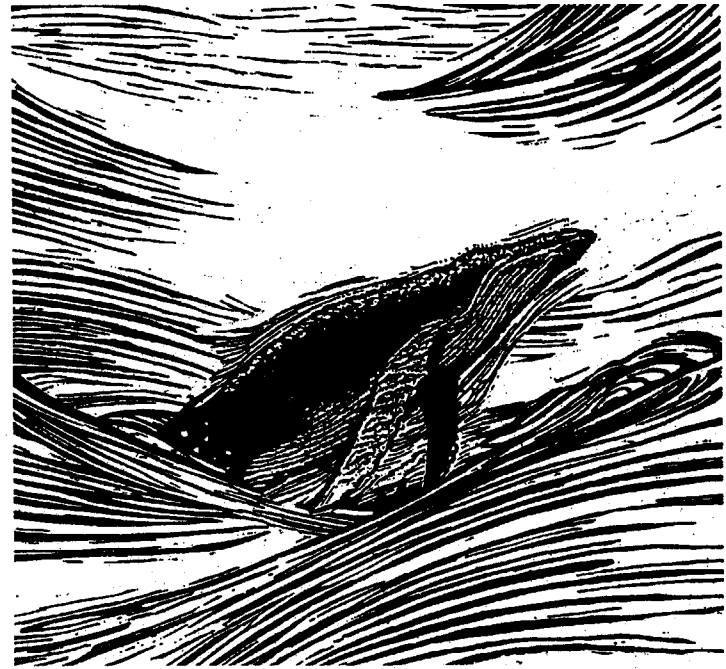


from:

Notes from the Wild

Bernie Krause

Humphrey: The Rescue



In previous chapters, I described how natural sound has provided a source of material for contemporary musical and ambient compositions. But sound plays a formidable role in contemporary medicine, building construction and architecture, and other branches of science as well. It is so integral to an animal's environment and so important to its sense of well-being that, in some cases, it can even be used to help free trapped creatures, or soothe those in captivity in zoos and theme parks. However, convincing people of the sophisticated ways in which sound may be used can be a problem. The rescue of Humphrey, a humpback whale who became an

international celebrity, is a case in point. The following excerpts are from my diary of the period:

Wednesday, October 16, 1985

I got a frantic call from Peigin Barrett, Director of the California Marine Mammal Center in Sausalito, who told me there was a whale in San Francisco Bay. The animal was first sighted six days ago. There's concern, she said, because the bay's saline content isn't high enough for the animal to survive for very long.

Smaller whales like the California gray are often found in the Bay during migration. This is a humpback, and the wayward creature has already become the center of a media circus. It has moved through the open Bay and is heading east, Peigin says, past the Sacramento Delta and into a narrow slough where it appears to be trapped. According to Mammal Center biologists, its breathing is shallow, and its skin shows signs of sloughing. There's concern that brain-swelling (*edema*) from osmotic pressure changes—resulting from the low salt content so far from the whale's ocean habitat—could kill it.

I told Peigin that although I worked with humpbacks while doing research on my Ph.D., I know only a little about them, like most researchers. I have experience with marine bio-acoustics, having recorded humpback mating songs in Hawaii, but don't know anything about their vocal behavior outside that environment. As far as I know, no one is sure what sounds a humpback might respond to—whether they might frighten or attract it. Nothing has ever been published on the matter.

A local researcher played some killer whale sounds to try to scare the animal back to the ocean, but without success. He stopped because the animal seemed to be under too

much stress. Peigin asked me to pull together equipment and technicians to try our own sound experiments. But she warned that her group has no funds for the operation, and expects little cooperation from the National Marine Fisheries Service (NMFS), who seem to want to direct the operation from 400 miles away in Long Beach. (NMFS enforces the Marine Mammal Protection Act, and governs what people can and can't do about marine mammal rescue operations under the constraints of federal law. Normally, one can't get within 100 yards of a protected marine mammal without a special permit, and under very few circumstances can an animal be harassed. The penalties for non-compliance are severe.) Several environmental groups are fighting for leadership of the operation, according to Peigin, in spite of NMFS's claim to authority. None of them can decide which rescue agency to support, or whether they themselves should lead the operation.

My gut tells me this one could get crazy. No money, lots of aggravation. I took a deep breath and told Peigin I would help.

