

C.S.

Scientific  
(Research Whaling)

No. 637/21

S. of S. Desps 66

SUBJECT.

1921

15th June

Previous Paper.

British Museum

Report on whaling operations in Dependencies.

C.S. 631/21

MINUTES.

S. of S. Des No 66 of 15th June 1921 Encl 6

H.E. the Governor,

Submitted.

2. C.S. 631/17 contains S. of S. No. 54 of 18th May last referred to in enclosed despatch.

*W. Thompson*  
A. C. S. 26/7/21.

H.E.S.

Will you please refer to Mr. Birnie with request that he will make such extracts as he considers should be recorded in the office of the Magistrate South Georgia. Attention is invited to paras 6 + 7 of Sir S. Harmer's letter of 3 June to page 8 of his report + to para 3 of K. Summary in report.

*SM*  
27 July 1921

*copy of the letter should be taken to Magistrate with copy of extracts made in*

Subsequent Paper.

Mr. Binnie,

will you kindly comply with the instructions contained in His Excellency's minute, and later return this paper with a copy of the extracts made in order that they may be sent down to South Georgia.

*H. W. Thompson*  
A. C. S. 27/7/21.

Hon. Col. Secy.

I forward herewith extracts which I have made from the attached Report and which I consider should be recorded in the Magistrate's Office at South Georgia.

2. I have also typed a copy of paragraph 7 of Sir Sydney Harners letter which I think would be useful to the Magistrate for reference, as the information required therein can be obtained.

3. With reference to paragraph 6 of the same letter; <sup>→ paragraph 16.3 in the Summary.</sup> the half yearly Reports were sent according to instructions from the Colonial Office and were treated as Interim reports and sent in every Quarter. Interim reports were intended, I understand, to include specially the following information for the Colonial Office: ( Quantity of oil produced during the period.  
Amount of oil shipped during the Quarter.  
Amount of oil awaiting shipment.)

4. The reports in future, however, will be seasonal, the one report giving all information required on the subject of the operations from 15th, September to 31st. May.

*E. B. Binnie*  
Ag. Postmaster  
30th. July 1921.

Letter to Magistrate South Georgia dated, 3/8/21... Encl: (2)

H. E. the Governor,

Submitted, before despatch of letter.

*H. W. Thompson*  
A. C. S. 3/8/21.

*H.E.S.*

*A record should be kept of extracts which are actually sent.*

*2. I have added two paras. to letter in order to make clear what information is specially desired.*

*Dr. 3 Aug 21*

Letter to Magistrate, South Georgia dated  
4th August, 1921.....Encl 2

Letter from Magistrate, S. Georgia  
29th October 1921 Encl (3)

S of S Despatch No 12 of 30<sup>th</sup> January 1922 - Encl (4)

Y. E.

Submitted

2 To the Govt. Naturalist send a  
copy of the letter from the Br. Museum  
to go to the Magistrate - S. Georgia?

~~ttttt~~ 20/4/22

HCS.

Para 2. Please forward.

2. Will Govt Naturalist please make  
complete two copies of specimen to be sent  
one for Museum in his office + one for the  
paper.

~~ttttt~~

10 April 1922

Govt Naturalist

accordingly

~~ttttt~~ 10/4/22

Hon. Col. Sec.

Complete copy herewith please,  
of following papers.

1. British Museum 31<sup>st</sup> Oct. 1921
2. Colonial Office 54260/21
3. British Museum 28<sup>th</sup> Sept. 1921  
(with appendix)
4. British Museum 3<sup>rd</sup> June 1921
- 5 do do do.  
Leaflet.
- 6 do do 19<sup>th</sup> May 1921.  
(with appendices 1, 2.)

2. My notes on above to follow  
please

J. Hamilton  
Government Naturalist

27<sup>th</sup> April 22

note. One page of typing is equal to a  
bout one and a half pages of his  
S. H. Armer's manuscript, I have there-  
fore had to alter the pagination.  
J. Hamilton.

Govt. Naturalist

Thank you

Will you please submit your  
notes when they are ready

J. Hamilton 4/5/22

Hon. Col. Sec.

My notes herewith please  
J. Hamilton  
Govt. Naturalist  
20/5/22



y/s. Submitted

2 Mr. Hammers reports is required to be returned & with the observations of the Govt. Laboratory

ttttt 21 June  
RR  
22 June 1922

Despatch No 84 of 24 June 1922 to Sops Encl -

y/s. Despatch submitted

ttttt 27 June 22



CS. 637/21

COPY.

