of going underwater: one in a diving suit and helmet which has air hoses

attached to a surface pump, and the other in scuba gear with air tanks strapped to the diver's body. Goff's original idea was to combine both methods and have a diver, wearing a helmet, receive his air from scuba tanks, instead of a surface pump. However, Zendar ruled out the idea because air could not be piped into the helmet from a scuba tank. A diver's air supply, which is regulated by a demand valve on the helmet, has to be adequate in both volume and pressure. This would require a greater amount of compressed air than a diver could ever get from a scuba tank.

Zendar and Goff decided to use the scuba method. Pooling their talents, they designed a rig which allowed a diver to breathe automatically with an aqualung. Zendar, who handled the technical aspects of the rig, placed an aqualung's inhalation and exhalation breathing tubes inside a Japanese pearl-diver's helmet. To receive or exhale air, a diver simply had to breathe through the mouthpiece which connected both tubes.

Zendar's next step was to create a

lightweight, watertight diving suit. "Walt didn't like the regular suit because it looked too bulky," the veteran diver said. "He wanted something tailored, so I got some surgical rubber, very thin rubber, and made suits out of that."

Because of his concern for what was, in essence, new prototype equipment, Zendar thought a little experimentation was necessary before he made the official presentation to Disney and Fleischer at the studio. On the night of November 6, 1953, Zendar, Goff and another diver went into the Del Mar Beach Club pool to test the equipment. With each diver wearing a helmet, modified scuba gear, lead weights, and 16-pound lead-soled shoes, they walked from the shallow end of the pool to the deep end without any difficulty. Everything had worked perfectly—until the day of the presentation to Disney.

"I tested the goddamn suit in the Disney tank on the first day," stunt diver Norm Bishop said. "Walt was there—everybody at the studio was there. Once I got into the water, I

A test shot of the Nautilus at the South Pole, a scene not found in the finished film. The edge of the painted backdrop is seen (right), during filming in the Fox tank.



realized there was a problem: I didn't have enough weight on me. Zendar, who was outside with the other people, saw me tiptoeing above the floor of the tank and knew immediately that I needed more weight on my belt. He signaled for me to come up."

Bishop made his way to the side of the tank and started for the ladder. "I was tired after spending ten minutes walking around the tank," the diver continued. "I barely made it to the ladder. Then, lo and behold, I passed out as I came up! I was out cold. Fred [Zendar] couldn't figure out what was the matter. After a day of asking questions, we found out that one of the special effects guys had cleaned the helmet—inside and out—with turpentine. The fumes, which I didn't smell, had caused me to pass out."

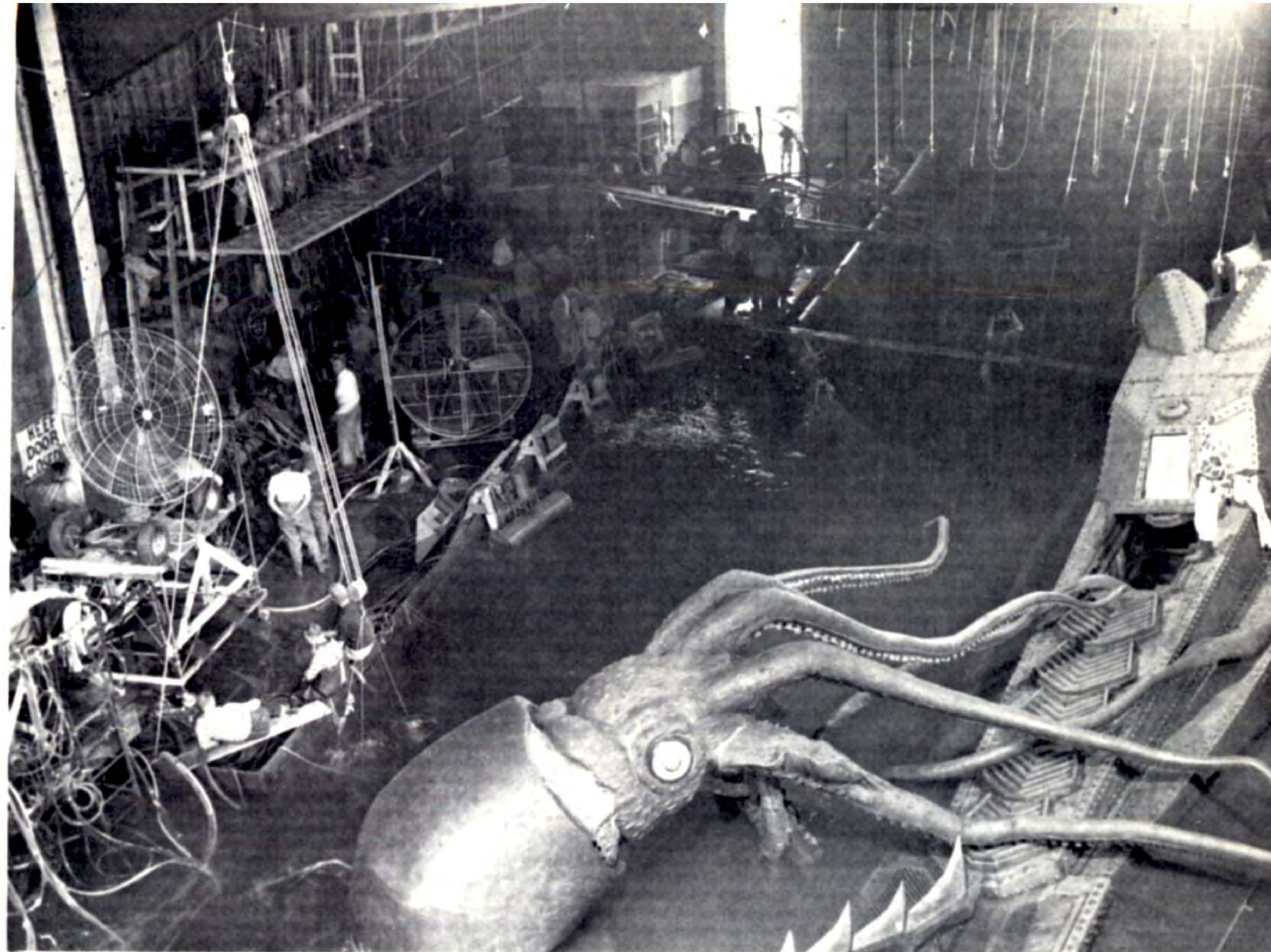
By this point, preproduction was far enough along for Zendar, Fleischer and Goff to leave Burbank to search for a good underwater location in the Bahama Islands.

"Freddy [Zendar] recommended the Bahamas because he believed the clearest water and best reefs were located there," recounted Fleischer. "We arrived in Nassau, hired a boat, toured all the islands, and went diving every day to scout shooting locations. First of all, we wanted to work in depths above 32 feet. If we went deeper, we would encounter greater pressure and greater dangers in working—a lot of time would be spent decompressing. Also, the sunlight falls off sharply below 32 feet, and there is no variety of color. We wouldn't get very much exposure because everything is blue."

"Eventually, we found a place called Lyford Cay, which was uniquely situated on the western tip of New Providence Island," continued Fleischer. "It had a beautiful reef, a white bottom, and was only 28 feet deep. Being on the tip of the island, we could shoot either on the lee side or the windward side of the cay. So, if we had bad weather on one side, we'd have good protection on the other. It was a perfect location."

The move to Lyman Cay, New Providence called for planning equal to that of a military maneuver. More than 20 tons of equipment—ranging from a 30 cent screwdriver to three specially-rigged underwater cameras valued at \$5,000 each—had to be packed into 212 wooden crates. Then a fleet of six boats assembled, including a 110-foot LCT, which served as the main base of operations, a LCM for use as a camera barge, and four speed boats which served as water-taxis.

On New Year's Eve, 1953, Fleischer and Zendar arrived in Nassau, New Providence with a crew of 54 men and enough equipment to sink a small barge. Because



THE SQUID FIGHT seen in the film was the work of second unit director James C. Havens. Shot in gale winds and rain with tortuous seas splashing (right) to obscure the mechanical squid and make it believable, the sequence was actually filmed at the shallow end of a massive tank built on Disney's Stage 3. On April 26, 1953, special effects technicians set up the wind machines, dump tanks and water cannon Havens rented for the scene from MGM. Grips on a high scaffold operate the squid's tentacles with guide wires. The reshooting cost Disney \$200,000.

the divers depended on compressed air when they worked beneath the water, two giant air compressors were flown in to lull the 350 cylinders, each of which held 200 cubic feet of air at 2,000 pounds pressure. On the average day, the troupe would use 50 of these cylinders, or 10,000 cubic feet of compressed air.

After one year of preproduction, filming finally began on January 11, 1954. The first scene to be shot was also the most difficult—a complicated burial sequence in which a crew member from the *Nautilus* is laid to rest in a coral grave. The scene, which took eight tedious days to film, required 33 men to be underwater simultaneously—11 in front of the camera and 22 behind it, including the cameraman, his assistants, prop men, grips, a still photographer and the ever-present underwater safety men.

On a typical day, Fleischer's first step was to diagram the action on a blackboard, and then have the actor/divers rehearse the scene on shore, step by step, until every man was familiar with every movement.

After the dry rehearsal, the cast was taxed to the LCT barge where



they put on their diving gear. Dubbed the "Nemo" in honor of the moody captain of the *Nautilus*, the diving rig consisted of six parts: a copper helmet with breastplate; a flexible, waterproof suit; two compressed air tanks; an emergency tank worn on the front of the suit; lead weights to balance the air tanks; and lead-soled shoes. Standard wear included long woolen underwear, heavy woolen socks and black leather gloves. The total weight of the gear was approximately 150 pounds.

After being put on air, the divers were helped from their bench to a rowboat which transported them to the shooting location. Once there, they lowered themselves to the ocean floor from ropes which hung over the sides of the boat. Each diver was met by an underwater guide (clad in a yellow shirt) who led them to his position in front of the camera.

"Each man carried a small air bottle with a needle which could go into the cuff of a suit and give a diver air if he had a problem," recalled Zendar. "We also had surface guards who were always in verbal contact with the boat."