I called some acquaintances who work for the Navy. Generously, they offered to loan me a \$17,000 underwater Navy loudspeaker, and to deliver it to my house in San Francisco this evening—though it means a 240-mile round trip from Monterey. No sooner was I off the phone when Peigin called again, saying we needed to cancel the underwater speaker. Sheridan Stone from NMFS in Long Beach had just called her to say he was coming to San Francisco with his boss, Jim Leckey (West Coast Director of NMFS) to make an on-site assessment tomorrow. It's NMFS's contention that because the whale has been in the delta for just a week they want to see if it can survive on its own. I believe the animal will die if we don't try something. And I couldn't reach my Navy buddies; they were already on the road.

After sending the equipment back to Monterey, totally

embarrassed, I called a colleague, Dr. Dianna Reiss. Turns out she and Peigin are friends. She suggested we drive to Rio Vista—a small town on the Sacramento River where the whale has been spotted—tomorrow to get a clearer picture for ourselves.

Thursday, October 17

The Mammal Center helps stranded marine mammals to recover from illnesses, including the all too common problem of gunshot wounds, then rehabilitates and releases them back to their environments. Guided by a volunteer staff, it's become a thriving, helpful organization, providing aid to thousands of stranded creatures.

All day they've been flooded by calls from "experts" and the press. One of the volunteers showed me a list of suggestions for saving the animal that have come in. These include dropping ice into the water so the whale will be more comfortable, dropping a curtain behind him so he can't go backward, and dangling a piece of raw meat in front of him to lure him away! There's lots of scurrying around, but no one knows what to do. Someone from a local paper suggested calling the whale Humphrey, and it seems to have stuck. He's being propelled from anonymity to media stardom. If only trapped human beings got so much attention.

I phoned Dr. Ken Norris at U. C. Santa Cruz. He's the director of Environmental Studies there, and knows as much as anyone about whales. He suggested that we try the *Oikomi* pipes, but says the NMFS folks won't listen to him. The pipes are eight-foot metal tubes, one end of which is submerged in the water. When the other end is hit with a hammer by folks in a boat, the jarring noise sometimes drives marine mammals away—the method was developed by

Japanese fishermen to herd dolphins close to shore so they could be slaughtered for dog food. Ken asked me to reinforce his suggestion with NMFS, and to keep him posted.

There's only one pay phone at the station for the press and everyone else; and it has been an instrument of high tension, since everyone wants to use it. We're having an Indian summer, so I stretched out on the grass in the late afternoon sun. Peigin came by to tell me that a boat had been found to take us to see Humphrey.

The *Sportfish*, approximately 26 feet long and set up for striped bass, is Jack Findleton's boat. He's a short, stocky Vietnam vet, and head of the California Striped Bass Association. He speaks with a machine-gun voice, as if he's shouting orders to a platoon; his intensity makes me feel withdrawn around him. Besides Dianna and Peigin, a couple of researchers—Mark and Debbie Ferrari—and a Time-Life photographer accompanied us. Using some of Dianna's equipment, I took readings of the river by recording with a hydrophone (an underwater microphone) a hundred yards north and south of the Rio Vista bridge.

We hoped to discover what's attracting Humphrey's attention, luring him from the salt water environments he's used to. The noise of traffic driving over the bridge gets transmitted through the pilings into the water, I quickly discovered, and *cavitation* (signature noise) from boat propellers makes the waterway pretty noisy. Maybe the animal is being drawn to the bridges—I want to explore this idea when I get back to the lab.

We headed up to Cache and Prospect Sloughs and there was the animal, swimming around, exhibiting what appeared to be feeding behavior, though—since no humpback has been observed in these waters before—no one knew for sure. Humphrey was leaving "footprints," pool-like formations on the surface of the water, a result of the

motion of his flukes, as he swam in elliptical paths. The Ferraris observed that he seemed to be breathing normally, though his skin is definitely turning gray, and showing signs of blistering. They didn't know whether this was a result of an earlier beaching in Oakland, the effects of sunburn, or—worse—edema. We're beginning to realize how little we know, and it's frustrating.

We wanted to find out if the whale was interested in food—a sign of good health if he is. Because schools of fish appeared on Findleton's fish scope, a couple of researchers suspected he's been drawn to an available food source.

Humphrey continued to swim near where the fish appeared, but I felt doubtful. The number of fish on the scope didn't seem to get smaller, so I suspect he hasn't grown too hungry yet. The water was 40 feet deep at that point, and we decided to do more sound tests. Nothing. Just the sounds of a hydrophone beginning to malfunction. Lots of pops and hissing. I changed the connector from the hydrophone cable to my recorder and things quieted down.

