

NOT FOR PUBLICATION

INSTITUTE OF CURRENT WORLD AFFAIRS

WEM - 8
The Ilo Canneries

Casilla 35
Arequipa, Perú
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Mr. Walter S. Rogers
Institute of Current World Affairs
522 Fifth Avenue
New York 36, New York

Dear Mr. Rogers:

The plane trip from Arequipa to Tacna is a forty minute flight over the coastal desert with a knife-edge of blue sea showing beyond the cliffs some hundred miles away. The four-motor slides over the gorges of the Tambo, Moquegua, Locumba and Sama rivers, where the swollen streams roll earth and boulders down from the hills. It comes in low over the northern lip of the Caplina valley and puts down on the Tacna airstrip. The blanket of wet heat makes breathing difficult at first after the cool, thin air of the altitude.

We had lunch at Tacna's modern Hotel de Turistas; we ate nut-flavored avocados in the sun and listened to the hotel's complete supply of vintage Crosby records. There were four of us: Jorge Bedoya Forga, manager of the San Pedro fish cannery in Ilo; George's wife, Rosa; Ernie Bedoya and myself - too many people for George's ancient Buick to handle during the two hour ride to Ilo. We decided to split the 200 soles (US\$ 10.00) necessary to hire a taxi with reasonably good brakes and tires.

Tacna is a Peruvian showpiece (MMM-2) and it is also a border town. Smuggling is big business here, and the authorities feel that the least they can do is to set up control points along the roads leading into and out of the city. What with the checking and the signing of papers, it was five o'clock before we turned onto the narrow ribbon of the Pan-American highway and began to climb out of the sweltering valley. Behind us was the calm sea and, through the heat waves, the great rock of El Morro and the Chilean town of Arica. In front of us, the rolling pampa reached out to the horizon.

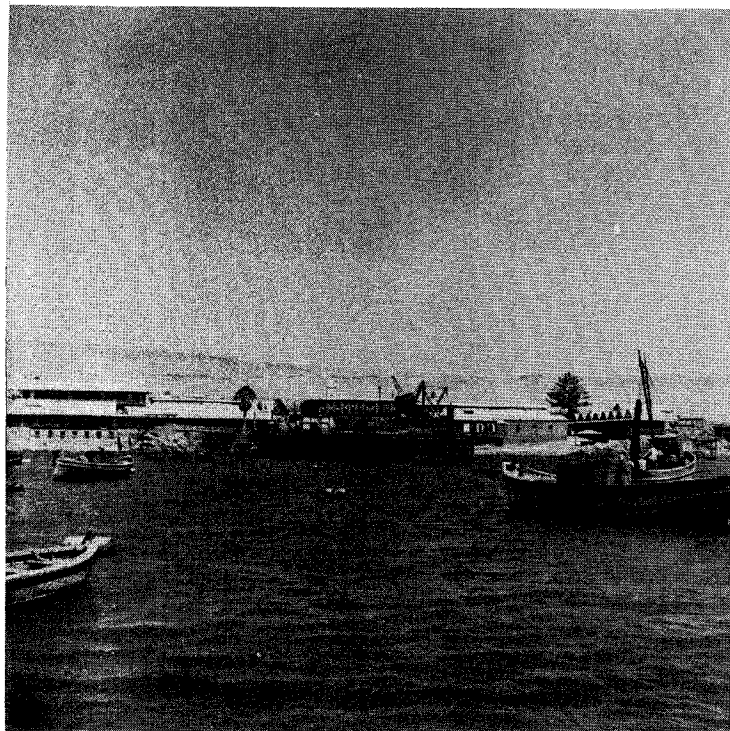
By sunset we had passed the Moquegua turnoff and had dipped down into a country of sharp hills and raw boulders. Stones had fallen from the sheer faces of the cuts in the hills, and in the dark we came close to smashing into them. The tracks of the autocarril or truck-train from Ilo to Moquegua crossed and recrossed the highway. Called "El Kalamazo", a castellano version of Kalamazoo, Michigan, the autocarril carried guano from the port to the interior markets.

At seven o'clock we topped the final rise and began to snake down the steep slope to Ilo. The town lay in a bay protected on the south by the long spit of Punta Coles and on the north by a fat bulge of coast. Looking down from the highway, I could see the running lights of the fishing fleet swaying in the long groundswell. North of the town were the lights of the big Episa cannery, and beyond them the tanks of the International Petroleum Company. Ilo itself was a small cluster of lights at the head of the bay.

"I think this is the place where my friend La Rosa had his accident," said George. "He says he was doing about 120 kilometers an hour coming around this curve and ran into a bunch of wild burros. He missed the first three but hit the last one head on and turned over. Now he says he's going to paint a little burro on the door of his next car; claims he's as good as any fighter pilot."

The taxi driver shifted down a gear and peered into the gloom, alert for burro charges from the hillside above. "Dangerous, oh very dangerous!" he muttered.

We checked our papers at the police station and drove down the dirt streets to the southern edge of town, past the autocarril station where the smell of



The port of Ilo

guano in the warehouses was like a physical blow, and out onto a sand flat covered with drying nets. The cannery manager's residence lay just beyond the flat - a square, large-roomed wooden house facing the ocean. We dumped our bags in the hall and sat on the porch drinking warm beer and listening to the movements of the sea in the windless night.

In the light of the morning sun, Ilo looked like any other fishing village along the southern Peruvian coast. There were the unpainted wooden houses, the smell of sea and kelp and cooking fish, the swarms of gallinazo buzzards soaring and dipping above the refuse sluices from the canneries. The fishing fleets had long since disappeared over the horizon, and the brown pelicans roosted undisturbed on the lighters and rowboats in the bay.

George, Ernie and I walked the short distance from the house to the San Pedro cannery, an old building which the company has rented from the Peruvian government. Having no refrigeration facilities, the plant must can each catch of fish within a day or two of the time they are caught, even if it means working beyond midnight. I asked George how many workers the plant employed.

"In the cannery itself, we have about 160 women. They seem to have a knack with the cleaning and canning of fish that men lack. All told, we have about 80 men operating heavy machinery and working in the boats. Of course, you must realize that this is seasonal work. We advertise for our labor in Arequipa and elsewhere, and we provide the women with a room in the town during the months the plant is in operation. They come to the factory each day to punch the time clock. If there is no work for them, they are still guaranteed a sum of five soles for the day. If there is a big catch, they'll get paid overtime for working late at night."

"What is the fishing season here?" I asked.

"Roughly speaking, September to May. October and November are usually very good months. Fishing starts slacking off around December, and by February things are pretty much at a standstill. Then from March through May, you catch fish again. The factory usually shuts down from the end of May until September, although we must pay the boat crews during those months."

The company, George told me, owns 11 boats. It is usually possible to keep 8 of the boats in operation at one time, the rest being deadlined for maintenance. Each boat is manned by a patron or captain and a crew of seven, including a mechanic and net handlers. Captains in Ilo and other ports have been known to make over 14,000 soles a month (US\$ 700.00), while their crewmen take home about 300 soles each. To rectify the situation, George Bedoya instituted a new pay scale. Boat captains working for San Pedro receive three-tenths and their crewmen one-tenth each of the evaluated amount of each ton of fish caught, with a higher evaluation on lower tonnage catches. The tripulantes or crewmen have thus received an incentive to stay out longer and catch more fish. Since last September, when the the system was put into effect, labor troubles have been greatly reduced. The new pay scale has created a more efficient labor force, for the bonus wage per catch is much more

important to the fisherman than his small "basic" pay (about 450 soles a month for a patron, 250-300 for a tripulante)

A small, wiry man was waiting for us by the main gate of the factory. He was Eliseo Pena Monterro, a Spanish fisherman who had fled his country during the Civil War and had worked his way up to top positions in both Chilean and Peruvian fisheries. Sr. Pena knew his business from front to back. He knew boats, nets, canning machinery, costs and profits. He showed us through the silent plant, answering every question in detail as we walked down rows of cleaning and chopping tables and canneries assembly lines. In the warehouse we saw some 13,000 cases (48 cans each) of yellowfin tuna, skipjack and bonito packed in cottonseed oil or brine. In a corner stood cases upon cases of oval cans containing huge, delicious sardines packed in tomato sauce. Pena told us that during World War II, cases of the higher quality fish were worth about \$11.00 each. Now U.S. importers offer five or six dollars for the same product f.o.b. Ilo.