Added Bishop, "We had a safety man for every two divers, including a 300-pound wrestler who could tuck one under each arm and swim up."

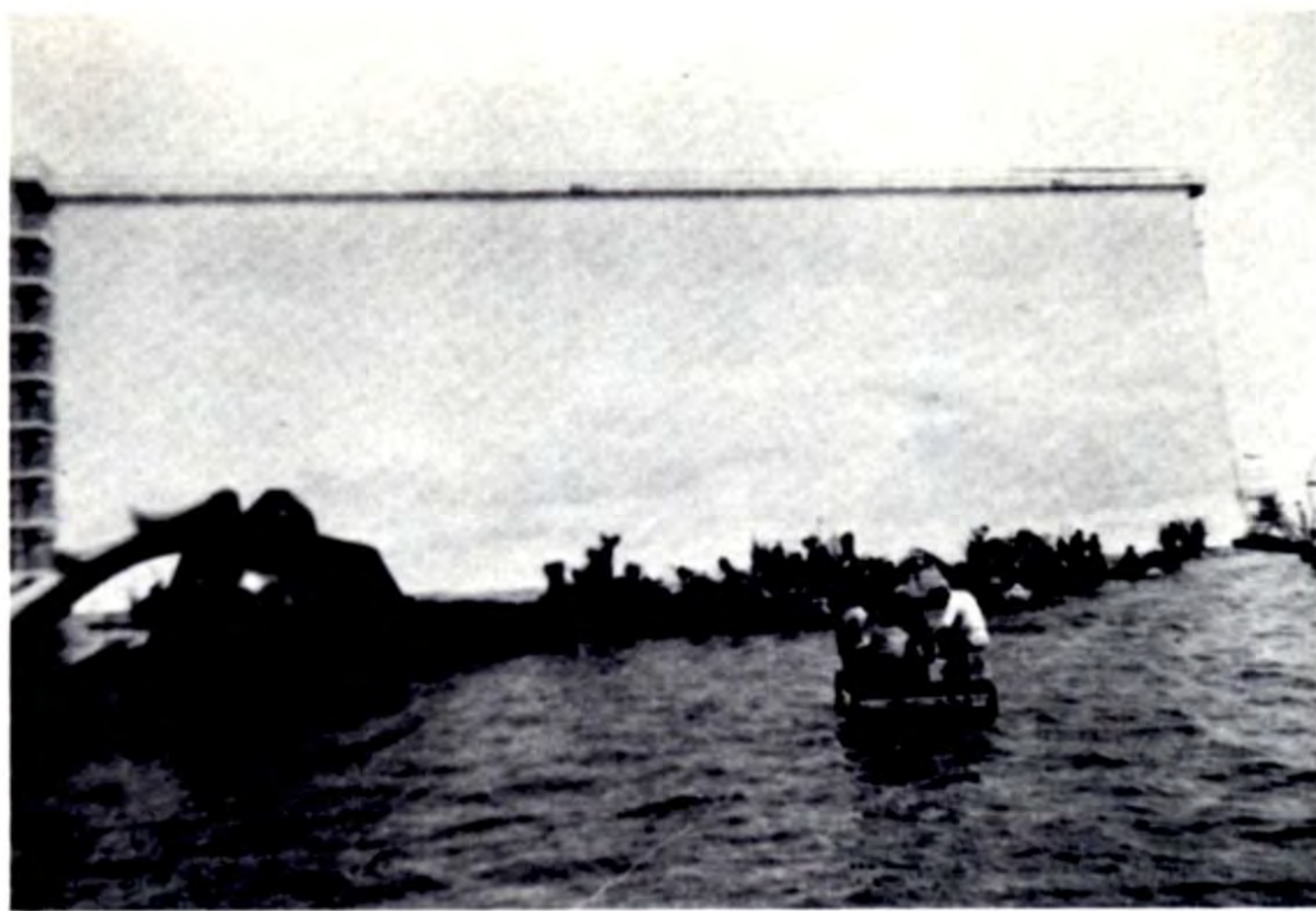
To photograph the underwater scenes, cameraman Till Gabbani used a self-powered, remote-controlled Mitchell camera with a CinemaScope lens inside a pressurized, waterproof case. Specially adapted for underwater filming by the Disney Machine Shop, the camera was mounted on a scaffold-platform which could be raised from five to 20 feet. Gabbani also used a portable Aquaflex Camerette, encased in a water-tight blimp, for "swim through" and dolly shots.

To communicate underwater, the Disney crew devised a set of 12 hand signals to cover such film directions as "action," "cut," "repeat scene," and—most important of all—one for "emergency—get me to the surface immediately!"

"We had well-planned emergency procedures if something should happen to a diver," said Fleischer. "Because we were so safety-conscious, nothing ever happened—until the people from *Life* magazine, who were covering the picture, asked us to stage an emergency so they could photograph a rescue operation. We decided to play along. However, while planning the fake emergency, two *real* ones occurred! One diver ripped his suit on a piece of coral. We took him out of the water immediately.

"The other emergency was more unusual," Fleischer continued. "The only way a diver could release the stale air in his helmet was by pushing an inside valve with the back of his head. One diver was getting a bruise on his head from hitting the valve, so he decided to wear a woolen cap to help stop the irritation. But each time he pushed the valve, the cap would move a little further down his forehead. Inevitably, it slipped down over his eyes and made him absolutely blind.

"He raised one arm, which signaled that he had a problem, but it wasn't serious," Fleischer continued. "The safety men came over to him and looked through the front window, but they couldn't see



Filming the native attack on the *Nautilus* in Fox's Sersen tank. This angle shows the extent of the huge painted sky backdrop, 77 feet high and 224 feet in length.

anything because it was too dark inside. Eventually, another diver came over and put his copper helmet against the helmet of the diver in distress. Earlier it was discovered that the divers could talk to each other when they put their helmets together. When the diver was asked what the problem was, he let go of his stiff-necked mouthpiece and replied, "The cap's over my eyes!" As he answered, the cap slipped further down and covered his mouth! Since he couldn't get the mouthpiece to breathe, he raised both arms which indicated that he had a *serious* problem. The safety men got him to the surface quickly and unscrewed his helmet

so he could get air."

Although these emergencies were rare, filming beneath the waters of Lyford Cay was still unusually laborious. The underwater illumination from the sun was spotty due to cloud cover, and its duration in the best of times never lasted more than six hours. Shooting was usually done between 10 a.m. and 4 p.m., with a maximum of four dives a day.

"A diver's oxygen supply was good for only one hour," said Fleischer. "The whole operation had to be completed within that limited period for safety. We would allow no more than 55 minutes from the time the first diver was put on air until the last diver went off air and was back on the barge."

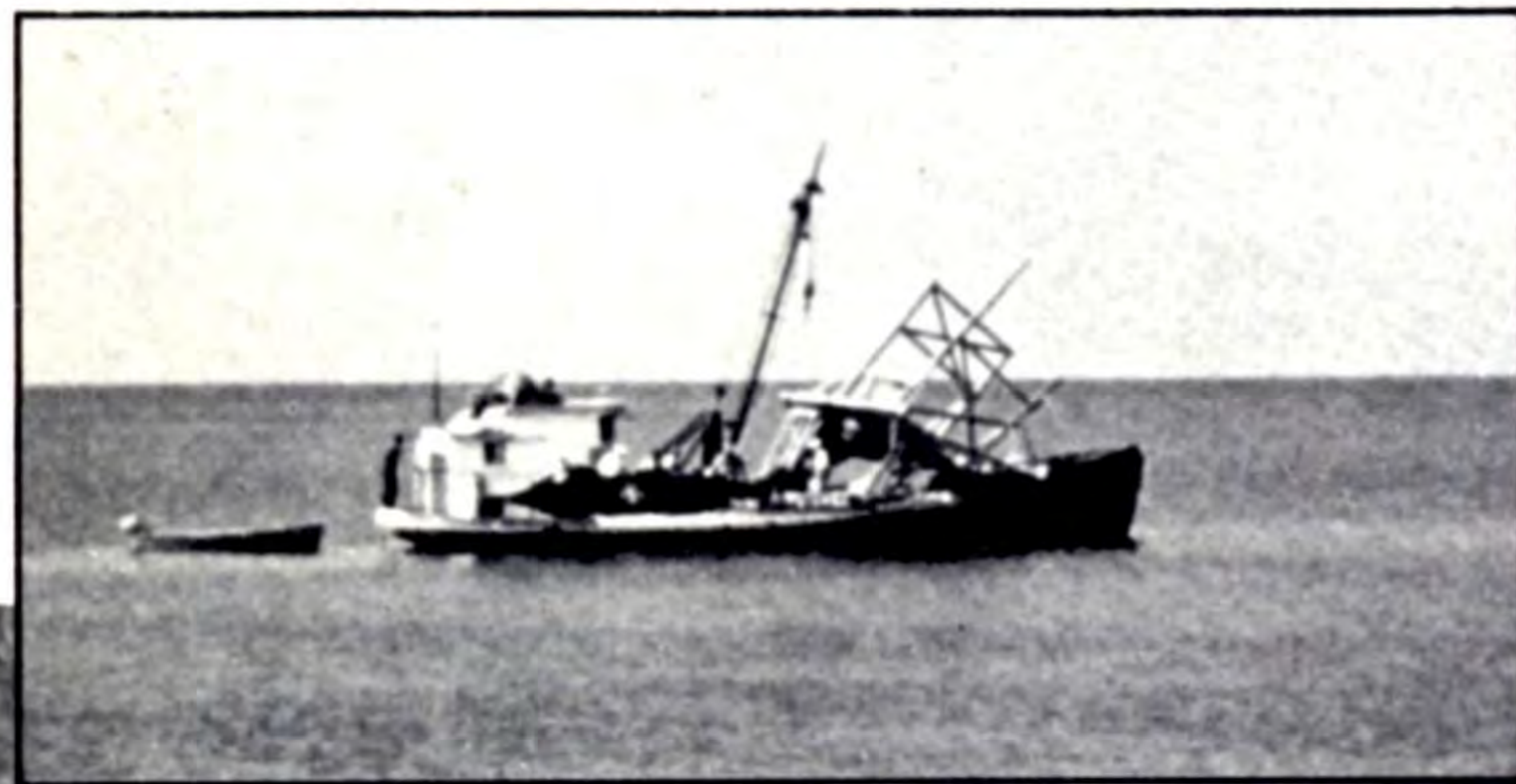
Daily the crew faced frustrating weather, choppy water and underwater turbulence. "On some days, when the conditions seemed right,

a cloud would cover the sun and we'd have to stop because we didn't have enough exposure," Fleischer said. "On other days, the tide change would lift up the stuff from the bottom, and the silt would hang in the water for hours and drift right in front of the camera." To avoid having the divers kick up clouds of sand and coral dust, the director had heavy hemp matting carpeted along the ocean floor.