It was getting late, so we returned to San Francisco for an evening meeting. A group of talented biologists has formed around the issue, and I feel encouraged by their enthusiasm.

At the meeting, NMFS made it clear that the group from the Marine Mammal Center was operating "outside" the authorized team of government scientists; we were cautioned to be careful. Because they have no one available to address cold water sciences—the arcane scientific realm under which humpbacks fall—their best recommendations were limited to quick fixes like cracker shells and seal bombs (underwater explosives which detonate on contact with the water, used to frighten marine mammals or fish that exhibit behavior NMFS deems improper) or to do nothing. It's their opinion nothing can be done anyway. A rescue would be expensive, and no one has a budget to pay for it.

I proposed to our group that we find a moderating influence, someone with enough personal and political presence to guide NMFS to more moderate positions. They agreed it was a good idea, but when I called congressmen, senators and marine consultants over a period of many hours and received no help, it was clear that the issue was either too hot or just low priority. We called the local CBS station again, and a woman in the newsroom who'd grown tired of hearing from us provided state Senator John Garamendi's home number, warning us not to reveal who we got it from.

As luck would have it Garamendi was home, and delighted we'd called. "I came home for dinner and told my wife I felt frustrated. I wanted to help with the rescue, but didn't know where to turn." Dianna and I gave him the scenario, and he asked for time to consider options. He called back almost immediately to say he'll be at the Coast Guard Station tomorrow morning with as many federal, state and local representatives as he can summon. Helicopters, barges, tugs, small boats and other support personnel will accompany him. He'll enlist whatever other agencies we need to help. We were all dead tired, but his confidence energized us.

Friday, October 18, 11:00AM

Rio Vista Coast Guard Station

For the first time in my life I was impressed with a politician. Anybody who can muster as much help as Garamendi promised in such a short time must have his act together. Wanting to be adequately prepared, I stayed up most of the night reviewing the literature on cold water science and whales.

Everyone gathered at the Coast Guard Station. Garamendi had managed to pull favors from a local con-

tractor who prepared pipes for us to bang, though no one will get to use them for a while. There was no organization. No one had figured how many pipes and boats we'll need after the animal leaves the 50-yard narrows of Cache or Prospect Slough and swims out into bodies of water miles across. One thing became clear, though: everyone wants to get the animal out. Everyone except the NMFS people, that is.

Garamendi's first move was to eliminate the press from our discussions. This had the tempering effect of focusing energy on the task at hand, instead of theatrics. Still, there were many views and interests.

It quickly became apparent NMFS wanted control. Stone and Leckey had discussed the matter with their bosses at the National Oceanic and Atmospheric Administration, and the agency wanted to avoid making a decision for a while longer. They invoked their authority to restrain our enthusiasm, expressing various concerns about costs. During a break I even heard one of them in the hall, suggesting that when the animal died—which should be soon he guessed—they'd hire the California Conservation Corps to cut him up and bury his parts.

Findleton was optimistic, though, his attitude infectious. So was Garamendi's. But that didn't change the situation: after Dianna and I presented a summary of known science, it was obvious no one had enough information to make decisions. We know that to mount a successful rescue we'll be applying new techniques, probably generating new science in the area of acoustics and its effect on whales. Garamendi emerged from the meeting as operation director. The NMFS folks sat across the room with scowls on their faces, arms folded tightly. They'd lost control and didn't know what to do.

Garamendi asked who wanted to be in charge of the scientific component. Everyone looked in my direction; since

Dianna and I had just given our summary, it appeared as if we knew something. I in turn looked at Dianna, who averted her gaze. As no one else would do it, I was designated Scientific Director, though I made Dianna promise that she'll be with me at all times. She knows more about current whale science than I do.

The meeting resumed, and we made the case for Ken Norris' Oikomi idea. The pipe solution is modest, and will offer the animal a chance without destroying its hearing. Stone and Leckey still preferred seal bombs, which we believe might seriously harm the animal. They want fast results, but otherwise expressed the conviction it's a no-win cause. Even though there's great optimism among the group, we all wondered deep down if they weren't right.

As I looked around the room, it struck me that most of the members of our odd assembly would never otherwise be able to agree about where to eat lunch, let alone decide how to free a whale.

