

Factory Ship Whaling Around Bonin Islands in 1948

Kazuhiro Mizue

1. Introduction

The author carried on investigation on board the whaling factory ship *Kaiko Maru* of the Nippon Marine Products Co., which carried on whaling in the waters around Bonin Islands from February to May, 1948.

Various biological investigations were made on board the factory ship and a general outline will be presented here.

Catcher boats attached to the factory ship were the No. 2 *Kyo Maru* and No. 3 *Kyo Maru* of the Nippon Marine Products Co., and those attached to No. 9 ship of the Taiyo Fishery Co., were the *Seki Maru*, No. 7 *Seki Maru*, and the No. 7 *Seki Maru* was replaced by the No. 2 *Seki Maru* during the operation.

Salting and refrigeration ship was attached to both fleet to act as transporting ships, and in general, the composition of the fleet was as above.

First, a brief history of whaling in the waters around Bonin Islands is as follows. Whaling was begun in Japan before the preceding century but whaling in the waters of Bonin Island was of relatively recent origin. In 1922, an investigation was made to determine latent resources in the waters of Bonin Islands as a whaling ground, and actual operation was begun in the following year, 1923. That is, the *Toyo Whaling Co.*, the predecessor of the present *Nippon Marine Products Co.*, was the first to develop the whale resources in this region. Much later, in 1937, *Taiyo Fishery Co.*, known as *Hayashi Kane Shoten* at that time, also engaged in this operation.

From then, the so-called Bonin Islands base whaling was continued until 1944. During this period, *Nippon Marine Products Co.* maintained a base on *Chichi Jima* and *Taiyo Fishery* on *Haha Jima*, competition between the two was removed and operation was carried on in a friendly manner.

At the time when land bases were established and operation begun in 1922, it was a good fishing ground for winter, shore approaching hump back whale, similar to those offshore *Galanpi Cape* in *Formosa*, and together with this, the whaling ground was developed year after year, so that catches

of Sperm Whale and Sei Whale gradually increased and considerably good whaling record was established, such that after 1939, a total of 200 whales were caught.

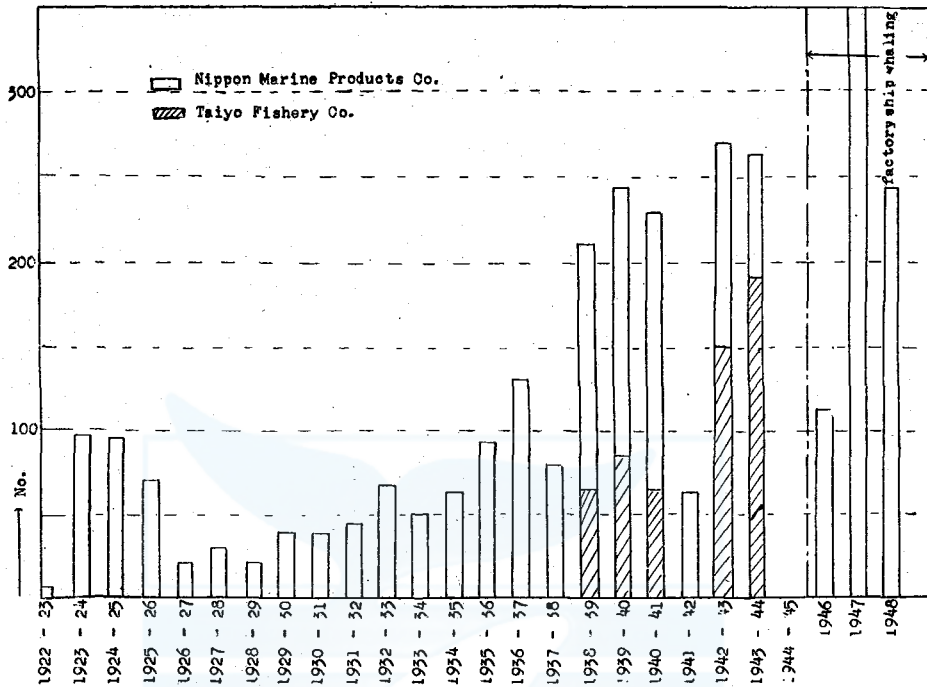
Table 1.
1922—1946 Monthly Whale Catches for the Bonin Islands