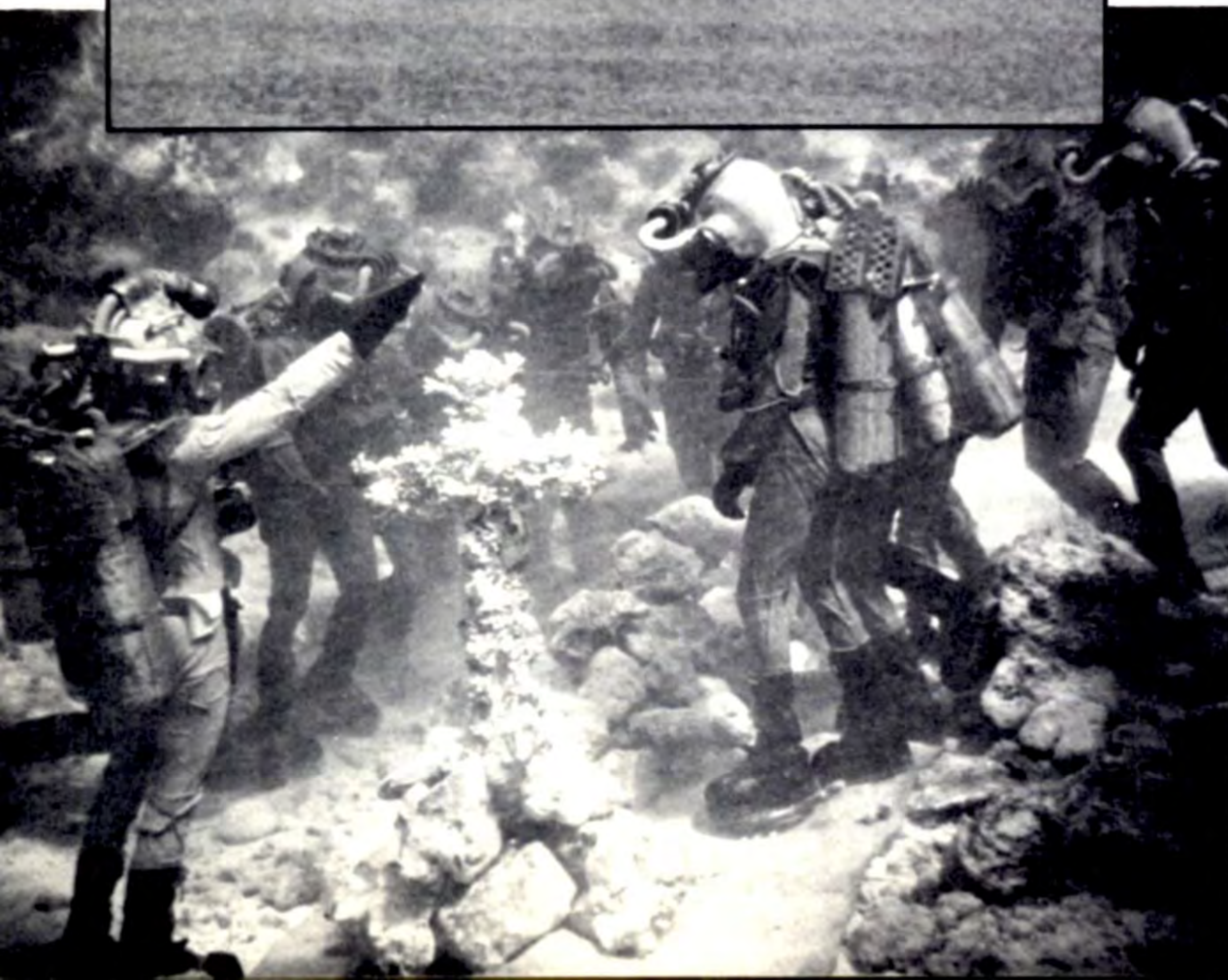
Although the reef abounded with numerous species of colorful fish, capturing them on film proved difficult. Frightened by whirring cameras and human activity, the reef fish would always scatter in different directions before a shot was completed. Because every scene required the presence of as many creatures as the camera could catch, local fishermen were recruited to net large quantities of them. Once netted, they were placed in wire mesh pens until needed for a scene. When Fleischer was ready to shoot, the fish would be placed in small cages by the prop men, who released them out of camera range on cue.

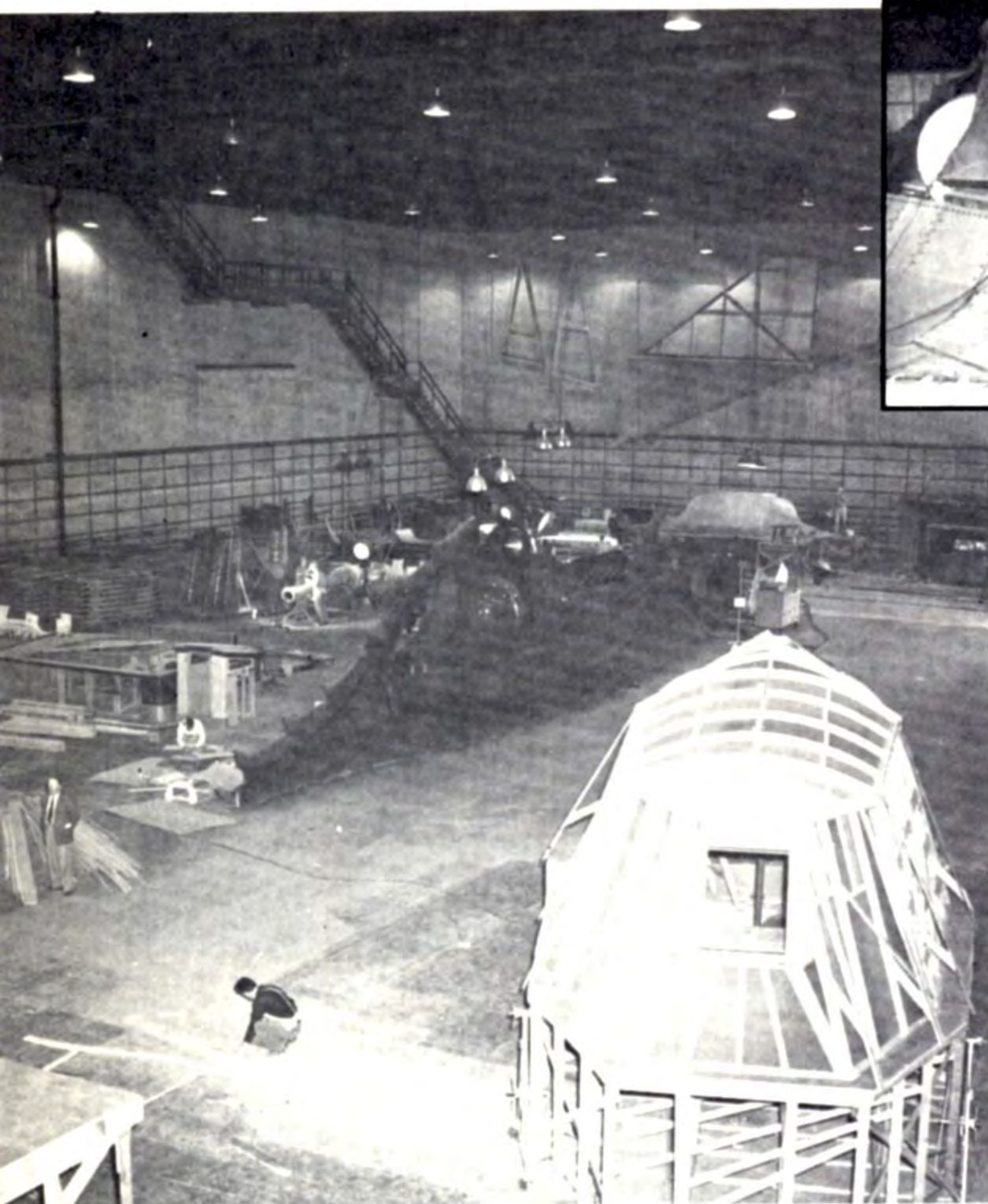
The most unusual incident experienced by the Disney company involved an eight-foot shark. "After the shark was captured and killed, we sewed up its mouth and left it on deck overnight," the director said. "The next day, we attached a cable to its mouth so we could pull the creature in any direction. I wanted an over-the-shoulder shot of the shark, so a camera was tied to the shark's back with a rope that had a slipknot. If anything went wrong, the cameraman simply had to pull the slipknot to release the camera.

"We put the shark into the water and made a couple of dives. With-



Captain Nemo conducts an underwater burial (left). Note carpet on sea floor to keep down silt during filming in the waters of Lyford Cay, the Bahamas. Richard "Nemo" Fleischer, in wetsuit (right), directs the divers in preparation for the scene, which is sketched-out in detail. The diving barge (inset) included a wood-braced set of the *Nautilus* diving hatch, and a cast-iron cutout of the *Nautilus* used for undersea shots where the submarine is seen from the divers' point-of-view.





Production designer Harper Goff (far left) surveys set construction on Stage 2. In the background is the finished exterior deck set of the *Nautilus*. In the foreground, the interior set of the wheelhouse takes shape. Inset: Details of the exterior deck set's wood construction are visible as it is torn-out of a display at Disneyland, years later.

the middle of shooting and we'd have to glue them back."

