

**On the Body Proportions of the Fin Whales  
(*Balaenoptera physalus* (L)) caught in the  
northern Pacific Ocean (I)**

(Preliminary Report)

By

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**Introduction**

As regards the fin whale population Y. Matsuura and K. Maeda (1942) deduced that the northern Pacific and the Antarctic fin whales belong to the different populations by the studies on the following items: (1) body length frequencies of the catch, (2) body proportions, (3) average body length at which sexual maturity is attained, (4) food habits and (5) diatom film infection. However, the reliable results of this has not been reached yet.

H. Omura stated (1950) that the fin whales in the adjacent waters of Japan may be distinguished into two populations, namely the west side's (Japan sea) and the east side's (Pacific Ocean) one, and that the American coastal and the Japanese coastal fin whales migrate northward through the Bering Strait and may reach convergently to the Arctic Ocean. The same results as the above were attained by the H. Kasahara's deduction also.

The author took up the "Body proportions" as a method of investigation on the fin whale races, and has been studying the materials obtained in the northern Pacific and the adjacent waters of Japan so far. The results hitherto obtained are stated in the present account as a preliminary report from which some ideas to the future investigation will be drawn.

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**Material and method**

The series of measurements is based upon that used by N. A. Mac-

kintosh and J. F. G. Wheeler (1929) for the blue and fin whales in the southern hemisphere.

The body proportions are expressed as the percentages of the total length, and in studying the differences in the various areas it was also considered whether the proportions of some parts varies according to body length or to the number of corpora lutea. The number of material examined is shown in Table I.

Table I. Number of fin whales on which the measurements of body proportions were made

Measure- ment No.	Body parts, examined	Japanese coastal		northern Pacific		Antarctic*	
		male	female	male	female	male	female
1	Total length	15	22	35	25	192	134
3	Tip of snout to blow-hole	15	22	35	24	172	118
4	Tip of snout to angle of gape	8	2	0	0	114	74
5	Tip of snout to centre of eye	14	22	35	25	192	134
6	Tip of snout to tip of flipper	13	22	31	22	158	113
7	Centre of eye to centre of ear	13	21	35	25	173	113
8	Notch of flukes to posterior emargina- tion of dorsal fin	14	20	33	23	148	94
10	Notch of flukes to centre of anus	15	21	35	25	189	131
11	Notch of flukes to umbilicus	15	20	30	20	178	129
12	Notch of flukes to end of system of ventral grooves	13	20	34	25	132	81
13	Centre of anus to centre of reproductive aperture	15	21	35	25	185	117
14	Vertical height of dorsal fin	14	20	32	22	150	99
15	Length of base of dorsal fin	15	20	25	15	153	98
16	Axilla to tip of flipper	11	21	0	0	169	114
17	Anterior end of lower border to tip of flipper	14	21	34	25	122	73
19	Greatest width of flipper	14	21	35	24	124	78
20	Length of severed head from condyle to tip	0	0	5	6	135	88
21	Greatest width of skull	14	20	25	15	128	74
22	Skull length, condyle to tip of premaxilla	14	20	25	15	0	0

\* Cited from Discovery Reports Vol. I, 1929.

From the results of the general biological investigation and the frequency of the occurrence of the different blood groups, it may be considered that the stock of fin whales in the northern Pacific is consisted by some different populations. Furthermore the whaling grounds in 1941 and 1952 are different from each other. By these reasons the comparison was made between those in these different years firstly and then between

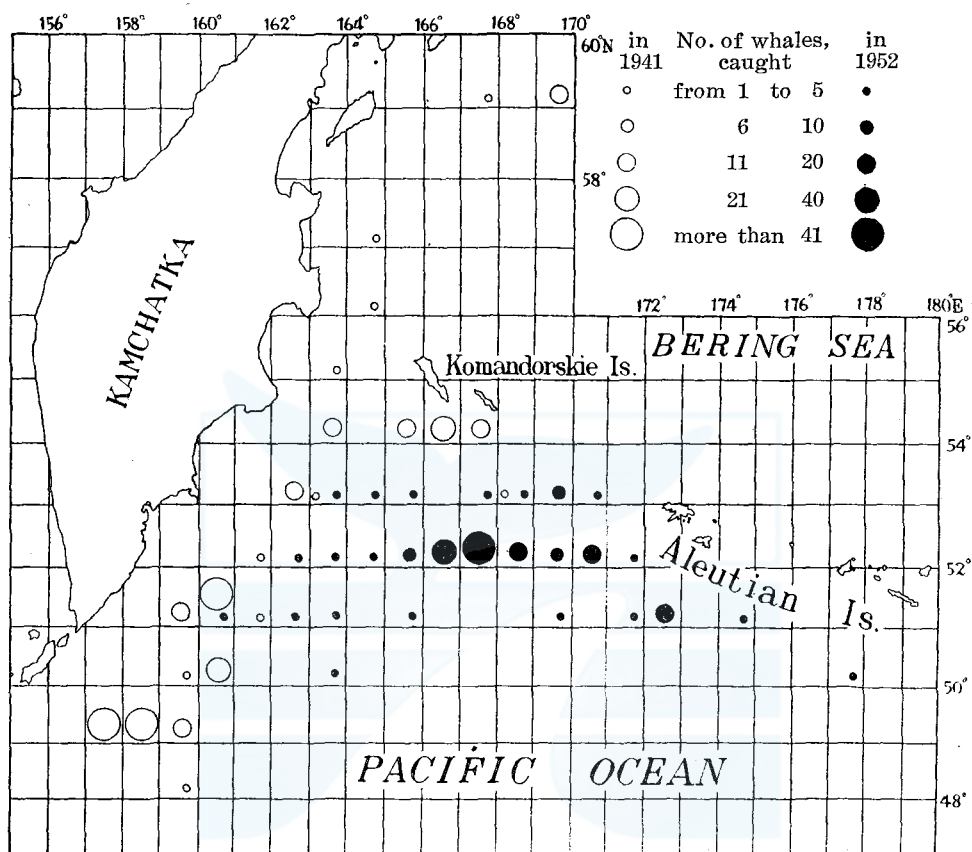


Fig. I. Northern Pacific whaling grounds in the years 1941 and 1952 (Fin whale).

those in the northern Pacific and in the Japanese coastal waters (east side of Japan) or in the Antarctic, based upon the data given by Mackintosh and Wheeler.

As shown in the Figure II these materials are not only rather scanty comparing with the total catch, but also cannot be said as representative sample. However still I consider the results of this study may give some light for the study of the population or communities in this species of whale.

### Body proportions

(I) Comparison between the northern Pacific fin whales caught in 1941 and 1952: 10 males and 10 females in 1941 and 25 males and 15 females

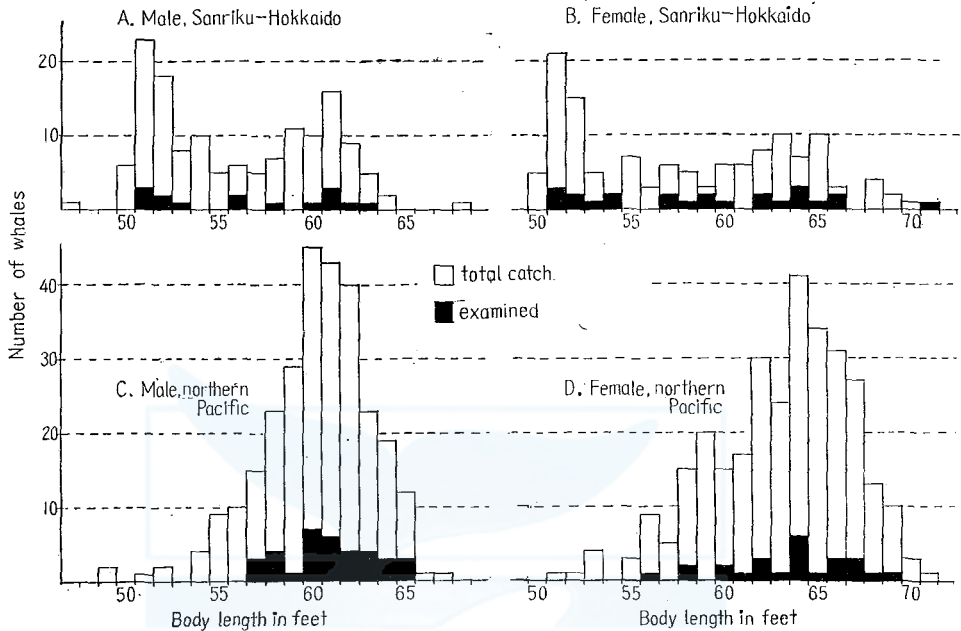


Fig. II. Fin whale. Total number of catch and the number examined according to body length in different areas in 1950.

in 1952 were examined. The comparison of these are shown separately by the body length groups in the Table II.

Measurement nos. 3 and 20 (or 22) which represent the head proportion increase at first with the growth of body and reach to the maximum at a definite body length and after that body length is attained they show the tendency to decrease. On the nos. 8 and 10 which represent the posterior part of the body decrease according to the growth but this trend ceases at a body length at which the proportion of nos. 3 and 20 (or 22) reach their maximum. This body length is about 18 or 19 metres. No difference of the variation of proportion was seen between those measured in 1941 and 1952 concerning the points above mentioned. In other items representing the head or posterior regions any remarkable differences were also not recognized.

No whale in which the ventral grooves end anterior to the umbilicus was reported in 1941, but in 1952 6 males and 4 females among 25 and 15 males and females, respectively were found as such, and in the most remarkable case (60 ft. male whale No. 261) the distance from the end of ventral grooves to the umbilicus reached to 70 cm. (3.9% of body length).

Table II. Comparison of the body proportions of the northern Pacific fin whales taken in the years 1941 and 1952

A. Males

B. Females

3. Tip of snout to blow-hole

Range of values	1941				1952				Range of Values	1941					1954				
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.
16.5						1		1							1		2	1	4
17.0		1		1		1		1							1				
17.5	1		1	2	1	1	1	3						1		2	2	5	
18.0		2		2	1	1	2	4							1	2		3	
18.5	1	1		2	2	2	1	5			2	1	3		2			2	
19.0			1	1		4	2	6									1	1	
19.5		1		1	1	1	2	3					1	1					
20.0					1			1											
20.5					1			1											
21.0		1		1															
Total	2	6	2	10	6	11	8	25	1	2	2	4	9	2	3	6	4	15	
Mean Value	18.0	18.8	18.3	18.50	18.8	18.3	18.6	18.56	18.0	18.8	19.5	19.4	19.11	18.0	19.3	18.3	18.6	18.56	
Stand. Devi.									0.70										
Stand. Devi.	1.16								0.93										

5. Tip of snout to centre of eye

Range of values	1941				1952				Range of Values	1941					1952				
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.
19.0					1			1							1				1
19.5	1	1	1	3		4	1	5											
20.0	1	2		3			1	1											
20.5		1		1	2		2	4		1	2	1	6			1	2	1	5
21.0						2	2	4			1		1		1	2	1	5	
21.5							2	4					1						
21.5					1	3	1	5					1		1				
22.0		2	1	3		2	1	3							1		1	2	
22.0								3											
22.5								2								1		1	
23.0								2											
Total	2	6	2	10	6	11	8	25	1	3	2	4	10	2	3	6	4	15	
Mean Value	19.8	20.5	20.5	20.35	21.1	20.8	20.8	20.84	20.5	20.7	21.3	20.9	20.85	20.3	21.7	21.4	21.4	21.30	
Stand. Devi.	0.81								1.01	0.50									

(II) Comparison between the northern Pacific and the Japanese coastal fin whales: As stated above no difference was recognized between the proportions of the northern Pacific fin whales in 1941 and 1952, so both of them were brought together and were compared with those in the Japanese coastal waters. The comparison of both areas are shown separately according to the body length in Table III.

Table II. (cont.)

## A. Males

## B. Females

## 6. Tip of snout to tip of flipper

Range of Values	1941				1952				Range of Values	1941					1952					
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.	
39						1		1	39									1		
40					2	1	1	4	40			1			2				4	
41						4	1	5	41		1			1	2				5	
42	1	2	1	4	1	1	1	3	42	1	1		2	2		3			3	
43		2		2	1	1	2	4	43				1	1					4	
44					2	2	1	5	44							1			5	
45		1					2	2											2	
46				1																
Total	1	5	1	7	6	10	8	24	Total	1	2	1	3	7	2	3	6	4		
Mean Value	42.0	43.2	42.0	42.86	42.2	41.6	42.9	42.17	Mean Value	42.0	41.5	40.0	41.7	41.43	42.5	40.3	42.0	41.5	41	
Stand. Devi.	1.36				1.72				Stand. Devi.	0.91						1				

## 7. Centre of ear to centre of eye

Range of Values	1941				1952				Range of Values	1941					1952					
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.	
3.5						1		1	3.5										1	
4.0			1	1		6	7	13	4.0		1		2	2	2	6			2	
4.5	2	4	1	7	6	4		10	4.5	1	2	2	1	7	2	1			1	
5.0		1		1					5.0				1	1						
5.5							1	1												
6.0																				
6.5		1		1																
Total	2	6	2	10	6	11	8	25	Total	1	3	2	4	10	2	3	6	4		
Mean Value	4.5	4.9	4.3	4.70	4.5	4.1	4.2	4.24	Mean Value	4.5	4.3	4.5	4.5	4.45	4.5	4.2	4.0	4.0	4	
Stand. Devi.	0.64				0.38				Stand. Devi.	0.27						0				

To clarify the relation between the proportions  $y$  of various parts and the body length  $x$ , the correlation coefficients  $r$  were calculated by the following formula:

$$r = \frac{1}{n} \cdot \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sigma_x \sigma_y}, \quad 1 \geq |r| \quad (I)$$

where  $\sigma_x$  and  $\sigma_y$  denote the variances of  $x$  and  $y$  respectively. In Table IV the correlation coefficients of various items are shown, calculated by

Table II. (cont.)

A. Males

B. Females

8. Notch of flukes to post. emarg. of dorsal fin

Age of flukes	1941				1952				Range of Values	1941					1952				
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.
.0							1	1	21.0										1
.5							1	1	21.5							1			3
.0								1	22.0			1	2	3		1			3
.5			1				1	1	22.5					1		1		1	4
.0		1					1	1	23.0		1			1		1		1	2
.5		1					2	1	23.5		1			1			1		2
.0	1						1	1	24.0					1				1	1
.5	1						1	1	24.5										2
.0			1				1	1	25.0			1	1	2					2
.5		1					1												1
Total	2	5	1	8	6	11	8	25		0	3	2	3	8	2	3	6	4	15
Mean Value	23.3	22.9	21.5	22.81	22.4	22.0	21.9	22.60		23.8	23.3	21.8	22.93	23.0	22.2	21.9	22.9	22.37	
Stand. Devi.				1.06				0.85						1.38					0.85

10. Notch of flukes to centre of anus

Age of flukes	1941				1952				Range of Values	1941					1952				
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.
.0							1		25.5										2
.5									26.0										1
.0								1	26.5							1			3
.5			1				2	1	27.0							1		2	5
.0		1					2	1	27.5				1	1		1			5
.5		1						5	28.0					1		1			3
.0	1	2					2	1	28.5					1	1	1			3
.5		1					1	1	29.0										1
.0									29.5		2	1		3	1				1
.5	1	1	1					1	30.0			1		1					1
.0								1	30.5	1			1	2					1
Total	2	6	2	10	6	11	8	25		1	3	2	4	10	2	3	6	4	15
Mean Value	28.8	28.1	28.0	28.20	26.8	27.8	27.2	27.34		30.0	28.8	27.8	27.8	28.80	28.0	26.8	25.8	27.0	27.14
Stand. Devi.				1.00				1.00						1.21					0.98

the formula I. It may be seen from this table that nos. 3, 5, 8, 10 and 22 of Japanese coastal whales are closely related with their body length, because the absolute values of their coefficients are more than

Table II. (cont.)