Pena led us over to a pile of close-meshed nets. "This light net is for the sardines," he said. "When they are caught, they live and float in the net. This -", pointing to a heavy net, "is for the anchovies. They die in the net, and you have to haul in a dead weight."

"Do you can anchovies here?" I asked.

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Timberrrrr!
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Chinguillo ready for hoisting
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"No. They are used only for fish meal," said George. "We don't have a fish meal plant yet, so we sell our waste to Episa. I think you'll be interested in seeing that plant this morning."

In Pena's car, we drove north through the town towards the large, gray cement buildings of Empresa Pesquera Ilo S.A. (Sociedad Anonima). The Spaniard told us about one of his patrones, a zambo or Indian-Negro mestizo who, he said, had been on the verge of being fired for some time. He had fouled his net in the propeller, come in empty-handed when the other boats were laden with fish. The patron never stayed around the dock with the other captains, but disappeared as soon as he landed. Then, a week before we arrived, the zambo had a stroke of luck. That day every boat except his came in early with no fish. Just as they were about to give him up for lost, the zambo came sailing into the bay, gun'd deep in bonito. The patron was so proud that he bounced around the dock like a Napoleon and refused to leave





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Above: bonito in the cleaning room
Below right: preparing cooked tuna
for the cans.

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until he had told everyone, Pena included, about his magnificent skill as a finder of fish. From that time on, however, he had gone from bad to worse - no fish caught in a week.

"Even with the good skippers, it's chiefly a matter of luck," said George. "It's a big ocean."

"But tame!" said Pena. "A woman could fish in the Pacific," he snorted.

I asked George if most of his fishermen came from Ilo.

"No. On the contrary. Most of them come from inland towns. A lot of them are Indians from Puno and the Titicaca district. With men like these, you can see why we can't use compasses and radios on our boats."

The car pulled up in front of the main Episa building. The place lived up to its advertisement in the Peruvian Times. Modern workers' quarters and dormitories stood on a rise of ground above the factory buildings. The bungalows of the company officers were equipped with gardens, bits of lawn and a pebble beach.

The cannery plant was in full operation. Hundreds of women in white uniforms prepared the cooked fish or packed the cans on the long assembly lines. Episa's great cold storage rooms provide a regular flow of fish

1. The Episa plant (major stockholder: Wilbur-Ellis Co.) placed the following advertisement in the December 24, 1954 "Peruvian Fisheries Supplement" of the Peruvian Times:

"EMPRESA PESQUERA ILO S.A.
Ilo Peru

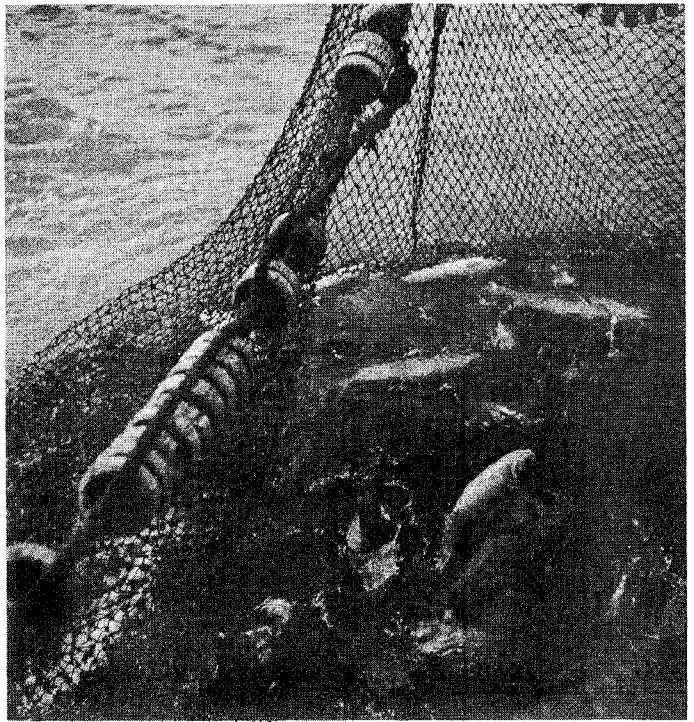
- 1.-30 Fishing Vessels in operation of from 12 to 100 tons each, equipped with Purse Seine Nets and Diesel Motors. In addition, a Freezing Ship with a capacity of 100 tons of fish in its holds.
- 2.-Quick Freezing Plant with a capacity of 66 tons in 24 hours.
- 3.-Freezing Chambers for the storage of 1,200 tons of frozen fish and 300 tons of ice.
- 4.-Ice Plant with a capacity of 12 tons daily
- 5.-Canning Plant for the packing of 2,400 boxes of 40 cans each in 10 hours.
- 6.-Plant for the Reduction of Fish meal with a capacity of 10 tons of fresh fish per hour
- 7.-Machine Foundry, Carpentry Shop and Ship.
- 8.-Warehouse for Products and Spare Parts.
- Fuel Oil Tanks of 260 tons capacity, Tanks



from one day to another, irregardless of the daily catch. In the sub-zero temperatures of the freezing rooms, tuna, bonito and skipjack were piled like cordwood - enough to give the cannery several days work. Behind the refrigeration building, the fish meal plant was turning out 100 pound sacks of valuable fertilizer at the rate of one every few minutes. Fish guts and whole fish were cooked, pressed, dried and ground into a heavy brown powder.

A fish meal plant has a decided advantage, George told me - that of prolonging the fishing season. June, July and August are excellent months for anchovy fishing. Even when the cannery is forced to work on a reduced schedule due to lack of tuna and bonito, the fish meal plant can work at full capacity.

At lunch in the Kokting Hotel - named for a local Oriental who seems to own most of the real estate in the town - the subject of freight rates came up. George told me that the Pacific Conference steamship lines, which service the west coast of South America (Grace, West Coast Lines, etc.) are an extremely powerful force to reckon with whenever any danger to their monopoly exists. No new steamship line would be tolerated by these transportation giants, whose great influence in the port cities is due to their hard-working shipping agents. Recently, the Conference decided to raise their freight rates 20% - an increase which, if it goes into effect, would result in lower offers on the part of U.S. buyers to cover the extra \$7.00 in freight charges (the price would move from US\$ 35.00 to US\$ 42.00 per metric ton).



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End of a "set".
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The Southern Peru Copper Corporation - a corporation formed by the American Smelting and Refining Company, the Phelps Dodge Corporation, the Newmont Mining Corporation and the Cerro de Pasco Corporation to develop the Toquepala, Quellaveco and Cuajone areas in southern Peru - will begin their operations shortly. With the exploitation of the above areas, Ilo will undergo a radical change, for it is slated to become the chief port for the project. A new railroad will link Ilo with the mines. San Pedro, along with the other industries, will have to move to the northern or downwind side of town. San Pedro is already engaged in securing a piece of land just north of the International Petroleum Company property and is considering plans for its new buildings. A pilot plan for Ilo is now being drawn up by government engineers in Lima. The salient point in all the hustle and bustle is that within five years an estimated 200 million dollars will be poured into this area of mines, railroad and port.

"In the long run," said George, "the Toquepala project will be beneficial for southern Peru. But for the first twenty years or so, I hate to think what is going

I. (continued)

for the storage of 100 tons of Vegetable Oil.

9.-Diesel Electric Generators of 550 KW (700 H.P.)

10.-Workmen's Quarters, Commissary, Nursery, Dining Rooms, Staff Residences, Radio Communications Station, etc.

11.-Total area, 105,000 square meters.

Lima, 19 of November, 1954"

to happen to the cost of living in this area. You won't be able to find an able-bodied workman in Arequipa or anywhere else in the South. They'll all be heading for Iloquepala. Salaries will skyrocket, and food prices will jump to two or three times their present value. Two hundred million dollars in an area this poor will do a lot of harm before any good comes of it."

During lunch the wind had come up out of the southeast - a planing wind that flattened the waves outside the harbor. By mid-afternoon, it was blowing a near gale, streaking the streets with sand. The fishing boats began to come in. Fishing that afternoon was difficult, for the wind frosted the surface of the swells and obliterated the telltale signs of feeding fish.