Since Fleischer had to continue shooting the rest of the film, Disney hired second-unit director James C. Havens to restage and reshoot the squid fight. A veteran director of action sequences, Havens' credits include *CAPTAINS COURAGEOUS*, *THE CREATURE FROM THE BLACK LAGOON* (in which he directed all of the underwater scenes) and both versions of *MUTINY ON THE BOUNTY*.

Disney screened the original footage of the squid fight for Havens. "It was terrible," he recalled. "Everything looked fake. There was absolutely no menace to it. Also, the actors didn't take the fight seriously and clowned around on the set. The editor who put the footage together had a sense of humor, too; he dubbed in voices for James Mason and the squid. For example, while Mason was jabbing at a tentacle with his harpoon, his dubbed voice would say, 'Sorry about that, old chap.' Then the squid's beak would open and reply, 'That's quite all right, dear boy, because I have nine more!' It was

added weight would break the wires and the squid would just lay on the deck like a lox. After a few days of struggling with it, Walt said to me, 'Stop working on this scene and go on to something else. Let's see if we can solve the problem.'"

"The problems were numerous," Goff added. "The deck looked like a concrete island. With all the people and activity on board, the deck should have floated and canted to one side. The tentacles were another problem. They would deteriorate right before our eyes. Big chunks would fall off in

them.

While Mueller gave the squid its body, it was up to Robert A. Matthey to give it life. Matthey, who has spent 50 years in the film industry, became interested in the field of special effects while working in RKO's prop shop on the mechanical props for *KING KONG*. RKO's series of *TARZAN* films gave Matthey the opportunity to create a variety of mechanical animals, including a walking turtle that could spit water and a radio-controlled 15-foot alligator. Another creation, a giant octopus that attacked John Wayne in *WAKE OF THE RED WITCH* (1918), attracted Harper Goff's attention, and Matthey soon found himself working on *20,000 LEAGUES*, his first of many Disney films.

On March 17, after a week of shooting the squid fight, Disney stopped the filming. "No matter what I did, or what any director could have done, I couldn't make the fight look realistic," remembered Fleischer. "The scene took place on a placid sea at sunset. In the bright light, it was difficult to hide the flaws, especially the wires that supported the tentacles. When you tried to do something with the squid, it looked phony as hell.

"For example, its body, which was filled with kapock, would absorb water and become so heavy that the technicians couldn't move it," continued Fleischer. "The

very funny."

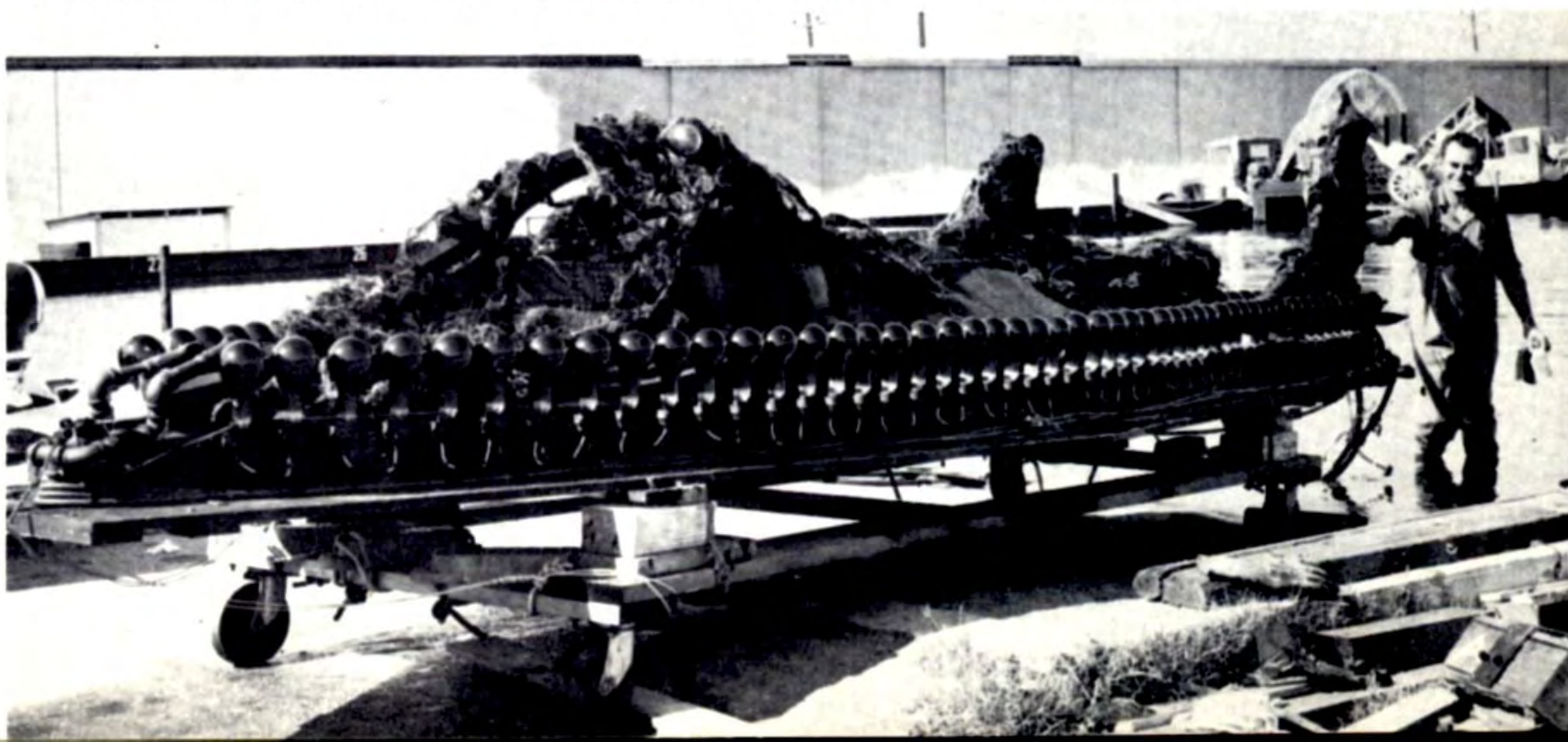
Havens' solution to the problem was to reshoot the fight in a tremendous storm, with the wind and waves crashing into the submarine. The director believed the sequence would be far more exciting with Nemo fighting the elements as well as the squid, and the "bad weather" would hide the artificiality of the squid. [Fleischer disagrees with Havens, however, and credits writer Earl Felton for the idea of shooting the fight in a storm.]

"I told Walt that a terrific gale would add more menace to the fight," Havens said. "He said, 'Go ahead, you've got a blank check. But make it right—it's got to be right or we haven't got a picture.'" The new sequence would cost Disney \$200,000 and a six-week delay in shooting.

While waiting for Matthey to come up with a better method for operating the squid, Havens took his second unit to San Diego to shoot the scene in which Ned, Aronnax and Conseil are left on the deck of the *Nautilus* while it submerges. To make the scene look as realistic as possible, a mock-up of the boat's afterdeck and dorsal fin was attached to the stern of an actual submarine, the *USS Redfish*. One remote-controlled camera was screwed down fairly low on the deck while another was stationed on top of the conning tower at periscope fairwater. On deck were Fred Zendar, Gil Parker and Charles Regan, who doubled for the actors. Simulating a dive, the *Redfish* was supposed to go down only far enough for the cameras to shoot the ocean lapping at the stern surface.

"The captain and I were on the bridge when he ordered the boat to submerge," recalled Havens. "But it went deeper than expected and washed the three stuntmen overboard. The captain and I had to climb up to the top of the conning tower while the *Redfish* continued to submerge. Soon all that was visible on the surface were two guys

Effects technician Les Wharburton prepares to float the 22-foot model of the *Nautilus* at Fox's Sersen Tank. The light bulbs which ring the miniature below the waterline were to make it appear to glow in the water. A water cannon in front enhanced the model's bow wake. The seaweed camouflage was designed for a scene at the film's beginning, but the effect was not used.





The Nautilus lies in wait, prior to ramming the nitrate ship. Filming the scene at Fox's Sersen tank, an artist paints the backing in front of which the miniature of the nitrate ship will float. A 10K stage light mounted on a tower above the backing provides a reflection of the setting sun. The light and the mountain cut-outs to reflect on the water were covered by a Peter Ellenshaw glass matte during filming.



hanging on to two periscopes. Finally, the crew in central control got wise and surfaced before we got washed off. Fortunately, two boats went out and picked up the three men." The submerging scene, which lasts less than a minute on the screen, took nearly one week to set up and shoot.

Meanwhile, director Fleischer was putting his actors through their paces on soundstages in Burbank. Although both Kirk Douglas and James Mason were considered temperamental actors, it was Paul Lukas, who played the kind and open-minded Aronnax, with whom the director had the most difficulty.

"In the beginning, everything was fine," the director explained. "I didn't have any trouble with Kirk or James. I got along with everyone except Paul. He and Peter Lorre were the closest of friends when we started shooting, but by the time we finished the picture, they weren't talking to each other.

"Paul was going to sue Walt, Kirk and myself," continued Fleischer. "He was going through some kind of crisis. He was a very distinguished stage actor and as actors grow older, they have difficulty remembering their lines. Paul had that problem, and I think it disturbed him. When he couldn't remember his lines, he'd blow up at somebody. He and I had a terrible argument on the set one day. He thought his dialogue was terrible and blamed Earl Felton for it. I defended the writer and told Paul to blame himself because he couldn't remember his lines. I said it because I had finally lost my temper."

In April, the main unit moved to the 20th Century-Fox backlot to film exteriors. The deck of the Nautilus was moved in sections via

trailer trucks to Fox's Chicago Lake, which served as the location for Nemo's base. Another Fox facility rented by Disney was the huge Sersen tank with its painted sky backdrop, used to film the scene in which the cannibals are shocked with electricity while attempting to board the submarine. After two weeks of shooting, the main unit returned to Disney's Burbank lot to shoot additional interiors.

On April 26, second-unit director Havens went back to re-shooting the all-important squid fight. In order to get the rough weather needed for the scene, Havens rented MGM's wind machines, dump tanks, water cannons and other effects equipment, which cluttered Disney's Stage 3.

