

## CALIFORNIA MARINE FISHERIES INVESTIGATIONS, 1914-1939

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These are exciting times. But also there is much in the past, and I want to go back about sixty years. To you that is probably a long time; it's just yesterday to me.

Fish and game studies in California started in 1914. At that time, there was a Fish Commission composed of five men who decided that there must be a marine fisheries investigation. So they organized a Department of Commercial Fisheries and named Norman Bishop Scofield its administrator. The responsibilities of this investigation were to gather statistics, to study fishing methods, fish processing and handling, and to learn about fishes, their habits, how they migrated, where they appeared on the fishing grounds, when they spawned—just the little minor details. We're still struggling!

Norman Bishop Scofield, to me, was the father of commercial fisheries investigation in California. He was born in 1869 in the Midwest and had a bachelor's degree in biology before he came to California about 1890. He was known throughout the years as N.B., so from now on he probably will be N.B. when I refer to him.

When N.B. came to California he registered at Stanford as a graduate student, and in 1895 was awarded a master's degree with Stanford's first graduating class. While he was a student at Stanford, he studied some of the San Francisco Bay and central California fisheries under Dr. Charles Henry Gilbert. You people probably know that Gilbert was the man who determined, in general, that Pacific Coast salmon return to spawn in the streams in which they hatched.

Because of N.B.'s interests and his work as a student, he was employed by the Department of Fish and Game from 1897 to 1899. Then he dropped out of the picture for several years. He was in the East doing some business; I don't know what. But California seemed to be his love, and he came back and was employed again by the Department of Fish and Game from 1908 until he retired in 1939.

He was a man who had the imagination to know what needed to be done, and the ability to find out how to do it and to provide the means for doing it. He took over the direction of this new fisheries investigation in 1915, supposedly to study statistics. You can't study statistics without information and figures. So in 1915 a law was passed that required fish buyers to issue receipts, and that was the beginning of our figures on the catch.

By 1917 N.B. discovered that you can't do fisheries

investigations without money. California at that time sold licenses for commercial fishing, for sport fishing and for hunting. That was the department's revenue. But more money was needed, so a law was passed requiring the dealers to pay two-and-a-half cents per pound for all fish they bought. This, plus the sale of fishing licenses, was the sole support for the Department of Fish and Game for quite a number of years. Nothing came from the general fund. As the years went by, the price per pound was increased, and more money came in.

By this time Scofield had gotten things organized. There was a way of getting information, and there was some money, so he looked around to find somebody to direct this new investigation. He selected William Francis Thompson, who is known to all of us for his work throughout the years. He had done some studies on the halibut in Washington and in the northern area, and Scofield admired his work. So Thompson was hired and started at Monterey. He stayed there for a year or two and then decided that the center of California fisheries was going to be in southern California.

Thompson employed William Lancelot Scofield, known as Lance Scofield to all of us, to study sardines and other fisheries in the Monterey area. Thompson transferred to southern California, where he employed Elmer Higgins and a few other people and started the work in that area. Thompson and Higgins used patrol boats to try to explore some of the waters off southern California. Thompson mentioned in some of his laboratory notes that they had taken eggs that he thought might be sardines. But his chief interest in this exploration was to try to learn about albacore. At that time the albacore canning industry was expanding rapidly.

By 1918 Thompson and Scofield realized that the information they were getting from the dealers and their receipts was not adequate. They needed more information for a fisheries investigation. So they set up what we have called the pink-ticket system. It required three receipts: one to the fisherman; a pink copy to Fish and Game—that's the origin of the term "pink ticket"; and a third copy kept by the dealers.

Again, I want to give a little credit to another man, H.B. Nidever. He was working for patrol, first in the San Francisco area. There he had worked with N.B. when N.B. was first employed. Nidever had tremendous admiration for the biologists. In fact, he had us up on a pedestal, which was not justified. But he had

the ability to work with people, and when he went out to arrest the fishermen, he could almost make the fishermen like him for doing it!

So when Nidever and N.B. felt that we needed this detailed information, they drew up the plan for the pink-ticket system, which is the basis for much of the detail that we have from our fisheries. Thus things were under way, going nicely. Higgins and Thompson were working. They also employed students for a short time during the summer vacation and occasionally for longer terms.

By 1920, Oscar Elton Sette was working with Thompson, also Harlan Holmes, Tage Scogsberg, whom some of you probably know as the man who was with Hopkins Marine Station doing biological work in Monterey Bay for a number of years, and Lance Scofield. Thompson realized then that they must have permanent quarters, and the plan for the California State Fisheries Laboratory at Terminal Island was drawn up. The building was constructed and subsequently occupied in November 1921.

Things were going along nicely, but by 1922 there were hard times. The depression that followed the First World War was with us. At the same time, the cost of living was rising rapidly. Doesn't that sound familiar? But the price of fish dropped rapidly. The revenue to the California Department of Fish and Game was falling off. The fishermen weren't fishing; they weren't being paid; and yet the cost of living was going up. The biologists just couldn't afford to work: they weren't paid enough.