Season	November	December	January	February	March	April	May	Total
1922—23	0	3	0	0	0	0	0	3
1923—24	0	3	9	29	28	17	8	94
1924—25	0	0	21	17	28	23	6	95
1925—26	0	0	12	19	20	12	7	70
1926—27	0	0	5	5	9	2	0	21
1927—28	0	5	8	9	4	4	0	30
1928—29	2	0	6	6	8	0	0	22
1929—30	0	14	18	3	5	0	0	40
1930—31	0	1	16	12	11	0	0	40
1931—32	0	5	16	13	11	0	0	45
1932—33	0	1	26	25	16	0	0	68
1933—34	0	11	10	16	9	4	0	50
1934—35	1	13	10	16	23	1	0	64
1935—36	0	5	11	22	28	25	2	93
1936—37	0	17	18	36	42	18	0	131
1937—38	0	1	23	11	16	22	6	79
1938—39	0	3	44	67	55	34	8	211
1939—40	0	0	9	40	141	50	4	244
1940—41	0	0	7	72	52	93	5	229
1941—42	0	0	20	37	6	0	0	63
1942—43	0	0	19	36	115	82	18	270
1943—44	0	0	11	32	158	67	0	268
1944—45	0	0	0	0	0	0	0	0
1945—46	0	0	0	0	59	54	0	113
Total	3	82	319	523	844	508	64	2343

Table 1 shows the yearly catches of whale by month, from 1922 when operation was begun, up to 1948.

In regards to Table 2, only one company was engaged in whaling from the time whaling was begun, up to 1938 so that yearly average number of whales caught was only 62. However, after Taiyo Fishery began actual operation in the following year, the rate of catches increased rapidly for the following three years and the yearly average catches increased to 228 whales. The following year was the year in which war began and with the outbreak of war, operations in the waters were greatly restricted. As the result of this, the catches shows a sharp decline and only 68 whales were caught during this year. Operations were again resumed to normal

Fig. 1
Whale Catches Around the Bonin Islands, 1922—1948



the following year and the year after, inspite of being in the midst of war and with the increase demand for the army and domestic use, a record number of catches were made.

The following year was the year in which war was terminated and base whaling in the Bonin Islands were stopped with the fall of Saipan and with the occupation of Iwo Jima by the United States Forces. During this period, (22 years), the average yearly catches were 155 whales.

In regards to the whaling season, as can be seen in Table 1, the total catches is greatest in March, followed by February and April.

As to kinds of whale, ordinarily, they are Humpback Whale, Sei Whale, and Sperm whale and sometimes, Blue whale and Fin whale are caught.

In regards to whaling ground, the center of operation is 100 nautical miles east of Haha Jima. (It is needless to say that Humpback Whales have the habit of approaching the shore so this is an exception).

With the termination of war, the Bonin Islands were outside the area in which fishing is permitted. However, due to the zeal of the whaling firms and efforts of the Fishery Bureau, and due to the kind consideration

of SCAP, factory ship whaling in the waters of Bonin Islands was permitted with various conditions attached. The result of whaling after the use of factory ship whaling is as shown in Table 2.

Table 2.

Year \ Kind	Blue Whale	Fin Whale	Sei Whale	Humpback Whale	SprmWhale	Total
1946			29	12	72	113
1947	4		150	1	195	350
1948	1	3	105	3	131	243

As mentioned above, many Sperm whales, Sei whales and Humpback whales are found in this fishing ground and Blue whale, Fin whale and Right whales only rarely migrate here. After the termination of war, operation was changed to factory ship whaling and the number of catches of Humpback whales was greatly reduced, as compared with the period when whaling was by base whaling. This is a natural result because Humpback whales likes to migrate close to the reef of the island and since factory ship whaling cannot be carried on within 12 nautical miles from shore.