FALKLAND ISLANDS.

No. 66.

DOWNING STREET,

15th June, 1921.

Sir,

I have the honour to transmit to you the accompanying copy of a letter from the Director of the British Museum (Natural History) enclosing a Report on Recent whaling operations in the Dependencies of the Falkland Islands and elsewhere.

2. I have to draw attention to the recommendation in paragraphs 6 and 7 of Sir S. Harmer's letter.

3. As regards the sending home <sup>of</sup> specimens of Killer Whales, regarding which instructions are given in paragraph 3 of the letter, I have to refer to my despatch No. 54 of the 13th May.

I have the honour to be,

Sir,

Your most obedient,

humble servant,

WINSTON S. CHURCHILL.

GOVERNOR

J. MIDDLETON, ESQ., C.M.G.

Copy.

BRITISH MUSEUM (NATURAL HISTORY)

ENCLOSURE TO DESPATCH

No. 66 OF 15 June

Cromwell Road,

London, S.W.1.

3rd June, 1921.

Sir,

With reference to previous correspondence on the subject of Whaling, I am directed by the Trustees of the British Museum to forward, for the consideration of Mr. Secretary Churchill, the accompanying Report dated 19 May, 1921, which is devoted to the consideration of papers submitted by the Colonial Office, the Governor of the Falkland Islands, the High Commissioner for South Africa, and others, on various subjects, the most important of which are the operations in South Georgia, 1917-1918 and 1919-1920, and the South Shetlands with Graham Land, 1919-1920. The Report may be regarded as a continuation of that dated July 17, 1920, transmitted with the letter, July 31, 1920, from the late Mr. C. E. Fagan.

2. The outstanding feature of the present Report is the evidence tending to show that the Blue Whale has already passed its zenith and that its numbers have commenced to fall in a way which recalls the history of the Humpback, off South Georgia, after the Season 1911-12. I regard the observed fall as ominous, in view of the fact that results which are in close agreement numerically have been obtained from the study of three independent sets of figures. With the reduction in the number of Blue Whales caught, the Fin Whale naturally assumes greater importance in the totals. If the

Blue

THE UNDER SECRETARY OF STATE,

COLONIAL OFFICE, S.W.1.

Blue Whale has really become less numerous, the intensive capture of Fin Whales cannot fail to affect the numbers of this species as well, and the Sub-Antartic Whaling may come to a natural end by the reduction of the three kinds of Whales on which the industry is based, to such an extent as to make their pursuit unprofitable.

3. The above reading of the facts may be an incorrect one, due to mistaking a temporary fluctuation of no consequence for something of more serious import. The Trustees hope that the forecast is misleading, but in view of the large interests involved they consider it desirable to direct the attention of the Colonial Office to a reading of the figures which is at least a possible one.

4. The Trustees note that the close season during the Winter months came into operation at South Georgia in 1920, and they recognize with satisfaction that this will do something to afford protection to the whales, particularly in view of the diminution in whaling which appears likely to result from the present low price of whale-oil.

5. Attention may be drawn to the fact that the half-yearly whale-oil Reports, a new form of Report, are not altogether convenient, since they divide the year into two halves beginning respectively in January and July. The information they contain is thus not easily correlated with that supplied by the ordinary half-yearly Whaling Reports, which refer to a year beginning on October 1st. This difficulty may not be felt in future, however, as with the disappearance of the Winter season, Reports are to be rendered annually instead of half-yearly as before.



6. The half-yearly Report on the Summer season 1919/20 (South Georgia) omitted certain important information of a kind which has always been given in earlier years. In order to avoid this omission in future it would be desirable to call the attention of the officials concerned to the interest of the tables showing (a) the total number of each species of whale captured during the season; (b) the number of each species captured during each month.

7. A resemblance was noticed, in respect of the catch of Sei Whales, Right Whales and (to some extent) Sperm Whales, between the seasons 1913/14, 1917/18 and 1919/20. This points to the desirability of having more definite information than has previously been supplied with regard to climatic conditions. Even if there would be difficulties in keeping a record of the temperature of the water at different times and seasons, information with regard to the ice-conditions might be given more easily, and would be worth having. I venture to add that another important point about which the half-yearly Reports give next to no information is the locality of the whaling fields. It is most desirable to know in what direction the whalers have to go, when leaving port, in order to find whales, and how many miles it is necessary to travel. Variations from year to year in these respects might be significant.