Ernie and I walked down to the municipal pier to get some shots of the boats unloading what little catch they had in their holds. The San Pedro boats "Oscar" and "Don Pepe" dropped anchor smartly and signalled for the dinghies to bring out the chinguillos or fish hoist nets. As the small boats moved out from the pier, a huge black head broke the surface of the water behind them, a glistening seven-foot body rolled on its side. The old bull lobo was waiting for his dinner. During the unloading, several fish missed the hoist net and floated in the sea. The bull seal roiled the water, tossing the fish in the air, playing with his meal before he swallowed it. As he sounded, the gulls and pelicans dove at his head, trying for a few bits of fish that bobbed in the water around him.

The lobo is bad business for fishermen. He will follow a school of fish into the net and tear the meshes apart with his teeth and flippers until he finally escapes. That same old bull in the harbor once mistook the bare foot of a crewman for a bonito; he rose out of the water and neatly removed part of the man's heel.

The loaded chinguillos were hoisted by donkey engine to the dock and dumped into waiting trucks. From the pier, the fish were hauled to the cleaning room of the factory where a line of men gutted them with one long slice of their knives and placed them on wire racks to be cooked. Two hours of cooking in the steam ovens and a night of cooling in the open air. Then the fish would be ready for canning. Though the catch was small, the plant hummed with activity until well after sunset. The wind brought the smell of cooking fish down to the verandah where we sat and watched the slick water of the kelp beds turn green and gold in the dusk.

All night long the wind moaned around the house. By morning the sea was breaking hard against the rocks of the shore. We drove out along the corduroy road in the sand to the long Punta Coles peninsula protecting Ilo from the southeast winds. Across the neck of the point a fancy cement wall had been built to keep the pampa foxes from molesting the guano birds and eating their eggs. From wall to lighthouse at the tip of the point, the rocks were white with thick beds of guano. An enormous black cap covered a piece of high ground far out on the peninsula - a cap which was constantly changing shape, thinning out, getting denser - a colony of millions of guanay or Peruvian cormorants. We had seen them fly in from their fishing grounds the night before, twisting ropes of birds in flight stretching from horizon to horizon. For a half an hour the flight curved into the peninsula and landed high on the rocks. The only other time I had seen guanays flying was at Ancón, north of Lima. There was a sea mist then, and the birds flew straight at the boat and banked steeply into the fog again when they saw us. That flight took well over an hour to pass by.

Two condors were wheeling over the bare pampa outside the peninsula wall. The birds had come down from the sierra to escape the rains and to scavenge with the coast buzzards for scraps of rotting fish. The sun caught the white neck ruffs and the white-striped wings of the giant birds as they circled.

We swam in the clear water of a small cove fed by an eddy of the coastal current. My teeth chattered on the way back to town, kept chattering until I had downed several double shots of Pisco brandy at the house.

At four-thirty on Thursday morning, a crewman from the "Oscar" scratched at the window and asked us politely to get the lead out and be at the municipal pier within five minutes. Still half asleep, Ernie and I shrugged on what clothes we could find lying around the room, grabbed our cameras and slipped out the door into the windy blackness. The town was sleeping. Dogs lay in scratched-out wallows in the dust, too drowsy to growl. The Ilo church chimed out the quarter hour. From behind and to the sides of us, the sounds of men walking down the slope to the pier. Feet stomped and men coughed and spit and talked quietly in the dark.

In the bay the fishing boats circled and signalled the service barges to bring the crews out to them. A waterlogged dinghy took us out to the "Oscar", threading its way through the maze of circling boats. As soon as we were aboard, the "Oscar" straightened out of her circle and headed "downstream" ² along the coast. In the dawn light we could see the desert hills rising out of Ilo and the gorge of the Moquegua river. A yellow band of mud stretched from the river mouth to the ocean horizon. Two Episa boats were making "sets" just outside the line of cloudy water.

The patrón of the "Oscar" throttled down and began his circle close to the Episa boats, while the seven crewmen crouched in the stern, ready for the signal to begin the "set". The six-foot high pile of the purse seine dwindled quickly as the net was passed from hand to hand and paid out over the transom. In a few minutes the "set" was complete - a huge circle of bobbing corks, with the shadow of the net hanging straight down in the water. The pursing cable came in foot by foot over a metal roller set in the starboard gunwale. Crewmen strained and slipped on the wet deck. The circle of the net drifted into a flat oval as the cork and lead lines were hauled in and stowed in the stern. In twenty minutes the cabezal or head of the net lay heavy against the hull. Looking down from the cabin roof, we saw the catch swimming in tired circles or floating belly up in the meshes of the net. Working slowly now, the crew lifted the net taut and began to toss the fish into the open holds. Bonito and skipjack glinted silver in the air and thudded on the deck. Sea lice, some of them as big as crayfish, clung to the slippery bodies or protruded from the gaping mouths.

The captain brought a small fish over to us, holding it gingerly by the tail. It was a machete, a member of the shad family, with an edge on his belly sharp enough to cut a man's finger to the bone. Razorbelly or no, the machete is one of the most valuable fish in the fish meal business.

As the net was tilted to allow the smaller bonito to escape, a lobo broke water nearby. He ignored the shouts of the crew and began to play, slipping on his side and waving a flipper at the "Oscar". He scented the tired bonito slipping from the purse seine and sounded quickly. When he reappeared, a bonito hung in his jaws. He played with the fish, ducking out from under the pestering sea birds and looking at us with a jaundiced eye as we got under weigh again.

The patrón headed the "Oscar" for the open sea, and the waves grew rougher. We anchored ourselves to the hatch coaming and talked with the men. They were mestizos, most of them from the mountains. The Captain, Navarro, a zambo, was one of the best patrónes in the San Pedro fleet, they said. He found his fish by sight and sound; he coned his boat by the feel of the wind. Without compass, radio or fish finding gear of any sort, the captain relied on his senses for his catch.

An hour of driving into the heavy seas brought the "Oscar" to a point some seven kilometers off Punta Coles. Suddenly, the mechanic whistled sharply and pointed towards a spot about a mile and a half off the starboard beam where a swarm of sea birds banked against the wind and dove into the waves. Navarro swung the "Oscar" hard over and gunned the engine. Within fifteen minutes we were under the umbrella of the birds, moving through patches of brown and dark red sea. The mechanic dragged a bucket through one of the stains and showed us the contents: hundreds of thousands of camaroncilla crabs in the larval stage. Each organism was a transparent needle about a quarter of an inch long. There were so many of them in

². Based on the direction of the Humboldt Current, "abajo" or downstream is to the north.

the bucket that the water looked like soup. Acres upon acres of camaroncilla crabs stained the sea around us. They were dust motes in the wavering sun rays deep in the water.

Navarro leaned far out over the gunwale and peered down into the sea. Suddenly he called out, "Anchoveta!". The crewmen grinned and crowded to the rail. Beneath the hull, the deep water flashed green and silver as the anchovies rose to the surface. The big feed was on. For a quarter of a mile around us, the sea boiled with slapping tails and leaping, curving bodies as the bait fish fed on the fields of tiny crustaceans. The birds went wild, screaming and chopping at the water with their beaks. And far down below the carnage the big tuna and bonito lay. They were there, Navarro said, but they wouldn't rise to the kill because of the heavy wind. Perhaps if we waited, they would come. He cut the engine, and the "Oscar" turned broadside to the wind and pitched crazily in the heavy seas. The wind brought the snipping sound of the feeding anchovies down to us. Then, as suddenly as it had started, the feeding ended. The racing schools of bait fish sounded, the birds flared up into the wind and drifted away up the coast, leaving the decimated armies of crabs bobbing in the swells.

To test Navarro's theory about the presence of big fish in the vicinity, we rigged up a spinning rod, baited a hook with anchovy, and made a short cast downwind. The bait sank until it hung straight down from the boat. There was a slight nudge, and the reel began to chatter. Ernie tightened the drag as much as he dared and watched with a look of complete resignation as the fish took 100 yards of 12-pound test line, snapping it cleanly at the spool. "Tuna," said Navarro. "Big one, too! But they won't come up in this wind." He reached inside the cabin and started the engine, laughing to himself about the ignorance of landlubbers in general, and the stupidity of those who tried to catch 30 or 40-pound yellowfin with a toothpick, in particular.

