

WEST AUSTRALIAN WHALING

Whaling is proceeding according to plan at all three stations in Western Australia, Point Cloates, Carnarvon and Albany. Just as we go to Press we learn that the Commonwealth Minister for Commerce and Agriculture (Mr. McEwen) has approved of the Albany quota being increased to 75 humpbacks for the current season - it was originally fixed at 50.

To July 26 the take at each place, and oil recoveries, were as follows -

STATION	1952 QUOTA	NUMBER TAKEN	OIL PRODUCED	
			Total	Average each whale
	Whales	Whales	Barrels	Barrels
Point Cloates	600	160	8,740	54
Carnarvon	600	321	17,990	56
Albany	75	39	2,094	53
	1,275	520	28,824	55

The 28,824 barrels of oil produced represent approximately 4,800 tons, valued at approximately £A100 a ton, or a total value of £480,000.

SHARK BAY MARLIN

In the July issue of the Bulletin reference was made to the capture of a marlin at Shark Bay. As proper identification was not possible locally, photographs (of which one is published in this issue) were sent to Mr. G. P. Whitley, of the Australian Museum, Sydney, Australia's leading fish taxonomist. Mr. Whitley, who is well known to the majority of the staff, has now written as follows -

"Thank you for your letter of July 11 and the photos of the head and tail of the marlin taken last May near Dampier Reef by Axel Bertelsen, whose

## Electrocution of Whales

### More Humane and Economic Killing

Despite long experience in hunting, little exact knowledge has been accumulated on whales and whaling. Such paucity of precise data and experimental conclusions has rendered it most difficult to develop and apply a safe method of electric whaling. Yet increased efficiency in catching remains of the utmost importance.

From the humane aspect, the firing of several explosive harpoons into a dumb animal, which may fight in agony for up to two hours, is highly undesirable, to say the least. From the commercial point of view, the use of whale oil and other products is so widespread that it is important to take full advantage of every opportunity to lower the costs of catching and to improve the quality of products.

The Svend Foyn heavy harpoon was introduced in 1865 and has been little altered up to the present day. Electric harpooning was first recorded in London in 1868, when a patent for electrical equipment was granted, but no practical results of any experiments are known. There followed two Norwegian experiments, but the first promise of some success came in 1929, when Dr. Webber, a German engineer, succeeded in electrocuting four fin whales off the Norwegian coast.

Further experiments, including the reported electrocution of 250 whales in 1932-33 by the Sir James Clark Ross expedition, were carried out in co-operation with Dr. Webber until 1945, when he destroyed all his papers on committing suicide. Research and new design have been continuously carried on for the last five years by the General Electric Co., Ltd., London, in close co-operation with United Whalers, Ltd., London, and in conjunction with Elektrohval, Oslo.

Renewed impetus was given to this research upon the return from the Antarctic of Dr. Lillie in 1947, when he described explosive harpooning to members of the Universities Federation for Animal Welfare, who strongly advocated a thorough investigation of more humane methods. These investigations indicated the electrical method of killing as the most promising solution.

This was supported by the directors of United Whalers, who undertook the extremely heavy costs of commissioning an experimental catcher to collect data during the 1948-49 Antarctic season. The fact that this cost some hundreds of pounds per week emphasises both the generous response of the company and the importance which they attach to the matter.

The whalecatcher "Terje 2" was hurriedly equipped for the Antarctic. Complete heavy, waterproof control equipment was built, with a 250-volt, single-phase alternator; electric manila forerunners (the lines to which the harpoons are attached) were made up; and the Kongsberg Gun Company, of Norway, sent an experienced technician to assist.

Three major difficulties were revealed. First, the gear received such an enormous buffeting when mounted in the bow, ploughing through high seas, and icing-up in snow and gales; the equipment demanded too much attention. Secondly, the harpoon was deflected in flight by the trailing of the electric manila forerunner and by the heavy tubular sheathing on the leg of the standard harpoon by which the weapon was insulated from possible short-circuiting with the sea. Thirdly, many post-war gunners had adopted nylon forerunners, which suited Antarctic conditions better than manila, particularly as the latter absorbs a much greater percentage of seawater than does nylon.

In agreement with United Whalers, the G.E.C. redesigned the master control panel, to be housed in a miniature marine enclosure and mounted on the bridge for convenient control by the helmsman or other appointed operator. In Norway, Elektrohval and the Kongsberg Gun Company made a clean break with the adapted forms of Svend Foyn harpoon and produced an entirely fresh design. Unencumbered with the heavy insulating tube, this is now well known as the "detachable-leg" type harpoon; the flow of current into the sea is prevented by withdrawing the shaft of the harpoon when the head and forerunner have become fast in the whale.