The deck of the submarine, which had been on an even keel in the first version, was now canted to port in order to give the impression that the squid was clinging to the hull. Working closely with art director John Meehan, Havens replaced the sunset backing with a black and gray cyclorama.

"There is no color in the sky on a dark and stormy night," said Havens. "For that reason I graded the cyclorama down from pure black to medium-dark gray at the horizon line so that we'd get some differential between that and the sea."

After several weeks of trial and error, Robert Matthey had finally devised an effective method for operating the mechanical squid's 20-foot-long tentacles. "We utilized vacuum and air pressure," explained Matthey. "It was a system that had never been used before. Each tentacle, which had a pneumatic tube and thin spring steel interior, was hooked into an air pump. When you pressurized the interior, the tentacle would expand

and straighten out. When you vacuumized it, the tentacle would draw back and coil up. Each tentacle was supported by half a dozen wires and, in some shots, we had as many as 50 people in the stage rafters working them.

"The most difficult problem was getting those tentacles to do what you wanted them to," he continued. "They seemed at times to have a mind of their own. A lot of rehearsal went into coordinating the tentacle movement. After a lot of practice, we could get one to reach out and literally roll up an actor's leg."

This was, indeed, puppetry on a grand scale. The squid's 10-foot-long body was attached to a hydraulic ram that could raise it several feet out of the water; a dolly below the ram could move the body in any

direction. Its snapping, parrot-like beak was operated pneumatically, and other actions, like the movement of the eyes, were electronically controlled. A team of 16 men was needed to operate the mechanical beast—which weighed nearly a ton.

"Walt gambled everything on this picture, including his studio and the future of Disneyland," said Havens. "There were many days when Walt would bring down a number of guests to the effects stage to see the shooting of the squid fight. These guests were money people—bankers, owners of oil refineries and chemical plants—wealthy businessmen whom he was trying to interest in the Disneyland project. He needed money badly because it was impossible to build the park himself.



An effects crew rigs the model of the nitrate ship at Fox's Sersen tank. The free-floating model was designed to be pulled through the water by cables. Inset: The Abraham Lincoln and nitrate ship miniatures in their storage carriers.



"We had a grandstand built on the edge where Walt's guests could sit and watch the action with the squid," he continued. "Walt wanted his potential investors to realize that he was making an exciting picture that would be popular with the public and do well at the box office."

Because the squid fight took place at night during a storm, the faces of those on deck were indistinguishable before the camera, therefore neither Kirk Douglas nor James Mason were needed on the set. However, on May 10 and 11 (which was the only time Fleischer and his unit worked on the sequence), both stars were present to film their close-ups. Things did not go smoothly. While maneuvering toward the squid, one of Mason's legs became entangled in a lateral wire, which swept him overboard. When the crew realized that the actor was being pulled under the water by the wire, they quickly jumped into the tank to help him. Luckily, Mason surfaced uninjured.

On May 12—nearly three months after the squid fight sequence was first attempted—Havens wrapped it up, completing the film's toughest work.

Even with this big sequence out of the way, Fleischer and his crew still found the last weeks of principal photography hectic. Not only did they have to shoot the opening sequences of the film, but also interior scenes that required water effects, like the flooding of compartments after the submarine is shelled by a warship.

Filming the water-effects scenes involved rebuilding and reinforcing the set pieces and mounting them in a shallow section of the tank on Disney's Stage 3. Because of extensive preproduction planning, the shooting of the flooded interiors went smoothly and without major delays.

In early June, the main unit moved to the back lot of Universal Studios to shoot exteriors for the San Francisco sequences that appear in the beginning of the film. After a couple of days, the

company returned to Disney Studios to film additional pick-up shots and wet interiors. Finally, on June 19, Fleischer completed principal photography with the filming of the Treasure Galleon sequence, with divers Norm Bishop and Ed Stepler doubling for actors Lorré and Douglas.

Ralph Hammeras, director of effects photography for 20,000 LEAGUES, was one of the great film pioneers, who invented the "glass shot" and was among the first to use rear-screen process photography. Hammeras worked mainly for Fox Studios, and it was there that he was approached by Disney, who was negotiating with Fox for the use of their CinemaScope lenses, along with various production facilities and some of the studio's special effects personnel. Hammeras joined the project in November, 1953—a few months before on-location shooting started—and was ready to begin filming tests on December 22.

The first tests shot were of a prototype model of the *Nautilus* designed by Harper Goff. At this time, there was only one CinemaScope lens, and Fox was using it on *THE ROBE*. Fox would send it over to Disney's Burbank studio, via motorcycle, several times a week until another lens could be made by Bausch and Lomb. To free-up the lens for other tests, Goff's model was built to anamor-

phic proportions—the same height but squeezed to only about half the length—and filmed with a regular flat 35mm lens. The image, when projected through an anamorphic (Cinemascope) lens, had the correct proportions on the screen. The delivery of a second anamorphic lens for Disney's use and more design changes on the submarine eliminated the use of this unique model.

The first miniature sequences to be shot were the underwater scenes of the *Nautilus*. An 11-foot model of the submarine was the first out of the shop; the hull was made of 1/8-inch iron plates with the detailing done on brass plates "sweat-welded" on. The model was powered by five car batteries, with practical lights in the wheelhouse and salon viewports and an electric motor to turn the prop. The entire model, fully rigged, weighed more than a thousand pounds.

Shooting the underwater scenes was done in a tank in the new sound stage at Disney studios. Using both wet and dry-for-wet techniques, the submarine was run through the tank on a track rig designed by consultants Howard and Theodore Lydecker. Controlled from a panel next to the camera, this rig could run forward or reverse and raise or lower the model. Hung from the rig by four main wires, some six other wires controlled the practical effects built into the model.

Shots of the submarine cruising the depths of the sea were fairly standard effects for a submarine film, but the script of 20,000 LEAGUES called for much more ambitious action, including underwater scenes of the *Nautilus* ramming through the keel of a warship, running aground on a reef, traversing the tunnel into Nemo's base and its encounter with the giant squid.

Finishing the cruising scenes in fairly short order, the miniature unit was ready to move on to the more elaborate set-ups. The attack on the nitrate ship was accomplished by first using the dry-for-wet technique. For the close-up shot of the *Nautilus* tearing through the



keel of the doomed ship, the models were photographed upside down, so wood debris from the nitrate ship would seem to float up. The following long shot of the submarine pulling away from the hull of the sinking ship was photographed underwater in the tank with the Lydecker rig.

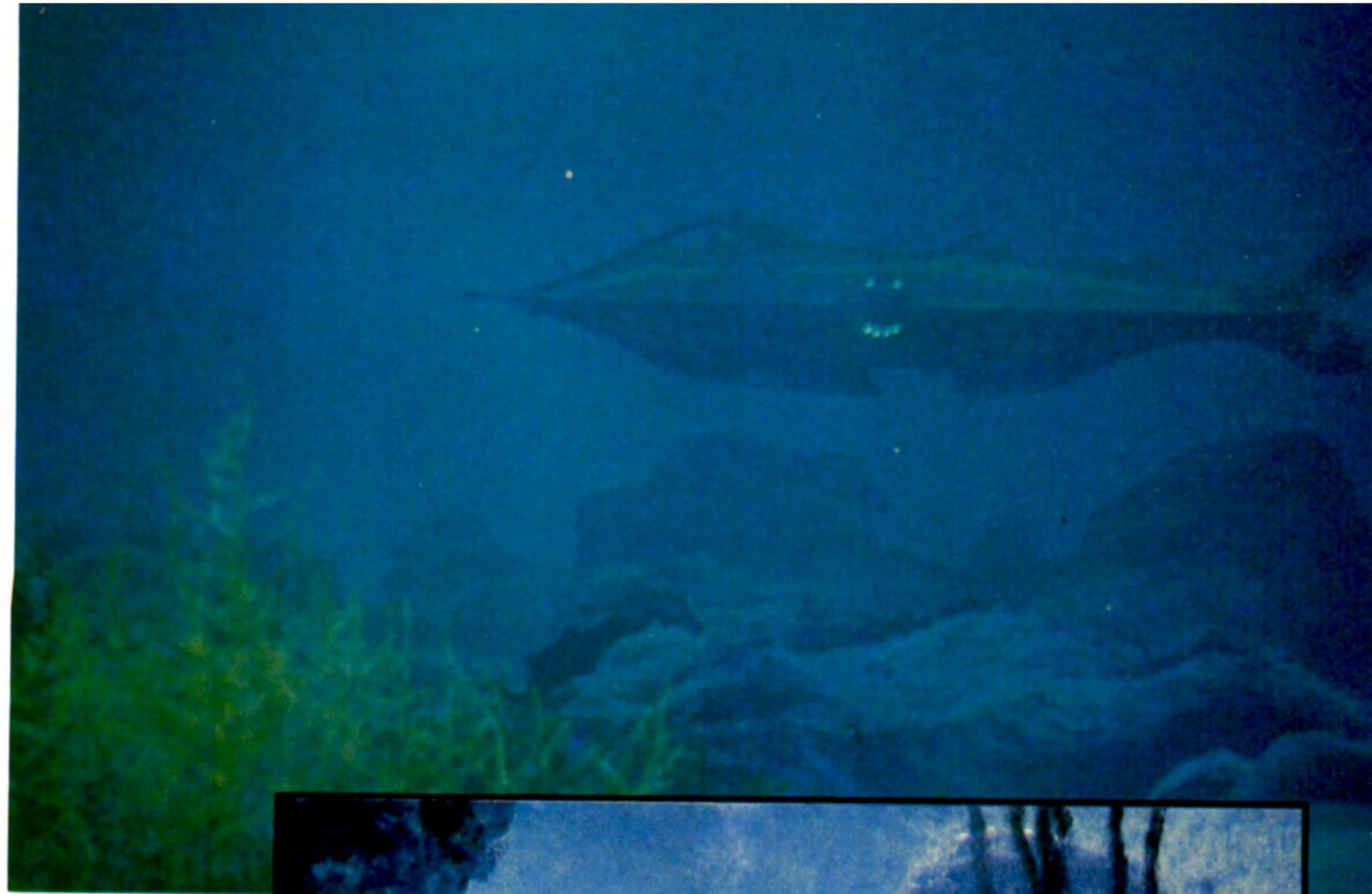
Dry-for-wet shooting was kept to a minimum even though much greater control could be exercised. Toward the end of production further scenes would be shot using this technique to extend the shots in the Vulcania tunnel, with actual wet scenes kept to quick establishing shots of the *Nautilus* tracking through the miniature tunnel set.

