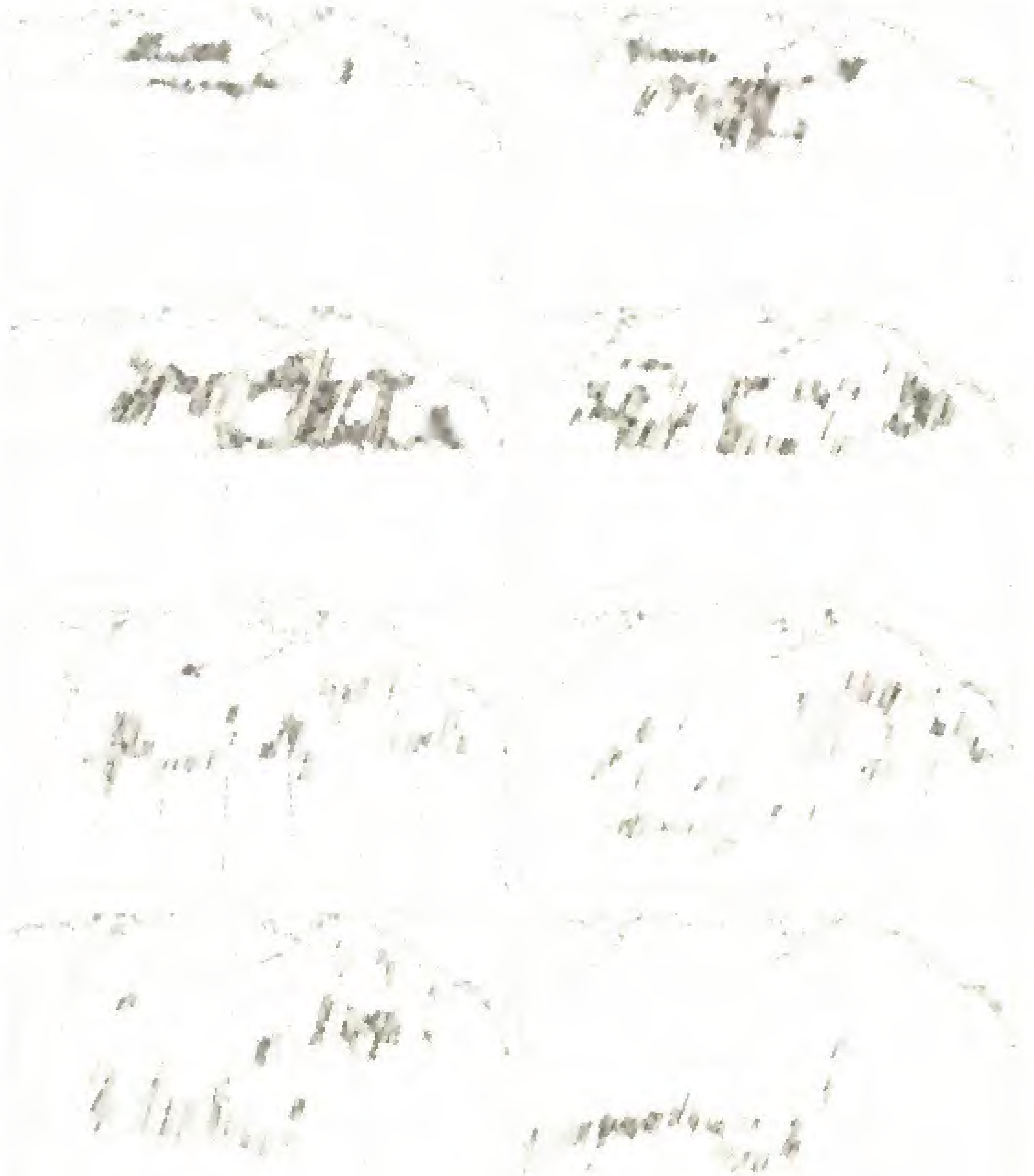
Sperm Whales



Minke Whales

accurately, for example, when it is too rough to keep the H-line on the horizon.

The situation with respect to assessing the value of scale binoculars is obviously unsatisfactory, given the possibility that the scale was misinterpreted. Thus a further assessment is required. We would suggest that it would be preferable to provide an interval scale which would allow observers to allocate each sighting to one of a number of predetermined ranges, rather than expecting observers to give distance estimates to an arbitrary degree of accuracy. The distance estimation experiment would then assess the probabilities of misclassification. Furthermore since the topmen may provide as few as half of the sightings used to estimate mean density, all observers should be provided with scale binoculars and all observers should be tested during the distance estimation experiment.

PHOTOGRAPHIC ANGLE ESTIMATION

1. Measurement of angles to sightings

Accurate estimation of the angle to each sighting from the track line is essential in line transect sampling. Errors in estimating the angles to sightings at large radial distances but small angles to the trackline have a profound effect on the distribution of perpendicular distances of sightings in the important area close to the trackline. The accuracy of angle estimation (by the topmen only) is assessed during the mid-cruise distance and angle estimation experiment. It is doubtful whether the conditions applying during this experiment are representative of those applying during the actual survey. Because the target is stationary during the experiment the time available for angle estimation is much longer than usual.

It was decided at the planning meeting for the cruise, held in Tokyo, to obtain on an experimental basis, independent estimates of angles to sightings made during transit by the K27 between survey areas and the mid-cruise meeting. These estimates were obtained using a camera mounted above the barrel which could be fired remotely by means of a shutter release on the topmen's binoculars (Fig. 6). To use the apparatus, the topman centres the sighting in the binocular field using the vertical reference marks shown in Fig. 1 and fires the camera, producing an image of the type illustrated in Fig. 7. As well as recording the orientation of the topman's binoculars at the moment of sighting, the image also shows the position of the compass points on the giro compass repeater situated just ahead of the barrel.

The bearing to the sighting is calculated from the positions of the binoculars and compass recorded on the photograph. The angle of the sighting from the trackline is obtained by comparing this bearing to the course recorded on the effort forms. To calculate the bearing to the sighting from the photograph the Cartesian coordinates of various points on the binoculars and compass were recorded using a digitising tablet. First the angle of the camera relative to the plane of the compass was calculated using coordinates of the four markings made on the compass housing. Next the angle between the line running through the South and North points on the compass repeater and the line bisecting the four markings on the binoculars was calculated. This was then corrected for the deviation of the camera axis from a line perpendicular to the compass plane. This gives the bearing to the sighting assuming that the compass plane was horizontal at the moment the camera was fired. Because the compass was not gimbled some error is introduced due to the roll of the ship. This error is greatest at angles near 45° from the ship's heading but is never more than 1° assuming the ship's roll was never more than 15° during survey.

To identify any inherent bias in this procedure a test was carried out in Wellington at the end of the cruise. The photographic equipment was used to measure the bearings to a number of land marks and compared to compass bearings taken simultaneously by another observer. This procedure was performed three times for each of the four land marks used. The results are presented in Fig. 8(a). The three replicate angle estimates obtained using the

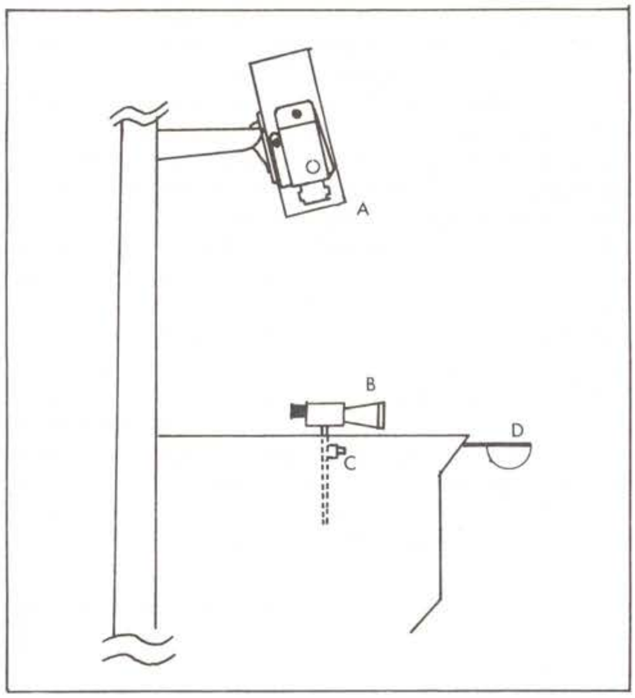


Fig. 6. Diagrammatic representation of the photographic equipment for recording the orientation of the topmen's binoculars. A = Camera, B = Bionoculars, C = Remote shutter release, D = Compass.