8. With reference to Sir Herbert Read's letter, May 18, on the subject of the Killer Whales and other smaller whales of Sub-Antarctic waters,

I am to state, for the information of Mr. Secretary Churchill, that the Trustees are much interested in these Cetacea, and that they will be prepared to defray reasonable expenses incurred in this connection. A statement has been drawn up in order to direct attention to the specimens which it is specially desirable to collect, and to the best way of preparing them, and it is enclosed, for transmission to the Governor of the Falkland Islands, with certain Museum publications bearing on the subject.

I have, etc.,

(SD) S.F. Harmer

637/21.

4th August,

21.

Sir,

I am directed by the Governor to forward herewith the enclosed extracts taken from enclosure to the Secretary of State's Despatch No. 66 of the 13th June, 1921, for record in the office of the Magistrate, S. Georgia.

2. In future, one annual report covering the whole period of the whaling season should be furnished. It should contain tables showing (a) the total number of each species of whale captured during the season and (b) the number of each species captured during each month.

3. Information should also be furnished as to climatic and ice conditions and as to the locality of the whaling fields.

I am, Sir,

Your obedient servant,

(sgd) W. A. Thompson,

Ag. Colonial Secretary.

The Stipendiary Magistrate,  
South Georgia.

COPY.

COPY OF PARAGRAPH 7 OF SIR SYDNEY HARMERS LETTER  
TO THE UNDER SECRETARY OF STATE.

Enclosure to Despatch No. 66 of 15th June.

(7). "A resemblance noted, in respect of the catch of  
SEI WHALES, RIGHT WHALES and (to some extent) SPERM  
WHALES between the seasons 1913-14, 1917-18 and 1919-20.  
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to add that another important point about which the  
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the locality of the whaling fields. It is most des-  
irable to know in what direction the whalers have to  
go, when leaving port, in order to find whales, and how  
many miles it is necessary to travel. Variations from  
year to year in these respects might be significant."

The information contained in the above tables is of special value. The first table which grows longer year by year, is important as bearing on the question whether any particular species shows signs of becoming less plentiful as the result of the whaling operations. The second table which can be compared with similar tables for earlier years, recorded in the previous reports, gives invaluable information with regard to the frequency of the whales on the whaling grounds, at different parts of the season, thus throwing some light on the migration of the several species. The results naturally have to be correlated as far as possible, with weather conditions and other factors affecting the catch.

Sir Sydney desires to call attention to the fact that, the figures on which these tables can be constructed have been omitted from the half yearly report and to recommend that the Colonial Office be asked to take steps to secure the inclusion in future reports of (a) a statement of the total number of each species of whale captured during the season (3) a table shewing the number of each species captured each month.

The Statistical Returns (162-70) are reserved for consideration on some future occasion. This will probably be done when the number of new foetal records has increased to such an extent to make it worth while to take up their study with the view of ascertaining how far they confirm or modify the conclusions arrived at in the Report dated Decbr. 17th. 1918.



Page 13.

WASTE OF MATERIAL.

This subject received special attention on pp.29-32 of the Report dated July 17th,1920. It is obvious that a wasteful use of material has continued in certain companies and Mr Binnie's remarks,quoted on page 6,on the poor results of the South Georgia Coy.may be noted he can hardly have meant,however,that this company ought to have obtained twice as much oil from the whales actually captured, since its average production per whale is given as 43.2 and twice that figure would have been too much to expect. The criticism apparently means that a larger number of whales should have been captured,given with increased efficiency in the methods of production of oil an amount twice as large as that actually obtained.Difference in the efficiency of the various companies is also noted on page 5 (under 174(a) ) waste of material is further indicated for 1918-19 and 1919-20 (South Georgia) by comparing these seasons with 1917-18

Page 19. para (5).South Georgia.

A Report has been received pp.5-8 on the Summer season 1919-20 shewing a slight increase over the corresponding season of 1918-19 in the total catch,but a reduced efficiency in the extraction of oil due specially to the poor results of the South Georgia Coy.