One of the key miniature effects scenes is the attack on the *Nautilus* by the giant squid. Hammeras tackled what seemed a difficult shot in a rather simplistic, but very effective way. Wrapping the tentacles of a small squid, sculpted and cast by Chris Mueller, around the 11-foot model and tying the ends with thread, Hammeras pulled the squid away on a guide wire, then he cleverly reversed the film. This technique gave the illusion that the monster was swimming toward and then latching onto the *Nautilus*.

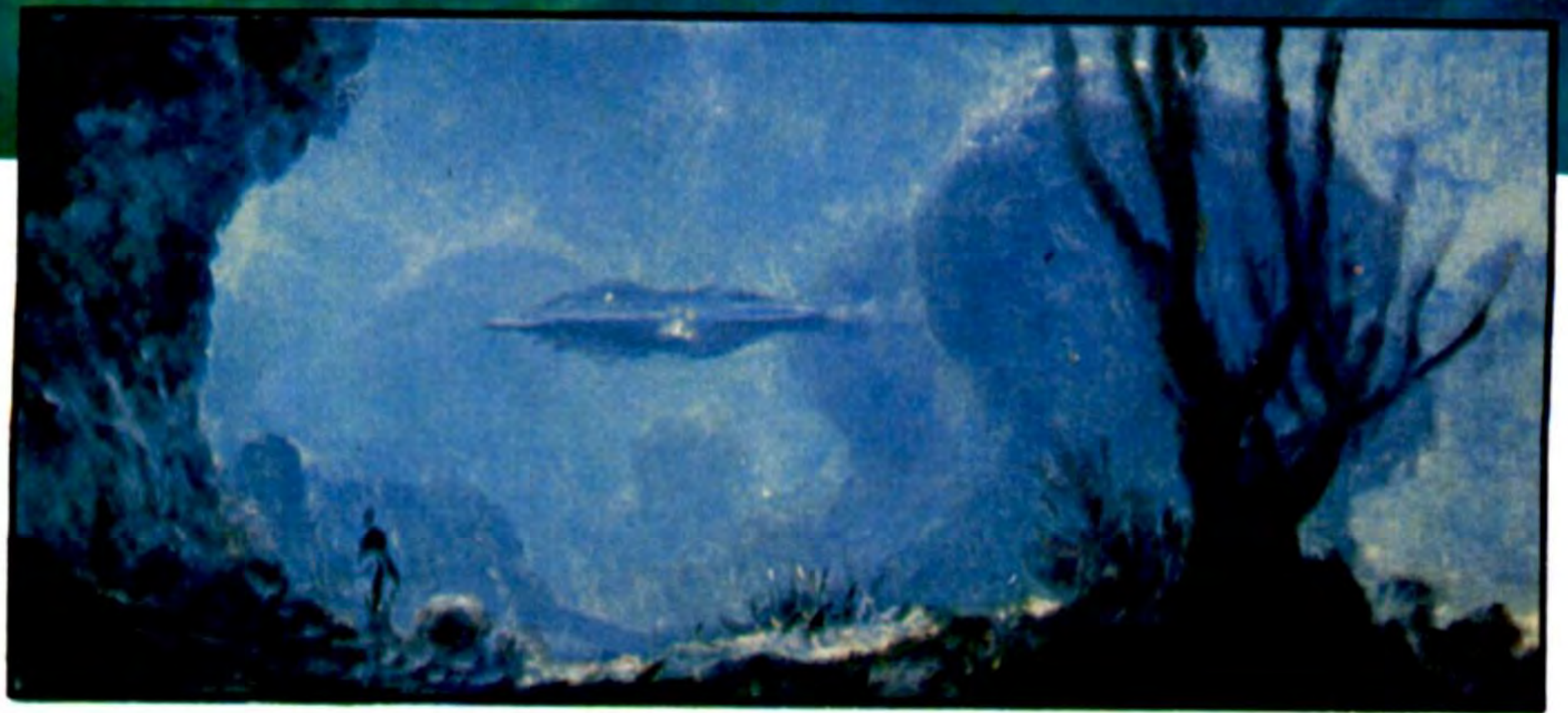
Walt Disney had only one complaint about Hammeras' work. Warren Wray Hamilton, miniature painter and technician on 20,000 LEAGUES, recalled, "Ralph shot so much test footage of the miniatures that Walt called him in on the carpet a few times, but other than that we had a fairly free hand and were able to test and shoot things over until they were perfect."

With completion of most of the effects work on Stage 3, the miniature unit moved to Fox Studios to shoot exteriors in Fox's effects tank, called "Sersen Lake" after the studio's resident effects expert, Fred Sersen. The tank was 300 feet long, 190 feet at its widest point and about three feet deep, with a 20-foot

Diver Fred Zendar, as Ned Land, and two stuntmen, standing in for Conseil and Professor Aronnax, are filmed clinging to a dorsal fin of the *Nautilus* mounted on the U.S.S. Redfish, as it submerges in the waters off San Diego.



The 11-foot *Nautilus* miniature running amid a seascape created on the floor of the mammoth effects tank built on Disney's Stage 3. Inset: A preproduction concept for the submarine's voyage through an undersea grotto, painted by Peter Ellenshaw, the film's matte artist.



deep pit in the center. Running the width of the tank and about 30 feet from the rim was a painted sky backdrop, 73 feet high and 224 feet wide.

For exterior effects shots, models of three conventional ships, as well as those of the submarine, were used. Largest and most detailed, the *Abraham Lincoln* was nearly 30 feet long and rigged for such practical effects as bow wave, cannon and smokestack smoke, and running lights.

Rigged the same as the *Abraham Lincoln*, the *Golden Arrow* (sunk by the *Nautilus* in the opening of the film) and the unnamed nitrate

ship were acquired from Fox. The *Golden Arrow* model was originally a sailing ship, but the Disney model shop added paddle boxes to give it a new look. The nitrate ship had been seen in RAIDERS OF THE SEA starring Douglas Fairbanks Jr. and in REAP THE WILD WIND. All three models were free floating and were towed through the Fox tank by cable.

For scenes of the *Nautilus* running on the surface, Hammeras principally used a 22-foot-long waterline model of the submarine, which was attached to a wheeled dolly that was weighted and pulled by cable. Rigged with air hoses and

water jets for foam and bow wash, the model was ringed with lights below the waterline to give the effect of phosphorescence in the night shots.

Pulled through the tank by a truck, the surface model was photographed by Hammeras using a 35mm camera, with a Bausch and Lomb anamorphic lens, overcranked to 50 frames a second to slow down the various practical effects. After shooting innumerable tests, Hammeras eliminated several planned sequences as too weak, including an interesting shot of the *Nautilus* threading through the ice floes of the South Pole.

Largest and most elaborate of the "live" surface effect shots is the final scene of the film: the destruction of Nemo's secret base and the sinking of the *Nautilus*. The shot called for the island to blow up, the warships anchored around it to sink, a tidal wave to engulf the submarine, and the sub to sink with the smoking remains of the island in the background.

"In all my years of working on miniatures, this sequence was one of the most complicated and the most successful," said Warren Ray Hamilton, miniature painter and technician on 20,000 LEAGUES. "We had the sky backdrop in the background, then a cut-out of the





Peter Ellenshaw's preproduction painting of the prison camp at Rorapandi. Inset: The actual scene as filmed, featuring Ellenshaw's glass painting of the ship, rendered while the scene was being shot. Ellenshaw composited the painting with separate foreground and background exposures of the same extras as slave laborers.

island done by Peter Ellenshaw [Disney's resident matte expert], then the charge [60 pounds of flash powder]. Now all this was *behind* the rim of the tank.

"In the tank, we had some small warships, rigged so we could pull them underwater," he continued. "And in the center of the tank was the *Nautilus*. We had a "dead man" weight in the pit with a cable and pulleys so we could pull the submarine down by the tail. Underwater we had two dollies, built-up and weighted, that were moved by a pulley system and a truck to generate the tidal wave. At the narrow end of the tank was the camera with a glass painting by Ellenshaw hanging in front to extend the height of the painted backdrop.

"The only real trouble we had

with the shot was with the tidal wave," continued Hamilton. "The driver of the truck that pulled the dollies was a little anxious and on the first try took off like a bat. Well, we didn't know how much water the dollies would displace, so the truck took off and the wave rolled down the length of the tank, right up the ramp at the narrow end and washed out the camera crew."

After several trail-and-error retakes, the shot was made to work. "It went something like this," said Hamilton. "The charge was set off, the island cut-out was dropped below the rim of the tank, and the warships were then pulled under. Then the wave started, passing the submarine, which was given some slack so it could be tossed about. Then it was pulled under."

films. Disney recognized Ellenshaw's value to his live-action plans and invited the artist to move to Los Angeles. Arriving during the end of preproduction for 20,000 LEAGUES, Ellenshaw went to work immediately with Hammer's miniature unit.

One of Ellenshaw's first jobs was a series of "mood" paintings for the special effects scenes, including several of the underwater shots of the *Nautilus* in silhouette, gliding among giant coral formations.