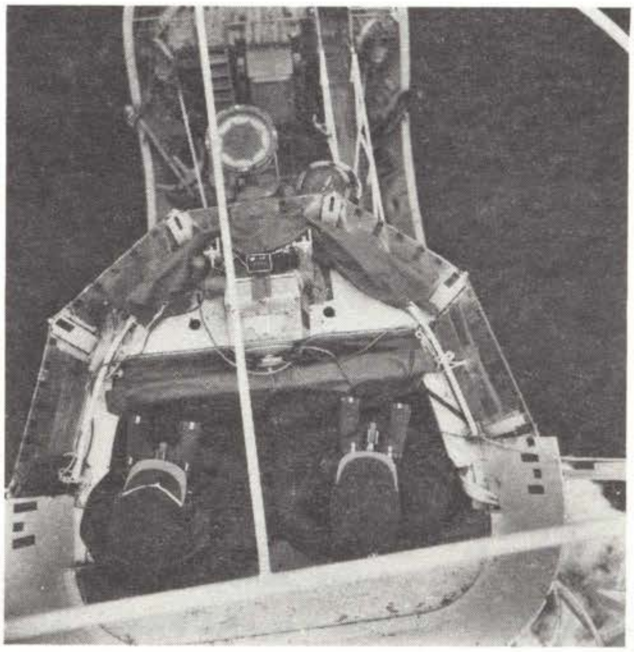
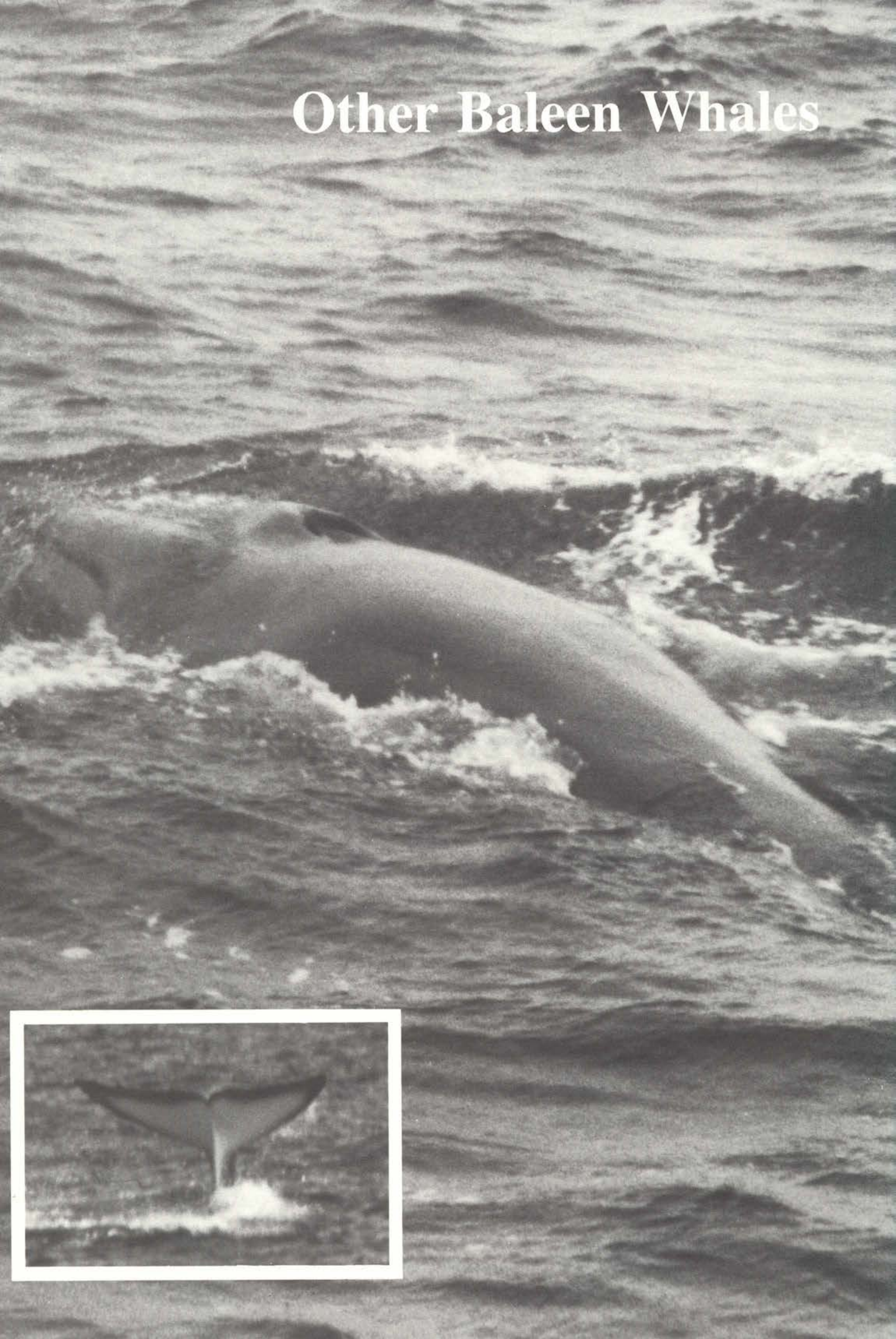


Fig. 7. An example of the photographs obtained using the equipment shown in Fig. 6.

Other Baleen Whales



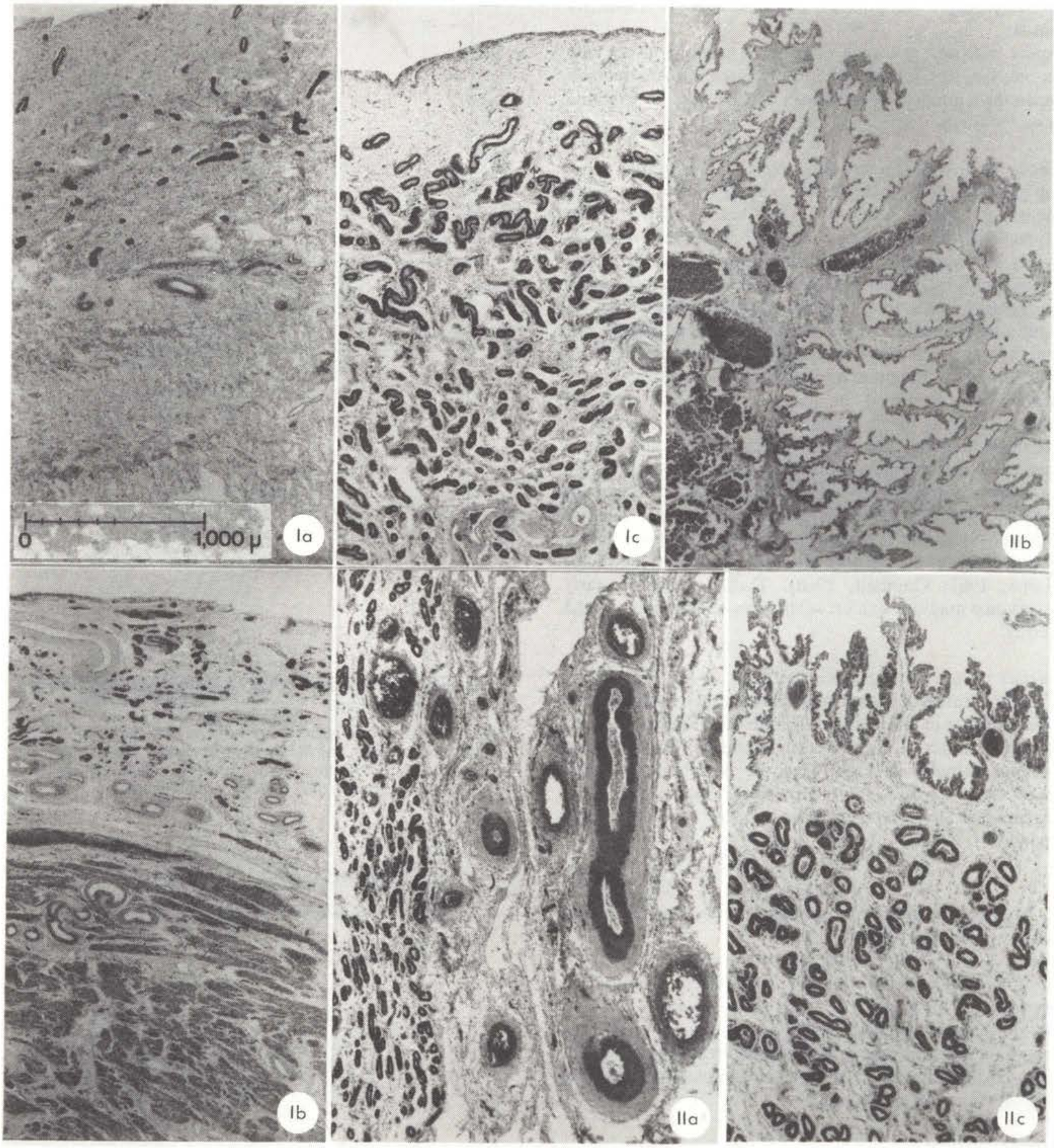


Plate I. Scale photomicrographs of uterine mucosa in: (a) Immature Sei, showing *stratum compactum, stratum spongiosum, sub-mucosa* and myometrium. (b) Lactating Fin, showing *stratum compactum, stratum spongiosum, sub-mucosa* and myometrium. (c) Anoestrous Sei, showing *stratum compactum* and *stratum spongiosum*.

Plate II. Scale photomicrographs of uterine mucosa in: (a) Mid-pregnant Fin, showing blood vessels in *stratum spongiosum* and *sub-mucosa*. (b) Late-pregnant Fin, showing *stratum compactum* and a few glands. (c) Mid-pregnant Sei, showing *stratum compactum* and a few glands.

Stratum spongiosum

The appearance of the *stratum spongiosum* also changes with reproductive status. This layer is highly glandular, and the glands significantly increase in size with pregnancy (Fig. 4c, and Plates I and II) with maximum diameters of glands being observed in late-pregnancy (Plate II). The gland size in the lactating specimen however is exceptionally small and the general appearance of the entire mucosa is one of dramatic shrinkage and atrophy (see Plate Ib, and Figs 3, 4c).

Histologically, the glands stain purple-blue, in contrast to blood vessels which are eosinophilic and appear bright pink-red with the stains used. These glands are highly convoluted, and in section therefore, most glands have been cut through several times. The glands ultimately open to the exterior through the *stratum compactum*.