A kilometer from Ilo, the patrón swung the "Oscar" around again and hustled for the open sea. He pointed to a speck on the western horizon and informed us that a boat was making a "set" out there. So far as I was concerned, that speck could have been an island or the result of too much Pisco the night before. However, Navarro wasn't the only patrón with eyes like a hawk. Episa and San Pedro boats all along the horizon altered their courses and headed full speed for the lonely speck. In three quarters of an hour, the "setting" boat was ringed with circling, waiting purse seiners. As the lone net came in, the waiting crews joked and shouted across the water. An Episa crewman began an impromptu hula atop the piled net in the stern of his boat. The head of the purse seine was lifted, and a few bonito showed belly up in the meshes. The lone boat had drawn a blank. Navarro headed the "Oscar" away from the circling fleet and headed for home, running close in by the lighthouse peninsula where the bull seals slept in the sun on the white rocks.

That night Pena dropped in to say goodbye to us. We told him about the camaroncillas and the feeding anchovies. "It's too bad you didn't see a bollo," he said. "That's when there are a lot of anchovies, and the bonito are working them over on the surface. Of course, there was too much wind today for good fishing."

I asked Sr. Pena about the dimensions of the "Oscar".

"She's a 16-tommer. Thirty-six feet long, 12 foot in beam, and she draws five foot six inches. The "Oscar" and most of our other boats were built in Callao around 1948."

Knowing that Pena had recently purchased two boats and was planning to leave San Pedro soon, I asked him where he planned to start operations. Not in the North, he told me, for the fishermen in ports like Chimbote are too well organized. Their unions could force a man out of business in short order. Perhaps he would put his boats to work here in Ilo, working as an independent for Episa or San Pedro.

The big companies had plenty of headaches with their fleets, he said. Besides keeping the boats in operating condition, they had to worry about buying and maintaining the purse seines. Each net is at least nine hundred feet long by 100 feet deep. San Pedro nets; for instance, weigh at least 700 kilos, and the line necessary to repair them costs 42 soles a kilo. Therefore, the companies were glad, he said, to turn over the responsibility of maintaining the boats to an individual owner in return for a fair price for his catch. Pena stretched himself and said he must be getting back to the factory. We walked with him as far as the sandy field where the drying nets rustled in the wind and said goodbye to the Spaniard.

The next morning a Faucett monomotor took us from Ilo up the rocky coast to Mollendo and then inland, climbing up the inclined face of the pampas of La Joya, and dipping down through the foothills to the green valley of the Chili and Arequipa.

As soon as I could, I went to see George Bedoya at his office. He showed me some of the recent prices offered by U.S. buyers in Lima: bonito flakes in oil, \$4.25 per case in American cans (a 25 cent bonus per case is offered when San Pedro uses American cans) yellowfin flakes in brine, \$6.25 a case. Solid tuna in brine, \$7.25 (due to high U.S. tariff barriers, it is not profitable to can tuna packed in oil). Prices rise and fall from one day to the next. On February ninth, San Pedro sold a lot of solid bonito in oil for \$5.40 a case (48 half pound cans). The next day, the buyers offered \$5.80. Despite the variations, George said, the market is fairly dependable, although it fell off a little in 1954.



Does the future of the Peruvian canneries depend on Market prices in the States? George Bedoya thinks not. Europe is now coming in as a market, he told me. In recent years, England has become a steady customer. Although she demands a better product than the States, she pays a higher price for it.

About four years ago, San Pedro stockholders - most of them arequipeños - discovered that due to mismanagement, the company was in the hole by some two and one half million soles. Creditors were close to taking over the company when George became manager. However, by tightening belts and investing more money in the plant, the stockholders kept their heads above water long enough to allow the normal profit making machinery of the cannery to get underway again. In three years, San Pedro has replaced the 2-1/2 million soles and is now making about 700,000 soles yearly profit. Without George Bedoya's leadership and the loyalty of the stockholders, the company would certainly have folded. As it is, San Pedro is now making plans to install a fish meal plant - a much better business than the cannery, according to George Bedoya. A company which has pulled itself up by its bootstraps, San Pedro is an excellent illustration of the healthy state of affairs in the Peruvian fishing industry.

Sincerely,

William H MacLeish
William H. MacLeish

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 The following article appeared in the December 24, 1954
 "Peruvian Fisheries Supplement" of the Peruvian Times,
 and is reprinted here with the permission of the Times
 editor, Mr. C.N. Griffis. The author, Mr. Tarnawiecki,
 was until recently manager of the Empresa Pesquera Ilo, S.A.

A SURVEY OF THE DEVELOPMENT OF OCEANIC FISHERIES IN PERU

By Antonio Tarnawiecki

Fishing activities in Peru have often been in the news in the last few years. The astonishing growth of these industries, the threats of new tariffs on our exports to the U.S., some incidents with foreign fishing boats off our coast, and the prominence of Cabo Blanco as a big game sport fishing center, have all kept Peruvian fishing in the limelight. Paradoxically, fishing, one of the oldest occupations of the Peruvian native - witness the "huacos" or ceramic vases depicting fishing scenes found in Pre-Columbian and Pre-Inca settlements along the coast - is, at the same time, one of the newest industries in modern Peru. Fourteen years ago fishing was practiced on a primitive scale, and no fish products were industrialized. Today it is one of the most important economical activities in the nation. The present worth of its fixed and current assets can be estimated at 380 million soles, and the total market value of all fish landed, and fish products processed in 1953 was above 180 million soles. At the end of the Second World War, the fishing industries went through a crisis brought about by changes in the markets. Most of the badly organized and financed enterprises were weeded out of the picture, and the surviving ones are now more or less stabilized. But, we might witness a new upheaval in the next few years, with new resources found, new methods used, and new equipment bought. This year value of production may double last year's.

DRAMATIC RISE IN EXPORTS

It is interesting to analyze the export figures because they mirror the trend of the industry's development. Only dried guts were exported in 1941 (200 metric tons for soles 48,000). In 1942, fish livers and salted fish were the most important products, by weight, and canned fish made its first appearance. In 1944, the sudden demand for fresh salted fish created by UNRRA made it the biggest item in our exports, but this market disappeared, as suddenly as it had begun, in 1947. In the meantime, canned fish exports had increased steadily, and in 1947-1948, they were three quarters of the total volume of fish exports representing more than 90% of their value. The commercial utilization of fish wastes for fish meal and fish oil began in 1946, and frozen fish was first exported in 1948. These products have been on the increase since then, and in 1953 about 23,000 gross tons of all fish products were exported for an estimated value of 180 million soles. Exports in 1954 will be, from all estimates, much higher. (See Table).

IMPROVED FISHING METHODS

Most of the fishing boats used before 1940 were open double-bowed boats. In the north, from Sechura, south of Paita, to Moche, near Trujillo, "caballitos de totora" - long, narrow rafts made of reeds were used, and are still used. Now row boats and sail boats are used mostly to catch ground fish for the local markets. In 1949, there were 2,869 fishing boats registered with the Dirección de Capitanías, and of these, 577 were motor boats. The number of motorized vessels can be estimated now to be more than 650. A good number of these are purse-seiners, or boats especially designed to handle purse-seine nets. These are nets which are "set" in a circle around a school of fish with the webbing hung vertically by means of a cork line on top and a lead line strung on the lower part. Once the "set" has been made, a rope or cable that passes through rings in the lowest part of the net is pulled from the boat, closing the opening under the net, like a purse, and

hence the name. Purse-seine nets 900 to 1,500 feet in length, and 100 to 200 feet deep, which cost up to one hundred and fifty thousand soles, are in operation. Bigger nets can be expected to be used soon. Gill nets - where fish are caught by their gills when they try to swim through the meshes of the net - are also extensively used. Some kinds of fish are fished by hook and line, and swordfish are harpooned.

As mentioned above, few - if any - boats were motorized prior to 1940. During the war truck gasoline engines were adapted to the old fishing fleets, but modern boats are powered by specially designed marine gasoline engines, and many Diesel petroleum engines, among which we can mention the Caterpillar, P. & H., Buda, Atlas and Ruston makes. The German Deutz has introduced a line of air-cooled Deisel engines ranging from 12 to 75 H.P.