## A. Males

## B. Females

## 11. Notch of flukes to umbilicus

Range of Values	1941				1952				Range of Values	1941					1952			
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20
42							1	1	41								2	
43						2	2	4	42								1	
44					3	1	3	7	43								1	
45		1	1	2	2	4		6	44					1	1		1	2
46		1		1		2	2	4	45		1	1	2					1
47			1	1	1	1		2	46								1	1
48	1			1		1		1	47	1	2			3				
Total	1	2	2	5	6	11	8	25	Total	1	2	1	1	5	2	3	6	4
Mean Value	48.0	45.5	46.0	46.20	44.8	45.2	44.0	44.72	Mean Value	47.0	47.0	45.0	45.0	46.20	44.5	44.7	42.8	44.8
Stand. Devi.				1.17				1.42	Stand. Devi.					0.98				

## 12. Notch of flukes to dist. end of vent. grooves

Range of Values	1941				1952				Range of Values	1941					1952			
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20
41					1			1	41				2	2			2	
42		3		3	1			2	42				1	1			2	
43						1	3	4	43			1	1	2	1			
44			1	1	2	2	1	5	44			1		1	2		1	1
45		2		2		5	1	6	45	1				1			1	2
46	2			2	1		1	2	46		2			2		1		1
47			1	1	1	1	1	3	47									
48						2		2	48		1			1				
Total	2	5	2	9	6	11	8	25	Total	1	3	2	4	10	2	3	6	4
Mean Value	46.0	43.2	45.5	44.33	44.0	45.4	44.1	44.64	Mean Value	45.0	46.7	43.5	41.8	43.93	43.5	44.7	42.5	45.0
Stand. Devi.				1.83				1.83	Stand. Devi.					2.21				

0.5. In other words, the positive correlations in the nos. 3, 5 and 22 and the negative one in the nos. 8 and 10 are seen with the growth of the body. In other measurements, namely nos. 6, 7, 13, 14, 15, 17 and 19, the correlation with the body length is seemed rather little.

As regards the northern Pacific fin whales the absolute values of the coefficients are less than 0.5 and little correlation with the body length are recognized in nos. 3, 5, 8, 10 and 22. Besides the same tendency is also seen on the measurements in which a little correlation



Table II. (cont.)

A. Males

B. Females

13. Centre of anus to centre of repr. aperture

Range of values	1941				1952				Range of Values	1941					1952						
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.		
.5		1		1			2	2	2.0				2	2	1				1		
.0		1		1	2	5		7	2.5	1			1	2	1	2			3		
.5		1		1	1	3	5	9	3.0		2	1	1	4	1	2	3	4	10		
.0			1	4	2	2	1	5	3.5		1	1		2							
.5	1			1	1	1		2	4.0							1			1		
.0			1	1																	
.5	1			1																	
Total	2	6	2	10	6	11	8	25	Total	1	3	2	4	10	2	3	6	4	15		
Mean value	8.0	6.5	7.5	7.00	6.7	6.5	6.5	6.46	Mean Value	2.5	3.2	3.3	2.4	2.80	2.5	2.8	3.0	3.0	2.90		
Stand. Devi.				0.84				0.53	Stand. Devi.						0.51						0.42

14. Vertical height of dorsal fin

Range of values	1941				1952				Range of Values	1941					1952						
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.		
.6			1	1	1			1	1.4			1		1							
.8	1	1		2	1		1	1	1.6												
.0					1	3	4	8	1.8		1		1	2							
.2		1		1	3	4	2	9	2.0		1			1	1				1		
.4		1		1		3		3	2.2				1	1					7		
.6	1	1		2		1	1	2	2.4	1		1		2		1		1	2		
.8					1			1	2.6						1		2		3		
									2.8							1			1		
									3.0		1			1							
Total	2	4	1	7	6	11	8	25	Total	1	3	2	2	8	2	3	6	3	14		
Mean value	2.2	2.3	1.6	2.14	2.2	2.2	2.1	2.18	Mean Value	2.4	2.3	1.9	2.0	2.15	2.1	2.4	2.4	2.3	2.34		
Stand. Devi.				0.38				0.25	Stand. Devi.						0.46						0.22

with the body length were seen in the whales in the Japanese waters. This endorses the fact stated in the section (I), that is, the proportion of the head and caudal regions reach to the extremities at a definite body length. Such trend are also recognized in the Antarctic whales (Mackintosh and Wheeler, 1929), but the further discussion on this point will be stated in the next section. Only the comparison between the northern Pacific and the Japanese coastal waters is discussed in the present section.

Table II. (cont.)

## A. Males

## B. Females

## 17. Anterior end of lower border to tip of flipper

Range of Values	1941				1952				Range of Values	1941					1952				
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	
9.0		1		1					10.0		1			1				1	
9.5									10.5									1	
10.0									11.0			1	1	2		1	1	1	
10.5						1		1	11.5			1	1	1	2	3		1	
11.0		1		1	1	2	1	4	12.0			1	1	2	2	1			
11.5		1	1	2	1	4	1	6	12.5		2			2			1	1	
12.0	1		1	2	1	1	4	6	13.0	1			1	2					
12.5		1		1	1	3	2	6	Total	1	3	2	4	10	2	3	6	4	
13.0	1	1		2				2	Mean Value	13.0	11.7	11.5	11.9	11.85	12.0	11.3	11.8	11.5	
13.5					2			2	Stand. Devi.					0.93					
Total	2	5	2	9	6	11	8	25	Mean Value	13.0	11.7	11.5	11.9	11.85	12.0	11.3	11.8	11.5	
Mean Value	12.5	11.4	11.8	11.72	12.3	11.6	11.9	11.90	Stand. Devi.					0.93					
Stand. Devi.				1.16				0.74											

## 19. Greatest width of flipper

Range of Values	1941				1952				Range of Values	1941					1952				
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	
2.3					1			1	2.5					1				1	
2.4					1	1		2	2.6				1	1				1	
2.5					1	1		1	2.8		1			1	2	1	1	1	
2.6					1	1		2	2.9		1		1	2		1	3	1	
2.7					1	1		2	3.0		1		1	2		1	2	1	
2.8		1		1	1	2	2	5	3.1					2		1	2	1	
2.9	1	2		3	1	1	2	4	3.2	1				1		1			
3.0	1		1	2	1	3	2	5	3.3			1	1	2					
3.1		1		1			1	1	Total	1	3	1	4	9	2	3	6	4	
3.2		1	1	2		2		2	Mean Value	3.2	2.9	3.3	3.0	2.92	2.8	3.0	2.9	2.8	
3.3					1		1	2	Stand. Devi.					0.19					
3.4		1		1					Mean Value	3.2	2.9	3.3	3.0	2.92	2.8	3.0	2.9	2.8	
Total	2	6	2	10	6	11	8	25	Stand. Devi.					0.19					
Mean Value	3.0	3.1	3.1	3.04	2.8	2.9	3.0	2.88											
Stand. Devi.				0.17				0.24											

As stated already the proportions of nos. 3 and 22 of the coastal finbacks increase with the body length, but this increasing trend ceases at the body length of 18 or 19 metres, as was the case in the northern

Table II. (cont.)

A. Males

B. Females

20. Head length, condyle to tip

22. Skull length, condyle to premaxilla

Range of values	1941 (20)				1952 (22)				Range of Values	1941					1952									
	17	18	19	To.	17	18	19	To.		17	18	19	20	To.	17	18	19	20	To.					
23.5					2	1		3	24.5	1				1				1	1					
24.0						1	1	2	25.0				2	2	1			1	2					
24.5		1		1		1	1	2	25.5							4		1	5					
25.0	1	1			1	1	2	4	26.0			1	1	2		3			3					
25.5		1		1		3	1	4	26.5						1				1					
26.0					1	3	3	7	27.0							2	1		3					
26.5		1		1	1	1		2	27.5															
27.0					1			1	28.0		1			1										
<b>Total</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>11</b>	<b>8</b>	<b>25</b>	<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>15</b>					
<b>Mean Value</b>	<b>25.0</b>	<b>25.4</b>	<b>—</b>	<b>25.30</b>	<b>25.3</b>	<b>25.3</b>	<b>25.3</b>	<b>25.26</b>	<b>Mean Value</b>	<b>24.5</b>	<b>—</b>	<b>27.0</b>	<b>25.3</b>	<b>25.91</b>	<b>25.8</b>	<b>26.0</b>	<b>26.0</b>	<b>25.5</b>	<b>25.84</b>					
<b>Stand. Devi.</b>					<b>0.68</b>				<b>Stand. Devi.</b>						<b>1.09</b>									

Pacific, showing the nearly same percentage against the body length. Also the decreasing trend of no. 10 is not seen at the body length of 18 or 19 metres in females, and its value approaches to that of the northern Pacific. Any remarkable differences between those in the both areas are not recognized on the whole number of measurements except no. 8 for males in which a higher value is seen in the coastal waters than the other.

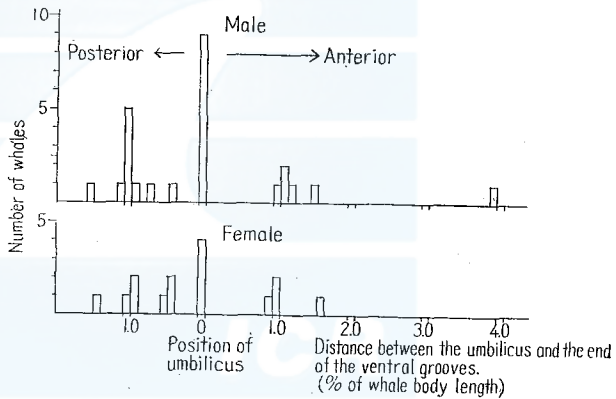


Fig. III. Position of the end of the ventral grooves against the umbilicus.

(III) Comparison between the northern Pacific and Antarctic fin whales: According to Mackintosh and Wheeler, the proportions of various parts representing the head and caudal regions increase or decrease with the growth of the body and reach to the extreme values at the body length of 22 or 23 metres and 19 or 20 metres in the South Georgian and in the South African fin whales, respectively. As the sexual maturities

Table III. a. Variation of the body proportions according to the growth of the fin whales taken from the adjacent water of Japan

% of body length	Male						% of body length	Female							
	15	16	17	18	19	Total		15	16	17	18	19	20	21	Total
3.							3.								
16.0	2					2	16.0		1						1
16.5							16.5								
17.0	3					3	17.0	2							2
17.5		1	1	1		3	17.5	3		1	1				5
18.0				1	1	2	18.0				2				2
18.5			1	3		4	18.5				2			1	3
19.0			1			1	19.0			2	2				4
19.5							19.5			1	2	1			4
							20.0			1					1
Total	5	1	3	5	1	15	Total	5	1	5	3	6	1	1	22
Mean Value	16.6	17.5	18.3	18.2	18.0		Mean Value	17.3	16.0	19.0	17.8	19.0	19.5	18.5	
5.							5.								
18.5	1					1	17.0								
19.0	2		1			3	17.5								
19.5							18.0								
20.0			1			1	18.5	1		1					2
20.5	2					2	19.0	2			1				3
21.0			1	2		3	19.5		1						1
21.5				1		1	20.0	1		2					3
22.0		1		1		2	20.5			1	3	1			3
22.5							21.0				3				6
23.0							21.5	1							1
23.5					1	1	22.0				1				1
							22.5								
Total	5	1	3	4	1	14	23.0				1				1
Mean Value	19.5	22.0	20.0	21.4	23.5		23.5							1	1
							24.0								
Total	5	1	5	3	6	1	Total	5	1	5	3	6	1	1	22
Mean Value	19.8	19.5	20.4	19.7	21.4	20.5	Mean Value	19.8	19.5	20.4	19.7	21.4	20.5	24.0	
6.							6.								
37	1	1	1			3	37	2		1					3
38							38	2	1						3
39							39			1	1	3			5
40			1	1	1	3	40		2	1	2	1			5
41	2					2	41		1	1	1				3
42	1			1		2	42						1		1
43			1	2		3	43	1	1						2
Total	4	1	3	4	1	13	Total	5	1	5	3	6	1	1	22
Mean Value	40.3	37.0	40.0	42.0	40.0		Mean Value	38.6	38.0	40.6	39.0	39.7	40.0	42.0	

Table III. a. (cont.)

% of body length	Male						% of body length	Female								
	15	16	17	18	19	Total		7.	15	16	17	18	19	20	21	Total
7.							7.									
2.5	1					1	3.0				1					1
3.0				1		1	3.5			1				1		2
3.5			1			1	4.0	1		1						4
4.0	2			2	1	6	4.5	3	1	3	2	1	1			11
4.5	2	1		1		4	5.0					3				3
Total	5	1	2	4	1	13	Total	4	1	5	3	6	1	1		21
Mean Value	3.9	4.5	3.8	3.9	4.0		Mean Value	4.4	4.5	4.2	4.0	4.7	4.0	3.5		
8.							8.									
23.0	1			1		2	19.5					1				1
23.5	1			1		2	20.0									
24.0						0	20.5							1		1
24.5	1		1	2	1	3	21.0					1				1
25.0			2	2		4	21.5						1			
25.5	1					1	22.0									
26.0	1			1		2	22.5	1		2	1					4
Total	5	0	3	5	1	14	23.0	1		1	1	2				5
Mean Value	24.5	—	24.8	24.5	24.5		23.5				1					2
							24.0			1	1					1
							24.5					1				1
							25.0		1							1
							25.5	1		1						2
							26.0									
							26.5	1								1
							27.0									
Total	4	1	5	3	5	1	Total	4	1	5	3	5	1	1		20
Mean Value	24.4	25.0	23.5	23.2	22.2	21.5	Mean Value	24.4	25.0	23.5	23.2	22.2	21.5	20.5		
10.							10.									
27.0				1		1	27.0					1				1
27.5				1	1	2	27.5			1		1		1		3
28.0			1	1		2	28.0			1	2					3
28.5			1	2		3	28.5			1	1	1	1			4
29.0	1					1	29.0	2				2				4
29.5	2	1	1			4	29.5	2		1		1				4
30.0							30.0	1								1
30.5	2					2	30.5									
Total	5	1	3	5	1	15	31.0			1						1
Mean Value	29.8	29.5	28.7	27.9	27.5		Total	5	0	5	3	6	1	1		21
							Mean Value	29.4	—	28.9	28.2	28.4	28.5	27.5		



Table III. a. (cont.)