The gland diameter in the surface zone of the *stratum spongiosum* appears greater than in the deep zone (Plates Ic and IIc, and Fig. 4c). The relative gland density (Fig. 4a) varies little in immature and anoestrous animals, but

Protected Species

SC/36/PS8

A Note on the Net-Entanglement of a Bowhead Whale (*Balaena mysticetus*) in Northwest Greenland, November 1980

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ABSTRACT

A young bowhead whale (*Balaena mysticetus*) was reported trapped in a white whale net in November 1980 at Kangaarsuk (73°15′N 56°12′W) in Upernavik district, Northwest Greenland. In September 1983 the author had the opportunity to interview the hunter about the incident and collect remains which confirmed the species identification. Details are given in the present paper, and previous information on the occurrence of the bowhead whale in the region in question is reviewed.

INTRODUCTION

At one time, the bowhead whale (*Balaena mysticetus*) was a common species in Greenland waters, as indicated by one of its other common names, the Greenland (right) whale and its local name, *arfivik* ('the real whale'). However, the Baffin Bay stock is now severely depleted and evidence on its present occurrence is scarce. Consequently, any new information is valuable and this is the rationale for offering this little case story.

Just before Christmas 1980, I received a note reporting that a hunter from the village of Tasiusaq in the north of the Upernavik district had netted a bowhead whale. The hunter is a friend of mine and when I visited Tasiusaq in September 1983, I listened to his story.

THE STORY

In the autumn of 1980, the hunter had placed one of his white whale nets at the point Kangaarsuup nua (73°15′N, 56°12′W), some 15 km south of Tasiusaq. Many hunters use such nets at this time of the year in an attempt to catch southerly-migrating white whales (*Delphinapterus leucas*).

Fig. 2. Jaw bone of young bowhead whale (*Balaena mysticetus*) found on the beach in Tasiusaq, Northwest Greenland (73°22′N, 56°04′W) in September 1983. Jaw bones of a minke whale are placed beside for size comparison. (Photo F. O. Kapel.)

Fig. 1. Young bowhead whale (*Balaena mysticetus*) in the harbour of Tasiusaq, Northwest Greenland after being towed from Kangaarsuk (73°15′N, 56°12′W), where it was trapped in a white whale net in November 1980.

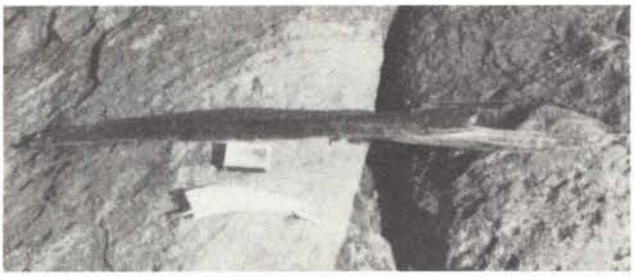

Fig. 3. Part of a baleen of young bowhead whale (*Balaena mysticetus*) found on the beach in Tasiusaq, Northwest Greenland (73°22′N, 56°04′W) in September 1983, compared with the baleen of a minke whale, and a matchbox. (Photo F. O. Kapel).

His net, made of 25–30 mm line, was about 30 m long, drew 175 cm and had a mesh width of about 30 cm.

When inspecting the net on 6 November 1980 he found a young bowhead entangled in it. The whale must have been dead for about three days because it was warm (i.e. had gas in its belly) and had a 'faint smell'. When reporting this to the doctor in Upernavik he was advised that the carcass should not be used for human consumption. The whale was, however, towed to Tasiusaq and beached there (Fig. 1 shows the whale floating in the harbour before being beached). The hunter did not witness what happened thereafter, as he left the area soon after, but he was later told that the carcass had been used for feeding the sledge dogs. He estimated the length of the whale to be 9–10 m, with a maximum height of about 2 m.

THE EVIDENCE

The hunter and other villagers reported that the carcass and skeleton were either eaten by the dogs or washed out to sea. On inspection of the area where the whale had been beached, however, I found a jaw bone which almost certainly came from a bowhead and some pieces of baleen which definitely did (Figs 2 and 3). The jaw bone measured 250 cm in a straight line (261 cm curved) and part of the tip appeared to be missing. Although only fragments of baleen were found on the beach, I was later shown some plates kept by local people (one was secured as evidence). The longest measured 136 cm but lacked a base; the hunter estimated its maximum length at about 160 cm.

The incident was reported to both the municipal corporation in Upernavik and to the central authorities in the capital, Godthåb, as the hunter was well aware that the bowhead is a protected species in Greenland.

DISCUSSION

Winge (1902, pp. 481–7, citing Eschricht and Reinhardt, 1861 [1866]) stated that one of the southerly migration routes used by bowhead whales in the autumn followed the west coast of Greenland. The whales arrived in the Upernavik district from the north in October (occasionally as early as September) and were sometimes present until well into December. In the spring, bowheads reappeared in April and were seen until July. In the most northerly area of Upernavik district (74–75°N), several bowheads were seen by O'Reilly (1818) close to the coast in July 1817, while Ross (1819) observed bowheads further north in Melville Bay (75–76°N) in July and August 1818.

The net entanglement described in this note suggests that the current, much-reduced stock may follow the same southerly migration routes as the original larger population. An observation of a bowhead about 150 km south of Kap York, 74°30′N, in May 1978 (Vibe, cited in Anon., 1981), provides evidence that the former northerly route may also be followed.

Although it is clearly unfortunate that a bowhead should have been accidentally killed, it is in one sense encouraging that it was a young animal as this is further proof (see Born and Heide-Jørgensen, 1983) that some successful mating is occurring in this severely depleted population.

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METHODS

The sources of the data for this paper are the logbooks, ledgers, and records of the American Pacific Whaling Company which have been in private ownership and were previously unavailable to researchers. The company operated two stations in Alaska from 1917 to 1939. The Akutan Island whaling station was operated from 1917 through 1939 by the American Pacific Whaling Company. The station was originally owned by the Alaska Whaling Company from 1911 to 1914, then by the North Pacific Sea Products Company from 1914 to 1917, when it was purchased by the American Pacific Whaling Company in 1917 (Birkeland, 1926). The Port Hobron whaling station operated from Sitkalidak Island near Kodiak Island from 1926 through 1937. The Akutan station was closed in 1921 because of a depressed economy, and closed again in 1931, 1932, and 1933 as was also the Port Hobron station in 1931 because of a glut of whale oil in the marketplace. While in operation, generally six to seven catcher boats, distributed between the stations, hunted whales from May to September or October; the whaling season terminated in the fall because equipment, such as ropes for towing whales, could not withstand the strain from the severe winter weather. Hunting was confined to an approximately 130 nautical mile (nm, 241 km) radius from each station, since the whales had to be processed within about 24 hours to ensure a high grade of oil and rendering was done at each station.

Analysis of the catch data followed standard statistical procedures. Differences in the monthly and yearly catches were detected by applying a two-way ANOVA (following the square root transformation). Distances of the catch from shore and lengths of blue whales were detected by applying a one-way ANOVA. Chi-square analysis was used to test differences in sex ratios. Comparisons between female and male lengths were made with the t-statistic for two means. All tests were made at the 0.05 level of significance.

The catch records of the Akutan Island and Port Hobron stations for 1917 through 1919 and 1924 through 1939 are provided in the Appendix. Catch records from 1920 through 1923 are not in the Appendix because the records primarily contain monthly catches which are summarized in the text. Only the 1924 through 1939 catch records listed the sex, length, and location of the harvested blue whales and the number of females with fetuses.

RESULTS AND DISCUSSION

Abundance and distribution

During the 21 years of whaling recorded by the American Pacific Whaling Company in Alaska, 1,053 blue whales were processed at the Akutan and Port Hobron stations (Tables 1 and 2). Approximately 79% of the catch was by the Akutan whalers, who harvested an average of 43.9 whales per year, compared to 19.8 at Port Hobron. During the period of operation, the annual catch decreased at both stations (Fig. 1). This was particularly the case at Akutan, where the catch declined ($p > 0.05$) from the high of 131 whales in 1917 to 17 in 1926, then vacillated between 21 and 53 for the next 9 years, before finally dropping to 5 in 1939 when operations ceased. The catch at Port Hobron was more irregular, particularly in 1932 when the harvest peaked at 79 blue whales after the 1931 closed season, but also showed a downward trend ($p < 0.05$). The trends do not appear to reflect a bias in the species taken, since whalers were rewarded a bonus for blue whales that was second in amount to the few right whales harvested (Brueggeman *et al.*, in press). An additional 60 blue whales were struck, but lost, either because the harpoon dislodged or the harpoon line or gear broke.