Many of the bigger boats have short range radio transmitting and receiving sets for communications to shore stations or among themselves. Some have sonic sounders for location of schools of fish. Most of the Peruvian fishing boats operate at short range from their bases, but some of them, fishing at more than forty miles from their ports, send their fish in "packers", or boats that are fitted with bins, where layers of fish and crushed ice are interspersed. Landing facilities are in general primitive and most of the fish handling is by hand. But, in Samanco, one fish pump, able to move 20 tons of fish per hour is already in operation, and others may be installed in other ports.

The number of fishermen, registered as such by the Dirección de Capitanías in 1949 were 7895, only 15% higher than in 1943. There are strong fishing traditions in Callao, and in some northern ports, but due to the rapid expansion of the fisheries in Perú, in many places workers are brought from other zones, even from Puno, high up in the mountains, and the result is that good fishermen, and, worse, fishing boat skippers are scarce, and will be scarce until a new generation of experienced fishing people are formed. A school of fishing crafts might be helpful in meeting the shortage.

The total catch of fish has increased from some 5,500 tons in 1939 to an estimated 122,000 tons in 1953 (See Table One). There has also been an interesting change in the distribution of fish landed by species, the industrial ones, bonito, tuna, swordfish and herring showing a more pronounced growth. Six Latin-American countries, Brazil, Mexico, Chile, Perú, Venezuela and Argentina provide 95% of all the fish landed in Latin America, and among them Perú is the country where the fisheries are more highly industrialized and are expanding fastest. The most active fishing ports in Perú are Callao, Mancora, Ilo, Chimbote, Paita, Talara, Huacho, Samanco and Sechura (See Table II). The most important species, bonito, is found all along the Peruvian coast, but it is seldom fished in the extreme north. It is a curious fact that the tuna species, and swordfish, are found only from Paita to the Ecuadorian border in the north, and from Mollendo to Chile in the south. In the last 1953-1954 season tuna was also caught for the first time in commercial quantities off Chimbote. Machete, a fish similar to herring and shad, is landed mainly in Samanco, Callao, and recently, in Ilo.

Shrimp have been found near the border with Ecuador, and a new fishing industry, centered in Puerto Pizarro, has been developed in the last two years. Modern boats have been adapted to this type of fishing, and provided with traps for bottom fishing, and with insulated boxes to hold the shrimp until they are delivered to the freezers. Shellfish of many kinds, squid and octopus are gathered by men ashore, and at least thirty boats are being used for long periods of time to get mussels by diving for them. Callao, Huacho, Pisco and Ilo are specially active in this type of fishing, and some mussels are canned each year.

Few data on the fresh fish consumption in Perú are available, but "paiche", one of the largest fresh water fish in the world - it reaches 400 pounds - has been an important staple in the protein resources of the people in the Amazonian region. Except for "succha", a small fish found in the Titicaca lake and its closed river system, where it has been fished thousands of years from sail boats made entirely of local reeds - sails included - few fish were to be caught in the Andean rivers and highland lakes, until the twenties. B.T. Colley and J.F. Mitchell of Cerro de Pasco Corp. pioneered in the introduction of trout to the rivers and lakes of the Junin department. Later Mr. Morales started a hatchery, and finally

the Peruvian government became interested in the possibilities of this enterprise, and by now a considerable number of Andean rivers have become populated with rainbow, lake, cut-throat and stream trout. Carp have also been brought to this country, but they do not take to great altitudes, though they may possibly live in the lower, warmer, section of the Amazon tributaries. Fresh water prawns living in the short, seasonal rivers that empty into the Pacific ocean have long been considered a delicacy, and they were in danger of being wiped out. Conservation and re-population measures have been taken to increase their numbers.

FREEZING FISH ON LAND AND AT SEA

Large capacity refrigeration plants are now available in Paita, Chancay, Callao and Ilo. These plants comprise sharp freezers operating at about 40 degrees F. below zero, and holding rooms held between zero degrees F. and 10 degrees F. below zero, where fish can be stored for several months. These plants, as well as some smaller ones in other ports, also have ice making installations. Ice is often used for the temporary holding of the fish prior to canning, and in the fishing boats themselves. Total freezing capacity of the private land installations is 180 tons per day, and holding capacity is about 2,850 tons. The government has also built a fishing terminal or market in Lima with a 10 ton freezing room, and storage rooms for 100 tons. It also has a 50 ton flake ice making machine. Besides these facilities there are 19 refrigerated boats working for fishing companies established in Peru. They can freeze up to 300 tons per day, and the capacity of their refrigerated storage rooms is some 4,000 tons. In these figures, tuna-clippers operating off the Peruvian coast have not been considered, and among land installations, those like Frigorifico Haveco, which are not specially dedicated to fish products, have not been taken into account. These marketing refrigeration facilities are of the highest importance to fishermen as well as to government officials because of their stabilizing influence in prices and supplies, and the possibility of taking advantage of bigger landings in peak days. Fish are already being sent to Lima from ports as far away as Chimbote and Paita, but there is room for a substantial rise in the domestic consumption of fish and fish products, as Peru is one of the countries with lowest per capita fish consumption: 6.2 lbs. per year compared to 83 lbs. in Japan, 36 lbs. in Venezuela, 23 lbs. in Chile, and 14 lbs. in the U.S. New refrigeration plants, and more insulated and refrigerated trucks will help in the development of the internal market for fish.

The greatest part of the refrigeration facilities are used for tuna, swordfish and bonito, and lately for shrimp too. There is no doubt though, that a slowly increasing capacity will be dedicated to ground fish for local consumption, and to ready-to-prepare frozen fillets and sticks - which have proven so popular with the U.S. housewife - as well.

Frozen fish exports - made almost exclusively to the U.S. - were started in 1948, when 712 tons were shipped, and increased to 9,100 tons in 1950; in 1953, they were down to 6,300 tons, but in the first half of 1954, they were again on the increase. (See Table III). The ports used in frozen fish shipments are Mancora, Paita, Talara and Ilo, and, in the last season (July 1953 - June 1954), Chimbote, too. The exports of yellowfin tuna and skipjack accounted for 80% of the exports of frozen fish in 1953, while swordfish took 12%. Shrimp, the exploitation of which was started last year, accounted for the other 3%.

CANNING IS THE BIGGEST FISHING INDUSTRY

The development of the fishing industry was sparked during the Second World War by the demand for salted fish and fish livers for European rehabilitation and other food deficits, but this demand died as suddenly as it had begun, and many companies were faced with the threat of extinction. Canning saved the more enterprising of them, and it is only fair to say that the industry as a whole is a healthy result of private enterprise, and has developed without economical aid from either the governments of Peru or the United States, although technical advice received from both governments' organizations has been greatly appreciated.

There are at least fifty canneries in Perú, which have operated at one time or another, but many of them have been inactive for several seasons, or work fitfully for only a few days each year. The most important canneries going southward along the coast are Compañía Pesquera Coishco S.A., Conservas Miramar S.A. and Sociedad Anónima de Pesca y Envase in Chimbote; Sociedad Anónima Manufacturera de Conservas (Amial S.A.) in Samanco; Sociedad Pesquera Cantabria S.A. in Huarney; Empresa Pesquera Perú S.A. in Supe; Conservas y Salazones S.A. (Consa) in Huacho; Compañía Marítima Pesquera S.A. (Gildemeister) in Chancay; Pan American Fish Packing S.A., Industrial Pesquera S.A., Conservas Peruanas S.A., Emp. Pesquera Chalcaca S.A., & Fab. Conservas Marfé, in Callao; Pesquera Naplo S.A. in Pucusana; Emp. Pesquera Mollendo S.A. (Empemosa) in Mollendo, and Emp. Pesquera Ilo S.A. (Episa) and Comp. de Pesca San Pedro S.A. in Ilo. Total capacity of all the canneries in Perú is about 21,000 cases of 48 cans each per day (260,000 kilos in gross weight), but since many canneries are out of business, and canneries seldom work at peak capacity even during the canning season, production of canned fish is well below theoretical capacity. In the calendar year 1951, the last one for which official statistics have been obtained, the output of the canneries was 11,228 tons equivalent to 850,000 cases of 48 half pound tins, the usual unit of production in the canning industry. In 1952 and 1953 production must have been larger to judge from the export figures, and for the last season, July 1953 to June 1954, the pack is estimated at 1,250,000 cases (16,000 tons). The biggest part of the pack is made up of bonito packed in oil, in half pound tins or cans. Net contents in these cans are 7 oz. for the solid pack, and 6 or 6-1/2 oz. net for grated fish, flakes or chunk-and-flakes packs. One pound flat cans are also used for bonito and tuna, while one pound tall cans are most often used for the "salmon"-type bonito or herring. For institutional consumption four pound cans are sometimes employed. Some small canneries pack sardines and other fish in oval cans. Domestic consumption of canned fish is small. It was only 57,000 cases of 48 half pounds in 1951, or 7% of the production. For the 1953-1954 it has been estimated to have gone up to 120,000 cases taking 9% of the season's output. But, there is plenty of room for expansion if we notice that Chile, with a smaller population than Perú, has a yearly production of some 400,000 cases of which only one-tenth are exported.