% of body length	Male					
	15	16	17	18	19	Total
14.						
1.8					1	1
2.0	1		1	1		3
2.2			1	1		2
2.4	1		1	1		3
2.6	1			1		2
2.8	1		1	1		3
3.0						
3.2						
3.4		1				1
Total	4	1	3	5	1	14
Mean Value	2.5	3.4	2.4	2.4	1.8	

% of body length	Female							
	15	16	17	18	19	20	21	Total
14.								
1.4					1			1
1.6								
1.8	2		1		3		1	7
2.0				1				1
2.2			1	1		1		3
2.4	1		1	1				3
2.6	2		1					3
2.8					1			1
3.0					1			1
Total	5	0	4	3	6	1	1	20
Mean Value	2.2	—	2.3	2.2	2.1	2.2	1.8	

15.	15	16	17	18	19	Total
3.5			2	1		3
4.0			1	3		4
4.5	1					1
5.0	1				1	2
5.5	1			1		2
6.0	2	1				3
Total	5	1	3	5	1	15
Mean Value	4.2	5.5	3.7	4.2	5.0	

15.	15	16	17	18	19	20	21	Total
3.0					1		1	2
3.5					1			1
4.0	2		1	1				4
4.5	1		1	2	2			6
5.0			1		1	1		3
5.5	1		2					3
6.0	1							1
Total	5	0	5	3	5	1	1	20
Mean Value	4.8	—	4.9	4.3	4.1	5.0	3.0	

17.	15	16	17	18	19	Total
9.0			1			1
9.5						
10.0					1	1
10.5		1				1
11.0	2		1			3
11.5				2		2
12.0	1					1
12.5	1			1		2
13.0			1			1
13.5	1			1		2
Total	5	1	3	4	1	14
Mean Value	12.0	10.5	11.0	12.3	10.0	

17.	15	16	17	18	19	20	21	Total
10.0			1					1
10.5	2							2
11.0	1		2		2	1	1	7
11.5			1		1			2
12.0	1		1	1	3			6
12.5	1			2				3
Total	5	0	5	3	6	1	1	21
Mean Value	11.3	—	11.1	12.3	11.6	11.0	11.0	

Table III. a. (cont.)

% of body length	Male					
	15	16	17	18	19	Total
19.						
2.1			1			1
2.2						
2.3						
2.4						
2.5	1	1				2
2.6	2					2
2.7				1		1
2.8	1		1		1	3
2.9						
3.0	1					1
3.1				1		1
3.2				2		2
3.3			1			1
Total	5	1	3	4	1	14
Mean Value	2.7	2.5	2.7	3.1	2.8	

% of body length	Female							
	15	16	17	18	19	20	21	Total
19.								
2.5							1	1
2.6								
2.7	1							1
2.8	4							7
2.9			1	1	2	1		4
3.0			1		2			3
3.1			1	1	1			3
3.2				1	1			2
Total	5	0	5	3	6	1	1	21
Mean Value	2.8	—	2.9	3.1	3.0	2.9	2.5	

21.	15	16	17	18	19	Total
10.0	1					1
10.5						
11.0	2	1	2	2		7
11.5	2			1		3
12.0				1	1	2
12.5			1			1
Total	5	1	3	4	1	14
Mean Value	11.0	11.0	11.5	11.4	12.0	

21.	15	16	17	18	19	20	21	Total
10.0	2	1			1			4
10.5	1			1		1	1	4
11.0	1				3			4
11.5			4	1				5
12.0			1					1
12.5				1				1
13.0								
13.5					1			1
Total	4	1	5	3	5	1	1	20
Mean Value	10.4	10.0	11.6	11.5	11.3	10.5	10.5	

22.	15	16	17	18	19	Total
22.0	1					1
22.5		1				1
23.0	1		1			2
23.5						
24.0	1					1
24.5	2		2			4
25.0						
25.5				1		1
26.0				2	1	3
26.5				1		1
Total	5	1	3	4	1	14
Mean Value	23.6	22.5	24.0	26.0	26.0	

22.	15	16	17	18	19	20	21	Total
22.5		1						1
23.0	1							1
23.5	1		1					2
24.0	1							1
24.5	1			2				3
25.0					1			1
25.5			2	1	4	1		8
26.0			2					2
26.5								
27.0							1	1
Total	4	1	5	3	5	1	1	20
Mean Value	23.8	22.5	25.3	24.8	25.4	25.5	27.0	



Table III. b. Variation of the body proportions according to the growth of the northern Pacific fin whales

% of body length	Male				% of body length	Female				
	17	18	19	Total		17	18	19	20	Total
<b>3.</b>					<b>3.</b>					
16.5		1		1	17.5	1		2	1	4
17.0		2		2	18.0	1				1
17.5	2	1	2	5	18.5	1	1	2	3	7
18.0	1	3	2	6	19.0		2	2	1	5
18.5	3	3	1	7	19.5		2	2	1	5
19.0		4	3	7	20.0				1	1
19.5		1	2	3	20.5				1	1
20.0	1	1		2	21.0					
20.5	1			1	21.5					
21.0		1		1						
<b>Total</b>	<b>8</b>	<b>17</b>	<b>10</b>	<b>35</b>	<b>Total</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>8</b>	<b>24</b>
<b>5.</b>					<b>5.</b>					
19.0	1			1	19.5	1				1
19.5	1	5	2	8	20.0					
20.0	1	2	1	4	20.5	1	2	2	2	7
20.5	2	1	2	5	21.0	1	1	2	3	7
21.0		2	2	4	21.5		2	2	2	6
21.5	1	5	2	8	22.0		1	1	1	3
22.0		2	1	3	22.5					
22.5	2			2	23.0			1		1
<b>Total</b>	<b>8</b>	<b>17</b>	<b>10</b>	<b>35</b>	<b>Total</b>	<b>3</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>25</b>
<b>6.</b>					<b>6.</b>					
36					39				1	1
37					40		2	1		3
38					41		2	2	2	6
39		1		1	42	2	1	3	2	8
40	2	1	1	4	43	1			2	3
41		4	1	5	44			1		1
42	2	3	2	7						
43	1	3	2	6	<b>Total</b>	<b>3</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>22</b>
44	2	2	1	5						
45			2	2						
46		1		1						
47										
<b>Total</b>	<b>7</b>	<b>15</b>	<b>9</b>	<b>31</b>						

Table III. b. (cont.)

% of body length	Male				% of body length	Female				
	17	18	19	Total		17	18	19	20	Total
<b>10.</b>					<b>10.</b>					
25.0	1			1	25.5			2		2
25.5					26.0			1		1
26.0			1	1	26.5		1	2		3
26.5	2	1	3	6	27.0				1	1
27.0	2	2	2	6	27.5		1	1	5	7
27.5		6	1	7	28.0	1	1	1	1	4
28.0	1	4	1	6	28.5					
28.5	1	2		3	29.0	1	2	1		4
29.0			1	1	29.5					
29.5	1	1	1	3	30.0		1			1
30.0		1		1	30.5	1			1	2
<b>Total</b>	<b>8</b>	<b>17</b>	<b>10</b>	<b>35</b>	<b>Total</b>	<b>3</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>25</b>
<b>11.</b>					<b>11.</b>					
42			1	1	41			2		2
43		2	2	4	42			1		1
44	3	1	3	7	43			1		1
45	2	5	1	8	44	1	1	1	2	5
46		3	2	5	45	1	2	1	2	6
47	1	1	1	3	46			1	1	2
48	1	1		2	47	1	2			3
<b>Total</b>	<b>7</b>	<b>13</b>	<b>10</b>	<b>30</b>	<b>Total</b>	<b>3</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>20</b>
<b>12.</b>					<b>12.</b>					
41	1			1	41			2	2	4
42	1	3	1	5	42			2	1	3
43		1	3	4	43	1		1	1	3
44	2	2	2	6	44	1	2	2	1	6
45		7	1	8	45	1		1	2	4
46	3		1	4	46		3		1	4
47	1	1	2	4	47					
48		2		2	48		1			1
<b>Total</b>	<b>8</b>	<b>16</b>	<b>10</b>	<b>34</b>	<b>Total</b>	<b>3</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>25</b>
<b>15.</b>					<b>15.</b>					
3.0			1	1	3.0				1	1
3.5	1			1	3.5			2	1	3
4.0	1	1	1	3	4.0					
4.5		5	2	7	4.5		1			1
5.0	2	2	1	5	5.0	1	1	2		4
5.5	2	1		3	5.5	1		1	1	3
6.0		1	2	3	6.0				1	1
6.5		1	1	2	6.5		1	1		2
<b>Total</b>	<b>6</b>	<b>11</b>	<b>8</b>	<b>25</b>	<b>Total</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>15</b>

Table III. b. (cont.)

% of body length	Male				% of body length	Female				
	17	18	19	Total		17	18	19	20	Total
<b>21.</b>					<b>21.</b>					
10.5	1		3	4	10.5				1	1
11.0	2	2	1	5	11.0	1	1		1	3
11.5	2	3	1	6	11.5		1	2	2	5
12.0	1	6	3	10	12.0		1	4		5
					12.5	1				1
<b>Total</b>	<b>6</b>	<b>11</b>	<b>8</b>	<b>25</b>	<b>Total</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>15</b>

% of body length	Male				% of body length	Female				
	17	18	19	Total		17	18	19	20	Total
<b>22.</b>					<b>22.</b>					
23.5	2	1		3	24.5				1	1
24.0		1	1	2	25.0	1				1
24.5		1	1	2	25.5			4	2	6
25.0	1	1	2	4	26.0		3			3
25.5		3	1	4	26.7	1				1
26.0	1	3	3	7	27.0			2	1	3
26.5	1	1		2	<b>Total</b>	<b>2</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>15</b>
27.0	1			1						
27.5										
<b>Total</b>	<b>6</b>	<b>11</b>	<b>8</b>	<b>25</b>						

are attained at the body length of 19.5 metres in males and 20 metres in females, it may be concluded from these facts that the extreme values of proportions are reached after the sexual maturities are attained. Such trends are also seen in the northern Pacific. H. Sakiura, K. Ozaki and K. Fujino (1953) stated that the sexual maturities are attained at the body length of 57 or 59 ft. (17.40 or 18.10 metres) in male and 61 ft. (18.60 metres) in female in most of the northern Pacific fin whales. These body lengths are nearly the same or slightly smaller than the lengths at which the proportion of head region reaches to its maximum, namely 18 or 19 metres. This fact may be explained from the assumption that the advancing velocities of the ossification of the cervical and caudal vertebrae are different from each other after the sexual maturities are attained.

Comparing the northern Pacific and the Antarctic fin whales, keeping in mind the above consideration, it is noted that the differences in the head and caudal regions are only recognized after the former reached its body length of 18 or 19 metres. In other items, namely nos. 8, 14, 15, 17, 19 and 21, some differences are seemed to exist between both areas as shown in Figure IV. It may be seen from this figure that the northern Pacific fin whales have (1) smaller and more posteriorly situated

Table IV. Correlation coefficient  $r$  between the body proportions  $y$  and the body length  $x$ 

Measurement	northern Pacific		Adjacent waters of Japan	
	Male	Female	Male	Female
No. 3	0.0	0.2	0.8	0.6
" 5	0.0	0.3	0.9	0.6
" 6	0.1	0.0	0.3	0.3
" 7	-0.2	-0.2	0.0	-0.1
" 8	-0.2	-0.2	-0.01	-0.6
" 10	0.0	-0.2	-0.8	-0.5
" 11	-0.2	-0.3	-0.8	-0.3
" 12	0.0	-0.3	-0.9	-0.4
" 13	-0.2	0.0	0.1	-0.3
" 14	-0.2	-0.1	-0.3	-0.2
" 15	0.1	-0.3	-0.5	-0.4
" 17	-0.2	-0.1	-0.1	0.1
" 19	0.3	-0.1	0.1	0.4
" 21	-0.1	-0.3	0.4	0.1
" 22	0.0	-0.1	0.7	0.7

dorsal fin (nos. 8, 14 and 15). (2) the bigger flippers (nos. 17 and 19) and (3) the slightly wider skull (no. 21) than the Antarctic. However, no differences are found in no. 20 (or 22) which represents the head (or skull) length. So it can be concluded that the Antarctic finback has the lankier skull (Fig. V). This difference in the width of skull seems to be characteristic and can be regarded as racial, so it will be stated later in detail.

(IV) Correlation between the number of corpora lutea and growth of various parts of body: As pointed out in the sections II and III, the remarkable variations of the rate of growth on the head and caudal regions are recognized after the whale attained its sexual maturity. In relation to this trend Wheeler (1930) stated on the Antarctic finbacks "(1) Ankylosis of the epiphyses starts from both ends of the vertebral column, but anteriorly it does not proceed much beyond the cervical series, Ankylosis is completed among the anterior thoracic vertebrae and (2) complete ankylosis—that is, physical maturity—bears little relation to length, but is found when more than fifteen corpora lutea are present in the ovaries."

The relation between the number of corpora lutea and growth of various parts of the body is shown in Fig. VI, separately those in the northern Pacific in 1952 and those in the Antarctic in 1948-51, in which some differences according to the areas are shown. It may be said from this figure that the Antarctic females show the larger value than the

northern Pacific in all items. It should be left in future investigation that how many corpora lutea should be accumulated when the growth of the various parts of the body ceases, because of the scantiness of the data at present.

Correlation coefficients of "skull length" to the number of corpora lutea are 0.6 in 1948-51 Antarctic and 0.7 in 1952 northern Pacific females. This shows that the length of skull has a positive correlation with the number of corpora lutea, and has the smaller variances than the other items. In other words, the actual length of skull is closely related with the age of whale.

(V) Correlation between the number of corpora lutea and the proportions of skull: As stated in sections III and IV, shape of the skull

seems to be very useful as a indicator for the study of the problems of the races. So I should like to discuss here still more on this problem using the data obtained in 1948-51 Antarctic and 1952 northern Pacific, though the data are not sufficient yet.

The measurements of the skull were made on the following items:

- no. 21 greatest width of the skull
- no. 22 skull length, condyle to tip of premaxilla
- no. 26 distance between the tips of the both pterygoids

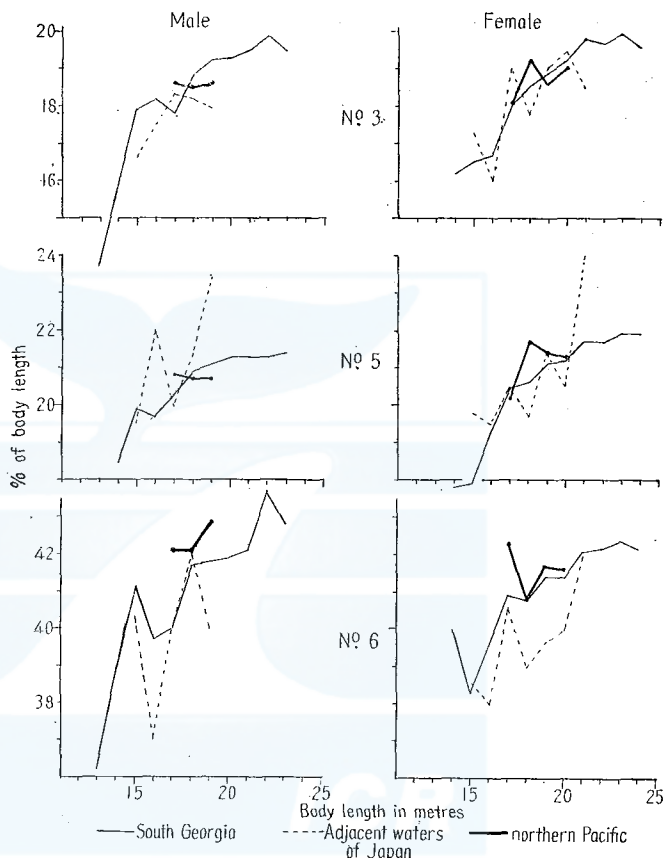


Fig. IV. Comparison of the body proportions between the northern Pacific, Adjacent Waters of Japan and Antarctic Fin whales.