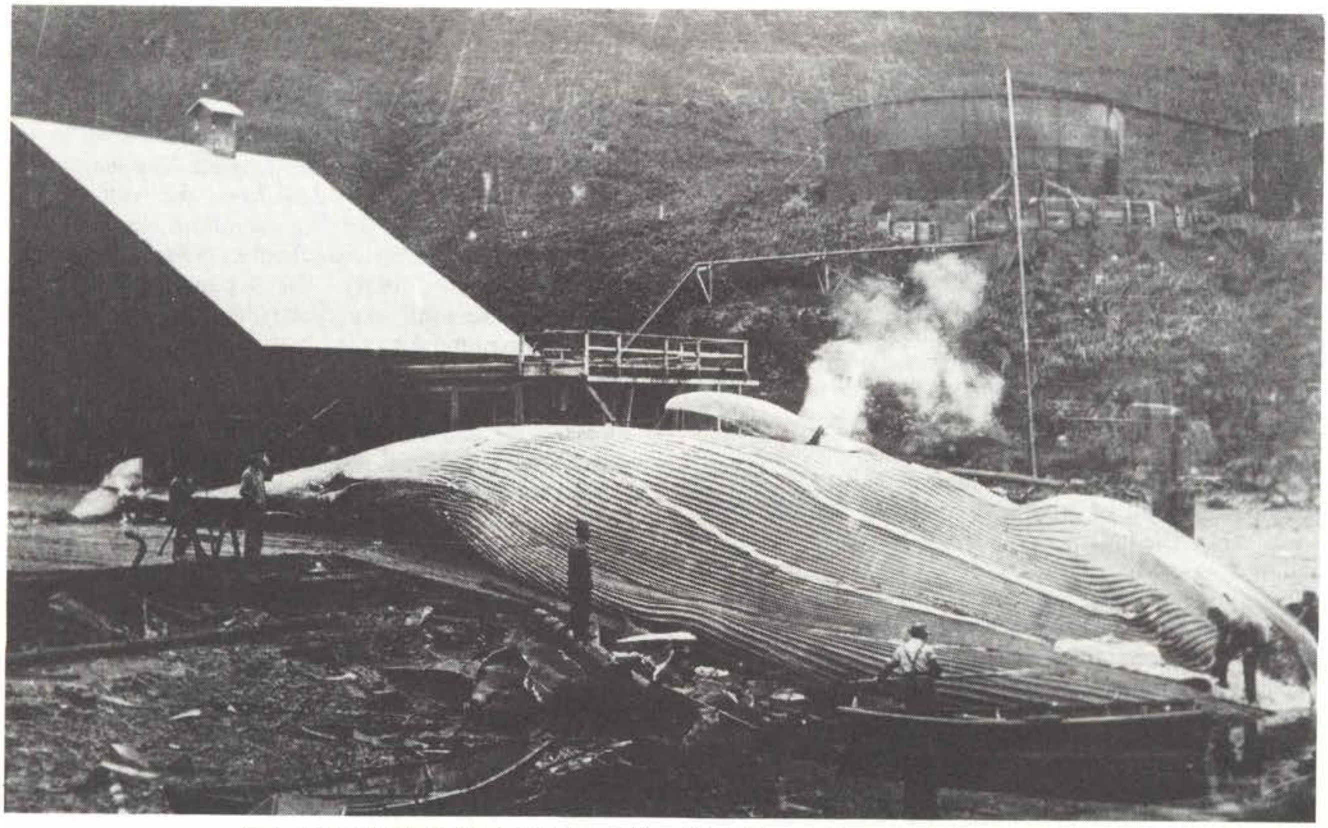


Plate 1. Blue whale at Akutan whaling station, 1920s. (Photo. Courtesy of William Lagen.)

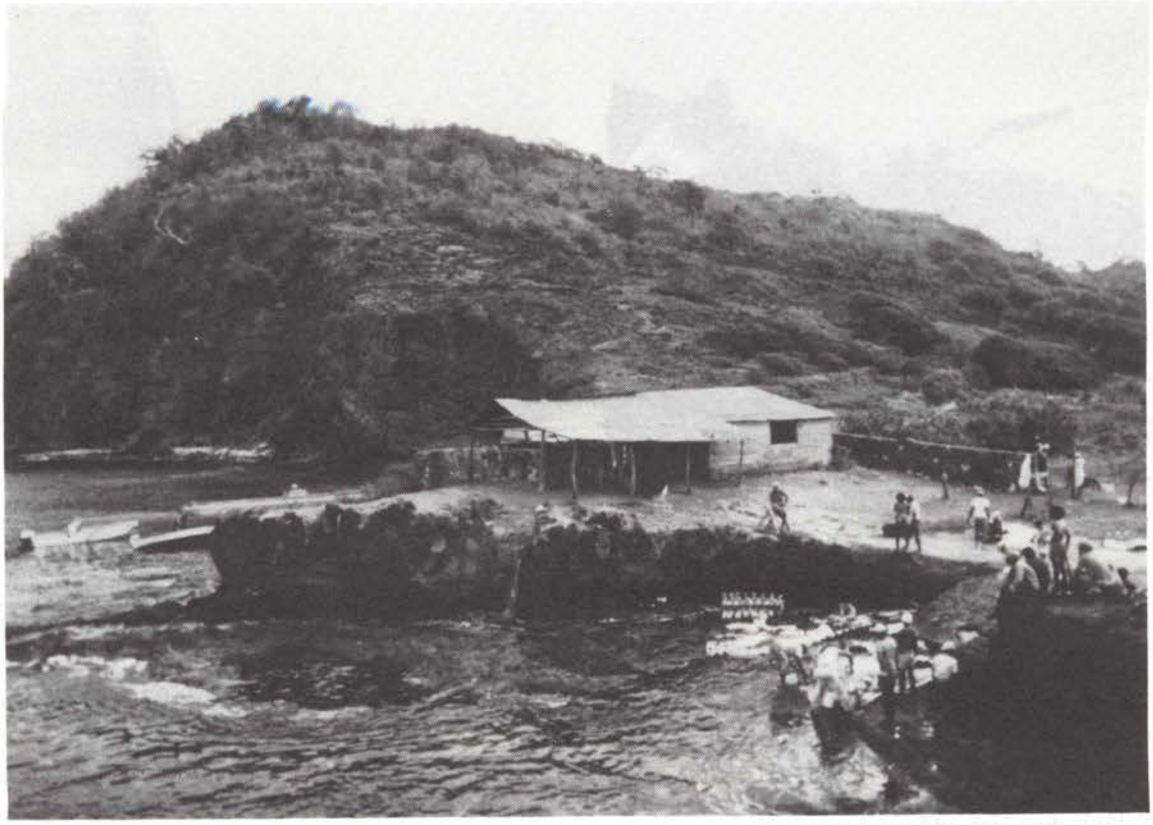


Fig. 3. The Bequia whaling station on Petit Nevis Island on the second and last day of cutting up of the bull humpback whale landed 20 February 1982.

consumed locally and the remainder is exported to either Trinidad, Barbados or St Lucia.

At present there is no known market for sperm whale oil, the meat of which is considered inedible locally. Consequently, although abundant they are not hunted.

Prior to 1980 the fishery was teetering on the verge of collapse, but the success of the 1982 and 1983 seasons at least temporarily changed the situation. This surprising success appears to be due to a combination of a relatively large number of whales sighted and the increased hunting efficiency resulting from the use of marine radios and on one occasion a power boat. Interest was revitalized in the industry and the financial return resulted in the construction of a new whale boat and additional facilities at the landing area.

In December 1984 the new whale boat belonging to Athneal Ollivierre, the chief harpooner, was launched with great anticipation, but just two weeks later he was admitted to hospital and did not return for the season. As a cornerstone of the the whaling industry and sole successful harpooner since 1956, without him the crews lost both confidence and enthusiasm. In addition whale sightings were very low, only 4 for the season. The crews gave chase once but no harpoon was thrown.

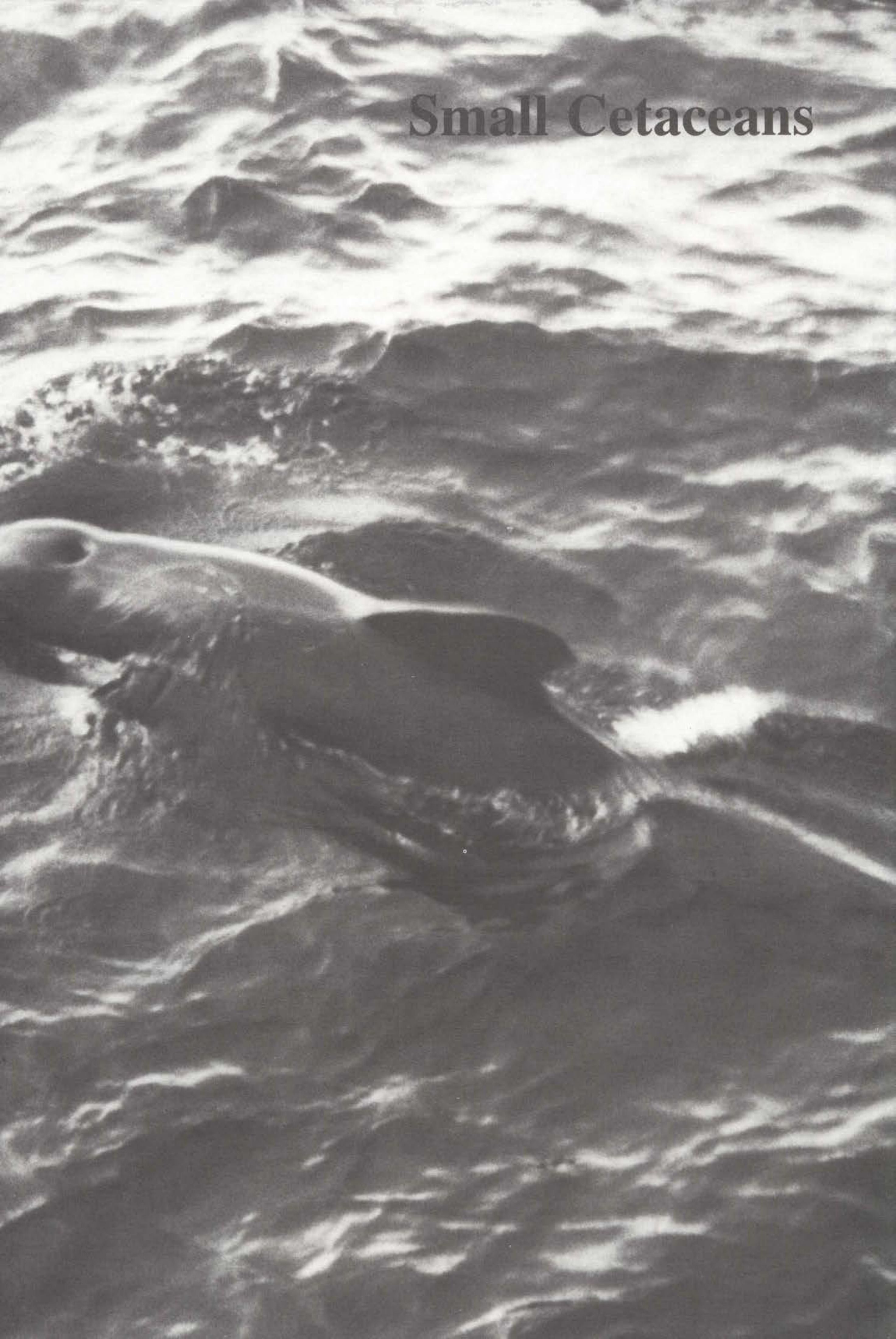
Fig. 4. Athnal Ollivierre, Chief Harpooner and kingpin of whaling in Bequia hurls a harpoon from one of the two Nantucket style whaling boats operating from the Bequia whaling station.