The NMFS folks checked with their absentee boss, Charlie Fullerton, and decided to let the whale ride out the weekend without interference; they won't be pushed into action. In the meantime, they told us to start preparing for the pipe operation, in case the animal shows serious deterioration. Mark and Debbie Ferrari were chosen to monitor the animal's health, and Findleton to direct the flotilla of volunteers and boats he's assembling. Dianna and I, meanwhile, are pulling together a group of advisors familiar with humpback whale science, in an effort to establish alternative plans.

Saturday-Sunday, October 19-20

Dutra Construction, the firm that supplied us with the pipes, generously made their helicopter available to me all weekend; I visited Humphrey both days with their help.

I've been recording the whale at every opportunity. Sunday morning we got a report that he couldn't be located. Apparently, he slipped by all of the observers and the Coast Guard boats during the night. A bit later, we got word he had ended up in Shag Slough, a shallow fresh water channel a couple of hundred yards long and 80 feet wide located between two heavily fertilized fields. He was found swimming back and forth between an old wooden bridge at one end and the high dirt banks along the sides. A group from UC Berkeley tested the water and determined that toxins were leaching into the slough from surrounding fields, with high levels of selenium and PCBs both present. We have no idea how these might affect the whale.

Humphrey had somehow managed to swim past the rotten pilings below the water at high tide with little problem. A few boaters were given permission to try to herd him with the noise of their engines. But he seemed unwilling or unable to swim under the bridge in the opposite direction. Meanwhile, a couple of tattooed punks on the opposite bank began pelting Humphrey with beer cans each time he surfaced. I called the police on my cell phone. After several minutes, the highway patrol appeared and led them away. I'm worried for the animal and for the people trying to help him.

We continued to record Humphrey for several hours, but there was a lot of boat noise from curious powerboaters, though the Coast Guard had sealed the entrance to the channel where Humphrey was trapped. We got occasional click sounds we thought were coming from the whale, which we'll analyze later. Some of them suggested a type of *echolocation* (a sonar-like sound produced by some whales to "visualize" objects in their environment). If that is indeed what they are, it would be the first time humpback echolocation has been recorded.

Monday, October 21

I'm unable to determine conclusively whether Humphrey's using echolocation; we've picked up sounds we can't identify. The clicks we heard yesterday may also be the downshifting of gears from boats in or near the slough. I spent hours analyzing the recordings but can't be sure. In the meantime, NMFS continues to refuse our appeals for action.

Tuesday, October 22

Early in the morning I drove to Shag Slough, to record the whale again and evaluate its condition, and to speak with Garamendi about a meeting planned for tomorrow. Mark and Debbie Ferrari are getting good data with help from California Conservation Corps volunteers monitoring the animal. They're reassured by the positive reports.

Because of the intense media coverage, pressure has mounted on NMFS to become more pro-active. We've convinced them to try driving the animal out of the slough with the pipes, as far into the main channel as we can, and hopefully down river. We decided to be diplomatic and make it seem like it's NMFS's idea.

Wednesday, October 23

During the last few days we've been in contact with eight scientists about the rescue—Ken Norris, Joe Geraci, Bill Watkins, Peter Tyack, Barent Wursig, Robert Hoffman, John Twiss and Laurie Gage, a veterinarian. We've reviewed the literature, but are unable to shed any light on the problem. This morning we again considered options. They include seal bombs, strobe lights and a crane-suspended sling, whose offerer expects the 40-ton untrained Humphrey to leap into it so we can hoist him onto a barge

and carry him to open water. The pipe plan won a vote of confidence from all eight consultants and our group; if the pipes work the Conservation Corps will drop a weighted curtain over the side of the bridge after the whale passes so it can't return to the slough.

It's Findleton's job to lead the boaters in orchestrated fashion, and Dutra's responsibility to bring along about two dozen of the pipes and hammers to bang them. Peigin assumed responsibility for assembling 100 volunteers through her resources at the Mammal Center. At last, everyone's focused on a rescue. The energy we get from working together helps overcome the fatigue we're beginning to feel.

Thursday, October 24

64 | We gathered at the Rio Vista marina just after sunrise; it was another bright-hazy Indian Summer day. Findleton seemed uptight. Turned out he wanted one of his buddies—who'd been assigned to another boat—to travel with us. There wasn't room; the positions were pre-assigned, and we were too short on pipes to create another crew. He remained intense and quiet, except for his proclivity to bark orders, eyes fixed straight ahead on the beautiful autumn morning, refusing to be engaged in conversation.