- no. 27 length of the rostrum  
no. 28 width of the rostrum at base

Table V. Measurements of skull proportions of the mature female fin whales

Measurement number	Parts of skull, examined	northern Pacific in 1952	Antarctic in 1949~1951
21	Greatest width of skull	11	16
22	Skull length, condyle to tip of premaxilla	11	16
26	Distance between the tips of both pterygoid	11	7
27	Length of rostrum	11	6
28	Width of rostrum at the base.	11	6

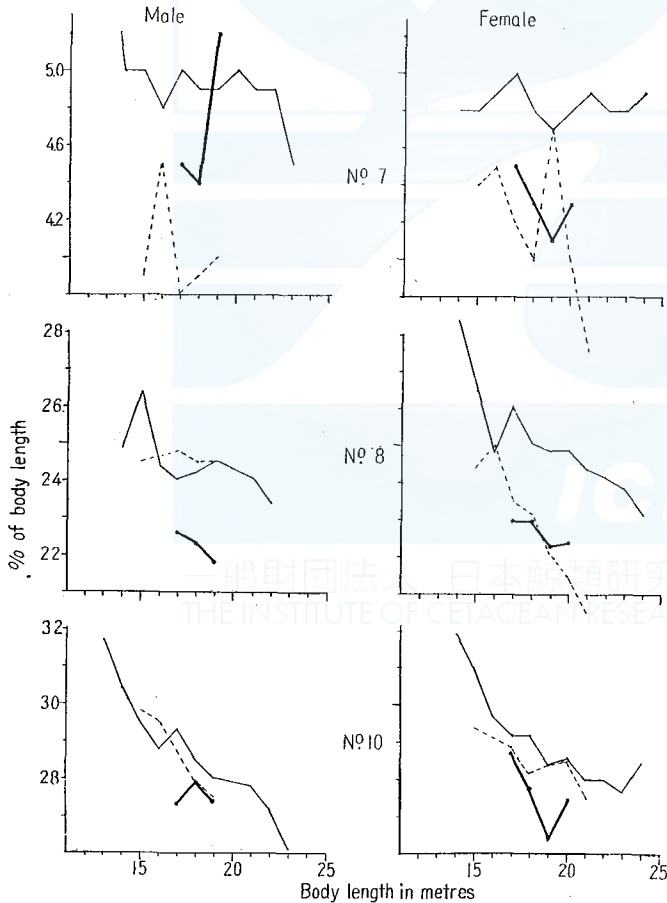


Fig. IV. (cont.)

The correlations between the number of corpora lutea and proportions of various parts against the skull length is shown in Figure VII. According to this figure, in 27/22 and 28/22 no differences are recognized, but in 21/22 and 26/22 the northern Pacific shows the larger value than the Antarctic, that is to say, the Antarctic females have the larger skull than the northern Pacific females, even possessing the equal number of corpora lutea.

As regards the variation according to the accumulation of corpora lutea, 21/22 of the Antarctic

female reaches to its maximum at the numbers between 10 and 15 of corpora lutea and then turns to decreasing. From this fact, the following may be drawn regarding the Antarctic female fin whale:

(1) Growth of the skull in length will be continued even after the number of corpora lutea reached to 10 to 15.

(2) Growth of the skull in width becomes very slow or cease when the number of corpora lutea reached to 10 to 15.

From the observation of ossification of vertebrae, Wheeler (1930) concluded that the physical maturity of the Antarctic female fin whale is attained at the number of corpora lutea of 15. Considering this fact together with the fact above stated, it may be thought that the complete cessation in growth of the skull

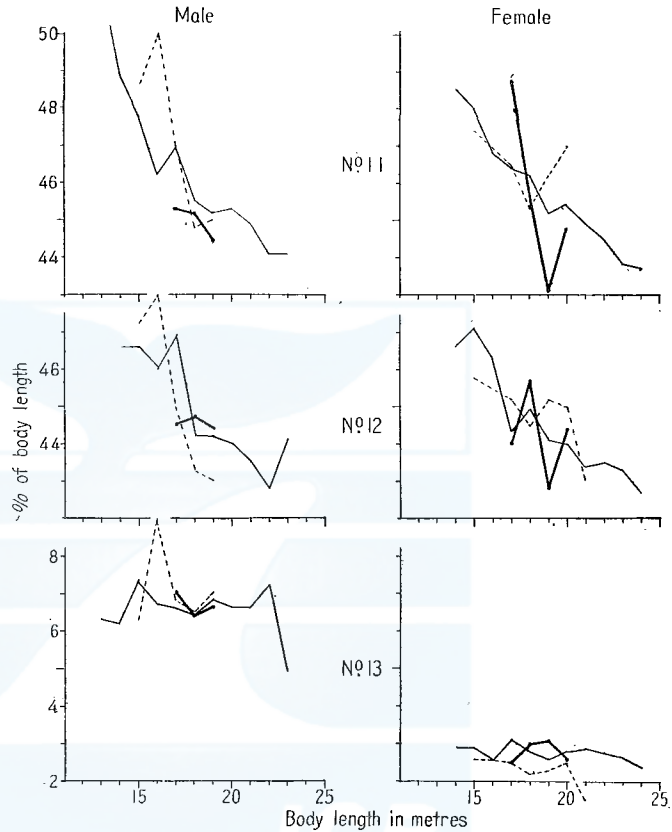


Fig. IV. (cont.)

is attained after the ossification of the vertebrae is completed. As regards the northern Pacific finbacks the discussions on this point should be left to the future investigation owing to the scantiness of materials.

#### Number of ventral grooves

Two times of the number of ventral grooves on one side between the axilla of the flipper and mid-ventral line are deemed as the "number of ventral grooves". Comparison between the northern Pacific and the Antarctic (data given by Mackintosh and Wheeler, 1929) are shown in

Table VI. Frequencies of the number of ventral grooves.\*

No. of Ventral Grooves	Males			Females		
	n. Pacific	S. Georgia	S. Africa	n. Pacific	S. Georgia	S. Africa
50~60	1			1		
60~70	13	1		10		
70~80	9	10	2	2	5	1
80~90	2	7	3	2	12	10
90~100		4	3		8	2
100~110		3			6	
110~120					3	
Total	25	25	8	15	34	13
Average	65	84	85	63	91	85
Range	58~84	68~106	76~94	50~86	72~114	78~98
Standard Deviation	7.0	—	—	7.9	—	—

\* S. Georgia's and S. Africa's were cited from the Discovery Reports Vol. I, p. 358

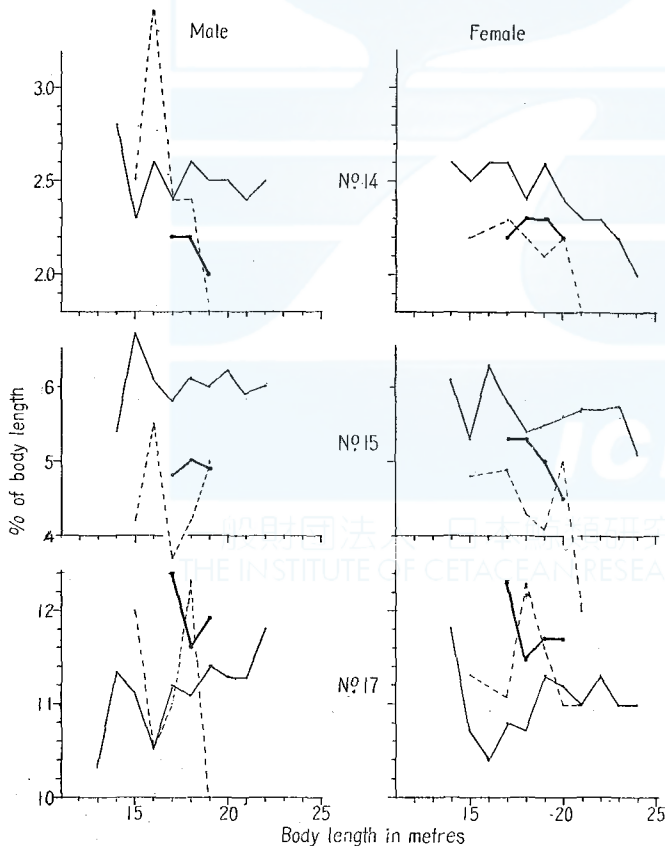


Fig. IV. (cont.)

Table VI. According to this table, the northern Pacific has fewer ventral grooves than the latter. However, the different way of counting from that followed by Discovery Investigations was used by us, so the definite conclusion may not be reached here.

### Summary

(I) Measurements of body proportions were carried out by the methods which was used by Mackintosh and Wheeler. Analysing the data obtained according to the different areas



the following conclusions have been reached, though the final conclusions will be reached in future when more sufficient data are available.

(1) No remarkable differences are recognized between the Japanese coastal fin whales captured during the years from 1949 to 1951 and those in the northern Pacific in the years of 1941 and 1952.

(2) Between the northern Pacific and the Antarctic fin whales,

(a) Any differences on "skull length" and "distance from tip of snout to centre of eye", which represent the head region, were not recognized among whales of which body length is less than 18 or 19 metres. However, after the attaining of sexual maturity in the northern Pacific whales the value varies each other abruptly according to the rise of body length. That is to

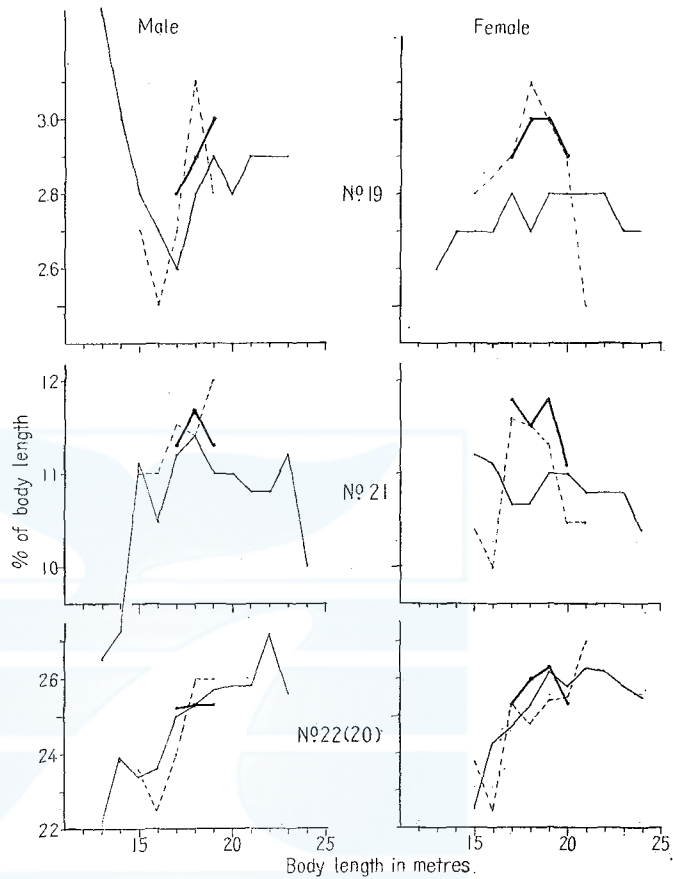


Fig. IV. (cont.)

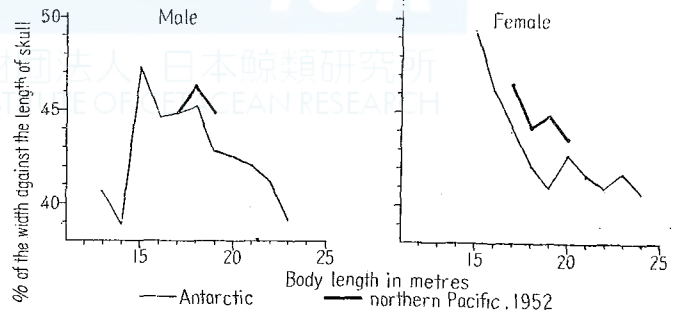


Fig. V. Comparison of the proportion of the greatest width against the length of skull, between the northern Pacific and the Antarctic Fin whales.

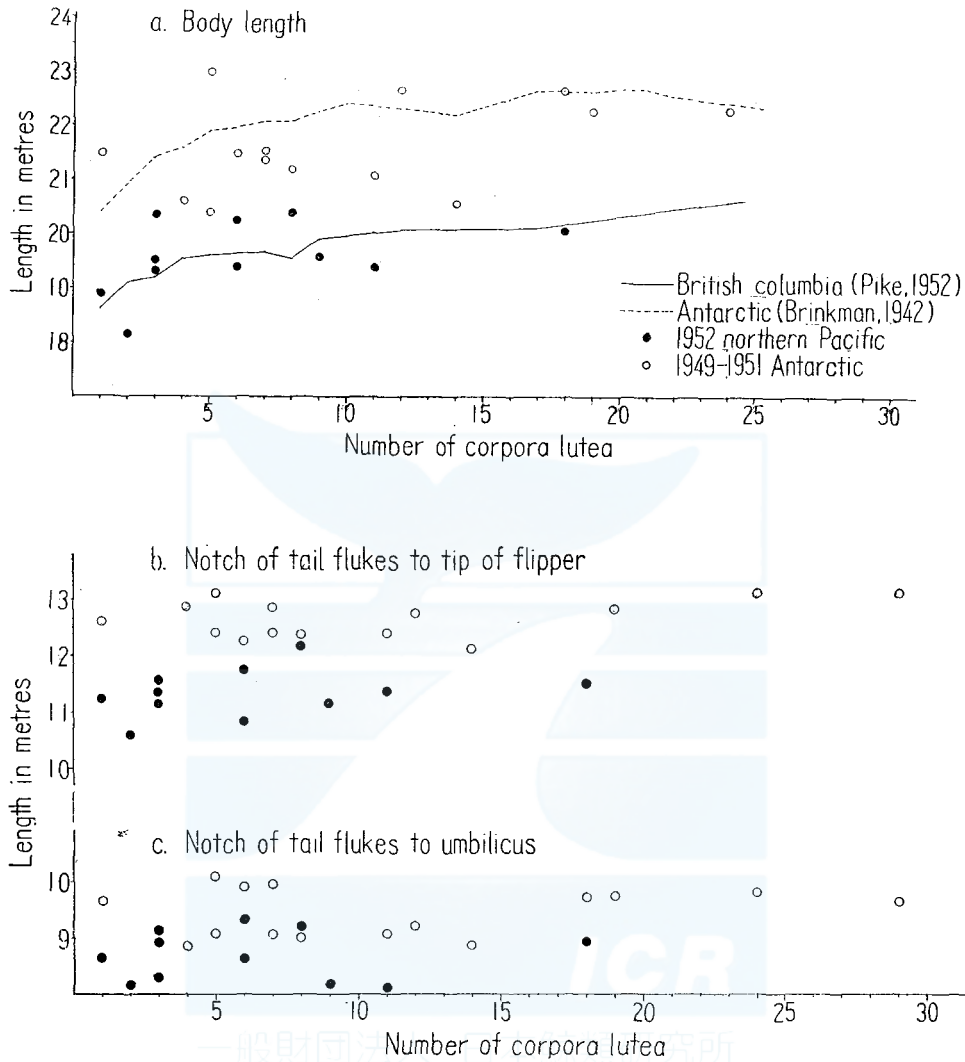


Fig. VI. Correlation between the number of corpora lutea and the dimensions of the various parts of body.

say, the Antarctic finback have a larger head and smaller caudal parts than the other after attaining of the sexual maturity.