During the base whaling period, operation was carried on from Nove-

Fig. 2a
Location of Catch of Sperm Whale

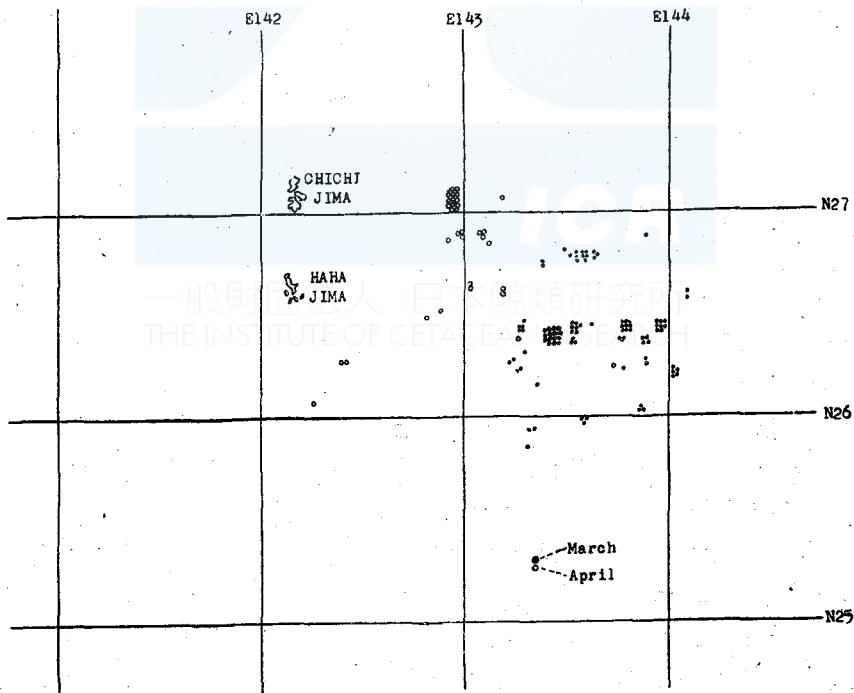
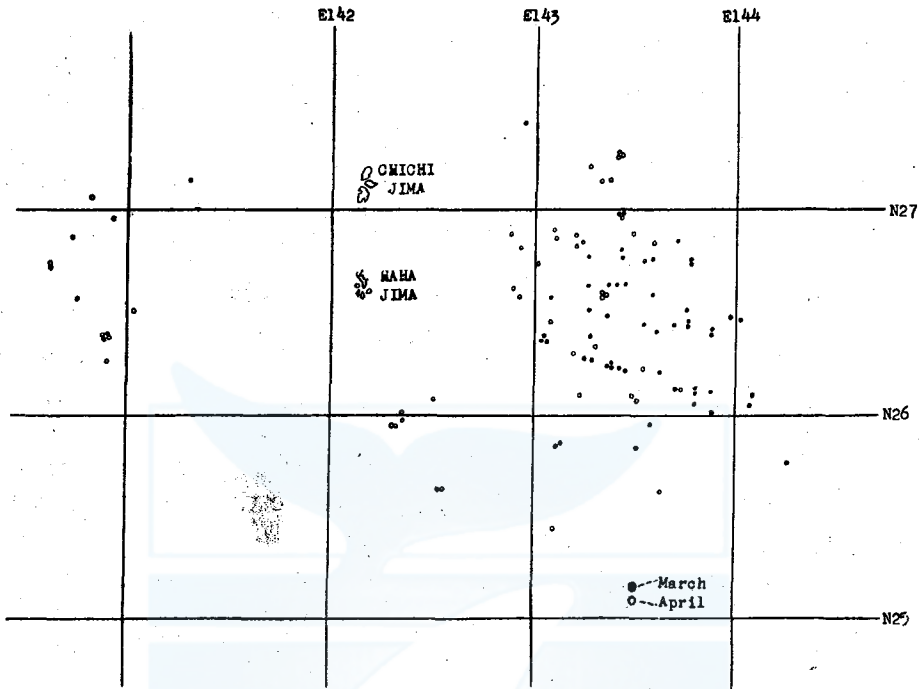


Fig. 2b
Location of Catch of Sei Whale



number to May of the following year, the peak being from February to April. Even with the change to Factory ship whaling, this peak period is taken advantage of.

Originally, the fishing ground in the Bonin Islands is very small, compared to that off shore Sanriku Area. Table 4 is a chart showing the position of catches in 1948 and in looking at this, catches were made between lat. 26°N — 27°N , long. 143°E — 144°E , or in an area of 60 nautical miles square.

That is the principal whaling ground is 50—100 nautical miles E-SE of Haha Jima.

Also, in looking at this chart, the position of catches of Sei whale and Sperm whale gradually approach the islands from February to May. This is related with the water temperature and feed.

The quantity of fuel oil was very small in 1984 so during the 1948 whaling, the factory ship could not be stationed in the middle of the fishing ground and usually was in a drifting condition so in looking at the position of both factory ships in the course chart, it is apparent that they drifted

here and there at the mercy of the wind. As a result, both fleets were considerably separated from each other and resulted in numerous difficulties in operation.

2. Detail

In 1948, besides Sperm whales and Sei whales, only 3 Fin whales, 1 Blue whale, and 3 Humpback whales were caught. This is a very small number, and in the future, it will be necessary to investigate, compare and examine it with those of Antarctic Ocean and investigate it from the resource point of view.