Exports - as it was mentioned before - have been steadily increasing since 1942, when 40 tons of canned fish worth about 90,000 soles were shipped, and they reached 10,700 tons in 1953 with a value estimated at 84 million soles. Exports this year have already surpassed these figures. (See Table III). The most important ports in the trade of canned fish are Callao, Chimbote and Ilo. The biggest customer for our canned fish is the U.S. which took 70% of total exports in 1946, up to 85% in 1950, and 75% in 1953. Peruvian exports fill about one quarter of the total imports of canned fish in the U.S., but are not more than 10% of the consumption in that country, which has been increasing lately. The consumption in 1953, some 10 million cases, was 8% up from the previous year. Most of our exports to the U.S. are bonito packed in oil, and lightmeat tuna (yellowfin tuna or skipjack) in brine. This is due to the fact that while bonito packed in oil, and tuna in brine, pay an ad-valorem duty in the U.S., tuna in oil pays 45%. The growth of public demand for canned bonito in the U.S. can be traced to the efforts of some importing companies, Wilbur Ellis Co. foremost among them, which have spent millions of soles in demonstrations in groceries and chain stores throughout the U.S., and in propaganda through newspapers and radio programs. Some Peruvian canners such as Episa have contributed to the considerable expenses demanded by these campaigns. Of the other foreign markets, France and Colombia were the most important ones in 1946, but they were displaced by Switzerland, Belgium and Italy which held this position between 1940 and 1952. They in turn gave way to Canada in 1953, and to England in the first half of 1954, as our best customers outside the United States. Quarter pound tins ("picnic" size) have been exported - to the United Kingdom - for the first time last October.

FISH MEAL AND OIL

Fish meal is manufactured by cooking whole fish - herring, anchovy, spoiled

bonito, etc. - and waste discarded from the canning operations, and pressing the cooked material in screw presses, in which most of the liquid is squeezed off. The thickened paste is then dried in rotary driers and reduced to fine powder in hammer mills. It is usually packed in 100-lb. jute bags or in six-ply paper bags manufactured by W.R. Grace and Company in Paramonga. Averaging 65% proteins, fish meal is an excellent feed for cattle and chickens, and is also used as a fertilizer, often mixed with other materials.

The liquid obtained in the presses is centrifuged or sedimented to recover the fish oil, which has many applications. Herring oil is used as a drying oil in paints and inks. Treated with sulphuric acid it is employed in the textile industry, and deodorized and hydrogenated is a raw material for soap and shortening manufacture. Recovery of oil in Perú has not been widely practiced, and there are no figures for production or consumption of this material, but in 1953, nearly 200 tons valued at about 17 thousand dollars were exported.

Production of fish meal was started on a small scale in 1945, but exports were initiated only in 1947 (470 tons). Expansion has been very fast, and in 1951, 8,000 tons of fish meal were made, approximately one half from bonito and tuna cannery wastes, and the other half from whole herring and anchovy. Production for 1953 has been estimated by Dirección de Pesca y Caza at some 11,800 tons, of which 10,600 tons were exported. In spite of this rapid growth, the fish meal industry in Perú is still relatively small, open to great expansion. World production of fish meal in 1951 was 810,000 tons, two-thirds of which came from whole fish, such as herring and anchovy. Our best customer for fish meal - as for other fish products - is the U.S., but small amounts are being sent to Germany, the Netherlands, and England.

IMPORTANCE OF THE FISHING INDUSTRIES TODAY

All that we have said in the proceeding sections clearly shows the importance that fishing has assumed in the country's economic life. Value of all the fish products is 3.1% of all industrial production. Exports of fish products, which were only one-half of one-thousandth of the total value of exports in 1942 had expanded to 3.2% in 1953, when they were 6.9 million dollars out of the \$222 million total. But, this is only a small part of the influence that the fishing industries have in Perú. They give work to at least fifteen thousand people directly connected with fishing or processing fish, plus many more employed by industries which sell their products to them, such as boat builders, twine and rope manufacturers, two net making companies, repair shops, machine making factories where boilers, dryers, mills, conveyors, cookers and autoclaves are made, and many more. The fishing industries have also trained a great number of specialized workers, mechanics, carpenters and other craftsmen, who are or can be useful to other branches of Peruvian industry. Compañía Marítima Pesquera S.A. in Chancay, and Empresa Pesquera Ilo S.A. in Ilo, are of the greatest importance in the zones where they have been established. They are the largest canneries in Perú with a capacity of more than 4,000 cases per day, and they are well integrated comprising fishing fleets, fish meal plants, sharp freezers and refrigeration plants with capacity to store 1,700 tons of fish. Empresa Pesquera Ilo has built extensive workers' quarters on its 100,000 square meter property, with four-room and two-room housing units for families, and single rooms and dormitories for single men and women. It also has four residential bungalows for its officers, public dining room, employee's club and commissary.

It can also be pointed out that the exacting sanitary regulations under which acceptable fish products must be manufactured and the modern workers' quarters built by some canneries, have trained important numbers of men and women, who were used to very primitive conditions, to modern sanitary standards.

NOW, WHERE TO?

A question of paramount importance for the fishing industry, and even for the whole country, is that of the future possibilities of fishing in Perú. Few ac-

tivities are as aleatory as fishing. Fish roam the whole wide - and deep - sea. They come to certain places one year, and they might or might not come the next. Some communities like Mancora have appeared and grown only because of the great development in fishing activities during and after the Second World War. The vagaries of fish migrations might bring disaster to them.

What can the industry do to protect itself from these unpredictable changes? The most obvious answer lies in broadening the area of operations. Bigger boats are used today than a few years ago, and still bigger boats - sixty to eighty foot purse-seiners - will be used in the near future. Big "packers" or mother-ships with refrigerated rooms and brine tanks will also be more widely used. But in following this policy there is a danger in overdoing. Half-a-million-dollar tuna-clippers were a result of this kind of expansion, and if there is at least room for doubt as to whether they have given the results expected from them, their usefulness in fishing in Perú should be closely examined. Returns might not be commensurate to the investment required, and the upkeep, operational expenses and interest can be disastrous in a couple of bad years. It is at least possible that the best size of boat in Perú from an economic point of view is considerably below that of the giant tuna clippers.

Fish can move not only horizontally, but vertically too. To find them special echo sounders adapted from submarine finders developed during the war are used. These instruments send sonic or supersonic waves vertically downwards through the waters and detect the echo from the bottom. The depth is proportional to the time taken for the sound waves to travel to the bottom and back, and the echo shows as a flash on a graduated scale or dial, or as a pencil or ink mark on a piece of paper on the recording type of instrument. If schools of fish, beds of kelp or large animals are in the path of the waves before they hit bottom, they will also give an echo that will appear on the screen or on the recording graph showing their depth. Among the best known makes of fish finders are the Bendix, Raytheon, Skolite, and Hughes, and there are several in operation in Perú. Now, a new kind of instrument has made its appearance. It is able to probe for fish and other obstructions in the water in all directions within a semicircle in front of the boat, and in any angle between the horizontal and the vertical. Fish can be detected at a distance of one mile. Two manufacturers have already put these devices on sale: one is the Asdic made by Simonsen Radio A.S., Oslo, and the other is the Minneapolis-Honeywell Regulator Company's Sea Scanner.