(b) As regards the items of nos, 8, 14, 15, 17, 19 and 21, some differences are recognized, that is, the northern Pacific finback possesses more posteriorly situated and smaller dorsal fin, and the bigger flippers. (II) As regards the correlation between number of corpora lutea and the actual length of body dimensions, following results were obtained.

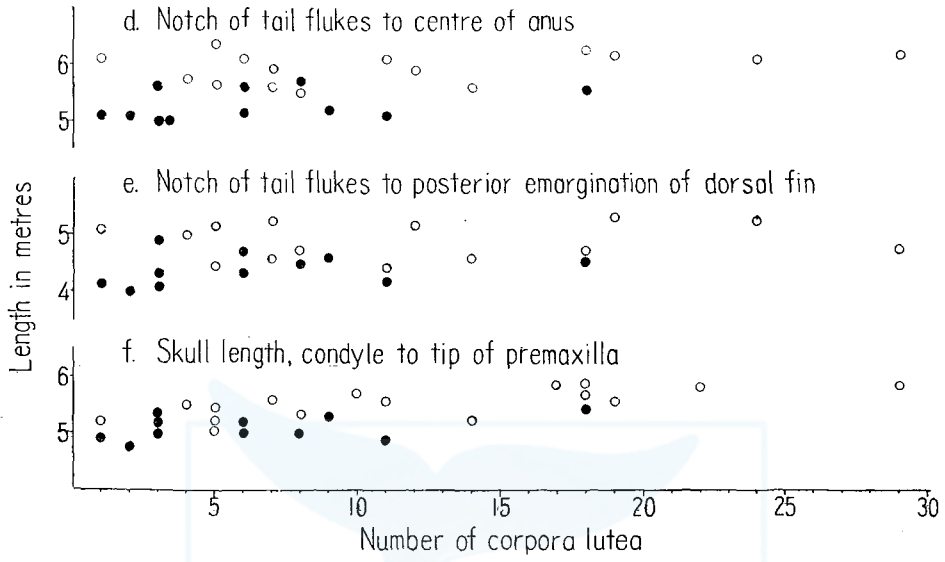


Fig. VI. (cont.)

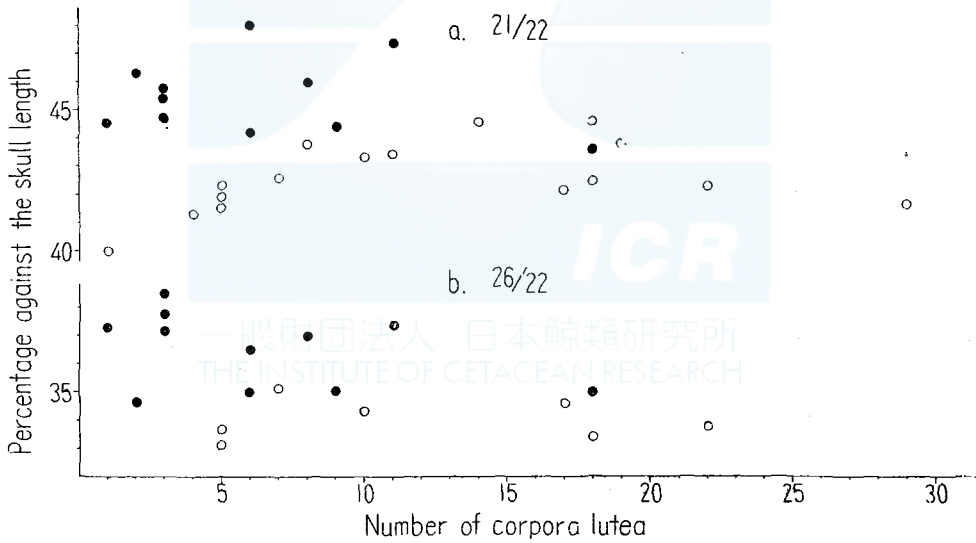


Fig. VII. Correlation between the number of corpora lutea and the growth of the body parts lengths.

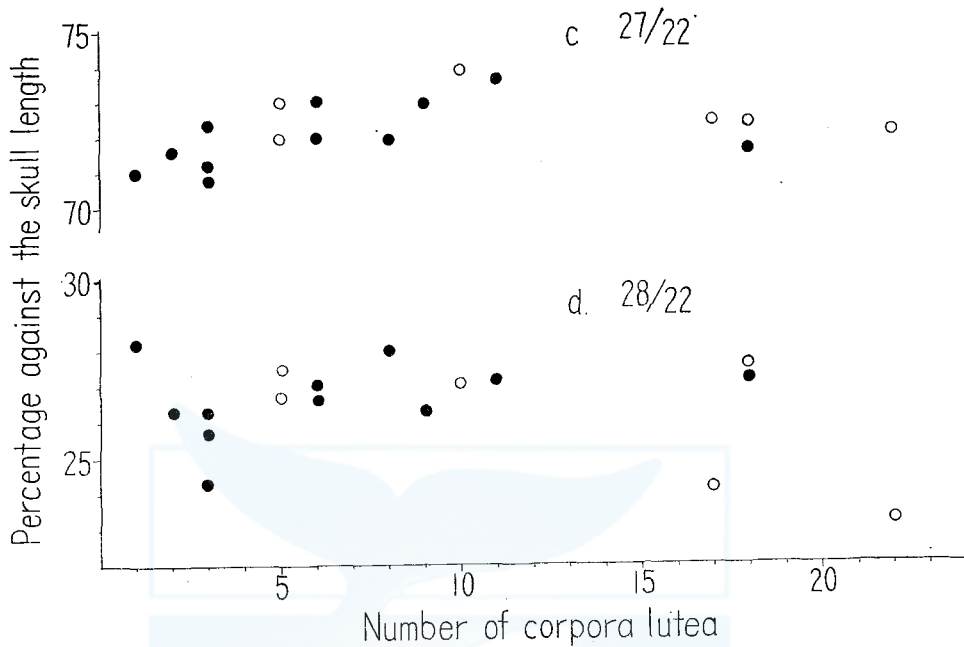


Fig. VII. (cont.)

(1) It is clear that the Antarctic finback is larger in the items of total length, distance from the notch of tail flukes to tip of flipper, distance from the same point to umbilicus, distance from the same point to anus and head length.

(2) In proportions of the rostrum length and its width at base against the skull length, no differences are recognized, but the northern Pacific whale has a wider skull when compared the greatest width of the skull each other, namely more rounded face.

(III) Number of ventral grooves

Two times of the number of ventral grooves on one side between the axilla of the flipper and mid-ventral line are deemed as the "number of ventral grooves", and these are compared with the data in the Antarctic described in the Discovery Reports. It seems that the northern Pacific whales have the fewer number of ventral grooves than the South Georgian and South African fin whales. However, a different way of counting was followed in the northern Pacific, so the definite conclusion may not be reached at present.

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## Appendix A

Measurements of Body Proportions of the Fin whales examined in the northern Pacific, Adjacent Waters of Japan and Antarctic.

Upper figures: actual value in metres

Lower figures: percentages against total length

Measurement No.	1.	Total length, tip of snout to notch of flukes.
		(upper: in meters)
		(lower: in feet)
"	"	3. Tip of snout to blow-hole.
"	"	5. Tip of snout to centre of eye.
"	"	6. Tip of snout to tip of flipper.
"	"	7. Centre of eye to centre of ear.
"	"	8. Notch of flukes to posterior emargination of dorsal fin.
"	"	10. Notch of flukes to centre of anus.
"	"	11. Notch of flukes to umbilicus.
"	"	12. Notch of flukes to end of system of ventral grooves.
"	"	13. Centre of anus to centre of reproductive aperture.
"	"	14. Vertical height of dorsal fin.
"	"	15. Length of base of dorsal fin.
"	"	17. Anterior end of lower border to tip of flipper.
"	"	19. Greatest width of flipper.
"	"	20. Length of severed head from condyle to tip.
"	"	21. Greatest width of skull.
"	"	22. Skull length, condyle to tip of premaxilla.

I. Northern Pacific, Males, 1941 (Cited from the Biological Investigation of the northern Pacific  
whales by Matsura, Y. and Maeda, K., 1942)

Whale No.	Date, killed	1	3	5	6	7	8	10	11	12	13	14	17	19	20
19	Aug. 1	17.40													
		57	18.5	19.7	—	4.7	23.4	28.4	48.8	46.2	7.9	2.6	12.4	3.0	25.0
10	June 28	17.90													
		59	17.6	20.3	42.4	4.7	23.6	29.8	—	46.3	8.6	1.9	13.2	2.9	—
17	July 19	18.10													
		60	18.2	19.9	42.1	4.8	24.4	28.1	—	42.6	7.0	—	—	2.8	24.6
3	June 18	18.30													
		60	17.1	20.7	42.6	4.8	—	28.5	—	45.8	7.3	1.8	11.1	3.2	—
4	"	18.30													
		60	18.8	20.3	46.0	4.5	22.5	29.7	—	45.0	5.9	—	9.2	3.1	25.5
8	"	18.60													
		61	18.4	20.0	—	4.6	24.5	28.1	—	—	7.0	2.4	11.7	2.9	25.3
20	Aug. 14	18.80													
		62	21.2	21.7	43.6	5.0	21.9	27.5	46.3	42.6	6.4	2.3	12.9	2.9	26.5
18	July 25	18.90													
		62	20.2	21.7	43.8	6.6	22.3	27.3	45.3	42.2	6.7	2.6	13.0	3.4	26.5
9	June 25	19.10													
		63	17.6	19.7	—	4.9	—	29.5	47.1	47.1	7.1	—	11.7	3.0	—
12	July 8	19.20													
		63	19.2	21.5	42.7	4.3	21.8	26.8	45.7	44.2	8.0	1.7	12.0	3.2	—

I. Northern Pacific, Females, 1941 (Cited from the Biological Investigation of the northern Pacific  
whales by Matsuura, Y. and Maeda, K., 1942)

Whale No.	Date, killed	1	3	5	6	7	8	10	11	12	13	14	17	19	20
14	July 15	17.00													
		56	18.4	20.5	42.1	4.6	—	30.9	47.9	45.9	2.9	2.5	13.0	3.2	24.8
13	" 10	18.20													
		60	19.3	20.7	41.3	4.2	23.8	30.2	47.2	46.5	3.2	2.1	10.3	2.8	—
1	June 9	18.50													
		61	—	21.0	—	4.6	25.1	29.0	47.2	48.5	3.3	3.0	12.5	3.0	—
7	" 21	18.90													
		62	18.9	20.7	42.5	4.5	23.3	29.2	—	46.7	3.7	1.8	12.7	2.9	—
11	July 6	19.40													
		64	19.7	20.9	40.6	4.5	25.0	29.2	45.2	44.4	3.1	1.4	12.0	3.3	26.4
6	June 20	19.50													
		64	19.9	22.2	—	4.8	21.9	27.5	—	43.1	3.6	2.5	11.0	—	28.0
15	July 15	20.00													
		66	20.5	21.7	43.2	5.2	21.8	27.7	—	41.8	2.4	—	13.0	3.3	—
16	" 18	20.30													
		67	18.5	20.9	—	4.5	—	28.1	45.5	43.1	2.4	1.8	11.6	3.0	25.1
2	June 17	20.60													
		68	19.2	20.6	41.7	4.9	21.6	30.6	—	41.6	3.4	—	12.1	2.6	26.4
5	" 18	20.90													
		69	19.5	21.4	41.7	4.2	22.5	27.0	—	42.0	2.7	2.3	11.3	2.9	25.2

## II. Northern Pacific, Males, 1952

Whale No.	Date killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22	29	
135	Aug. 20	17.28	3.55	3.90	7.65	0.80	3.80	4.70	7.90	7.70	1.10	0.50	0.90	2.40	0.40	—	—	2.05	4.60	62
		57	20.5	22.6	44.3	4.6	22.0	27.2	45.7	44.6	6.4	2.9	5.2	13.9	2.3	—	—	11.9	26.6	—
263	Sept. 10	17.38	3.25	3.65	7.40	0.75	4.00	4.70	7.30	7.20	1.25	0.35	0.90	2.10	0.51	—	—	1.96	4.40	64
		57	18.7	21.0	42.6	4.3	23.0	27.0	42.0	41.0	7.2	2.0	5.2	12.1	2.9	—	—	11.2	25.3	—
281	Sept. 14	17.60	3.25	3.85	7.80	0.80	3.60	4.70	7.80	7.80	1.10	0.40	1.00	2.25	0.48	—	—	2.15	4.60	78
		58	18.5	21.9	44.3	4.5	20.5	26.7	44.3	44.3	6.2	2.3	5.7	12.8	2.7	—	—	12.2	26.1	—
167	Aug. 25	17.70	3.60	4.00	7.70	0.80	4.00	4.80	7.80	7.60	1.30	0.30	0.70	2.40	0.58	—	—	2.10	4.80	68
		58	20.3	22.6	43.5	4.5	22.6	27.1	44.1	42.9	7.3	1.7	4.0	13.6	3.3	—	—	11.9	27.1	—
169	Aug. 25	17.70	3.10	3.40	7.15	0.85	4.30	5.10	8.40	8.40	1.20	0.40	1.00	2.00	0.49	—	—	2.00	4.20	68
		58	17.5	19.2	40.4	4.8	24.3	28.8	47.5	47.5	6.8	2.3	5.6	11.3	2.8	—	—	11.3	23.7	—
38	July 28	17.76	3.25	3.65	7.20	0.80	4.00	4.50	8.00	8.20	1.40	0.40	0.70	2.20	0.45	—	—	1.88	4.25	64
		58	18.3	20.6	40.5	4.5	22.5	25.3	45.0	46.2	7.9	2.3	3.9	12.4	2.5	—	—	10.6	23.9	—
261	Sept. 10	18.05	3.35	3.85	7.30	0.85	3.90	4.90	7.80	8.50	1.20	0.40	1.20	2.25	0.57	—	—	2.20	4.75	64
		60	18.6	21.3	40.4	4.7	21.6	27.1	43.2	47.1	6.6	2.2	6.6	12.5	3.2	—	—	12.2	26.3	—
14	July 22	18.20	3.50	4.00	—	—	0.65	4.00	4.90	7.90	8.10	1.20	0.36	0.90	0.45	—	—	2.25	4.90	60
		60	19.2	22.0	—	—	3.6	22.0	26.9	43.4	44.5	6.6	2.0	4.9	12.6	2.5	—	12.4	26.9	—
170	Aug. 25	18.30	3.30	3.60	7.50	0.80	4.10	5.10	8.90	8.90	1.10	0.40	0.90	2.07	0.55	—	—	2.20	4.70	74
		60	18.0	19.7	41.0	4.4	22.4	27.9	48.6	48.6	6.0	2.2	4.9	11.3	3.0	—	—	12.0	25.7	—
222	Sept. 3	18.30	3.20	3.65	7.20	0.80	4.30	5.20	8.60	8.80	1.20	0.40	0.80	2.00	0.53	—	—	2.20	4.55	72
		60	17.5	19.9	39.3	4.4	23.5	28.4	47.0	48.1	6.6	2.2	4.3	10.9	2.9	—	—	12.0	24.9	—
259	Sept. 10	18.54	3.60	4.00	7.80	0.80	4.00	5.30	8.50	8.40	1.40	0.40	1.10	2.30	0.60	—	—	2.15	4.90	70
		61	19.4	21.6	42.1	4.3	21.6	28.6	45.8	45.3	7.6	2.2	5.9	12.4	3.2	—	—	11.6	26.4	—
276	Sept. 14	18.56	3.65	4.00	8.30	0.85	4.20	5.10	8.50	8.50	1.30	0.50	0.90	2.20	0.55	—	—	2.18	4.90	84
		61	19.7	21.6	44.7	4.6	22.6	27.5	45.8	45.8	7.0	2.7	4.8	11.9	3.0	—	—	11.7	26.4	—
113	Aug. 13	18.61	3.15	3.70	7.65	0.85	4.00	5.20	8.50	8.30	1.20	0.45	0.90	2.10	0.50	—	—	2.10	4.50	76
		61	16.9	19.9	41.1	4.6	21.5	27.9	45.7	44.6	6.4	2.4	4.8	11.3	2.7	—	—	11.3	24.2	—
223	Sept. 4	18.63	3.25	3.70	7.70	0.80	4.30	5.20	8.30	8.10	1.20	0.45	0.90	2.20	0.52	—	—	2.10	4.45	70
		61	17.4	19.9	41.3	4.3	23.1	27.9	44.6	43.5	6.4	2.4	4.8	11.8	2.8	—	—	11.3	23.9	—
288	Sept. 16	18.70	3.50	4.00	7.80	0.80	4.00	5.30	8.50	8.50	1.30	0.40	1.00	2.20	0.56	—	—	2.15	4.70	84
		61	18.7	21.4	41.7	4.3	21.4	28.3	45.5	45.5	7.0	2.1	5.3	11.8	3.0	—	—	11.5	25.1	—