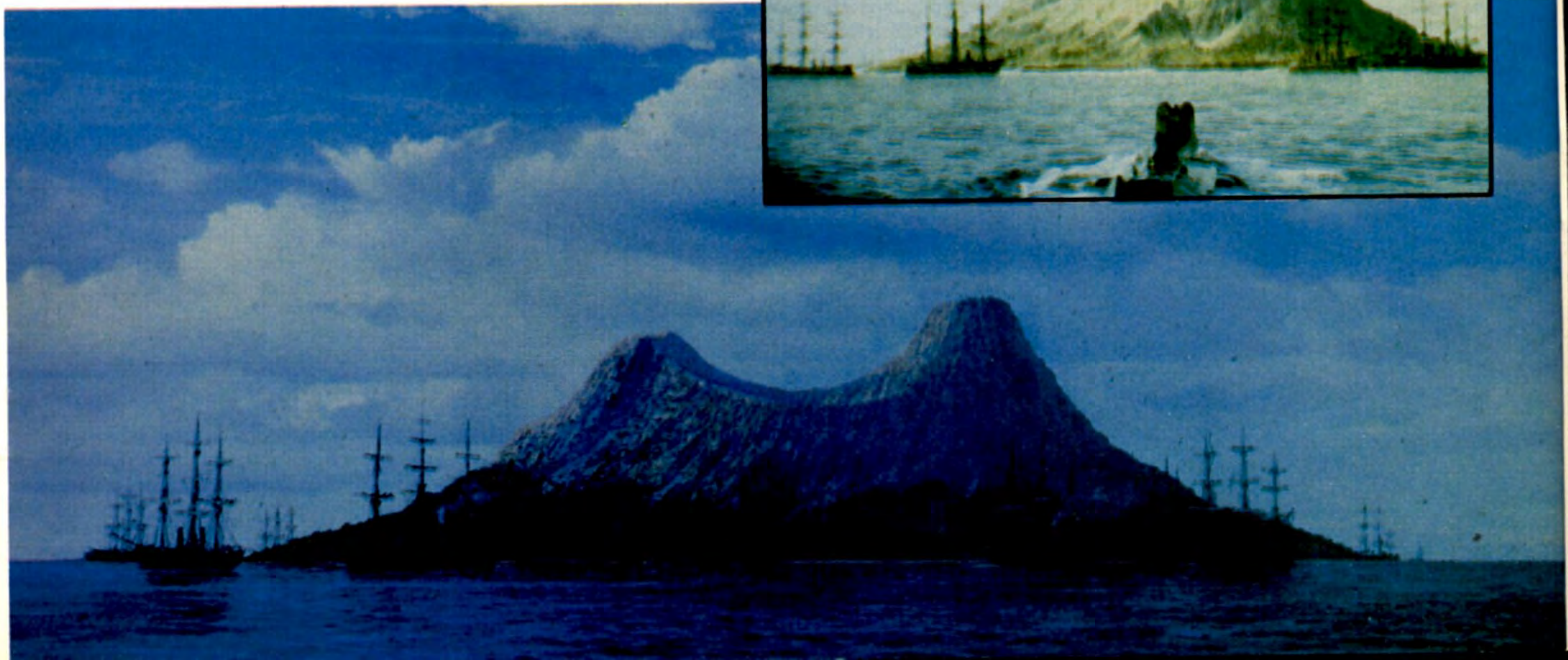
"The mattes were photographed mostly at Fox as glass shots done on the original negative," remembered Ellenshaw. "One of the most difficult shots was of the submarine surfacing in the lagoon. We mounted both the camera and the painting rather precariously on top of the 70-foot scaffold that held the painted-sky cyclorama and shot down on the miniature sub that moved across the Sersen tank."

Another matte, which depicted the Rorapandi Island shoreline, was actually painted on location. Recalled second-unit director James C. Havens, "Peter [Ellenshaw] and I, along with the crew and extras, went down to a plant near Corona to shoot portions of the slave camp sequence. This plant manufactured various types of clay products. We chose the location because of the different clay formations. I directed the action with the extras, while Peter painted his picture. We worked like hell all day to get the scene completed. It was a difficult chore because I had to match up all the action with Peter's matte." [The principal shots of Nemo and Aronnax at the Rorapandi beach were filmed earlier by Fleischer at Fox's backlot.]

Added Ellenshaw, "Because we had a limited number of extras, we

Contributing greatly to the success of the special effects in 20,000 LEAGUES were Peter Ellenshaw's expert glass paintings, which were photographed live on the original negative as opposed to being combined optically.

Ellenshaw began his matte painting career on such films as Alexander Korda's THINGS TO COME and THIEF OF BAGHDAD. After a stint in the R.A.F. during WWII, he began to supervise matte work on such films as STAIRWAY TO HEAVEN and QUO VADIS. Ellenshaw went to work for Disney in the early '50s, providing paintings for the producer's British-made, live-action

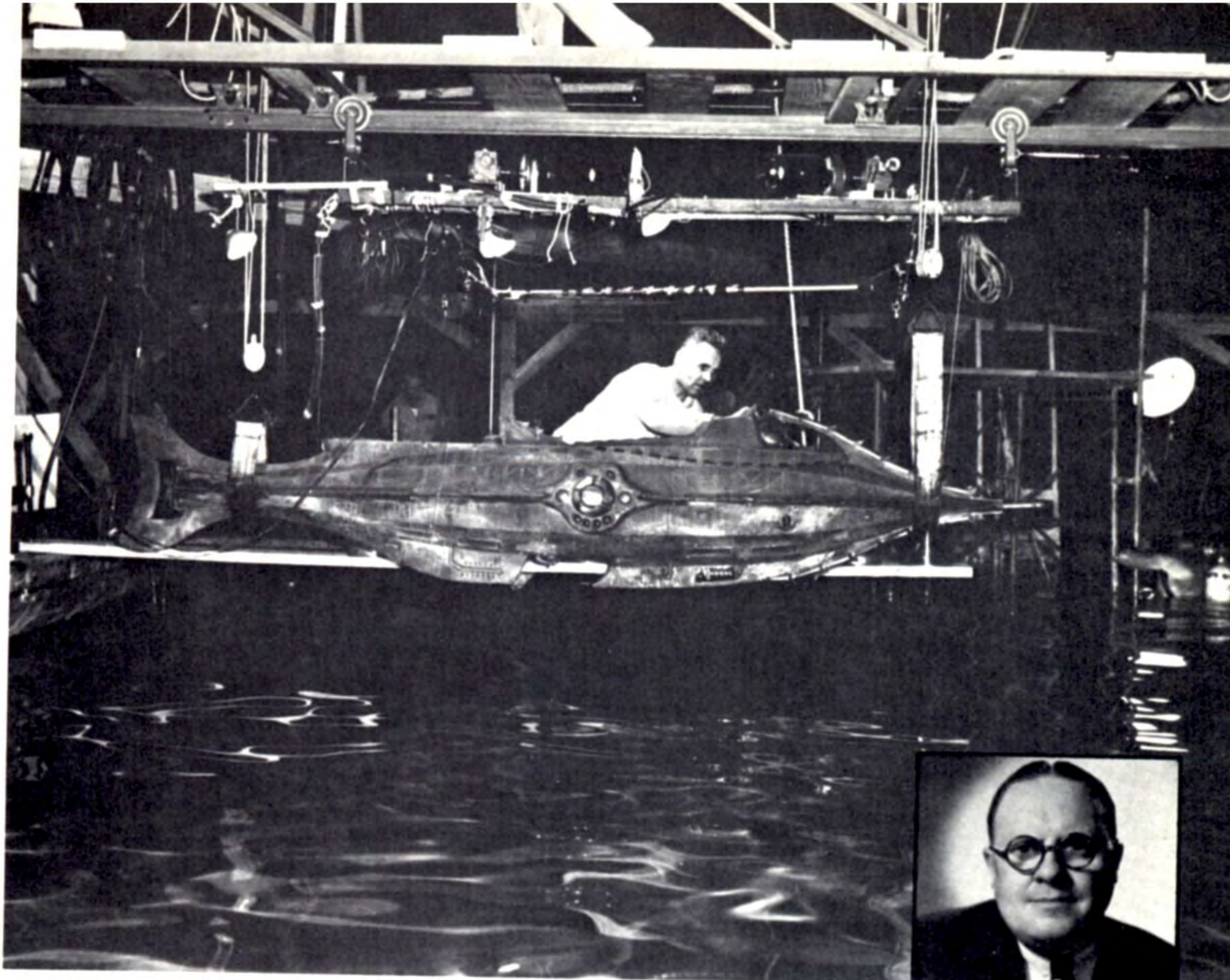


shot the foreground of the prison camp in the morning and then moved the actors to the background where we shot the same scene late in the afternoon [to give the impression that there were twice as many prisoners]. Then we shot the painting on the original negative."

Designer Goff was very pleased with the way the mattes fit into the film. "In the picture, there were 27 mattes and most people never notice them," Goff said. "I've looked and couldn't count more than 14, but I know all 27 were there."

"Most matte shots are too ideal," continued Goff. "The extreme now is to paint everything. Today's mattes are photographed so clinically that you can't help but see what's wrong with them. Peter [Ellenshaw] knew that if he painted a detailed matte, it would never be shown to full advantage on film. He knew what could be photographed and what the audience was going to see. He knew what to do with the camera if there was a shortcoming in the matte or glass. For example, he might say, 'We're losing our light. Since we can't spend any more time on the painting, let's open the camera lens and diffuse it.' Then he'd get the painting to look just right. He wasn't afraid to go out on location, paint the matte, and shoot it right there. He's a guy who knew what he wanted to do."

Besides the mattes, most people who see 20,000 LEAGUES won't necessarily notice something else—animation effects. John Hench, veteran Disney animator and effects supervisor on the film explained why: "The animation scenes were not especially different from anything else we had done. They just seemed to work in. Usually, you can pick out animation when it is combined with live-action footage. But I don't know anybody who can pick out all the animated effects in the film."



Film pioneer Ralph Hammeras (inset) was in charge of the film's special effects, which were recognized with an Oscar. The 11-foot miniature of the Nautilus is shown (above) being lowered into the effects tank built for the film on the Disney lot. Warren Hamilton adjusts the rigging, connected to an overhead track with winding motors to raise and lower the model.



At one point during preproduction, Disney planned many more animated effects to go along with the live-action footage, including many shots of an animated submarine cruising beneath the water. Said designer Harper Goff, "Once the miniature submarine was built and the stage tank completed, we found that there was something unreal about animation effects—they're convincing in a way and beautiful, yet they're not convincing."