At the same time, the federal government was paying its biologists more than the California Department of Fish and Game was paying. So things fell off. Sette and Higgins left for the Atlantic Coast to work for the federal government; Holmes went to Seattle to work for the federal government; and there were very few working at the laboratory. That led Thompson and N.B. to realize that California was the training ground for marine fisheries students. They took the matter up with the federal government and got some agreement. It was decided that the government would pay part of the salary of a few people. I don't know how it was paid, how much it was, whether it was a lump sum to the Department of Fish and Game, or whether it was a part of individual salaries. But I do know that George Rounsefell and Bill Herrington worked a year or two and then went back into federal government.

Then we carry on to mid-1920, when, because the economy was looking up, money came in and the program was going along nicely. In 1924, the North Pacific Fisheries Treaty with Japan was signed. Then in 1926 the United States and Mexico formed an International Fishing Commission. I am sure that this was

largely the work of N.B. Scofield, who was made the commission's director. They started an investigation, and several people were employed.

In 1926 Thompson went to Seattle and took over the work for the fisheries investigation with the United States and Japan. Lance Scofield, who had been working at Monterey, was transferred to southern California and became director of the work in California.

By 1928 things were expanding. Julie Phillips was employed, as were Dick Croker, Don Fry, and Harry Godsil. They used the patrol boats to investigate the local waters and the populations of sardine, albacore, and other fish along the coast.

The commission with Mexico did not prove successful and had faded away by 1929. Some of its staff were transferred to the California Department of Fish and Game. Among them were Bert Walford and Geraldine Conner. Walford worked with different fisheries and did quite a bit with the barracuda. Geraldine Conner had been a secretary to N.B. for many years, and had been the secretary for the International Fishing Commission. Now she took over the pink tickets, a mass of which had been collected. If a biologist wanted to learn what certain fishing boats had caught, all he had to do was to go through this mass of tickets and try to find the boats he was interested in.

Geraldine Conner is another person for whom I have great admiration. Her training had been limited, yet she was the person who had the ability, when there was a job to do, to know how to do it, and to go ahead and do it. She set up a program to sort and file the pink tickets and make their figures available with details of boat catches and kinds of fish.

That is a quick summary of the first fifteen years. We might pause a moment to consider what had been learned, for in the beginning practically nothing was known about our fisheries. A little had been learned about albacore. Thompson had indicated that there was some relation between albacore catch and the temperatures of the water. Gene Scofield, a young son of N.B., was doing work with the patrol boat *Bluefin* and some of the smaller boats, and had found and identified sardine eggs and larvae.

The fishing grounds for sardines and mackerel off California had been well defined. The staff had learned the sizes of the fish that were being taken, the fact that spawning abundance varied from year to year, and that there were differences in the sizes of year classes. They knew that fish taken on the fishing grounds in central and southern California varied to some extent. The time of the appearance in the fisheries varied for both sardines and albacore. Quite a

bit had been learned about tuna. Studies of the barracuda had been made, and of the white sea bass, the Pismo clam, and several of the other fisheries along the coast.

That takes care of the first fifteen years, and we'll start a new decade. In 1930 the government of Canada and the provincial government of British Columbia started a sardine investigation headed by John Hart, again a man of great ability. He came to California, talked with the people investigating here, and kept in touch by correspondence so that the work in Canada was integrated with that in California.

In 1931 it was realized that something must be done about the mass of pink tickets. Their information still was not being made available quickly enough. So the punch-card system, as we called it, started up. It was really the beginning of computers, again a tribute to Gerry Conner who started the program that developed into a computer program; she got the machines set up to punch the records, sort them, and make all the records available on printed copies.

In 1931 the sport-fish catch records were started. The *Bluefin*, the patrol boat that did much of the first oceanographic work, had explored California and Mexican waters. At this time, it was discovered that the value of fish oil and meal was greater than the value of canned fish. Up to this time, California had ruled that no whole fish could be directly reduced to fish meal and oil: only the trimmings, the offal, and fish that were too crushed or too small for canning. In addition, the commission stated that any processor could reduce only a certain percentage of his total catch. Because the demand for fish meal and oil was so great, the processors appealed to the Department of Fish and Game and obtained a grant of 130,000 additional tons for use in reducing whole fish into meal and oil.

At this time, in order to get around the department's control, two ships had been organized to go offshore and reduce fish into meal and oil beyond the state's jurisdiction. So the pressure for the use of sardines, especially, for fish meal and oil was becoming very heavy. In 1933 the law restricting the amount of tonnage used for fish meal and oil was removed. Then the pressure to increase the reduction of sardines mounted rapidly.