## II. Northern Pacific, Males, 1952 (cont.)

Whale No.	Date, killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22	29
162	Aug. 24	18.90	3.60	4.10	8.55	0.80	4.20	5.70	8.80	8.50	1.20	0.46	1.20	2.40	0.52	—	2.30	4.90	70
		62	19.0	21.7	44.2	4.2	22.2	30.2	46.6	45.0	6.3	2.4	6.3	12.7	2.8	—	12.2	25.9	—
83	Aug. 8	18.94	3.65	4.25	8.25	0.85	4.10	5.25	8.80	8.65	1.15	0.40	0.98	2.25	0.50	—	2.80	4.90	70
		62	19.3	22.4	43.6	4.5	21.6	27.7	46.5	45.7	6.1	2.1	5.2	11.9	2.6	—	12.1	25.9	—
95	Aug. 10	19.10	3.60	3.95	8.70	0.80	3.90	5.00	8.80	8.60	1.30	0.40	0.80	2.35	0.55	—	2.20	4.80	66
		63	18.8	20.7	45.5	4.2	20.4	26.2	46.1	45.0	6.8	2.1	4.2	12.3	2.9	—	11.5	25.1	—
262	Sept. 10	19.20	3.65	4.00	8.40	0.80	4.00	5.10	8.40	8.40	1.30	0.40	1.20	2.35	0.57	—	2.30	5.00	58
		63	19.0	20.8	43.7	4.2	20.8	26.6	43.7	43.7	6.8	2.1	6.2	12.2	3.0	—	12.0	26.0	—
40	July 28	19.30	3.70	4.30	8.65	1.10	4.70	5.40	8.90	9.10	1.40	0.35	0.60	2.40	0.60	—	2.40	4.75	76
		64	19.2	22.3	44.8	5.7	24.4	28.0	46.1	47.1	7.3	1.8	3.1	12.4	3.1	—	12.4	24.6	—
258	Sept. 10	19.57	3.87	4.25	8.50	0.85	4.20	5.30	8.70	8.50	1.30	0.50	1.30	2.45	0.65	—	2.35	5.05	68
		64	19.8	21.7	43.4	4.3	21.5	27.1	44.5	43.4	6.6	2.6	6.6	12.5	3.3	—	12.0	25.8	—
295	Sept. 17	19.64	3.85	4.20	8.20	0.85	4.30	5.20	8.60	8.60	1.30	0.45	1.00	2.25	0.55	—	2.15	5.15	62
		64	19.6	21.4	41.8	4.3	21.9	26.5	43.8	43.8	6.7	2.3	5.1	11.5	2.8	—	10.9	26.2	—
289	Sept. 17	19.73	3.60	4.15	8.90	0.85	4.30	5.50	8.30	8.30	1.10	0.42	1.20	2.40	0.57	—	2.15	5.20	64
		65	18.2	21.0	45.1	4.3	21.8	27.9	42.1	42.1	5.6	2.1	6.1	12.2	2.9	—	10.9	26.4	—
15	July 22	19.80	3.50	3.90	8.00	0.85	4.65	5.35	8.90	8.90	1.30	0.41	0.90	2.50	0.55	—	2.20	5.00	64
		65	17.7	19.7	40.4	4.3	23.5	27.0	44.9	44.9	6.6	2.1	4.5	12.6	2.8	—	11.1	25.3	—
275	Sept. 14	19.92	3.60	4.00	8.50	0.80	4.50	5.80	8.90	9.20	1.10	0.43	0.90	2.25	0.60	—	2.17	4.85	68
		65	18.1	20.1	42.7	4.0	22.6	29.1	44.7	46.2	5.5	2.2	4.5	11.3	3.0	—	10.9	24.3	—

## II. Northern Pacific, Females, 1952

Whale No.	Date killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22	29
285	Sept. 15	17.60	3.25	3.50	7.60	0.80	4.00	5.00	7.86	7.70	0.60	0.35	1.00	2.15	0.50	—	2.00	4.40	60
		58	18.5	19.9	43.2	4.5	22.7	28.4	44.7	43.7	3.4	2.0	5.7	12.2	2.8	—	11.4	25.0	—
277	Sept. 14	17.75	3.18	3.80	7.45	0.80	4.20	5.20	8.00	7.90	0.40	0.40	0.90	2.20	0.50	—	2.27	4.75	68
		58	17.9	21.4	42.0	4.5	23.7	29.3	45.1	44.5	2.3	2.3	5.1	12.4	2.8	—	12.8	26.8	—
287	Sept. 16	18.18	3.60	4.00	7.55	0.80	4.00	5.10	8.20	8.50	0.60	0.47	1.20	2.10	0.59	—	2.20	4.75	50
		60	19.8	22.0	41.5	4.4	22.0	28.1	45.1	46.8	3.3	2.6	6.6	11.6	3.2	—	12.1	26.1	—
264	Sept. 10	18.76	3.60	4.05	7.60	0.80	4.35	5.23	8.25	8.25	0.55	0.42	0.95	2.12	0.56	—	2.10	4.95	66
		62	19.2	21.6	40.5	4.3	23.2	27.9	44.0	44.0	2.9	2.2	5.1	11.3	3.0	—	11.2	26.4	—
79	Aug. 8	18.94	3.70	4.10	7.65	0.85	4.15	5.10	8.70	8.50	0.60	0.45	0.85	2.20	0.55	—	2.20	4.95	68
		62	19.5	21.6	40.4	4.5	21.9	26.9	45.9	44.9	3.2	2.4	4.5	11.6	2.9	—	11.6	26.1	—
274	Sept. 14	19.34	3.70	4.50	8.20	0.80	4.10	5.00	8.30	8.30	0.50	0.42	1.10	2.20	0.58	—	2.35	5.25	84
		63	19.1	23.3	42.4	4.1	21.2	25.9	42.9	42.9	2.6	2.2	5.7	11.4	3.0	—	12.2	27.1	—
287	Sept. 9	19.39	3.40	4.20	8.00	0.85	4.20	5.10	8.10	8.00	0.60	0.50	0.70	2.25	0.54	—	2.35	4.95	66
		64	17.5	21.7	41.3	4.4	21.7	26.3	41.8	41.3	3.1	2.6	3.6	11.6	2.8	—	12.1	25.5	—
49	July 31	19.40	3.40	4.00	8.20	0.80	4.20	5.50	8.40	8.10	0.60	0.50	0.70	2.25	0.57	—	2.25	5.00	64
		64	17.5	20.6	42.3	4.1	21.6	28.4	43.3	41.8	3.1	2.6	3.6	11.6	2.9	—	11.6	25.8	—
282	Sept. 14	19.40	3.65	4.10	8.60	0.85	4.30	5.20	8.70	8.70	0.60	0.45	1.00	2.40	0.56	—	2.40	5.00	64
		64	18.8	21.1	44.3	4.4	22.2	26.8	44.8	44.8	3.1	2.3	5.2	12.4	2.9	—	12.4	25.8	—
286	Sept. 15	19.50	3.65	4.15	8.10	0.85	4.30	5.00	9.00	8.80	0.80	0.45	1.00	2.26	0.56	—	2.30	5.06	66
		64	18.7	21.3	41.5	4.4	22.1	25.6	46.2	45.1	4.1	2.3	5.1	11.6	2.9	—	11.8	25.9	—
34	July 27	19.60	3.80	4.30	8.40	0.80	4.60	5.20	8.20	8.40	0.50	0.55	1.30	2.55	0.59	—	2.35	5.30	72
		65	19.4	21.9	42.9	4.1	23.5	26.5	41.8	42.9	2.6	2.8	6.6	13.0	3.0	—	12.0	27.0	—
168	Aug. 25	20.13	4.05	4.50	8.60	0.85	4.60	5.60	9.00	9.00	0.60	0.50	1.20	2.25	0.57	—	2.38	5.45	70
		66	20.1	22.4	42.7	4.2	22.9	27.8	44.7	44.7	3.0	2.5	6.0	11.2	2.8	—	11.8	27.1	—
138	Aug. 21	20.23	3.80	4.25	8.50	1.00	4.70	5.60	9.30	9.20	0.60	0.45	0.70	2.70	0.60	—	2.30	5.20	68
		66	18.8	21.0	42.0	4.9	23.2	27.7	46.0	45.5	3.0	2.2	3.5	13.3	3.0	—	11.4	25.7	—
273	Sept. 14	20.37	3.85	4.40	8.85	0.85	4.90	5.60	9.10	9.30	0.70	0.45	1.20	2.35	0.55	—	2.35	5.15	86
		67	18.9	21.6	43.4	4.2	24.1	27.5	44.7	45.7	3.4	2.2	5.9	11.5	2.7	—	11.5	25.3	—
47	July 29	20.40	3.60	4.10	8.10	0.80	4.50	5.70	9.20	9.40	0.70	—	0.70	2.15	0.52	—	2.15	5.00	60
		67	17.6	20.1	39.7	3.9	22.1	27.9	45.1	46.1	3.4	—	3.4	10.5	2.5	—	10.5	24.5	—

## III. Adjacent Waters of Japan, Males, 1950~1951

Area	Company	Whale No.	killed Date	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22	29
H	K	67	Aug. 28 1950	15.50	2.48	3.00	—	0.66	3.70	4.50	7.80	7.60	0.70	0.33	0.70	1.70	0.47	3.68	1.70	3.58	57
H	N	51	May 21 1951	16.0	19.4	—	4.3	23.9	29.0	50.3	49.0	4.5	2.1	4.5	11.0	3.0	23.7	11.0	23.1	—	
H	T	148	1950	15.54	2.68	3.00	6.50	4.00	3.80	4.60	7.20	7.10	1.00	0.40	0.80	2.09	0.40	—	1.80	3.80	—
H	T	252	1950	17.2	19.3	41.8	2.6	24.5	29.6	46.3	45.7	6.4	2.6	5.2	13.5	2.6	—	11.6	24.5	—	
S	N	77	July 2 1951	15.60	2.70	3.20	6.70	0.73	4.00	4.80	7.80	7.50	1.10	—	0.90	1.75	0.41	—	1.75	3.85	—
H	T	149	1950	17.3	20.5	42.9	4.7	25.6	30.8	50.0	48.1	7.1	—	5.8	11.2	2.6	—	11.2	24.7	—	
H	T	252	1950	15.80	2.72	3.30	6.60	0.70	4.10	4.85	7.70	7.50	1.00	0.45	0.95	1.95	0.45	—	1.85	3.80	—
S	N	77	July 2 1951	17.2	20.9	41.8	4.4	26.0	30.7	48.7	47.5	6.3	2.8	6.0	12.3	2.8	—	11.7	24.1	—	
H	T	149	1950	15.85	2.60	2.95	5.95	0.78	3.70	4.72	7.80	7.55	1.25	0.40	0.95	2.00	0.40	3.65	1.60	3.55	—
H	T	149	1951	16.4	18.6	37.5	4.9	23.3	29.8	49.2	47.6	7.9	2.5	6.0	12.6	2.5	23.0	10.1	22.4	—	
H	T	149	1950	16.20	2.85	3.60	6.10	0.74	—	4.85	8.10	7.80	1.50	0.55	1.00	1.72	0.41	—	1.78	3.70	76
H	N	64	June 11 1951	17.07	3.32	3.60	7.40	0.67	4.30	5.10	8.20	7.80	1.10	0.43	0.67	2.27	0.57	—	2.20	4.20	—
S	N	7	June 21 1951	17.07	3.15	3.47	6.89	—	4.27	4.82	7.87	—	1.28	0.49	0.61	1.58	0.35	—	1.95	4.20	—
H	T	156	1950	18.5	20.3	40.3	—	25.0	28.2	46.1	—	7.5	2.9	3.6	9.3	2.1	—	11.4	24.6	—	
S	N	13	May 15 1951	17.70	3.10	3.40	6.70	0.73	4.40	5.10	8.30	8.10	1.30	0.86	0.78	1.95	0.50	—	1.95	4.10	68
H	N	57	June 4 1951	17.5	19.2	37.9	4.1	24.9	28.8	46.9	45.8	7.3	2.0	4.4	11.0	2.8	—	11.0	23.2	—	
H	N	59	June 4 1951	18.29	3.20	—	7.90	—	4.30	5.20	8.15	7.90	1.10	0.53	1.00	2.55	0.57	—	2.20	4.82	—
H	N	54	Aug. 23 1950	60	17.5	—	43.2	—	23.5	28.4	44.6	43.2	6.0	2.9	5.5	13.9	3.1	—	12.0	26.4	—
H	N	57	June 4 1951	18.59	3.42	3.90	—	0.80	4.30	5.30	8.40	8.10	1.40	0.45	0.70	—	—	—	—	—	—
H	N	59	June 4 1951	61	18.4	21.0	—	4.3	23.1	28.5	45.2	43.6	7.5	2.4	3.8	—	—	—	—	—	—
H	N	54	Aug. 23 1950	18.59	3.50	4.10	8.10	0.60	4.70	5.30	8.40	—	1.30	0.50	0.80	2.40	0.60	—	2.10	5.00	—
H	N	54	Aug. 23 1950	61	18.8	22.1	43.6	3.2	25.3	28.5	45.2	—	7.0	2.7	4.3	12.9	3.2	—	11.3	26.9	—
H	N	150	1950	18.70	3.54	4.07	7.60	0.90	4.69	5.15	8.60	8.30	1.25	0.40	0.81	2.15	0.60	—	2.20	4.94	57
H	N	150	1950	61	18.9	21.8	40.6	4.8	25.1	27.5	46.0	44.4	6.7	2.1	4.3	11.5	3.2	—	11.8	26.4	—
S	N	2	May 30 1951	18.85	3.50	4.00	8.00	0.80	4.90	5.10	8.40	8.20	1.10	0.41	0.79	2.22	0.51	—	2.10	4.85	64
S	N	2	May 30 1951	62	18.6	21.2	42.4	4.2	26.0	27.1	44.6	43.5	5.8	2.2	4.2	11.8	2.7	—	11.1	25.7	—
S	N	2	May 30 1951	19.20	3.45	4.55	7.79	0.79	4.73	5.33	8.73	8.42	1.35	0.36	1.00	2.00	0.53	—	2.30	5.03	—
S	N	2	May 30 1951	63	18.0	23.8	40.5	4.1	24.6	27.8	45.5	43.9	7.0	1.9	5.2	10.4	2.8	—	12.0	26.2	—