Each of the eight small boats carried three or four volunteers—one to hammer, one to secure the pipes to the gunwales, and a driver to keep the integrity of the crescent-shaped flotilla intact. The boats were equipped with radios so Findleton could direct. Dianna remained at Liberty Island Bridge with my Nagra, recording the sounds of the pipes and—we hoped—responses from the whale.

The Coast Guard issued a directive to boaters to stay away from the site or anywhere that Humphrey might be

headed. At 10:30AM we began maneuvering the boats into position at Shag Slough's north end. We could see Dianna with her recorder at the bridge. The whale was soon sighted by Mark Ferrari halfway down the slough. The order was given to put the boats into gear, just a bit faster than idle speed, and to strike the pipes.

Until then, Humphrey had seemed lethargic. But as soon as the pipe noise was transmitted into the water, a different whale revealed himself—immediately, he responded. As the boats advanced, Humphrey moved south, keeping well ahead of the flotilla that was now spread across the 80-foot width of the slough. When he got to the bridge, though, the whale stopped dead in his wake, rolled onto his side, exposed one large fin and would not go under. The boat crews made several passes at him, but he wouldn't budge.

It turns out that earlier in the week at the bridge site, Findleton discovered what looked like rotted pilings on his fish scope, just below the surface of the water at the widest gap between the visible pilings and the deepest water. Though this is the broadest space between the new pilings, apparently the whale is aware of the old pilings, and believes them to be obstacles. He appeared reluctant to swim over them again, as he must have done when he entered several days before. Perhaps he injured himself the first time through. Debbie Ferrari ordered Findleton to stop the operation so the whale would not get stressed. At first he seemed put off by her order, but then he told the other boats to cool it.

We tried again later, but the animal eluded us, swimming past or underneath the boats, in opposite directions or stopping just short of the bridge. Back at the Coast Guard station I met with Garamendi, Findleton and Bill Dutra. Any rescue now appears to be a matter of removing the bridge, or at least the old pilings. Dutra offered to blow up the

bridge, since it's destined for removal anyway. Garamendi asked Dutra if he could just remove the old pilings. Dutra didn't know, but said he'd try to figure something out.

Friday, October 25

I talked to Dutra, who told me that his crew did a little work early this morning, removing some obstacles at the bridge's widest gap, but none of the submerged pilings. They couldn't hook the rotting timbers in an effective way, and didn't want to use explosives so close to Humphrey.

For most of the day nothing happened, but at about 4:15 PM I got a call from Garamendi's press secretary, telling me the whale had moved past the bridge. "Findleton and his crew have done it!" he shouted into the phone. I was delighted; at the same time, I realized that while we've moved the animal 200 yards, there are 65 miles to go to open sea. That'll take a lot of pipes and boats, particularly when Humphrey gets into stretches of open delta water several miles across.

Late tonight I got a call from a friend at one of the TV stations, telling me the animal has moved seven miles downstream. He's been sighted very close to Rio Vista.

Saturday, October 26

To my distraction, I've been subpoenaed to appear as a forensic witness in a drug case, in the Virgin Islands! When I checked into my hotel in St. Thomas after the tedious flight, there were a dozen messages from Rio Vista and the press. I've never felt so far away from home! I called Garamendi's office first, and learned that the whale has moved as far as the Rio Vista bridge, but has refused to go under the structure. In apparent frustration—and without consulting any of the biologists or Garamendi—Sheridan

Stone sneaked a shotgun aboard Findleton's boat and fired a seal bomb into the water behind where the whale was swimming, in front of nearly 10,000 people gathered on the river bank! Shortly after that, Humphrey beached himself.

I called the Mammal Center for confirmation—they were hysterical. If I'd been there I'd have had Stone arrested, under the terms of the same Marine Protection Act that he used to prevent our rescue attempts.

I spent the evening at the Virgin Island law library, reviewing the Act. I concluded that what Stone did is illegal, punishable by heavy fines and possibly jail. I wanted to see him arrested and start proceedings.

When I called Garamendi back I read him the part of the Act that applied to harassment; I told him what I wanted done. The Senator sounded tired. He spent forty-five minutes explaining that he understood my reaction. He told me he felt the same way, but thought it important to consider the outcome if we proceeded. He was persuasive; I relented. If the animal has a chance, I realize, we need all the help we can get. The Senator told me Stone was remorseful and, in fact, said he'd have Stone call me.

Stone called a while later and we talked. We're trying to solve the same problem, but with different agendas.