II. Barrouallie (St Vincent)

At the turn of the century the catches of large whales around Bequia had practically ceased and the incentive to hunt large numbers of the short-finned pilot whales or 'blackfish' and plentiful sperm whales prompted the development of this fishery further north on the main island of St Vincent. Around 1910 blackfish boats from Barrouallie began operating at least seasonally, and a strong impetus was given in 1931 by the late Griffith Arrindell.

Although somewhat similar to the Bequia boats, the Barrouallie 'blackfish boats' are sometimes shorter (6.1–7.3 m) and have a light harpoon gun (a locally modified 16 gauge shotgun) mounted on a stand bolted to the foredeck (Fig. 5). They are sail powered with auxiliary diesel or outboard engines. Each boat is equipped with one harpoon gun and gun harpoons, a varied number of 2 m hand harpoons, hand lances and a crew of about five men. By the late 1960s Griffith Arrindell had built up the fleet to some dozen blackfish boats in Barrouallie, as well as

Small Cetaceans



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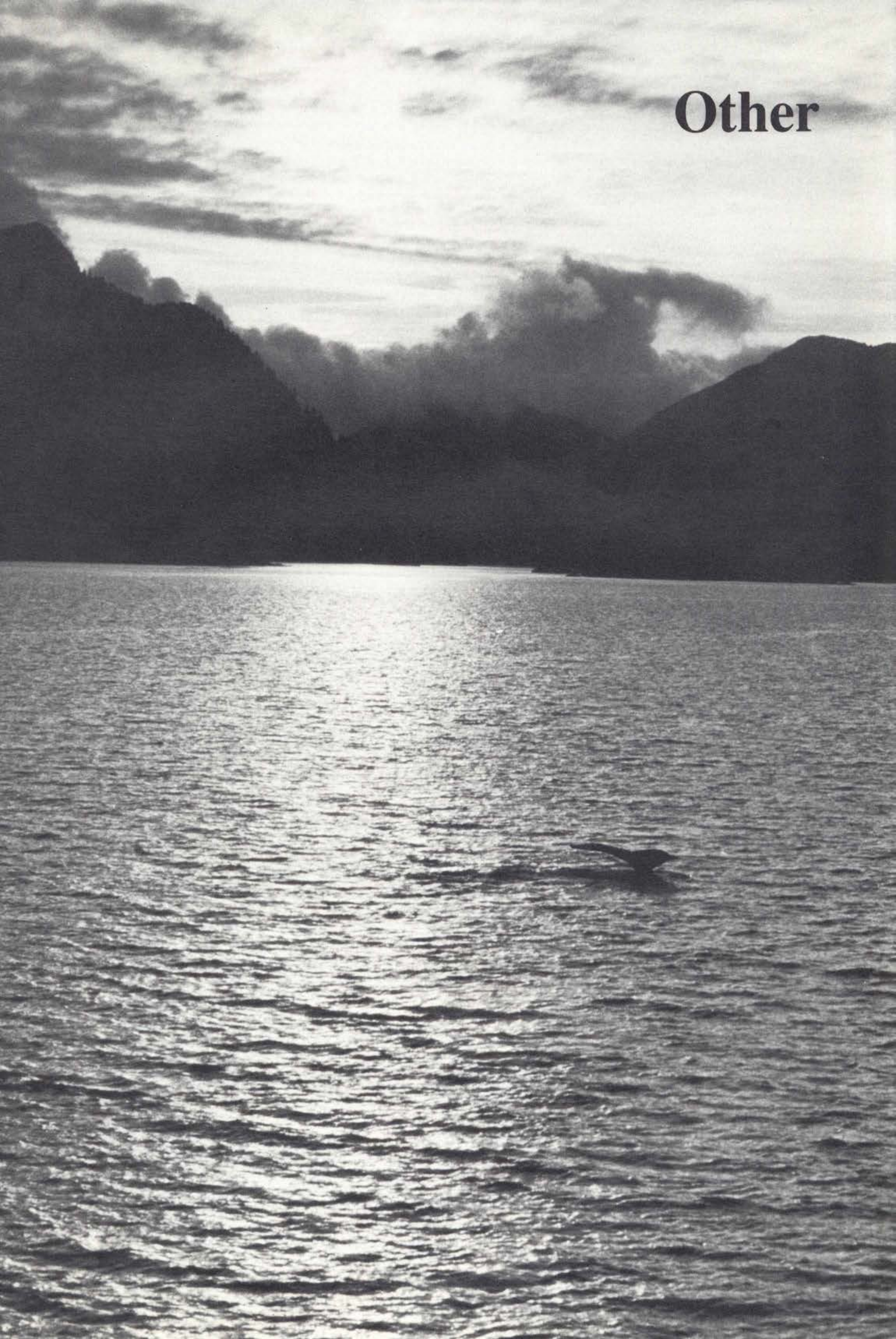


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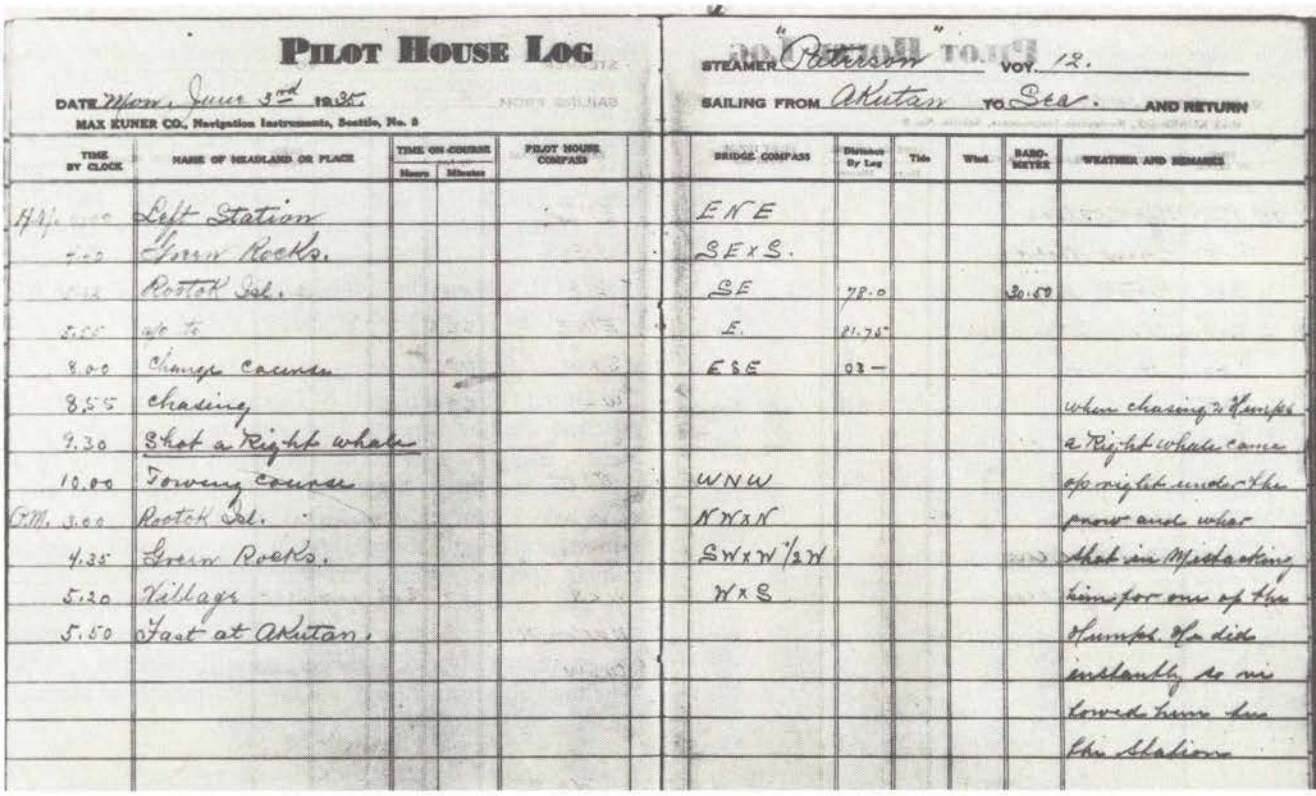

Fig. 3. Page from an Akutan catcher-boat log. (Courtesy of Manuscripts and University Archives Division, University of Washington Libraries).