## III. Adjacent Waters of Japan, Females, 1950~51

Area	Company	Whale No.	Date killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22	29
H	N	67	June 16	15.47	2.70	2.88	5.75	0.72	—	4.60	7.30	6.90	0.40	0.40	0.65	1.95	0.43	—	1.60	3.65	—
			1951	51	17.5	18.6	37.2	4.7	—	29.7	47.2	44.6	2.6	2.6	4.2	12.6	2.8	—	10.3	23.6	—
H	K	67		15.50	2.75	3.00	5.90	0.73	3.50	4.70	7.40	7.10	0.43	0.42	0.75	1.90	0.42	—	1.70	3.58	—
H	T	121	June 12	51	17.7	19.4	38.1	4.1	22.6	30.3	47.7	45.8	2.8	2.7	4.8	12.3	2.7	—	11.0	23.1	—
			1951	15.54	2.72	3.15	6.00	0.72	3.60	4.60	7.25	7.33	0.47	0.30	0.67	1.69	0.43	—	—	—	—
H	T	192		51	17.5	20.3	38.6	4.6	23.2	29.6	46.7	47.2	3.0	1.9	4.3	10.9	2.8	—	—	—	—
			1950	15.90	2.75	3.45	6.01	—	4.10	4.65	8.20	7.70	0.45	0.39	0.95	1.80	0.44	—	1.70	3.84	—
H	T	241		52	17.3	21.7	37.8	—	25.8	29.2	51.6	48.4	2.8	2.4	6.0	11.3	2.8	—	10.7	24.2	—
			1950	15.80	2.73	3.00	6.80	0.73	4.21	4.61	7.34	7.14	0.43	0.30	0.88	1.70	0.44	—	1.65	3.89	—
S	T	33	June 4	52	17.3	19.0	43.0	4.6	26.6	29.2	46.5	45.2	2.7	1.9	5.6	10.8	2.8	—	10.4	24.6	—
			1951	16.15	2.60	3.15	6.20	0.75	4.10	—	—	—	—	—	—	—	—	—	1.65	3.65	—
H	T	287	Sept. 2	53	16.1	19.5	38.4	4.6	25.4	—	—	—	—	—	—	—	—	—	10.2	22.6	—
			1950	17.37	3.48	3.65	7.20	0.82	3.95	4.88	8.08	7.90	0.38	—	1.00	1.80	0.51	—	2.07	4.55	—
H	N	299		57	20.0	21.0	41.5	4.7	22.7	28.1	46.5	45.5	2.2	—	5.8	10.4	2.9	—	11.9	26.2	—
			1950	17.40	3.34	3.65	7.50	0.85	4.20	5.20	8.20	8.00	0.50	0.43	0.77	2.05	0.52	—	2.00	4.43	—
H	T	159		57	19.2	21.0	43.1	4.9	24.1	29.9	47.1	46.0	2.9	2.5	4.4	11.8	3.0	—	11.5	25.5	—
			1950	17.60	3.10	3.30	7.00	0.65	4.05	5.50	8.60	8.20	0.50	0.34	0.80	1.95	0.51	—	2.10	4.20	60
H	T	162		58	17.6	18.7	39.8	3.7	23.0	31.2	48.9	46.6	2.8	1.9	4.5	11.1	2.9	—	11.9	23.9	—
			1950	17.90	3.50	3.70	7.20	0.74	4.60	5.00	8.04	7.90	0.54	0.47	1.05	1.97	0.51	—	2.18	4.65	64
S	T	30	May 30	59	19.6	20.7	40.2	4.1	25.7	27.9	44.9	44.1	3.0	2.6	5.9	11.0	2.8	—	12.2	26.0	—
			1951	17.98	3.40	3.75	7.20	0.85	4.10	5.10	8.40	8.10	0.50	0.42	0.90	2.20	0.55	—	2.10	4.60	—
H	T	225		59	19.0	21.0	40.2	4.8	22.9	28.5	47.0	45.3	2.8	2.3	5.0	12.3	3.1	—	11.7	25.7	—
			1950	18.36	3.35	3.55	6.80	0.87	4.30	5.15	9.00	8.55	0.50	0.42	0.80	2.30	0.58	—	2.00	4.50	52
H	T	244		60	18.2	19.3	37.0	4.7	23.4	28.0	49.0	46.6	2.7	2.3	4.4	12.5	3.2	—	10.9	24.5	—
			1950	18.85	3.35	3.78	7.80	0.89	4.60	5.40	8.00	—	0.42	0.45	0.91	2.37	0.59	—	2.25	4.67	—
H	N	392		62	17.8	20.1	41.4	4.7	24.4	28.6	42.4	—	2.2	2.4	4.8	12.6	3.1	—	11.9	24.8	—
			1950	18.90	3.45	3.80	7.50	0.60	4.25	5.35	8.55	8.25	0.40	0.40	0.90	2.30	0.65	—	2.40	4.85	—
H	T	246		62	18.3	20.1	39.7	3.2	22.5	28.3	45.2	43.7	2.1	2.1	4.8	12.2	2.9	—	12.7	25.7	—
			1950	19.15	3.70	4.40	7.70	0.95	4.70	5.60	9.30	9.10	0.70	0.53	1.00	2.35	0.57	—	2.60	4.93	48
			1950	63	19.3	23.0	40.2	5.0	24.5	29.2	48.6	47.5	3.7	2.8	5.2	12.3	3.0	—	13.6	25.7	—

III. Adjacent Waters of Japan, Females, 1950~51 (cont.)

Area	Company	Whale No.	Date killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22	29	
H	T	106	May 22 1951	19.51	3.60	4.30	7.60	0.98	4.15	5.70	9.10	9.15	0.35	0.36	0.96	2.38	0.62	—	—	—	—	—
S	T	29	May 30 1951	64	18.5	22.0	39.0	5.0	21.3	29.2	46.6	46.9	1.8	1.8	4.9	12.2	3.2	—	—	—	—	—
S	T	32	June 2 1951	64	19.5	21.0	39.7	4.6	23.1	27.7	45.6	45.1	3.1	1.5	3.1	11.3	3.1	—	—	—	—	—
H	T	154	June 27 1950	64	19.0	21.0	39.0	4.6	—	28.7	47.2	45.6	2.6	1.8	4.9	11.8	2.8	—	—	—	—	—
H	N	89	June 27 1951	65	18.9	21.2	40.9	4.2	23.0	29.8	46.0	44.9	1.0	1.8	3.5	11.3	2.8	—	—	—	—	—
S	T	31	June 1 1951	66	19.5	20.5	41.5	5.0	19.5	27.3	45.5	44.0	2.8	3.0	—	12.0	3.0	—	—	—	—	—
H	N	66	June 11 1951	66	19.6	20.6	40.3	4.2	21.9	28.8	47.0	45.2	2.5	2.2	5.2	11.4	2.9	—	—	—	—	—
				71	18.9	24.0	42.1	3.7	20.8	27.6	—	43.7	1.8	1.9	3.1	11.3	2.5	—	—	—	—	—



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## IV. Antarctic, Males, 1948~1951

Company	Whale No.	Date killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22
N	39	1948~49	18.06	—	3.85	7.50	0.90	4.10	5.00	8.05	7.07	1.44	0.35	0.58	2.10	0.50	—	—	—
N	25	1948~49	59	—	<b>21.3</b>	<b>41.5</b>	<b>4.9</b>	<b>22.7</b>	<b>27.7</b>	<b>44.6</b>	<b>39.1</b>	<b>8.0</b>	<b>1.9</b>	<b>3.2</b>	<b>11.6</b>	<b>2.8</b>	—	—	—
N	158	1948~49	63	18.2	19.7	40.4	4.4	23.4	28.9	45.6	45.1	7.2	2.3	4.4	11.7	2.8	—	10.9	—
N	927	1948~49	64	16.9	19.4	40.5	4.4	23.6	27.4	47.4	44.1	7.9	2.2	5.9	12.9	2.5	24.6	—	—
N	259	1948~49	65	18.6	20.5	42.2	4.9	21.4	27.5	44.5	39.6	6.3	1.9	6.7	—	2.8	—	—	—
N	219	1950	67	20.0	21.4	43.2	4.8	22.1	25.5	41.5	41.1	7.4	2.2	4.7	11.8	2.8	26.8	11.4	26.6
N	487	1948~49	67	18.6	19.8	41.1	4.2	23.8	29.1	45.3	43.6	6.9	2.4	5.4	12.3	2.6	—	11.5	—
N	417	1951	67	18.2	20.2	39.0	4.6	20.1	29.1	44.7	41.7	6.6	2.3	6.2	12.7	2.5	26.3	11.0	26.2
N	127	1948~49	67	19.7	20.7	42.1	4.1	22.8	27.8	42.6	42.4	7.1	1.9	7.5	12.4	2.8	—	10.0	—

## IV. Antarctic, Females, 1948~1951

Company	Whale No.	Date killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22
T	1207	Feb. 27	17.40	3.25	3.45	6.76	0.81	3.76	4.90	7.63	7.50	0.38	0.47	1.31	1.83	0.46	—	1.84	4.50
T	85	1951	57	18.7	19.8	38.9	4.7	21.6	28.2	43.9	43.2	2.2	2.7	7.5	10.5	2.6	—	10.6	25.9
N	116	1948~49	61	—	3.68	7.52	0.94	4.39	5.26	8.13	—	—	0.46	1.02	—	0.51	—	1.83	—
N	927	1948~49	61	—	19.8	40.6	5.1	23.7	28.4	43.9	—	—	2.5	5.5	—	2.8	—	9.9	—
N	116	Jan. 3	20.18	3.67	3.93	8.05	0.93	4.90	6.00	9.30	8.85	0.60	0.48	1.23	2.15	0.54	—	—	4.91
N	927	1950	66	18.2	19.5	39.9	4.6	24.3	29.7	46.1	43.9	3.0	2.4	6.1	10.7	2.7	—	—	24.3

## IV. Antarctic, Females, 1948~1951 (cont.)

Company	Whale No.	Date, killed	1	3	5	6	7	8	10	11	12	13	14	15	17	19	20	21	22
T	507	Jan. 17	20.32	4.00	4.27	7.91	0.94	4.45	5.70	9.11	8.91	0.54	0.41	1.92	2.35	0.61	—	2.20	5.20
N	919	1951	67	19.7	21.0	38.9	4.6	21.9	28.0	47.8	43.8	2.7	2.0	9.4	11.6	3.0	—	10.8	25.5
N	15	Mar. 7	20.60	3.95	4.40	7.70	—	5.00	5.75	8.90	8.70	0.60	0.60	1.20	2.70	0.54	5.55	2.27	5.50
N	15	1951	68	19.2	21.4	37.4	—	24.3	27.9	43.2	42.2	2.9	2.9	5.8	13.1	2.6	26.9	11.0	26.7
N	15	1951	20.62	3.95	4.25	8.60	0.74	4.52	5.55	8.96	9.00	0.65	0.44	1.20	2.75	0.59	—	2.35	5.25
N	287	1948~49	68	19.2	20.6	41.7	3.6	21.9	26.9	43.5	43.6	3.2	2.1	5.8	13.3	2.9	—	11.4	25.5
N	287	Jan. 20	21.09	4.13	4.49	8.68	0.91	4.35	6.05	9.10	8.80	0.50	0.47	1.42	2.59	0.55	5.60	2.42	5.57
N	276	1950	69	19.6	21.3	41.2	4.3	20.6	28.7	43.1	41.7	2.4	2.2	6.7	12.3	2.6	26.6	11.5	26.4
N	276	Jan. 18	21.20	4.21	4.39	8.80	0.94	4.70	5.66	9.07	8.70	0.60	0.56	1.77	2.56	0.56	5.41	2.36	5.37
N	795	1950	70	19.9	20.7	41.5	4.4	22.2	26.7	42.8	41.0	2.8	2.6	8.3	12.1	2.6	25.5	11.1	25.3
T	795	1948~49	21.41	4.34	4.47	8.94	0.99	4.65	5.74	9.14	—	0.66	0.48	0.79	—	0.63	—	2.84	—
N	264	1948~49	70	20.3	20.9	41.8	4.6	21.7	26.8	42.7	—	3.1	2.2	3.7	—	2.9	—	13.3	—
N	264	1948~49	21.45	3.80	4.48	8.60	0.92	5.25	5.90	10.0	9.25	0.60	0.75	0.92	2.70	0.54	5.55	—	—
N	540	1948~49	70	17.7	20.9	40.1	4.3	24.5	27.5	46.6	43.1	2.8	2.5	4.3	12.6	2.5	25.9	—	—
N	540	1948~49	21.50	3.95	4.40	8.90	0.95	5.10	6.10	9.70	9.40	0.70	0.40	1.35	2.40	0.58	—	2.08	5.20
T	86	1948~49	71	18.4	20.5	41.4	4.4	23.7	28.4	45.1	43.7	3.3	1.9	6.3	11.2	2.7	—	9.7	24.2
N	68	1948~49	21.51	4.27	4.72	9.24	1.07	—	6.02	9.96	9.01	0.68	0.41	1.24	—	0.53	—	2.54	—
N	68	1948~49	71	19.9	21.9	43.0	5.0	—	28.0	46.3	41.9	2.9	1.9	5.8	—	2.5	—	11.8	—
N	21	1948~49	22.25	4.45	4.80	9.45	0.95	5.15	6.15	9.85	9.65	0.65	0.40	1.15	2.75	0.65	—	2.45	5.60
N	21	1948~49	73	20.0	21.6	42.5	4.3	23.1	27.6	44.3	43.4	2.9	1.8	5.2	12.4	2.9	—	11.0	25.2
N	105	1948~49	22.30	4.20	4.80	9.20	0.98	5.28	6.10	9.85	9.40	0.63	0.45	1.15	2.52	0.59	—	2.20	—
N	105	1948~49	73	18.8	21.5	41.3	4.4	23.7	27.4	44.2	42.2	2.8	2.0	5.2	11.3	2.6	—	9.9	—
N	198	1948~49	22.65	4.90	5.10	9.90	0.98	5.15	5.90	9.25	9.60	0.60	0.55	0.85	2.78	0.68	—	2.54	—
N	198	Jan. 13	74	21.6	22.5	43.7	4.3	22.7	26.0	40.8	42.4	2.6	2.4	3.8	12.3	3.0	—	11.2	—
N	289	1950	22.67	4.79	4.72	—	1.05	4.65	6.30	9.80	9.55	0.60	0.67	2.28	2.72	0.62	—	2.51	5.90
N	289	Jan. 20	74	21.1	20.8	—	4.6	20.5	27.8	43.2	42.1	2.6	3.0	10.1	12.0	2.7	—	11.1	26.4
T	783	1950	22.70	4.48	4.83	9.69	0.95	4.80	6.20	9.70	9.60	0.55	0.58	1.35	2.46	0.63	5.86	2.44	5.83
T	783	1948~49	74	19.7	21.3	42.7	4.2	21.1	27.3	42.7	42.3	2.4	2.6	5.9	10.8	2.8	25.8	10.7	25.7
T	783	1948~49	23.04	4.70	4.95	9.91	1.09	5.18	6.40	10.16	—	0.31	0.48	1.19	—	—	—	2.21	—
T	783	1948~49	76	20.4	21.5	43.0	4.7	22.5	27.8	44.1	—	3.1	2.1	5.2	—	—	—	9.6	—