(a) Sei whale-Balaenoptera borealis (Lesson)

Table 3 shows the length of whales caught and of the total of 105 caught by both fleet, sex was about half and half.

Table 3.

Body length in feet	♂	♀	Total
35		1	1
36	2	3	5
37	2	1	3
38	1	5	6
39	3	3	6
40	2		2
41	7	9	16
42	10	9	19
43	7	3	10
44	6	4	10
45	3	5	8
46	5	6	11
47	3		3
48	3		3
49		1	1
50			
51		1	1
Total	54	51	105
Mean length	42.65	41.96	42.31

Mean length for ♂ was 42.7 feet and ♀ was 42.0 feet,

Mean length for ♂ and ♀ as 42.3 feet.

The largest whale was 48 feet for ♂ and 51 feet for ♀ and the smallest whale was 36 feet for ♂ and 35 feet for ♀. The peak of body length frequency curve is 42 feet.

In such Sei whales, there is a considerable difference in length with

sea areas, and average length is greater as it goes northward and gets smaller as it goes southward from Kurile Islands sea area, Sanriku sea area, Bonin Island area, Kinan sea area and Tsushima-Formosa sea area. In viewing former statistics, there is as much difference as 5 feet in those from north sea area and Tsushima-Formosa sea area. The average length of Sei whale caught in the waters around Bonin Islands in 1948 was in between these.

Also, in Sei whales caught in the waters around Japan there are some in which corrugated markings on the dorsal and ventral side are conspicuous and some which are not. Those which have corrugated markings are called "totan-iwashi" (corrugated Sei whale) and as a general rule, these are of Northern variety and those without corrugated markings are found in the south western sea area and are of southern variety. It is thought that northern and southern varieties may be differentiated from these corrugated markings and difference in length.

However, during the current investigation, Sei whale with corrugated markings are not limited only to large whales and considering other points, there are no indications that they are of different speice. That is, the so-called corrugated Sei whale are Sei whales with numerous old scars and are not regional difference or sub-specie. Scars which are the cause of this corrugated markings are due to parasitic protozoa and in extreme cases, there are considerable number of scars so that they can be scooped up with a spoon.

Outside of this, the only exterior parasites were small number of pen-nella whose part exposed from the skin surface, has fallen off. As a general rule, exterior parasite is very few because of sub-tropic area.

Furthermore, as to interior parasite, only a small number of distoma was discovered in the small intestine.

In regards to these parasites, it is planned to report on this after research, together with those in the stomach.

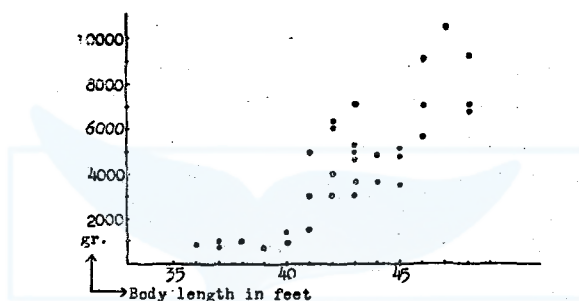
As to thickness of blubber, the vertical thickness was measured for 99 whales at the side below the dorsal fin and back of the head. The mean value below the dorsal fin was 5.2 cm and are of normal nutritional condition in general. In regards to investigation of the mammary gland, it will be omitted here.

As to feed, there were many with empty stomach and for 140 whales

investigated, 40 had empty stomachs, 13 had eaten *Euphausia*, 34 *Calanus* and 17 young sardines. As a general rule, kind of feed was of single variety.

As to the investigation of reproduction gland, the weight and volume of the ♂ testes was determined. Table 4 shows the relation between body length and weight of testes.

Fig. 3
Relation between the weight of the total of right and left testes and body length of Sei whale.



That is, it is about 1 kg (total of left and right) up to 39 feet and more than 4.0 kg above 42 feet. In general, it is said that the sexual maturity of ♂ Sei whale is 44.6 (13.5 m) but from this investigation, it is estimated to be 42.0 feet. However, there is a very marked difference in the Sei whale in different regions so it is necessary to make comparative studies with those of other regions.

As so the ♀, the weight, volume, number of corpora and graafian follicle of the ovary were determined.