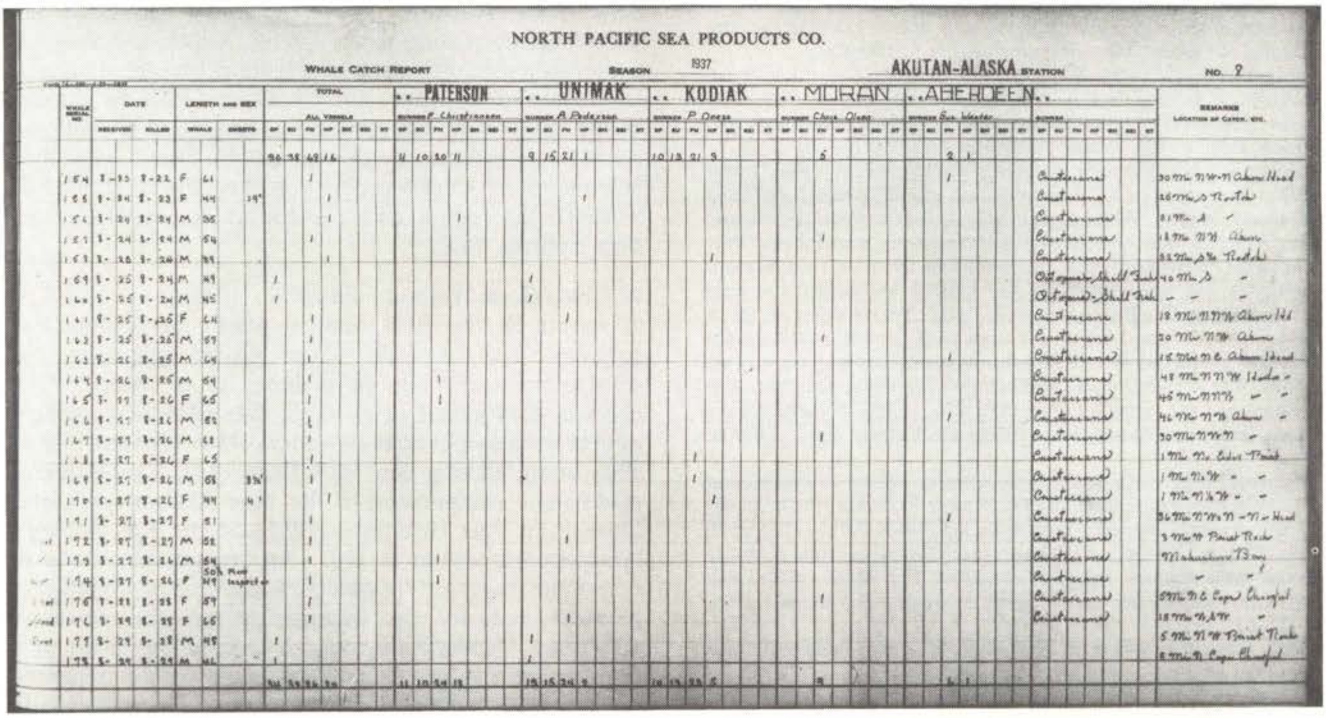

Fig. 4. Page from an Akutan station tally. (Courtesy of Manuscripts and University Archives Division, University of Washington Libraries).

south; vessel activity expressed as time and date of arrival and departure from the station; weekly weather reports; and remarks by the station manager (Oversize, Catch Records, 1919–39, WSL Coll.). These reports cover the years 1919–20, 1922–30 and 1934–39 for Akutan and 1935–37 for Port Hobron.

4. *Production and Catch Summaries*

A set of tables, partly typed and partly handwritten, contains data for Akutan on total oil production (1917–23), total whale catch (1917–23), and catch by vessel, by day, and by species (1917–19) (Box 11, WSL Coll.).

5. *General Correspondence*

In general correspondence of the American Pacific Whaling Company we found documents containing details on the catch at both stations in 1937 and at Akutan in 1938 (Boxes 1–3, WSL Coll.). In addition, we found typed tables showing the total whales caught, by year and by month, at Akutan (1914–36) and Port Hobron (1926–36).

METHODS OF DATA COMPILATION AND ANALYSIS

From all available sources, we compiled tables showing the catches at Akutan (Table 1) and Port Hobron (Table 2), by year and by species. Species other than those routinely reported in catch records were taken occasionally—e.g. minke whales (*Balaenoptera acutorostrata*) (Morgan, 1978, p. 37), killer whales (*Orcinus orca*) (Morgan, 1978, p. 36; Birkeland, 1926), and harbor porpoises (*Phocoena phocoena*) (Fig. 5). Killer whales, although common, were 'for the most part ignored' by the Akutan whalers (Birkeland, 1926, p. 24). We found no evidence that beaked whales (Ziphiidae) were seen on the whaling grounds, although sightings of 'Bottlenose' whales (probably Baird's beaked whales, *Berardius bairdii*) were reported at Naden Harbour (20 August 1938) and Rose Harbour (8–11 September 1935), British Columbia (Oversize, Catch Records, 1935–43, WSL Coll.); a few Baird's beaked whales were taken at British Columbia shore stations (Pike and MacAskie, 1969).

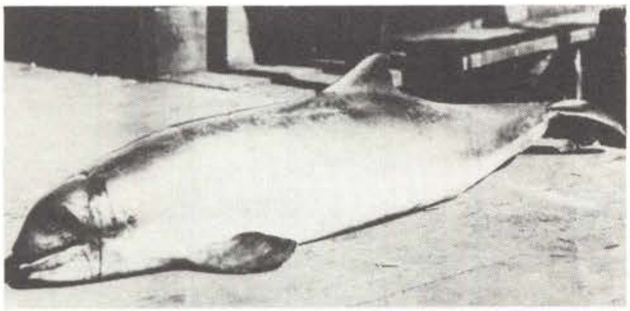

Fig. 5. This photograph of a harbor porpoise is labeled '"Dead whale (small) on pier" [Akutan AK, fetus]'. (Historical Photography Collection, University of Washington Libraries: Whales and Whaling—Whales #15).

Table 2

Catch of whales at Port Hobron whaling station, Alaska, 1926–1937. n = number of catchers, Hump = humpback whales, Ri = right whales and Sp = sperm whales

Year	Operation period[1]	n	Blue	Fin	Sei	Hump	Ri	Gray	Sp	Total
1926	17 July-31 Oct.	6		5		236	1			242[2]
1927	24 May-9 Oct.	3	5	23		244				272[3]
1928	9 May-10 Oct.	3	15	47		178	6	2	8	256
1929	23 May-13 Oct.	3	27	26		169			3	225
1930	8 May-15 Aug.	3	25	21		178			4	228
1931	Not operating									
1932	17 May-23 Sep.	4	78	60		128	2		2	270
1933	26 June-11 Sep.	3	1	61		114	1	2	3	182
1934	15 May-13 Sep.	3	15	78	2	139			3	237
1935	7 May-26 Sep.	3	34	33		37	1		32	137
1936	25 Apr.-15 Sep.	3	12	53		107			16	188[4]
1937	6 May-13 Aug.	3	3	57	1	43			16	120
Totals			215	464	3	1573	11	4	87	2357

[1] For some years, based on the span of catch dates in station tallies; may under-represent actual period of operation, as boats were often whaling for several days before catching the first whale and for several days after catching the last whale.

[2] Note that in 1925, Captain Louis L. Lane took 1 fin whale and 15 humpbacks from the vessel *Gummar* in Prince William Sound and Cook Inlet and around Kodiak Island 'for sale as fox food to ranches along the coast' (Bower, 1926: 139).

[3] Note that floating factory *Lansing* was also operating this year near Kodiak Island with 3 catcher boats (Bower, 1928: 140).

[4] According to Bower (1938, p. 121) the Port Hobron statistics for 1936 mistakenly included 2 fin and 11 humpback fetuses.

The data from all available station tallies (Akutan, 1924–30, 1934–39; Port Hobron, 1926–30, 1932–37) were filed in a WICAT-150 computer at Hubbs Research Institute. Reported positions of catches were plotted on a chart and converted to latitude and longitude. In order to display the geographic distribution of catches graphically, the computer files were transferred to facilities at the Inter-American Tropical Tuna Commission in La Jolla, California, where the AMPS mapping package was used to plot catch locations. The resultant figures were examined for trends that might be tested statistically. Additional preliminary analyses consisted of (1) calculation of ranges, means, and standard deviations of lengths of whales caught, by species, sex and year, at each whaling station (Tables 3 and 4); and (2) examination of scatterplots of fetal lengths, by date, for blue, fin and humpback whales (Fig. 6).