It is recommended (see page8) that the attention of the Colonial Office be specially called to the omission of certain important information in this Report.

EXTRACTS OF SIR SYDNEY HARMERS REPORT FOR RECORD IN THE OFFICE  
OF THE MAGISTRATE SOUTH GEORGIA.

\*\*\*\*\*

Page 4, From information which had been supplied in the 1919 season it was possible to include in the report dated July 17th 1920 on pp.23.24.the total catch (448) of whales for the winter season of 1918,the total number of each of the species captured and the production of oil and Guano,with the average number of barrels of oil per whale.It is thus merely necessary to record the monthly catches.

MONTHLY CATCHES, WINTER SEASON, 1918.

Month.	Hump back.	Fin. whale	Blue. whale	Sei. whale	Right. whale	Sperm. whale	Total
April		185	15	7	9	7	223
May	2	34	15		1		52
June		6					6
July	-	-	-	-	-	-	-
August		6	2				8
September		133	26				159
Total	2	364	58	7	10	7	448

The marked predominance of Fin whales,which constituted 81% of the total catch,is a striking feature of this table.The great majority of them belonged to the two ends of the season (April to September) 174.(c)-(e).Mr E.B.Binnie's half yearly reports. Jan.1919-June19

These reports are in a form not previously received,and to some extent they overlap the ordinary half yearly report.

Page 7.

1. TOTAL CATCH SUMMER SEASONS 1912/13 -1919-20.

Season.	Hump back	Fin whale	Blue whale	Sei whale	Right whale	Sperm whale	Other whale.	Total
1912-13	2251	1724	212		2	7	1	4197
1913-14	474	1417	651	90	63	15		2710
1914-15	631	1476	1936		4	1		4048
1915-16	1260	1852	2398		6	1		5517
1916-17	335	1345	1920		3	26		3629
1917-18	58	780	1816	42	25	30		2751
1918-19	64	1232	1160	3	4	13		2476
1919-20	80	1586	925	46	11	7		2655

2. MONTHLY CATCHES SUMMER SEASON 1919-20

October  
November  
December  
January  
February  
March.



S.G.97/21.

The Magistrate's Office,

South Georgia,

29th. October 1921.

Sir,

I have the honour to acknowledge the receipt of your letter No 637/21, of the 4th. August 1921, covering extracts from a Letter from Sir Sydney Harmer to the Under Secretary of State for the Colonies, on the subject of whaling in the Dependencies.

2. Paragraphs 2 and 3 of your letter under reply have been noted and the information will accordingly be furnished.

I have the honour to be,

Sir,

Your obedient servant,

*E. W. B. Binnie*  
Magistrate.

The Hon: Colonial Secretary,  
Falkland Islands.

DUPLICATE

FALKLAND ISLANDS

NO. 12

Dowling Street,

30 January, 1922.

Sir,

With reference to my despatch No. 66 of the 15th June, I have the honour to transmit to you the accompanying copy of a letter from the Director of the British Museum (Natural History) enclosing reports on the Shaling and Sealing operations in the Southern Hemisphere.

2. The reports are forwarded in original and I request that they may be returned to me in due course.

3. I also enclose a copy of the reply which I have caused to be returned to the Director and would invite your attention to the last paragraph in particular.

I have the honour to be,

Sir,

Your most obedient

humble servant,

(Signed) WINSTON S. CHURCHILL

GOVERNOR

J. MIDDLETON, ESQ., C.M.G.,

Ac., &c., &c.,

BRITISH MUSEUM (NATURAL HISTORY)

Cromwell Road,

London, S.W.7.

31st October, 1921.

Sir,

With reference to previous correspondence on the subject of Whaling and Sealing operations in Southern waters, I am directed by the Trustees of the British Museum to forward for the consideration of Mr. Secretary Churchill, the accompanying Report dated September 28, 1921, with Appendix dated October 18, 1921, containing an analysis of papers submitted by the Colonial Office and the High Commissioner for the Union of South Africa regarding the operations during 1920 in Natal, and during 1920/21 in the South Shetlands. The Report may be considered a continuation of those dated respectively May 19 and 23, 1921, transmitted with my letter of June 1, 1921.

2. The figures for Natal show that the Season 1920 was characterized by the large number of Sperm Whales captured, amounting to slightly more than 44 per cent. of the total. Evidence is submitted that a considerable number of undersized whales, of more than one species, were killed. Attention is directed to certain statements indicating that the lines of migration of male and female whales along the South African coast may not be identical.