A great deal of research is being put into new methods of fishing. Dr. J. G. Ellison of the U.S. Fish and Wildlife Service has tried fishing smelt and herring at night by attracting them with underwater lamps, and sucking them into the boat through a 5 Hr centrifugal pump. Battery-run lights for lures used in trolling have been patented in Norway. Electricity has also been used in Norway and Germany to stun fish caught on a hook preventing their escaping or the tangling up of the line. Perhaps the most novel fishing method is to force fish to move towards the opening of a net or trap by means of pulsating currents, the characteristics of which can make selective fishing for different species and sizes possible. The main difficulty encountered is the tremendous power required, but room for improvement is seen in the use of very short bursts of electric energy. The Germans have pioneered in this field, and a German electric fishing vessel, the R-96, has recently been bought by a U.S. agency.

Information on the migration and breeding grounds of the most important fishes found in Perú are very meagre, in spite of the intensive labor realized by the Dirección de Pesquería y Caza of the Ministerio de Agricultura, the Compañía Administradora del Guano and other organizations. Fishing companies should contribute considerably to these efforts by reporting tagged fish used to plot their migrations. Relationships of fish abundance to temperature, salinity, oxygen content in the water, wind velocity, currents, moon phases, etc. must be recorded and the data correlated over long periods of time in order to gain significant clues.

We can expect to see in a short time the new fishing methods established in Perú. Trawling nets, which are big bags dragged along the bottom, their openings kept open by boards set at an angle, are very common in other fisheries, but in Perú they could be useful only to get fish like flounder. For the rocky, deep Peruvian waters, Icelandic or Danish trawling would be more successful because

the net is kept at an intermediate depth by floats, weights and the drag of the boat or boats used. The Danish boats, Kronjyden and Else Saxberg, have tried trawling in this fashion, very successfully on some occasions. More trials are necessary to determine the applicability of this system to our conditions.

Hook-and-line fishing of tuna is common in the U.S., Cuba and Chile, but is seldom practiced in Perú by Peruvian fishermen. Trolling, which is running a boat with several unbaited hooks trailing in lines behind or at the side of the boat, has been tried on a small scale. It might prove very successful in catching fish in those periods when they are scattered and not schooling up in a way appropriate for the use of the nets. Long lines are, as the name implies, long ropes or cables - sometimes sixty miles long - from which short lines with baited hooks at different depths are hung. Japanese fishermen use them to catch tuna. One trial in Perú was inconclusive, but new lines will be tried.

We should also refer to the new materials for nets. Nylon gill nets have shown extraordinary results in Canada and Europe, because of their effectiveness - they are almost invisible in the water - and, because they do not need any treatment against rot. Information on nylon purse-seines is not so definite, but a few will soon be in use in Perú. And, we may expect to see orlon and other synthetic fibers making their way into fishing gear.

A high proportion of fish are caught and lost because of spoilage aboard the boats, on landing or in storage ashore. Wider use of ice or refrigeration on boats, better landing facilities, and more refrigeration capacity for fish in the bigger cities, as well as in the canning plants, will help towards a better realization of our resources. The common marketing of refrigerated fish might create a demand for prepared frozen fish packages - fillets and sticks - which have become so popular in the U.S.

Foreign and domestic markets for canned fish can be expanded. Goods for the domestic markets should be subjected to controls, worked out in cooperation with responsible entities, to protect consumers from unscrupulous fly-by-night operators who have made canned fish sold domestically an unreliable product. In 1951 seven million soles worth of fish products were imported, and some of the products imported such as sardines, anchovies and some pastes can be manufactured locally.

Among the technical improvements we will possibly see soon in operation are packing machines, such as the Carruthers or Davies automatic machines which fill the cans with fish. Better utilization of wastes will come from concentration of the vitamin and protein rich "stickwater" or liquid from which fish oil has been recovered. By yields in fish meal might be obtained by the use of the eccentric disc type of presses, such as the P & L press. Other innovations are being studied, continuous sterilization of canned fish, and sonic rendering of fish in oil extraction among them.

Attempts to increase duties on fish and fish products imported in the U.S. should be vigorously opposed - as they have been in the past - by the Peruvian government and by all the industries concerned. It must not be forgotten that at least 90% of the fish landed by American fishermen to be canned in the U.S. is caught south of the border line, and within the 200-mile "protective" line proclaimed by several other American countries. These U.S. fishing boats need bait often found within the 3-mile territorial water line.

Exports of fish products are subject to several duties. Law 7103, the proceeds of which are earmarked for unemployment relief, levies 1% on the value of all exports. Laws 9466 and 10645 tax 10% of the difference between a "basic cost", fixed by the government, and the invoice value, or the "minimum quotation" - also fixed by the government - whichever is higher. The amounts paid on account of these laws are deductible from the taxes to be paid on profits - but they cannot be carried from one year to another. There is also a 2% tax on the freight rate (Law 11537), and a tax of U.S.\$0.15 per metric ton. The payment of export taxes that are deductible from profit taxes is unfair and dangerous to fishing industries, which can never be sure of catching any "raw materials", and are therefore subjected to bad runs of two or three years - or more - when huge losses pile up, and they can do nothing about them. If these export taxes cannot be repealed,

they should at least have provisions for a partial suspension of the same, in those cases where fishing conditions are not good for more than one year.

The fishing industries have to make considerable investments to modernize their equipment and methods. To encourage this, very rapid depreciation of fishing gear, and equipment for related industries, should be allowed, and appropriate organizations for the concession of long term credits should be established in Peru as they have been in other countries such as Japan, Norway and Mexico.

In conclusion, the fishing industries as a whole have shown a remarkable capacity for growth, which has made them an important factor in the national wealth. They have now before them possibilities for further expansion, but the investment required, and the risks involved, should be backed by some governmental encouragement, mainly in the form of credits and some sort of relief in taxes in the lean years.

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TABLE I
FISH CAUGHT IN PERU
FIGURES IN KILOGRAMS

SPANISH NAME, ENGLISH NAME, SCIENTIFIC NAME OR SIMILAR			1947	1948
Atún	Yellowfin Tuna	Neothunnus macropterus	1814706	2971526
Barrilete	Skipjack	Katsuwonus pelamis	67897	421253
Bonito y chauchilla	Bonito	Sarda chilensis	16084619	20223161
Pez espada	Swordfish	Xaphius gladius	104588	262474
Cojinova	Pompano	Neptumenus crasus	2365013	1237068
Corvina	Drum, Bluefish	Sciaena gilberti	603629	460636
Cabrilla	Sea Bass	Paralabrax (Several Species) ..	982304	1260698
Lorna y robalo	Drum	Sciaena (Several Species) .. .	1496412	2519035
Cazón y tollo	Sharks	Musteles and scoliodon (Sev. sp.)	703228	1039478
Caballa	Mackerel	Pneumatophorus peruanus	2502976	814553
Machete	Herring, shad	Ethmidium chilcae	419993	889844
Anchoveta	Anchovy	Engraulis ringens	--	--
Otros, mariscos y no clasificados	Other fish, shellfish and unclassified		3652847	3843555
Total according to Dirección de Capitanías-30778212			35943881	
(2) Total estimated by Dirección de Pesquería y Caza -36650400			47651700	

- (1) The difference would be due to about 2832 metric tons of tuna, 5170 metric tons of anchovy and some 446 metric tons of sardines not considered by the Dirección de Capitanías.
- (2) The catch from 1942 to 1946 as estimated by the Dirección de Pesca y Caza was in chronological order 21603, 26725, 33124 and 41722 metric tons.
- (3) Estimates of Dirección de Pesca y Caza.
- (4) Among the most important of these are ayanque or white sea bass (*Cynoscion annalis*) cabinza or grunt (*Isacia conceptionis*), coco or weakfish (*Paralichthys peruanus*), lisa or mullet (*Mugil cephalus*), pejeblanco (*Caulolatilus princeps*), pejerrey or silverside (*Austromenidia regia*), sardina or pilchard (*Sardinops sagax*), and sierra or Spanish mackerel (*Scomberomorus maculatus*).