Table 3

Body lengths by year, species and sex of blue, fin, humpback and sperm whales taken at Akutan 1924–1930 and 1934–1939, with range, mean and standard deviation (all measurements are in feet). Only animals for which length and sex were recorded are included. Source: Station tallies

		Blue		Fin		Humpback		Sperm[1]
Year		M	F	M	F	M	F	M
1924	n	25	22	79	69	28	43	17
	Range	43–81	66–86	42–64	40–66	27–46	28–48	50–60
	Mean	73.16	76.67	55.21	56.86	35.86	37.65	54.65
	SD	7.38	5.67	5.60	7.47	5.62	6.20	3.20
1925	n	23	13	116	119	84	107	33
	Range	66–80	40–83	42–75	44–69	27–66	24–54	42–60
	Mean	73.96	73.38	55.86	59.00	37.48	37.50	51.49
	SD	3.99	11.39	5.57	5.87	5.83	5.64	5.12
1926	n	10	6	77	98	61	84	1
	Range	66–74	40–80	36–69	35–70	23–41	23–77	–
	Mean	71.00	63.67	53.90	56.14	32.70	34.02	–
	SD	5.33	14.45	6.01	7.85	4.19	7.06	–
1927	n	12	9	38	46	48	49	3
	Range	65–76	72–83	44–65	28–67	26–42	21–50	41–50
	Mean	71.16	76.00	55.72	57.78	34.75	34.25	46.00
	SD	3.90	3.20	4.80	6.60	4.52	6.11	4.58
1928	n	21	15	20	31	19	23	16
	Range	66–85	65–82	38–63	40–70	26–48	24–46	45–58
	Mean	73.10	75.13	52.60	54.42	36.63	37.09	51.56
	SD	4.56	4.60	6.46	8.01	7.33	6.79	4.35
1929	n	12	13	35	42	23	22	9
	Range	68–85	70–84	40–65	48–73	20–51	26–48	50–61
	Mean	75.67	77.54	54.14	59.17	34.83	36.19	55.44
	SD	4.68	4.08	5.90	6.50	5.89	6.63	3.94
1930	n	35	17	10	18	6	7	32
	Range	68–85	72–84	42–69	44–72	30–46	28–44	42–60
	Mean	76.51	78.29	56.80	58.06	39.67	37.86	50.22
	SD	3.44	3.46	7.12	6.70	5.85	6.64	5.39
1934	n	13	16	72	81	13	14	18
	Range	72–80	58–82	45–67	40–72	28–40	30–48	44–61
	Mean	76.69	76.13	57.18	57.96	33.08	38.43	53.22
	SD	2.32	7.29	5.04	6.38	2.90	5.98	5.57
1935	n	34	19	28	33	55	49	38
	Range	56–82	68–82	43–65	42–70	27–44	25–47	40–60
	Mean	74.62	77.68	52.39	58.39	36.04	38.04	50.32
	SD	4.61	3.25	5.75	6.58	4.50	5.20	4.86
1936	n	19	10	51	56	6	5	49
	Range	70–82	74–84	50–68	48–70	36–44	36–46	42–60
	Mean	75.58	79.60	57.35	60.16	39.50	41.60	50.20
	SD	3.45	3.31	4.61	6.15	3.27	4.04	5.24
1937	n	23	19	65	48	31	30	39
	Range	64–78	67–83	45–66	47–67	31–51	30–46	40–60
	Mean	73.00	74.47	56.33	58.86	37.82	38.77	49.69
	SD	3.71	4.34	4.24	5.42	4.10	3.67	4.87
1938	n	19	14	35	30	5	7	63
	Range	69–79	68–83	50–65	50–69	35–42	35–48	39–58
	Mean	74.57	76.25	58.87	60.95	37.30	38.86	49.04
	SD	2.43	4.55	4.05	5.07	2.78	4.53	4.80
1939	n	3	2	37	53	14	12	49
	Range	71–78	73–78	53–65	49–67	35–41	35–47	40–54
	Mean	74.33	75.50	58.62	58.97	37.54	38.33	47.65
	SD	3.51	3.54	2.93	3.88	2.04	4.44	3.36

[1] Only one female was taken, in 1937.

the 'average' oil yield of whales taken at the three Alaskan shore stations (Tyee, Port Armstrong, Akutan) was sperm 80 bbls, blue 78, fin 30 and humpback 25 (Chamberlain and Bower, 1913, p. 70). The 'average' value of the various species in 1913 was estimated by a spokesman for the Tyee Whaling Co. as $1,000 for sperm, $2,000 for right (*Eubalaena glacialis*), $600 for blue, $500 for fin, and $400 for humpback whales (*Pacific Fisherman* 11[6]: 33).

We assume that the schedule of bonuses paid to gunners and certain other crew members provides an accurate index of whaling preferences. In 1913 the United States Whaling Co. operating at Port Armstrong, Alaska, paid gunners $5.50 for each humpback delivered to the station, $10.50 for each fin whale, $13 for each blue whale, $30 for each sperm whale and $50 for each right whale (*Pacific Fisherman* 11[4]: 23). From payroll records (Payrolls, Oversize, 1926–42) and general correspondence (Boxes 1–3) in the Lagen Collection, we compiled data on bonuses paid to gunners at Akutan and Port Hobron (Table 5). These indicate that right whales, before they became protected in 1935, were consistently more valuable than any other species (except, perhaps, in 1932). Because of their scarcity, right whales probably did not influence decisions about where the Akutan and Port Hobron vessels searched; rather, these whales were a prize to be chased at every opportunity during the course of operations aimed at finding and catching the more common species (Fig. 9). It is clear that by 1927, the first year for which we found full details of the bonus schedule for the stations considered in this paper, the blue whale had surpassed the sperm whale in value. The station manager at Port Hobron stated in 1935 that 'the boats are out anywhere from 55 to 90 miles looking for Blues and naturally if they can't find a Blue will pick a Sperm if there are any there' (General Correspondence, Box 2, WSL Coll.).

Although all vessels engaged in the fishery were evidently capable of killing, securing, and towing any species of whale they encountered, factors other than bonuses may have helped determine whaler preferences. Certainly in later years when sperm whales were no more valuable (judging by the bonus schedule) than fin whales and humpbacks (Table 5), the considerably greater difficulty of flensing and processing sperm whales at the plant discouraged their capture (Fig. 10) (W. S. Lagen,

Fig. 7. A shot at a balaenopterine whale, probably a fine whale, near the Akutan station. (Alaska Historical Library).

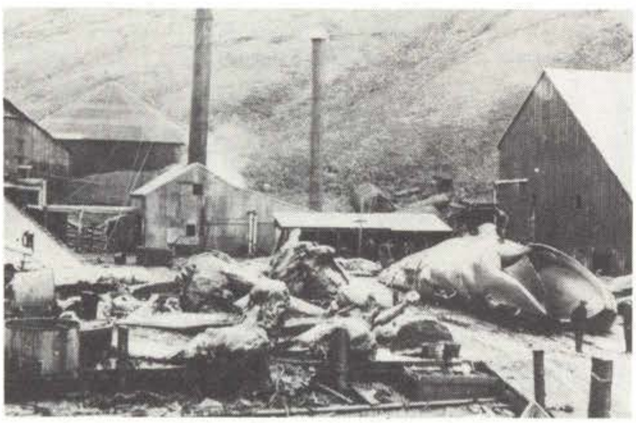

Fig. 8. A [probable] blue whale on the flensing deck at Akutan; date unknown. (Alaska Historical Library).

Table 5

Bonus schedule for Akutan and Port Hobron whaling stations, 1925–1939. Figures (in US dollars) are for amounts paid to gunners for each whale of a given species delivered to the station. Source: WSL Coll.

Year	Sperm	Blue	Fin	Humpback	Right
1925	–	30.00	10.00	–	–
1926	–	30.00	10.00	–	45.00
1927	10.00	30.00	10.00	10.00	45.00
1928	10.00	30.00	10.00	10.00	45.00
1929	20.00	30.00	15.00	15.00	–
1930	15–20.00	30.00	15.00	15.00	45.00
1931	–	–	–	–	–
1932	22.50[?]	15.00	7.50	7.50	22.50
1933	10.00	15.00	7.50	7.50	–
1934	10–15.00	22.50	11.25	11.25	30.00
1935	15.00	30.00	15.00	10.00	–
1936	15.00	30.00	15.00	12.50	–
1937	10.00	32.00	15.00	15.00	–
1938	10.00	32.00	15.00	15.00	–
1939	10.00	32.00	15.00	10.00	–

Fig. 9. A right whale landed at Akutan; year unknown (Alaska Historical Library).

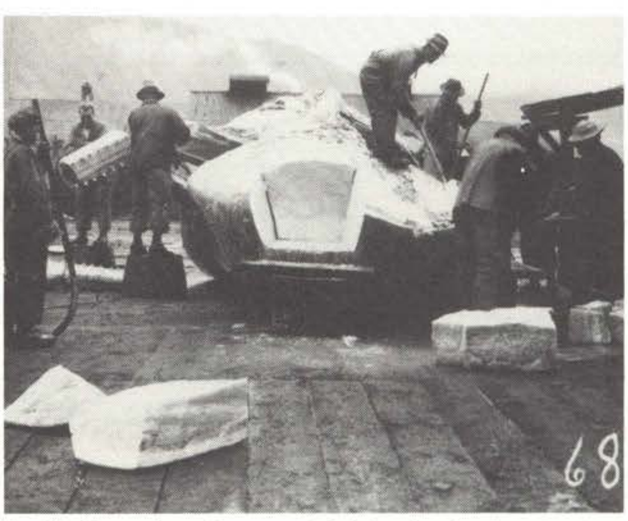

Fig. 10. 'Snout view of sperm whale being butchered at American Pacific Whaling Co., Akutan, Alaska'. (U.S. Coast Guard Photo #68, Alaska Historical Library, Album #26-G-150D-8A).