Tuesday, October 29

Back in San Francisco. The whale has been moving up and down the Sacramento River, staying near bridges with enough automobile traffic to transmit noise to the water below; the auto and truck noise must be attracting the animal. Findleton and his stalwarts shepherd Humphrey five to ten miles downstream each day, only to find that he has returned back upriver the next morning, toward the Rio Vista bridge. They have no way to prevent him from doing so.

By now we're all mystified, and the NMFS folks have scaled back the operation. I called Garamendi's office and learned one last effort will be mounted. We're to meet at the California Water Resources Board in Sacramento for an international teleconference of scientists and concerned parties.

Thursday, October 31

Sacramento

The conference began at a little after 10:00am, in an atmosphere of guarded optimism. Many of those who have been working since the operation began, however, are exhausted.

At half past twelve we began to consider options. Lou Herman, a biologist from the University of Hawaii, suggested it might be worth trying to lure the whale to some sound instead of trying to repel it. He told us his group tried some playback experiments in Hawaii, and that certain humpback feeding sounds drew the animals to underwater speakers where vocalizations were playing. If we used a suitable system like a Navy J-11 underwater speaker, he said, and locate it downstream from the animal, luring might be successful.

"Perhaps we can get a tape recording of your sounds from you," Dianna told him. "But what will keep the animal from getting habituated to the playback, especially if there are no fish around to feed them?"

Herman chuckled, and told us he was surprised that the experiment worked so well; humpback whales weren't known to feed in Hawaiian waters. Still, the animals were more attracted to the feeding sounds than to any humpback or synthetic sound they tried. He suggested we use his sounds for short periods of time until the animal is attracted, then turn them off, beginning again when the animal

gets off track. We accepted his offer, and—just in case—obtained as backup another source of humpback feeding sounds from Duane Johnson of California Fish and Game.

I checked with Findleton to see if he had 120 volts on his boat, which we'll need to power our amplifiers and tape playback machines. He doesn't, but said he'll help us find a boat that does. When I called Herman later, I asked for detailed information about the experiments.

Friday-Saturday, November 1-2

Herman's package arrived; it contained a two-paragraph description and an audio cassette. The letter says that the tape is a twenty-minute loop, originally played back on a Sony cassette recorder attached to an 800-watt amplifier that powered the J-11 underwater speaker. It says humpback whales were lured from as far as two kilometers away. I know quite well the J-11 can't handle 800 watts, since it's rated at a maximum of 200 and will be destroyed if you give it that much power. Since sound travels quickly in water; two kilometers isn't impressive. As for the decibel rating, I don't trust Herman's data—there's no information included about how he set up his instrumentation. His students gathered their data from studies with free-ranging animals in normal salt water, not a trapped animal in a fresh water river and slough, suffering everything from disorientation to edema. Finally, I realized, he provided no information about the duration of the tests performed.

When I put the cassette on my machine its quality was dreadful, confirming my worst fears. Field recordings made for experiments are typically poor, but these are terrible. There are lots of extraneous noises on the cassette and it's just one segment, fifty-five seconds in length repeated over and over. This may have worked under relaxed conditions

in Hawaii, but our situation is more problematical. If the idea is to work at all, especially given Diana's worries about the whale growing habituated to it, the recording will need to be cleaned up and altered. I have a vision of no sleep for the next three days.

I called Dianna and asked if she could find out who did the original recordings; I wanted to speak directly with those involved. We haven't been provided enough information by Herman, in the teleconference or in his letter. At my expense, I rented a local recording studio with a digital Kurtzweil sampling synthesizer and lots of digital and analog processing gear, and went to work. With a device originally developed for the FBI and the Federal Aviation Administration, I removed the unwanted noise on the recording. Mostly it consisted of boat engines, because the recordist forgot or was unable to get the engine stopped when the tape was made. Despite the fact that the original was only 55 seconds long, the process took six hours to accomplish. Though I was feeling overwhelmed by the task, one thing is certain—what I learn will add useful information to literature on such work.

Then came the hard part. I knew that we would have to have at least a fifteen-to-twenty minute tape of different-sounding segments so that it would appear natural to the animal. I know from my work in Hawaii that humpback vocalizations, though often similar, are almost never repeated the same way twice.

The boat engine noise was reduced without destroying the integrity of the feeding sounds, and the cleaned up short segment programmed into a sampler. I changed the duration, pitch, reverberation, amplitude (loudness) over time, even the timbre (texture) of the material, recombining and mixing the various blends so it wouldn't sound repetitive. I've worked on outrageous rock and roll sessions that were

easier and faster!