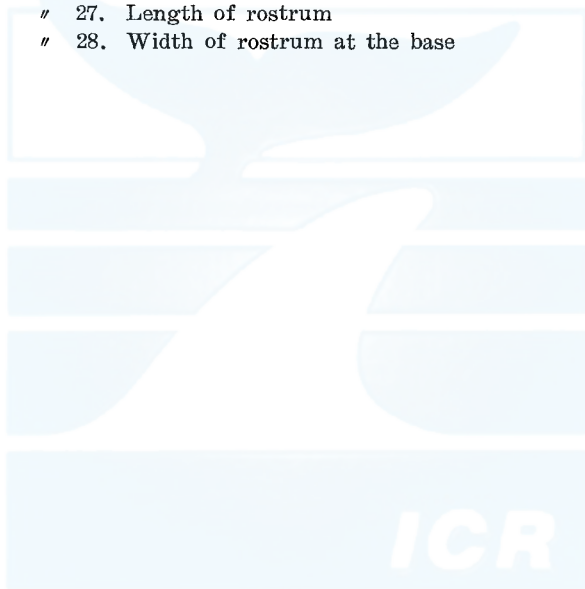
## Appendix B

## Measurements of Skull Proportions of the Fin Whales examined in the northern Pacific and Antarctic

Upper figures: actual value in metres

Lower figures: percentages against skull length

Measurement No.	22.	Skull length, condyle to tip of premaxilla.
"	"	21. Greatest width of skull
"	"	24. Length of lower jaw
"	"	25. Tip of premaxilla to posterior end of pterygoid
"	"	26. Distance between both posterior ends of pterygoid
"	"	27. Length of rostrum
"	"	28. Width of rostrum at the base



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## I. Northern Pacific, Males, 1952

Whale No.	Body length in m. and ft.	22	21	24	25	26	27	28
135	17.28	4.60	2.05	4.50	4.65	1.65	3.30	1.30
	57		<b>44.6</b>	<b>97.8</b>	<b>101.0</b>	<b>35.8</b>	<b>71.7</b>	<b>28.3</b>
263	17.38	4.40	1.96	4.15	4.40	1.62	3.00	1.25
	57		<b>44.6</b>	<b>94.3</b>	<b>100.0</b>	<b>36.8</b>	<b>65.2</b>	<b>28.4</b>
281	17.60	4.60	2.15	4.50	4.65	1.70	3.30	1.30
	58		<b>46.7</b>	<b>97.8</b>	<b>101.1</b>	<b>37.0</b>	<b>71.7</b>	<b>28.3</b>
167	17.70	4.80	2.10	4.70	4.80	1.80	3.45	1.40
	58		<b>43.7</b>	<b>97.9</b>	<b>100.0</b>	<b>37.5</b>	<b>71.9</b>	<b>29.2</b>
169	17.70	4.20	2.00	4.20	4.20	1.70	3.00	1.30
	58		<b>47.6</b>	<b>100.0</b>	<b>100.0</b>	<b>40.5</b>	<b>71.4</b>	<b>31.0</b>
38	17.76	4.25	1.88	4.10	4.35	1.60	3.15	1.20
	58		<b>44.2</b>	<b>96.5</b>	<b>102.4</b>	<b>37.6</b>	<b>74.1</b>	<b>28.2</b>
261	18.05	4.75	2.20	4.45	4.70	1.85	3.20	1.35
	60		<b>46.3</b>	<b>93.7</b>	<b>98.9</b>	<b>38.9</b>	<b>67.4</b>	<b>28.4</b>
14	18.20	4.90	2.25	5.00	4.85	1.95	3.30	1.25
	60		<b>45.9</b>	<b>102.1</b>	<b>99.0</b>	<b>39.8</b>	<b>67.4</b>	<b>25.5</b>
170	18.30	4.70	2.20	4.50	4.60	1.80	3.30	1.46
	60		<b>46.8</b>	<b>95.8</b>	<b>97.9</b>	<b>38.3</b>	<b>70.2</b>	<b>31.1</b>
222	18.30	4.55	2.20	4.35	4.50	1.65	3.20	1.35
	60		<b>48.4</b>	<b>95.6</b>	<b>98.9</b>	<b>36.3</b>	<b>70.3</b>	<b>29.7</b>
259	18.54	4.90	2.15	4.85	4.85	1.80	3.10	1.35
	61		<b>43.9</b>	<b>99.0</b>	<b>99.0</b>	<b>36.7</b>	<b>63.3</b>	<b>27.6</b>
276	18.56	4.90	2.18	4.75	4.85	1.70	3.40	1.30
	61		<b>44.5</b>	<b>96.9</b>	<b>99.0</b>	<b>34.7</b>	<b>69.4</b>	<b>26.5</b>
113	18.61	4.50	2.10	4.50	4.45	1.60	3.10	1.32
	61		<b>46.7</b>	<b>100.0</b>	<b>98.9</b>	<b>35.6</b>	<b>68.9</b>	<b>29.3</b>
223	18.63	4.45	2.10	4.40	4.45	1.65	3.00	1.25
	61		<b>47.2</b>	<b>98.9</b>	<b>100.0</b>	<b>37.1</b>	<b>67.4</b>	<b>28.1</b>
288	18.70	4.70	2.15	4.58	4.75	1.85	3.35	1.25
	61		<b>45.8</b>	<b>97.5</b>	<b>101.1</b>	<b>39.4</b>	<b>71.3</b>	<b>26.6</b>
162	18.90	4.90	2.30	4.70	4.90	1.90	3.50	1.38
	62		<b>46.9</b>	<b>95.9</b>	<b>100.0</b>	<b>38.8</b>	<b>71.4</b>	<b>28.2</b>
83	18.94	4.90	2.30	4.80	4.75	1.75	3.40	1.35
	62		<b>46.9</b>	<b>98.0</b>	<b>96.9</b>	<b>35.7</b>	<b>69.4</b>	<b>27.6</b>
95	19.10	4.80	2.20	4.55	4.80	1.80	3.30	1.30
	63		<b>45.8</b>	<b>94.8</b>	<b>100.0</b>	<b>37.5</b>	<b>68.7</b>	<b>27.1</b>
262	19.20	5.00	2.30	4.90	5.00	1.80	3.50	1.30
	63		<b>46.0</b>	<b>98.0</b>	<b>100.0</b>	<b>36.0</b>	<b>70.0</b>	<b>26.0</b>
40	19.30	4.75	2.40	4.50	4.90	1.90	3.55	1.40
	64		<b>50.5</b>	<b>94.7</b>	<b>103.1</b>	<b>40.0</b>	<b>74.7</b>	<b>29.5</b>
258	19.57	5.05	2.35	5.00	5.10	1.85	3.60	1.42
	64		<b>46.5</b>	<b>99.0</b>	<b>101.0</b>	<b>36.6</b>	<b>71.3</b>	<b>28.1</b>
295	19.64	5.15	2.15	4.90	5.10	1.75	3.60	1.35
	64		<b>41.8</b>	<b>95.2</b>	<b>99.0</b>	<b>34.0</b>	<b>70.0</b>	<b>26.2</b>
289	19.73	5.20	2.15	5.15	5.23	1.95	3.70	1.30
	65		<b>41.3</b>	<b>99.0</b>	<b>100.6</b>	<b>37.5</b>	<b>71.2</b>	<b>25.0</b>

## I. Northern Pacific, Males, 1952 (cont.)

Whale No.	Body length in m. and ft.	22	21	24	25	26	27	28
15	19.80	5.00	2.20	4.80	4.90	1.80	3.30	1.20
	65		<b>44.0</b>	<b>96.0</b>	<b>98.0</b>	<b>36.0</b>	<b>66.0</b>	<b>24.0</b>
275	19.92	4.85	2.17	4.70	4.85	1.70	3.40	1.20
	65		<b>44.7</b>	<b>96.9</b>	<b>100.0</b>	<b>35.1</b>	<b>70.1</b>	<b>25.2</b>

## I. Northern Pacific, Females, 1952

Whale No.	No. of corp. lutea	Body length in m. and ft.	22	21	24	25	26	27	28
285	0	17.60	4.40	2.00	4.30	4.45	1.70	3.40	1.20
		58		<b>45.4</b>	<b>97.7</b>	<b>101.1</b>	<b>38.6</b>	<b>77.3</b>	<b>27.3</b>
277	0	17.75	4.75	2.27	4.55	4.75	1.75	3.35	1.18
		58		<b>47.8</b>	<b>95.8</b>	<b>100.0</b>	<b>36.8</b>	<b>70.5</b>	<b>24.8</b>
287	2	18.18	4.75	2.20	4.57	4.70	1.65	3.40	1.25
		60		<b>46.3</b>	<b>96.2</b>	<b>98.9</b>	<b>34.7</b>	<b>71.6</b>	<b>26.3</b>
264	0	18.76	4.95	2.10	4.75	4.90	1.70	3.40	1.30
		62		<b>42.4</b>	<b>96.0</b>	<b>99.0</b>	<b>34.3</b>	<b>68.7</b>	<b>26.3</b>
79	1	18.94	4.95	2.20	4.80	4.90	1.85	3.51	1.40
		62		<b>44.4</b>	<b>97.0</b>	<b>99.0</b>	<b>37.4</b>	<b>71.0</b>	<b>28.3</b>
274	3	19.34	5.25	2.35	5.20	5.20	1.95	3.80	1.35
		63		<b>44.8</b>	<b>99.1</b>	<b>99.1</b>	<b>37.2</b>	<b>72.4</b>	<b>25.7</b>
257	11	19.39	4.95	2.35	4.75	5.13	1.85	3.65	1.35
		64		<b>47.5</b>	<b>96.0</b>	<b>103.6</b>	<b>37.4</b>	<b>73.7</b>	<b>27.3</b>
49	0	19.40	5.00	2.25	4.90	5.00	1.65	3.30	1.25
		64		<b>45.0</b>	<b>98.0</b>	<b>100.0</b>	<b>33.0</b>	<b>66.0</b>	<b>25.0</b>
282	6	19.40	5.00	2.40	4.70	4.90	1.75	3.65	1.35
		64		<b>48.0</b>	<b>94.0</b>	<b>98.0</b>	<b>35.0</b>	<b>73.0</b>	<b>27.0</b>
286	3	19.50	5.06	2.30	4.90	4.95	1.95	3.60	1.30
		64		<b>45.5</b>	<b>96.8</b>	<b>97.8</b>	<b>38.5</b>	<b>71.1</b>	<b>25.7</b>
34	9	19.60	5.30	2.35	5.10	5.20	1.86	3.87	1.40
		65		<b>44.3</b>	<b>96.2</b>	<b>98.1</b>	<b>35.0</b>	<b>73.0</b>	<b>26.4</b>
168	18	20.13	5.45	2.38	5.30	5.40	1.85	3.90	1.50
		66		<b>43.7</b>	<b>97.3</b>	<b>99.1</b>	<b>34.0</b>	<b>71.6</b>	<b>27.5</b>
138	6	20.23	5.20	2.30	5.10	5.25	1.90	3.74	1.40
		66		<b>44.2</b>	<b>98.1</b>	<b>101.0</b>	<b>36.5</b>	<b>72.0</b>	<b>26.9</b>
273	3	20.37	5.15	2.35	5.00	5.15	1.95	3.65	1.25
		67		<b>45.6</b>	<b>97.1</b>	<b>100.0</b>	<b>37.9</b>	<b>70.9</b>	<b>24.3</b>
47	8	20.40	5.00	2.30	4.90	5.05	1.85	3.60	1.40
		67		<b>46.0</b>	<b>98.0</b>	<b>101.0</b>	<b>37.0</b>	<b>72.0</b>	<b>28.0</b>

## II. Antarctic, Males, 1950~51

Whale No.	Body length in m. and ft.	22	21	24	25	26	27	28
963	19.83	5.20	2.39	5.20	5.16	1.83	3.60	1.42
	65		<b>46.0</b>	<b>100.0</b>	<b>99.2</b>	<b>33.3</b>	<b>69.2</b>	<b>27.3</b>
741	20.13	5.20	2.28	5.10	5.16	1.72	3.77	1.30
	66		<b>43.8</b>	<b>98.1</b>	<b>99.2</b>	<b>33.1</b>	<b>72.5</b>	<b>25.0</b>
747	20.44	5.26	2.19	5.30	5.20	1.78	3.78	1.30
	67		<b>41.6</b>	<b>100.8</b>	<b>98.9</b>	<b>33.8</b>	<b>71.9</b>	<b>24.7</b>
947	71.66	5.20	2.15	5.02	5.16	1.63	3.62	1.35
	71		<b>41.3</b>	<b>96.5</b>	<b>99.2</b>	<b>31.3</b>	<b>69.6</b>	<b>26.0</b>

## II. Antarctic, Females, 1950~51

Whale No.	No. of corp. lutea	Body length in m. and ft.	22	21	24	25	26	27	28
840	5	20.74	5.10	2.14	4.98	5.09	1.69	3.67	1.36
		68		<b>42.0</b>	<b>97.7</b>	<b>99.8</b>	<b>33.1</b>	<b>72.0</b>	<b>26.7</b>
675	7	21.35	5.56	2.37	5.58	5.57	1.95	—	—
		70		<b>42.6</b>	<b>100.4</b>	<b>100.2</b>	<b>35.1</b>	—	—
749	18	21.35	5.80	2.58	5.74	5.74	1.94	4.20	1.60
		70		<b>44.5</b>	<b>99.0</b>	<b>99.0</b>	<b>33.4</b>	<b>72.4</b>	<b>27.6</b>
870	5	21.96	5.48	2.28	—	5.47	1.84	4.00	1.50
		72		<b>41.6</b>	—	<b>99.8</b>	<b>33.6</b>	<b>73.0</b>	<b>27.4</b>
841	10	22.27	5.72	2.48	5.72	5.72	1.97	4.23	1.55
		73		<b>43.4</b>	<b>100.0</b>	<b>100.0</b>	<b>34.4</b>	<b>73.9</b>	<b>27.1</b>
743	22	22.57	5.85	2.48	5.79	5.85	1.98	4.22	1.35
		74		<b>42.4</b>	<b>99.0</b>	<b>100.0</b>	<b>33.8</b>	<b>72.1</b>	<b>23.1</b>
964	17	22.57	5.94	2.50	5.70	6.02	2.05	4.30	1.43
		74		<b>42.1</b>	<b>96.0</b>	<b>101.3</b>	<b>34.5</b>	<b>72.4</b>	<b>24.1</b>

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