According to the corpora Table showing the relation between corpora number and length of body, the body length of minimum sexual maturity of a ♀ is 38 feet, minimum for pregnant whale is 41 feet and maximum is 46 feet. Even when looking at the frequency curve of corpora number, the number of young whales with little corpora number in very large as a general rule. As to the weight of the ovary, there is considerable difference in accordance with the presence or absence of functional corpora but generally they are matured at 250 gr. It is said that as a general rule, the body length of sexual maturity of a ♀ Sei whale is 14.5 m (47.9 feet) but according to the present investigation, it is much smaller than this and is completely matured above 46 feet. Also, in case there were those with functional corpora the uterus was always out open, inspected for foetus and

their body length, sex, etc, were determined. Pregnant whales numbered 11, smallest foetus 2 inches and the maximum 3 feet 5 inches. Their sex were 6 ♂, 5 ♀ and no multiple foetus or deformity were noticed.

Next, the adhesion of the cartilagenous layer between the vertebral matter and tip of bone of the vertebrae was determined and the maximum body length of non-adhesion in ♂ was 46 feet and the minimum body length of adhesion was 42 feet. In the ♀, it was 49 feet in the former and 46 feet in the latter. In the ♂, there were some which had adhesion at 42 feet.

(b) Sperm Whale (*Physeter macrocephalus*, L)

Sperm whale is polygamous and has a habit of forming harems. They are distributed widely throughout the world and in the waters around Japan, from offshore Sanriku to Hokkaido and Kurile Islands are good fishing grounds. It is the general rule in all mystacoceti that ♀ is larger than ♂, but in the odontoceti, this is the opposite. In Sperm whales, ♂ is much larger than ♀.

Past statistics shows that large sperms of more than 60 feet are not rare but maximum for ♀ is 31 feet and there are only a few above 40 feet. Therefore, the body length and production of sperm whales differ considerably with sex so that they should be considered as of being of different variety.

Whalers in Japan classify Sperm whales into the three classes of large sperm, medium size sperm and small sperm. Table 4 shows the length of Sperm whales.

Fig. 4

Body length in feet	♂	♀	Total
26		1	1
27		1	1
28		1	1
29	1	1	2
30		3	3
31	1	5	6
32	1	6	7
33	2	6	8
34		3	3
35	4	27	31
36	3	13	16
37	1	8	9

Body length in feet	♂	♀	Total
38	1	3	4
39	1	3	4
40	3		3
41	1		1
42	1		1
43	1		1
44			
45	1		1
46	2		2
47	3		3
48	2		2
49	3		3
50	2		2
51	3		3
52	4		4
53	6		6
54	1		1
55	1		1
56			
57	1		1
Total	50	81	
Mean length	44.64	34.41	38.31

The total catches for both fleet was 131 and of this, 50 were ♂ and 81 were ♀. The size of the Sperm whale harem in the vicinity of Bonin Islands is much smaller than those off shore Sanriku, but even then, it is not a rare thing to see schools of 20—40 small Sperm whales. However, since the catching of whales less than 35 feet by factory ship whaling is prohibited, the catching of ♀ is restricted to a considerable extent and whaling is done for ♂.

Mean body length is 44.6 feet for ♂ and 34.4 feet for ♀.

Maximum body length for ♂ is 57 feet and 39 feet, for ♀.

Minimum body length is 29 feet for ♂ and 26 feet for ♀.

In picking out what appears to be the peaks of body length frequency curve, it is 35 feet, 40 feet and 53 feet for ♂ and 35 feet for ♀, but determination of age school is very difficult due to insufficient information, the same as in the case of Sei whale. In regards to color of body, Mr. Omura is investigating and classifying Antarctic sperm whales but in the case of sperm whale in Bonin Islands it differs with whales, and various kinds of scattered patterns and white spots are present around the stomach

and pudenda. However, these patterns are found not only in the large ♂ of the so-called isolated Sperm whales but even more in small Sperms. Also these differences in pattern is also recognized from the time of foetus.

Next, Sperm whales have teeth and there are two rows, in the lower jaw but in the case of whales with short body length, these are buried under the skin. Even in considerably matured whales, the innermost 2—3 pairs are not exposed but they appear only as protuberance of the skin when seen from the outside. The upper jaw has holes in which the teeth of the lower jaw fits in but 5—6 layers of traces of teeth can be recognized in it or in its vicinity.

In many cases, the number of teeth on the left and right side differs but as a general rule, there are from 12—25 pairs.

Scars of Sperm whale does not differ very much from that of Sei whale but only in that the number is relatively small. Also, they are present only in the tail portion in case of Sei whale, but in the case of Sperm whale some can be seen at the head.