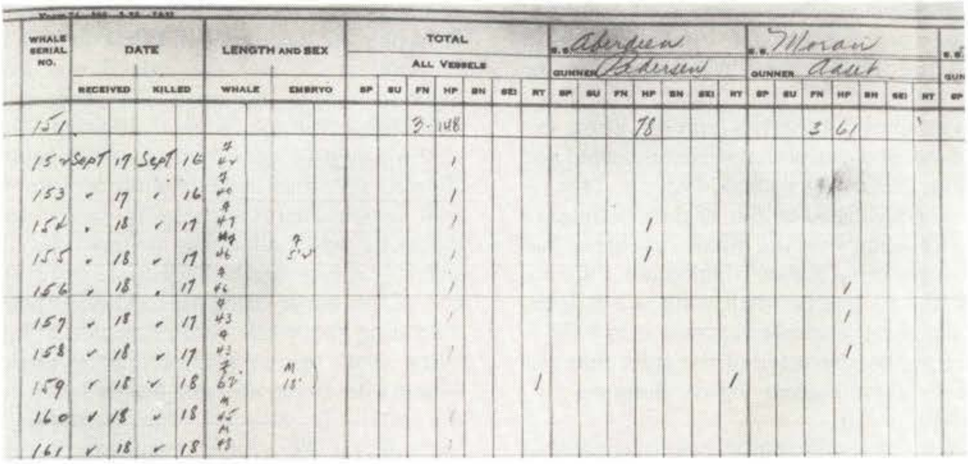

Fig. 24. Detail of page from the Akutan station tally, indicating that a 62 ft right whale killed, 18 September 1926 (whale No. 159), contained an 18 ft male fetus. (Courtesy of Manuscripts and University Archives Division, University of Washington Libraries).

June than in any other month. More females than males were taken (11 vs. 6 for animals that were sexed), and the catch tended to consist of large individuals (seven of them 50 ft or longer, six in the 40–49 ft range, and four in the 30–39 ft range) (Fig. 23). Two females were noted as being pregnant, one taken at Akutan in late June with a 5.5 ft fetus; the other at Port Hobron in mid-September with an '18 ft' fetus. The latter fetus is of particular interest as it would have been near term, assuming its length was measured and reported accurately.

The length of the September fetus was given in the station tally as '18'', and this figure was handwritten (Fig. 24). We tried to corroborate the measurement by examining other sources of data. A photograph in the Alaska Historical Library, Juneau, Alaska, shows a right whale fetus on a flensing platform which, judging by structures in the background, is almost certainly at Port Hobron (Fig. 25). The '18 ft' specimen is the only right whale fetus reported in the Port Hobron records, so we assume it is the subject of this photograph. Using as a reference the men standing near the fetus, we estimate the fetus's length as approximately 12 ft.

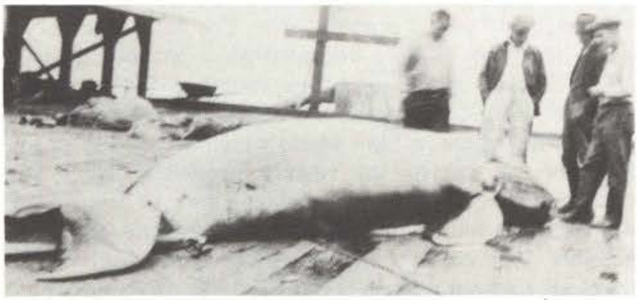

Fig. 25. A right whale fetus at Port Hobron – probably the '18 ft' specimen found in a 62 ft female taken 18 September 1926 (Table 7). (Alaska Historical Library).

Sperm Whales

The first sperm whales were evidently taken at Akutan in September 1915 (Birkeland, 1926, p. 131–36) or 1916 (*Pacific Fisherman*, 1916, 14[9]: 34). Of 456 sperm whales taken from 1924 to 1939 at Akutan and Port Hobron, only one, from Akutan, was a female.

VanDeVenter (1938) observed that the mean oil yield of sperm whales was greater at Akutan in 1938 (53.96 barrels) than at Port Hobron in 1937 (49.56 barrels). He also observed that 'the heavy and worn teeth and the battlescarred bodies of the Akutan Sperms showed them to be definitely more mature than those at Port Hobron' (Fig. 26). Although apparently based only on this one between-year comparison, VanDeVenter's conclusion is borne out by our body-length data. There is a significant difference between the mean body length of sperm whales taken at Akutan (50.32 ft, s.d. = 4.37, n = 368) and at Port Hobron (46.93 ft, s.d. = 5.92, n = 87) (F-test, df = [1,453], $p < .001$).

The exceptional catch of sperm whales at Port Hobron in 1935 (Table 2) was considered by the station manager there to be due to 'the fact we are operating outside the 100 fathom bank'. He also noted:

> Although the Sperms we get are not to be compared with the Sperms caught at Akutan they seem to be much younger and we have not as yet gotten any teeth except the hollow ones which I understand are only in the young Sperm (General Correspondence, Box 2, WSL Coll.).

Schools of females and calves were occasionally observed on the whaling grounds off the Queen Charlotte Islands, British Columbia (General Correspondence, Box 1, WSL Coll.).

Struck-but-Lost Component

There is no published estimate of the proportion of whales struck but not secured in the Akutan and Port Hobron fisheries. We do know that during the early years of the Akutan fishery there was a period when the whalers had

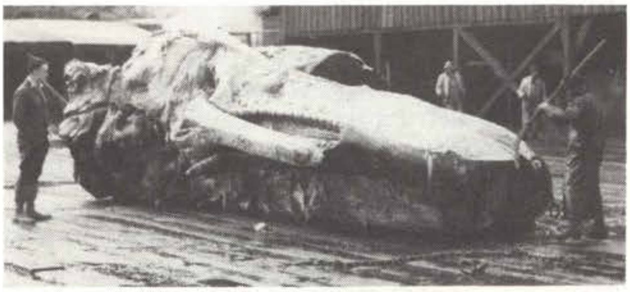

Fig. 26. Flensing a sperm whale at Akutan, Alaska, 26 May 1937; V.B.

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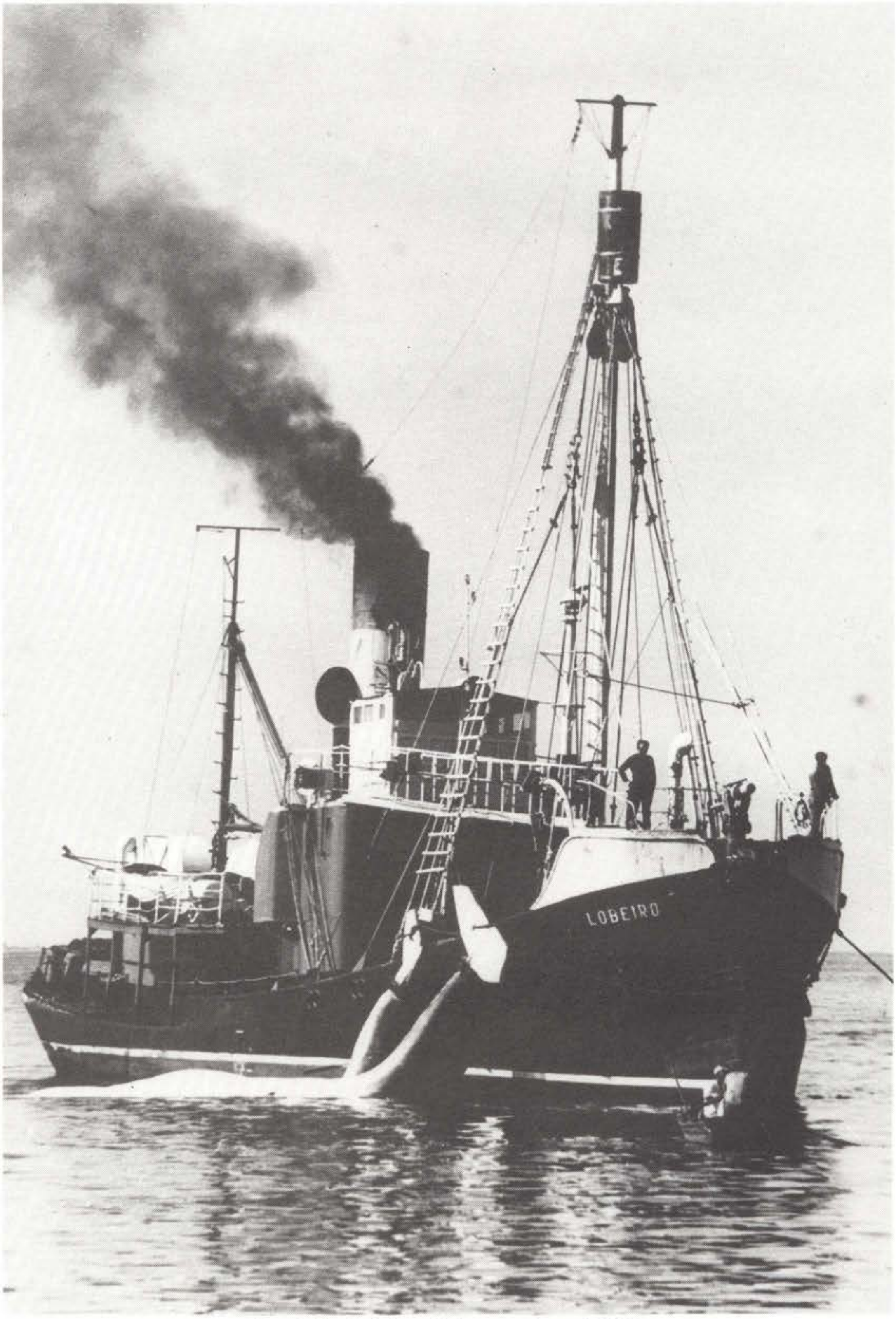

Plate I. The *Lobeiro*, which operated from 1955–81.

Resumé Section

This section includes Resumés of those papers presented to the Scientific Committee but not published in this volume. They are provided for information only and do not constitute publication; and as such should not be cited in papers without consultation with authors. Copies of the full papers are available at cost price from the IWC Secretariat.

Common dolphin off the coast of Spain, September 1981.
Photograph by G. Donovan.