TABLE I (Continued)

1949	1950	1951	1952 (3)	1953 (3)
3317159	12356010	6502248	4374707	
1370567	426510	1320018	4574006	
27237403	31840314	51129005	53321510	
365834	6903472	1491333	2572690	
1307658	1160148	2305063	1743287	
708562	1064316	666561	757349	
1095653	831,65	1263678	1292298	
1835049	4367172	3524974	5213726	
999549	897023	780053	1570013	
1843073	226,509	1142963	3311029	
1528329	6049536	12683079	8842560	
--	--	6829052	15950347	
3651198	5355754	7262602	9476701 (4)	
45260034	73519329	97101529	--	--
60800700	83640834	105550500	113000223	120000000

TABLE 11
FISH CATCH IN THE PRINCIPAL
PERUVIAN PORTS

NORTHERN ZONE	1947	1948	1949	1950	1951
Mancora	192162	718633	2100225	11649727	8156747
Talara	372800	632800	697700	5693055	354700
Paíta	2469943	3632120	3324035	3424497	2090108
Sechura	2118197	2002872	2101932	2307393	2342983
Other ports	2933034	3192195	1850587	4944732	4572900
Sub Total for northern zone	8086136	10178620	10074479	28019404	17317400
CENTRAL ZONE					
Chimbote and Samanco	1074184	2543570	5206125	9525069	36392033
Huarmey and Culebras	856912	1032810	1916214	377700	1530400
Huacho and Carquin	707010	1457066	3734564	5506000	6766000
Chancay	1115917	804346	1698849	1262320	7032000
Callao	10602953	12095131	11901001	13971025	15156596
Pucusama	1247083	988665	2151632	2971059	3044551
Other ports	2730543	2426605	1592666	4115190	3519440
Sub Total for central zone	18334602	21348193	28201051	37728363	73441000
SOUTHERN ZONE					
Ilo	3898118	3877228	6406553	7147685	5847249
Other ports	459356	539840	577951	623877	495880
Sub Total for southern zone	4357474	4417068	6984504	7771562	6343129
Grand Total according to Dirrec. Capitanías	30778212	35943881	45260034	73519329	97101529
Idem estimated by Dirrec. de Pesca y Caza	36650400	47651700	60800700	83640834	105550500

TABLE 111
FISH EXPORTS
QUANTITY IN METRIC TONS

	1941	1942	1943	1944	1945
Salted fresh fish ...	(1)	--	194	1773	4085
Salted dried fish ...	--	99	13	39	51
Fish livers	--	320	534	738	695
Canned fish	--	40	755	915	1754
Frozen fish and shrimp	--	--	--	--	--
Fish meal	--	--	--	--	--
Fish oil	--	--	--	--	--
Shell fish	--	(1)	--	--	--
Other products	208(2)	51(2)	270(2)	182(2)	2(2)
Total	208	510	1766	3647	6587
	---	---	---	---	---
	---	---	---	---	---

VALUE IN THOUSANDS OF SOLES

Salted fresh fish ...	1	--	65	619	1317
Salted dried fish ...	--	34	8	18	35
Fish livers	--	106	222	237	218
Canned fish	--	90	2308	2623	4988
Frozen fish and shrimp	--	--	--	--	--
Fish meal	--	--	--	--	--
Fish oil	--	--	--	--	--
Shell fish	--	5	--	--	2
Other products	48	21	87	59	2
Total	49	256	2690	3556	6562
	---	---	---	---	---
	---	---	---	---	---

1. - Quantity is less than one metric ton or one thousand soles
2. - Mostly dried guts and waste products, but including 50 tons of seal oil in 1946
3. - 2095 tons of whale oil and 340 tons of whale meal.
4. - In 1948 and 1949 exports of swordfish were slightly higher than those of tuna and skipjack. In 1950, 6522 tons of tuna and skipjack were exported compared to 2584 tons of swordfish. In 1951 the quantities were slightly higher than those of tuna and skipjack (including 4 tons of bonito), and 1170 tons of swordfish. In 1953, swordfish exports dropped to 784 tons. Shrimp accounted for 151 tons in 1953 and 161 metric tons in January - June of 1954

TABLE IV

BREAKDOWN OF MAIN PERUVIAN FISH EXPORTS BY COUNTRIES
(ALL FIGURES IN METRIC TONS)

CANNED FISH

Countries	Years	1946	1947	1948	1949	1950	1951	1952	1953	Jan-June 1954
United States	1959	3176	4664	5700	7653	7642	9514(3)	7990	7128	
Canada	--	325	20	--	--	149	566	630	345	
Switzerland	50	210	149	196	523	430	664	390	267	
England	--	--	--	--	--	--	314	430	2000	
Belgium	--	523	16	66	167	479	601	610	228	
Other Countries	643(1)	377	22	237(2)	379(2)	295(2)	841(2)	660(2)	244	
Total		2652	4618	4871	6199	8722	8995	12500	10710	10212

FROZEN FISH

United States	--	--	712	2601	9106	8111	7800	5409	4859
Other Countries	--	--	--	10	--	253	--	908(4)	508(4)
Total	--	--	712	2611	9106	8364	7800	6317	5367

FISH MEAL

United States	--	474	675	2708	3540	6048	8915	9900	8393
Other Countries	--	--	--	--	202	3	--	709	1428
Total	--	474	675	2708	3742	6051	8951	10609	9281

- (1) Mostly to France and Colombia
- (2) Mostly to Italy and Argentina
- (3) Mostly to Holland and Germany
- (4) To Puerto Rico
- (5) Estimates

TABLE IV (Continued)

VALUE, THOUSANDS OF SOLES

1946	1947	1948	1949	1950	1951	1952	1953(5)	Jan-June 1954(5)
5696	10796	16359	39131	50324	54543	66500	65586	75537
--	935	67	--	--	1039	3950	4980	3660
145	907	536	1588	4311	3543	4640	3100	2830
--	--	--	--	--	--	2580	3600	23420
--	1316	49	518	1383	4049	4200	4820	2420
2242	962	94	1813	2483	2704	4930	5210	2605
8083	14916	17105	43050	58501	65878	86800	84296	110472
--	--	898	6937	22762	17725	19530	16980	19500
--	--	--	20	--	465	--	2250	1792
--	--	898	6957	22762	181190	19530	19230	21292
--	210	271	2206	3909	7080	10390	15124	13251
--	--	--	--	341	2	--	1060	2250
--	210	271	2206	4250	7082	10390	16184	15501

TABLE V

FISH CAUGHT IN LATIN AMERICA
IN METRIC TONS

	Before the war	Average 1940-46	1947	1948	1949	1952
Brazil.....	103279(2)	118463	139733	144767	145500	150000
Chile	36554	43312	60071	64724	76246	118286
Venezuela	21664	54554	64426	79754	65043	62473
Argentina	55300(1)	57452	65133	65000(2)	65000(3)	78700
Mexico	18695(1)	36705	55536	49369	55000(3)	109512
Peru	4849(2)	22280	30778	35944	45260	113000
Cuba	18048	12990	13500(3)	13500(3)	13536	14000(3)
Other countries	12544	12868	29487	31712	33226	35000(3)
	270933	358624	458664	484770	498311	671971

1. - 1938.

2. - 1939

3. - Estimates. The other figures are official.

TABLE VI

BREAKDOWN OF PERUVIAN FISH EXPORTS
BY PRODUCTS

	1953		January - June 1954	
	Quantity Kilograms	Value Soles	Quantity Kilograms	Value Soles
Canned tuna in brine	220800	1883945	195973	1970165
Canned bonito in brine	581541	3754725	367416	3324737
Canned skipjack in brine	49463	391917	12870	120873
Canned bonito, natural	655809	4344483	421683	3598486
Canned tuna in oil	718377	6524122	1064571	12558385
Canned bonito in oil	8421840	66841161	8147651	88852774
Canned skipjack in oil	46004	387249	1755	21851
Canned sardines in oil	7662	130063	--	--
Canned sardines in tomato	8103	38023	--	--
Dried salted fish	--	--	2000	3000
Frozen tuna fish	1999434	3928296	2436046	6153328
Frozen skipjack fish	3382061	6785981	2274340	6321048
Frozen swordfish	784478	6006378	495720	5748445
Frozen shrimp	151114	2509488	160611	3059637
Fish meal	10608817	16184308	9821471	15501431
Fish oil	200134	427983	185356	328778
Whale meal	200800	378442	340281	693619
Whale oils	3592588	7086279	2094560	5505656
Fresh shellfish	40	102	--	--
TOTAL	31629065	127602945	28022304	153787213

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