Furthermore, in most cases, traces of line-like scratches can be seen around the mough, which tells of fierce battles with large cuttlefishs, which are its feed and coin-size traces on the suckers.

In regards to parasites the only thing is a few traces of pennella parasite and 2—3 cases of conchoderma parasites of tooth. In case of whales from northern parts such as White whale (not *Delphinapterenes leucus* but old bull) Aosa whale (refers to North Pacific Fin whale with diatom film attached), etc, forms diatom film on the body and diatmes is greater in whales in the lowen temperature belt and are parasitric and this is one way of estimating the period of life in low temperature belts. From this, it can be said that whale in the Bonin Islands has very little relation with the northern low temperature belt. As a general rule, there are very few parasites on Sperm whale in this region because of its subtropic water, similar to Sei whale. Also as to internal parasites, only the very common ones are found.

Thickness of blubber was determined by the same method as in the case of Sei whale and it was found that nutrition was ordinary.

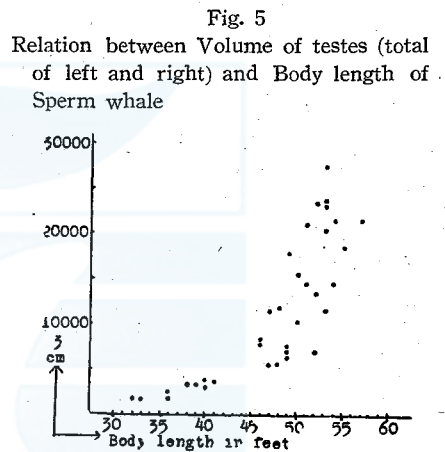
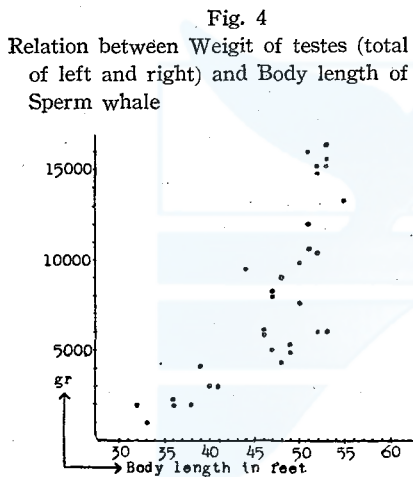
Feed is ordinarily cuttlefish and octopus but besides these, there were some which ate jellyfish. Those with empty stomach were 47 out of the 131 investigated but large amount of mouth piece and eye of cuttlefish and

Nematoda were found in the stomach.

In regards to reproductive organ, the weight and volume of testes, weight, volume, Graafian follicle corpora, etc were determined, the same as in the case of Sei whale.

The testes of ♂ Sperm whale is considerably larger than that of other Mystacoceti, spherical in shape and its position is entirely different from those of Mystacoceti.

Table 4 shows the weight of testes and body length and the curve makes a sharp rise from body length of 40 feet, and there are some which exceed 15 kg.



The same can be said for Table 9 also which shows the relation between volume of testes and body length.

There is considerable difference for each whale, but from this, it can be estimated that the sexual maturity of ♂ Sperm whale is body length from 42 to 44 feet, as a general rule. However, more investigation is necessary in order to arrive at a definite conclusion.

As to ♀, the body length of minimum sexual maturity is 28 feet, according to the corpora table. However, they are unmaturing whales of 35 feet. Since the whaling was by the factory ship method and as a result, catching was limited to whale whose body length is more than 35 feet, it is difficult to estimate the sexually matured body length by this investigation alone because in ♀ of Sperm whale, many reach sexual maturity below 30 feet. As to corpora, those with 5 were most numerous, centered around body length of 35 feet and maximum number is 14.

There were 22 pregnant whales, the maximum pregnant whale being 39 feet and the minimum 28 feet. Maximum body length of foetus was 13 feet and the minimum was 2 inches. Ratio by sex was 10 ♂ and 12 ♀.

It is reported that the length of pregnancy of Sperm whale is 16 months and can be roughly classified into the two groups of those which were pregnant for less than 1 year with foetus of less than 1 foot and those which were pregnant for a long time and approaching delivery, with foetus of more than 10 feet.

However, there is a necessity of collecting more data to find out the growing period, accurate period, of pregnancy and body length of foetus at delivery.

This ends the current report. The author wishes to express sincere gratitude to Mr. Omura and Sakiura of the Fishery Board for direct instructions in this investigation.