The session began at mid-afternoon on Friday and continued through the night, all day Saturday and late into the evening. During a break, I called Dianna to ask if she had learned more about the experiments. She told me that she'd spoken with Joe Mobley, the student who performed the Hawaiian studies. He told her that when the experiment was proposed, Herman balked at the idea. Mobley continued despite Herman's opposition, which explained why Herman was surprised by the results!

Mobley told Dianna that Scott Baker, another student in Herman's program, recorded the feeding sounds in Alaska during 1984. I asked her if she realized that none of Herman's comments at the teleconference or in the letter mentioned his students or what they contributed. She responded that this was standard operating procedure among some researchers.

Sunday, November 3

The Bootlegger, the boat Findleton arranged for us, picked us up at 8:00AM at the marina opposite Brown's Island in Pittsburgh. Dianna, her husband Stuart Finklestein, Larry Burr, a photographer, a woman I'm dating and myself were assigned to the command boat. Greg Pless and Brian Wilson joined us from the Navy Post-Graduate School in Monterey, bearing the precious J-11 underwater speaker and amplifier—considering how we treated them at the beginning of the operation, when I sent them back to Monterey with no warning, I'm surprised by their continued generosity. I brought the Nagra and several copies of the tape I'd labored over, in case one copy failed or broke during playback.

The boat, a 40-foot cabin cruiser, picked us up at 10:00 AM,

and we began to move upriver toward Antioch where the whale was last sighted. By sheer determination and endurance, Findleton and his volunteer boaters had managed to move Humphrey fourteen miles—more like a hundred and fifty if one took into account the retreats and advances they've endured these past ten days. That's a lot of pipe-banging, and Findleton is one of the heroes of the operation.

As we approached Antioch we couldn't actually see the animal, but heard on the marine radio that it had been sighted in the San Joaquin Delta upriver from where we were. Near the Antioch Bridge in the diffuse autumn morning light, the river seemed filled with boats—hundreds of them, stretched over a mile across from shore to shore. Helicopters from all the national TV networks dotted the skies, generating an incredible amount of noise—they wouldn't stay at the distances the FAA had set for the operation, at least one half mile horizontally and 1,000 feet off ground.

We couldn't be bothered about that now, though. Over the radio came a directive from the NMFS's Charlie Fullerton: we had five minutes from 11:00 AM to try our sounds. If they worked, fine—if not, we were to get off the water so the pipe drive could start.

Under pressure, we set up our equipment. We lowered the 120-pound speaker into the water off the bow to a depth of ten feet. A solid mass of stainless steel, it looked like a squat cylinder with rubber diaphragms attached to both ends. We could put a maximum of 200 watts through the speaker but wanted to be conservative, so we set our levels at a maximum of 168 watts. We were ready.

Looking off the stern of our boat pointed to the east, I was reminded of the Normandy invasion. There were private volunteer vessels, Navy vessels, boats from the Coast Guard, Marines, Army and National Guard—perhaps 200

boats in all. It was the first time I had ever heard of these suckers working together in war or peace. In the middle of the whole fleet and at the very front stood the press boat, so full of people, cameras, and other gear it bristled like a porcupine in the thermals rising off the river. It listed badly to starboard, but the Coast Guard—so careful about overloaded vessels ordinarily—must have been looking the other way.

Fullerton barked at us to start the tape; suddenly, he was boss. We were now a quarter mile away from the animal. I switched on the recorder with the reconfigured tape and, at first—because I was in the cabin—was unaware of what had happened. It didn't take long to find out. The whale made a run for our boat, covering the 400 yards between us in fifteen seconds. He came so fast that when he finally arrived, his nose nudged the underwater speaker at our bow. His body, which by now was alongside the *Bootlegger*—two feet longer than the entire 40-foot vessel—caused the boat to list so badly the port deck was nearly awash. We were terrified we might capsize, overwhelmed by the whale's behavior. Jim Cook and his wife Sandy, the boat's owners, looked like they'd seen a ghost.

I recovered my composure and shouted at Jim to put the boat in gear, but dead slow. He did, and to our wonder, Humphrey tucked his head to our stern, just as if he'd discovered a long-lost friend. Perhaps he recognized the voice we were transmitting. I told Jim to move the boat a bit faster, up to nearly six knots, and to hold that speed. He did and the whale continued to follow us.