By 1933 Don Fry had found, reared, and identified mackerel eggs and had established knowledge about mackerel spawning. Compared to all of the mechanical equipment we have now, there wasn't much in those days. Don reared his mackerel eggs, it's rumored, in the home bathtub. That's the way he was able to keep the eggs and larvae until they reached a size large enough for them to be identified.

In 1934 the *Bluefin* made five cruises. They were in local and southern California waters south to La Paz, and out to Tanner Bank. Much of this was under the direction of Harry Godsil, but all of the other biologists worked at turns on these different projects. Then in 1934 Gene Scofield brought out his report that sardine eggs and larvae were taken from San Francisco south to Cape San Lucas, and offshore for about a hundred miles.

In 1935 the tagging of tuna was started, again under the direction of Harry Godsil. In 1936 Fry brought out the summary of what he had learned about the mackerel spawning. Phil Roedel was employed in 1936. In 1937 sardine tagging was started off British Columbia, Washington, Oregon, and California. John Janssen was in charge of that program. The California Department of Fish and Game and Scripps Institution of Oceanography had released drift bottles off southern California to learn something about the surface drifts in the area.

By 1938 the sardine tagging was producing evidence that sardines were moving up the coast as far as British Columbia and south to Baja California waters. The tuna and mackerel taggings were bringing good results. It was particularly exciting in 1938 when about thirty-five small sardines, thirty-four to thirty-five millimeters in length, were taken in an albacore stomach about thirty miles off the mouth of the Columbia River and sent to California biologists, thus proving that baby sardines at times occurred even that far north.

The pressure to use sardines for fish meal and oil was tremendous. The industry claimed that California had no justification in trying to hold the total catch down to a basic 200,000 tons a year. Whether that was too small or too large no one knew, and probably will never know. The processors, the reduction people, were vociferous in their resistance to the California Department of Fish and Game's attempt to hold down the catch. Very unpleasant things were said about the biologists' bringing out statements and not knowing the truth about the facts they had. They couldn't be proved and probably never can be. The processors were certainly far from polite in the things they said to us, and they brought pressure on the federal government to have somebody come and really learn something about sardines! So Elton Sette transferred back to California and set up a program to study sardines. I'm sure Sette did not relish this problem. The California biologists obviously had a very big chip on their shoulders. Their feelings had been seriously hurt. They resisted somebody else's coming in and showing them that they didn't know anything.

So there were many heated meetings. There was

much discussion and final realization that the thing to do was to learn to work together and fuse the two programs so they would not overlap, but supplement each other. Thus with all the pangs, finally CalCOFI was born. It rapidly became a very lusty infant.

Also, in December of 1935 the *N.B. Scofield* research vessel was launched. This is the only time the California Department of Fish and Game has ever named one of its boats for anything but a fish, but it was certainly a wonderful tribute to the work that N.B. had done. In 1939 the *N.B. Scofield* made six cruises, traveled 16,000 miles from northern California to Central America, and took albacore 800 miles offshore. In the fall of 1939 N.B. Scofield retired, and here ends my account of the first twenty-five years of fisheries investigation.

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**Question:** Tell us something about what you did, Frances.

**Clark:** I came to work for the Department of Fish and Game in 1921, shortly before the move into the State Fisheries Laboratory. I stayed through to 1922, when people left because of lack of funds. I went to the University of Michigan to study for my doctorate under Alexander Ruthven and Carl Hubbs. I returned to the California Department of Fish and Game as a fisheries biologist in 1926 and continued on until I retired in 1957.

Here is a little anecdote about the beginning. I had an A.B. in biology from Stanford but was hired as a secretary and librarian. I had a very limited knowledge of shorthand; I knew nothing about library work. But I fortunately found that Thompson apparently didn't

care to dictate letters, and he asked me if I would rather have him dictate or write the letters myself for him to sign. That was much more fun. For two mornings a week I went into Los Angeles to a library school and learned the rudiments of library work, and in that way the extensive library developed by Pat Powell got under way.

**Question:** I'd like to ask you, Dr. Clark, what was the public's reaction to the factory ships offshore?

**Clark:** I have a feeling that, aside from the fisheries people and the industry, people didn't pay much attention. It was not a major California problem. As you probably know, they did pass a law that fish meal and oil processed outside of California waters could not be delivered at California ports. This, in part, shut down the offshore fish processing. But the thing that really stopped it was employment. The people who were working on the ships offshore worked twenty-four hours a day; the union said that they could not work longer than eight hours a day, and the wages had to be increased. That financially broke the reduction ships, and they had to give up.

**Question:** Through your career did you face any discrimination? I assume at that time you were one of the few women working in the field of fishery biology.

**Clark:** My personal experience is not that people didn't *want* to employ women, they just never *thought* of doing so!

**Blanca Rojas de Mendiola:** I am from the Instituto del Mar de Perú. I want to tell something about Dr. Frances Clark. She was in Perú in 1953 and in the beginning of 1954. We learned a lot from her, and all of the people who had the opportunity to work with her at that time appreciate it.