The animated shots of the *Nautilus* were scrapped, but this did not

eliminate animation altogether. In addition to the *Nautilus*' defensive electrical charge, which is an obvious example, animated fish, jellyfish and seaweed abound in the underwater footage. One example of the subtlety of animation in 20,000 LEAGUES is the scene in which the *Nautilus* rams the nitrate ship. As Aronnax, Conseil, and Ned Land watch from the salon viewport, the nitrate ship sinks, trailing bubbles and debris, burning internally. All bubbles, boards and other debris were animated in, including the burst from

the subsequent explosion.

With all visual effects work and filming finished, 20,000 LEAGUES UNDER THE SEA moved into the postproduction phase in the late summer and fall of 1954. At first, things did not go well.

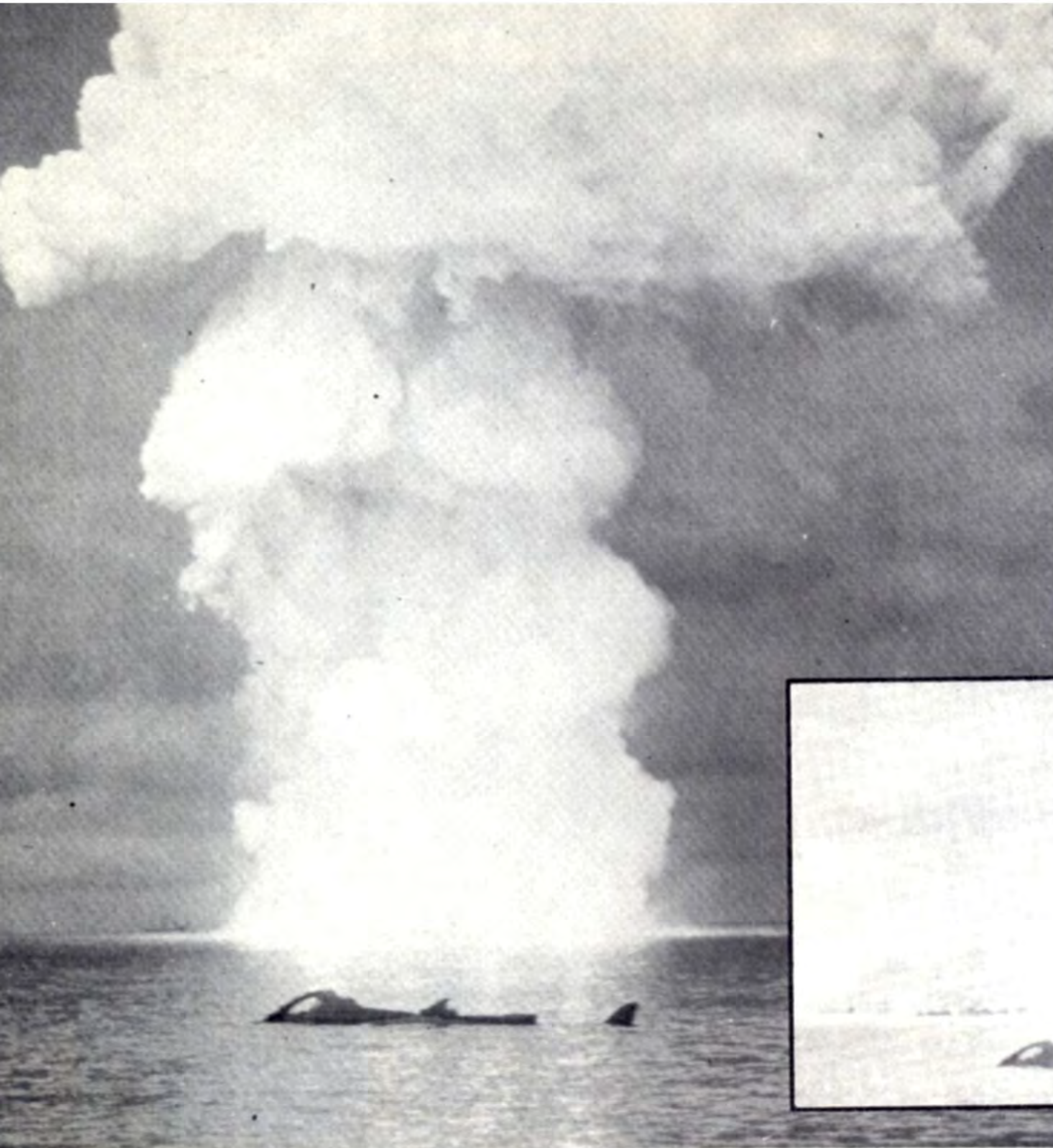
"The first sound effects job on the picture was very, very bad," editor Elmo Williams remembered. "We had to scrap the whole thing. I took on the job of supervising the sound effects. I remember going out one night to the Farmer's Market on Fairfax with one of the sound men. They had a huge Chinese gong hung there, and we taped the sound as we beat on it very gently. We reversed the sound, and it gave us the 'humming' sound of the *Nautilus*' engines that's almost constantly in the background."

Brought in by Richard Fleischer at the start of production, Elmo Williams' editing credits include Charles Chaplin's LIMELIGHT, THE MIRACLE OF THE BELLS and HIGH NOON, for which he won an Oscar in 1952.

"I did editing on the film at night," recalled Williams. "During the day, I stayed on the set with the director most of the time. I started editing right at the beginning of production and cut it together as shooting progressed. The first rough cut was three hours long, and it still wasn't quite finished. We shot a number of extra scenes and had planned quite a few more, such as the submarine at the



VULCANIA served as Nemo's island base in the South Pacific. Production designer Harper Goff sketched this concept of the island early in preproduction. For the film, the island was a glass painting rendered by Peter Ellenshaw. The artist retouched the painting shown here in 1978, adding the water that was to be matted in during production. The painting is shown as it appears in the film (inset), combined with a shot of the 11-foot Nautilus model, filmed in the Fox effects tank. The model and painting were composited on the original negative.



APOCALYPSE is envisioned in the form of a mushroom cloud at the film's climax, as Nemo destroys his base on Vulcania and the enemy ships that surround it. This atmospheric shot was filmed with the 11-foot Nautilus model in the effects tank at Fox, using a special sky backing. The explosion was set off using 60 pounds of flash powder. During the first few frames of the blast, as the charge goes off, the bright light casts a shadow of a cutout of the island onto the sky backing (inset).



South Pole, Atlantis, sailing through the ruins of Port Royal, and a lot more live action. Some of those sequences were never realized because we were going to have too much film.

"One shot I cut was of this weird luminescent fish in the deep trenches under the sea," continued Williams. "After Nemo fixes the sinking submarine's engine, he opens the shutter in the salon and shows his prisoners these strange creatures. About the same time the film was due to be released, *Life* magazine, *National Geographic* and others were running spreads of the real thing. The animators had done a great job, but it was *their* version of this kind of fish, so we eliminated it."

Editting was finished by the fall of 1954, and Disney was ready for the next step, distribution. Although both RKO and Paramount bid to distribute 20,000 LEAGUES, Disney decided to release the film through his own newly-formed distribution subsidiary, Buena Vista. Previous Disney productions had been released by RKO, which took a large share of their grosses; Buena Vista lowered Disney's distribution costs from 30 to 15 percent of the gross and gave the studio total control over the exploitation of Disney's films.

Looking like it would be a big boxoffice winner, 20,000 LEAGUES got its first commercial break weeks before the preview. A docu-

mentary on the making of the film, UNDERSEAS ADVENTURE, aired on Walt Disney's brand new television series, DISNEYLAND, and scored hot Nielsen ratings. The interest was obviously out there; Disney and company geared up for a solid success.

On December 9, the film was previewed for several hundred exhibitors at the Astor Theater in New York. The reception... fantastic! Prior to the screening, five major chains had paid \$3 million in advances to play the film.

Two weeks later, on December 23, the film opened in 60 houses across the nation to generally favorable reviews. *Variety* called it a "special kind of picture-making, combining photographic inge-

nunity, imaginative story-telling and economic daring. The production itself is the star."

Said the *Los Angeles Times*, "As a sci-fi job, 20,000 LEAGUES is the ablest since the previous year's WAR OF THE WORLDS. Nearly everyone should find the voyage exhilarating."

The film earned more acclaim—in the form of two Oscars for best art direction/set direction and best visual effects. Because the Oscar for special effects went to the Disney Studio, neither Ralph Hammeras, Peter Ellenshaw or Robert Matthey were honored for their contributions. (Disney once told Fleischer, "Why do the work yourself when you can get someone else to do it and still get the credit for it.")

After the awards ceremony, Disney wrote a congratulatory letter to Hammeras, thanking him for his creative contribution to the film. He closed the letter with an invitation for Hammeras to stop by his office any time he wanted to take a look at the Oscar.

Because Harper Goff was not allowed screen credit as production designer on 20,000 LEAGUES, the Academy could not put his name up for nomination. When asked if he had any ill-feelings about the matter, Goff shrugged and answered, "Not really, because most people in the industry knew who actually designed the picture. Although the Academy did not recognize my work officially, they did send me an Oscar, but it was not inscribed."

Despite winning awards and critical plaudits, 20,000 LEAGUES apparently never made a profit. Although it was one of Disney's most popular films, grossing \$6.8 million in its first release and \$2.2 million on its second in 1963, the boxoffice figures never exceeded the film's \$9 million price tag.

No one can call the film an *artistic* failure, however. The film is considered one of the best science fiction films of all time and, along with MARY POPPINS, Walt Disney's greatest attempt at live action.

And while the film is not regularly revived at theaters, 20,000 LEAGUES lives on at Walt Disney's parks. Bits and pieces of the film—from the original mattes to the 11-foot model of the Nautilus—have popped up at both Disneyland and Walt Disney World. The Nautilus will appear in a new attraction at Disneyland called "Discovery Bay," which should start construction by 1985.

This is all fine and good, but there are many out there who have never had a *chance to experience* the film on a big screen. Here's hoping that the Disney powers-that-be will bring it back, preferably on a regular basis. Like the perennial reissues of Disney's animation films, 20,000 LEAGUES is a timeless classic that should live on forever. □

An example of the film's elaborate storyboards. Begun as an animated project, the film was the first live-action feature to be fully story-boarded, a technique developed by Disney on his cartoon features that has become a standard filmmaking tool.