Using the protocol Joe Mobley described to Dianna, we used the sounds sparingly. The machine was turned on when the animal seemed distracted, or when he veered in another direction. I stopped the tape when he followed in our wake—we had over forty miles to go, and I didn't want

the animal to get used to my best record production to date. Finally, I had produced an irresistible hit!

The Coast Guard cutter *Point Hyer* cleared a mile-wide path for us on the river, ordering all other vessels out of the way. For the next several hours the cutter was the only boat we saw, more than half a mile ahead. We were alone on the river with Humphrey and he never stopped moving.

The press helicopters, however, were still an annoyance. We felt they were distracting the whale, coming in lower and lower with each pass until, in one case, we saw water roiling in the blades' downwash as one tried to get a close-up. It's then that I began to use the hand-held radio. I got the FAA on the horn and told them to get the choppers out of the area with all other aircraft. I asked Travis Air Force Base's Air Traffic Control tower to divert all flight approaches, takeoffs and landings to the north of the field, and to clear the area in the hope we could stretch our luck.

We were 10 miles downstream when the operation was interrupted. Fullerton got on the radio and ordered us to stop the playback, to cut our engines so that he could tag the animal. NMFS had tried to shoot tags into the whale when it was still near the Rio Vista bridge; the tags pierced Humphrey's sensitive skin, but he sloughed them off. Now Fullerton wanted to use a more powerful projectile.

Dianna and I had no patience for such nonsense. She warned Fullerton she was finished with the rescue if he persisted. She told him that there were several ways to identify whales developed by researchers Peter Tyack and Ken Balcomb, that he could use them if he cared to. Humphrey, she pointed out, was now history's most photographed whale. We had fluke silhouette photos to identify him no matter where he shows up; there was no need to jeopardize the momentum of the rescue.

Fullerton was adamant. So were we. Since we had the

more powerful hand-held transmitter, I simply held down the "send-receive" button so no one could transmit or receive and ordered Jim Cook to keep going. Thankfully, he complied, and that was the end of the discussion.

Or so we thought. When I finally released the button half an hour later an enraged Fullerton came on the air, and warned us that he would arrest us if we pulled such a stunt again. Of course, we weren't too alarmed, because the issue—as far as we were concerned—was resolved, and the press was monitoring and recording everything. We had the recording, and the whale, after all, was moving.

Humphrey, meanwhile, had captivated us all, leaving our wake to swim close to the shoreline of every river town we passed. At Martinez, Port Costa and Crockett, where townspeople lined the shore, he swam over to the river banks and either did a full breach or a tail slap, sending plumes of water into the air to the crowds' delight. It was as if he was thanking them for their support. We heard cheers and gleeful shouts a mile out on the river after each display.

The other miracle was that this creature—which everyone thought was ill, incapacitated or crazy—followed our recording for seven hours, covering nearly fifty miles from Antioch to just off Angel Island in San Francisco Bay before we lost him in the darkness Sunday night.

Monday, November 4

I'm at home with a bad case of the flu. I hear reports on the marine radio that the whale was located this morning off Point Richmond near the Brothers Islands. Typical of November weather, the region has been covered with pre-winter overcast; Humphrey was difficult to spot (according to Dianna and several others who have called), and swam around the bay, appearing to avoid contact with the rescue

team. The Findleton-Bootlegger team tried the pipes and our feeding sounds to lure him, pursuing him all day until finally, just before nightfall, he turned west and swam out beneath the Golden Gate.

Postscript

A year after Humphrey was rescued, we still weren't certain what led him into the Bay—we can only speculate. Early in October '85 the weather was extremely calm, and there was no wave action along the shore of Northern California. Perhaps some migrating whales use waves along the shore as an audio reference for their travels. While shore wave action was virtually non-existent in early October, noise transmitted through the pilings of the Golden Gate Bridge (and other bridges along Humphrey's path) by the auto traffic may have been similar enough to draw the animal off course. A comparison of the recordings we made at various bridges the whale passed under and off-shore wave action when it resumed revealed very similar patterns. It's only a guess; we may never know.

One day, some time ago, I dreamt of creating an audio journey that would guide the listener from the seashore to the depths of the ocean and back again. It would be a way to convey the drama of the environment and what Humphrey and his ocean associates listen to daily. (Part of that idea is heard in "A Gift from the Sea.") Little by little, we're beginning to understand that most of these creatures produce some kind of sound. We're just now beginning to look at their communication. Much mystery remains. Some of my older colleagues have remarked that we're having so much fun trying to discover the answers, we hope the revelation never comes.