#### Immediate Paralysis of Whale

Simultaneously, the Pirelli-General Cable Works, in close co-operation with British Ropes, Ltd., had to solve the problem of designing a flexible electrical conductor to be carried by the three-cordal rope and to

meet the inherent characteristics of the nylon, which can expand and contract by 40 to 45 per cent., according to the pull on the forerunner.

In considering the effects upon the whale itself, it was learnt that the flow of current with any satisfactory shot produced immediate paralysis, the whale surfacing with no struggle. The convulsion of the tail flukes (which can measure up to 24 ft. from tip to tip) acted as a brake upon the movement of the huge body and turning over on its side, the whale was dead within three minutes from the firing of the shot.

The directors of United Whalers next decided to commission a second catcher for the 1949-50 Antarctic season in order to ascertain some idea of critical buoyancy, load figures, stresses, short-circuit conditions, time of flight of the harpoon and the effects of Antarctic sea conditions. One of the initial problems to be determined was the critical buoyancy of the whale's body, so Westley Richards and Co., Ltd., Birmingham, produced a spigot gun to fire a very lightweight harpoon. Again, the Pirelli-General Cable Works had to construct an ultra-lightweight conductor of very high tensile strength together with the necessary mechanical apparatus to feed out this conductor at the higher operational velocity of the spigot gun.

Sir Vyvyan Board, a director of United Whalers, decided to join the expedition at Cape Town and travelled 15,000 miles in the whalecatcher round the Antarctic continent to the Ross Sea area, accompanied throughout by Mr. Robert Marsden, of the G.E.C. In addition, Mr. Dagfinn Brøther, of the Elektrohval Company, with Mr. Venaas, of the Kongsberg Gun Company, carried out successful electric killing with the standard Kongsberg gun. Westley Richards and Company were represented in these trials by Mr. Roy Hill, who, having helped to build the experimental spigot gun, serviced this in the severe climatic conditions.

Once in the Antarctic, the effects of low temperatures and the icing-up were soon manifest. Elementary manipulations of the gear took longer to perform than in warmer climates owing to the heavy clothing and bitter weather. Obvious, too, became the practical difficulties of recording observations when the crew were working watches in such conditions. An

instance was provided, moreover, of the snapping of the light harpoon, made of high-tensile steel, by the convulsive movement of the whale's dorsal muscles; thus the conductor was parted by the enormous strength of these muscles and the whale regained consciousness, ultimately swimming away and taking part of the harpoon with it.

In the end the expedition returned from the Antarctic with much vital information of the behaviour of various species of whale, the electric current required, time duration and so on, and with a catch of 51 whales by the Konsberg gun.

Attention was then directed to the outstanding problem of the stresses and strains imposed upon the equipment. Greater tensile strength was needed than was possessed by the light research harpoon and this necessitated a light yet stronger forerunner. Wrights Ropes, Ltd., Birmingham, undertook many experiments, with manila as an alternative to nylon, in conjunction with Pirelli-General Cable Works, who were faced by the problems of higher velocity, reduced weight and less coverage of yarn for the electrical conductor within the rope. Finally a lighter manila forerunner was successfully tried out with a newly-designed Westley Richards gun.

Instead of waiting for the forthcoming Antarctic season, the directors of United Whalers arranged for a trial expedition to the little island of Sao Thome, on the equator, off the African coast. A whale of the sei species, weighing 50 tons, was quickly killed and, after various tests in which the mammal sank to approximately 300 ft., it was safely retrieved and hauled in on a new type of forerunner, which the Pirelli-General Cable Works had produced on a new principle with a tensile strength of little more than half that normally used. Based on this initial success, further experiments are contemplated with an improved spigot gun, still utilising a lighter harpoon than normal.

It may now be said that the whale can be killed without any undue pain and with less waste of products. The average time for the shooting, killing and making-fast of a whale is considerably reduced with the electrical method, while fewer electric harpoons are used.

(The Fishing News, London, May 24, 1952.)

Whaling Commission

Need for International Co-operation

Unless something was done to control the hunting of whales, the stocks were in danger of extinction, said Mr. G. R. H. Nugent, Joint Parliamentary Secretary to the Ministry of Agriculture and Fisheries, in his address of welcome at the fourth meeting of the International Whaling Commission which opened in London last Tuesday.

"You have to decide where whales should be caught, also when and how many, for in another five to ten years of indiscriminate catching, the whales will have been virtually exterminated," he went on. "The world is still in need of oils and fats, though world prices are lower than they were a year ago.

"The International Whaling Convention, which set up this commission, is the result of the need for more oil and the un wisdom of destroying the source of future supplies. It seeks to limit the numbers of whales taken, especially in the Antarctic, to maintain a reasonable balance between the satisfaction of present needs and of those of future years."

(The Fishing News, London, June 7, 1952)