3. The prohibition by the Governor of the Falkland Islands of the capture of Sperm Whales, Right Whales and Humpbacks has been noted, but the

Trustees

THE UNDER SECRETARY OF STATE  
COLONIAL OFFICE.



Trustees desire to know whether the Ordinance refers to South Georgia as well as to the South Shetlands. While this protection of Right Whales and Humpbacks may be cordially welcomed, it is possible that in view of the general distribution of the Sperm Whale the inclusion of this species is not very important. An alternative suggestion is made in my Report with reference to the Sperm Whale, to the effect that by imposing a certain size-limit it might be possible to protect practically all the females, in addition to those males which are so small that their capture is undesirable. An appreciable amount of protection might be afforded to the Sperm Whale if the Union Government of South Africa were willing to adopt this suggestion.

4. The order made by the Governor of the Falkland Islands with regard to the proportion to be observed between oil produced in high pressure boilers and that obtained in open boilers seems calculated to effect some economy in the use of the raw material, and it may be hoped that it will be instrumental in reducing the unnecessary slaughter of Whales.

5. Mr. J. E. Hamilton's Report contains much interesting information, but the value of his Reports would be increased if he would in future include a table recording the number of whales of each species captured in each month. It is also suggested that he be asked to endeavour to satisfy himself as to the amount

amount of reliability to be placed on the Statistical Returns furnished by the Whaling Companies on the Museum Form 132, particularly with regard to the question what amount of care is devoted to the correct recording of the sex and length of the whales captured and of the length of the foetal specimens obtained. Any evidence he may have to submit on the subject of the breeding of whales would also be welcomed by the Museum.

6. Although the Whaling Season 1920/21 was a particularly good one at the South Shetlands, an analysis of the Returns shows that the percentages of Blue Whales and Fin Whales in the total catch remains very nearly at the levels reached in the preceding three years. This is confirmatory, so far as it goes, of the suggestion made in my letter of June 1 that Blue Whale may already have passed its maximum; and it follows that the results of future operations should be closely watched with regard to this point.

7. Special attention is drawn, in the Appendix to my Report, to a striking result of the analysis of the recorded captures of male and female whales, during several seasons. While the numbers of males and females are practically identical in certain years, statistics for other years represent males as having occurred to the extent of about 60 per cent of the total for a species. At South Georgia in 1918/19 the recorded  
male

male Fin Whales were almost exactly twice as numerous as the females, although male and female Blue Whales were practically equal in number. At the South Shetlands in the same season, males and females were approximately equal in number, in both Fin Whales and Blue Whales; while in 1920/21 (South Shetlands) males constituted more than 60 per cent of the total, in both species.

No explanation is suggested for these results which may prove to have a practical bearing; but it is recommended that the attention of the Governor be called to the recorded facts, with the view of elucidating the matter further.

8. An examination of the figures for 1920/21 at the South Shetlands, show that the total catch actually recorded might have been diminished by about 650 Blue Whales, or alternatively by about 1150 Fin Whales, without any reduction in the total amount of oil produced, if less wasteful methods had been employed. This appears to be a necessary consequence of the use of floating factories, and the physical conditions prevailing at the South Shetlands make it difficult to use land factories.

The question requires the most serious consideration whether the use of floating factories should not be discouraged, or better prohibited altogether. It will be difficult to justify a policy which has tolerated this enormous amount of unnecessary slaughter should the operations now

in

in progress prove to be contributing to the not very distant extinction of the whaling industry. Reasons are given in my Report for believing that an excessive amount of whaling at the South Shetlands is likely to react on South Georgia since from their Geographical position these two whaling fields may intercept the vast herds of whales which are said to frequent inaccessible regions at other times in the year.

9. The Trustees have noted with interest other parts of Mr. Hamilton's Report, particularly his conclusion that it is unnecessary to attempt to reduce the number of Killer Whales, and the information he gives with regard to the distribution of Seals.

10. The Returns for 1920/21 furnished by the Whaling Companies in the South Shetlands do not appear to have been quite complete, since the numbers of whales of different kinds recorded are less numerous than those given by Mr. Hamilton. The most noteworthy omission is that of the Sydhavet Company, which heads its papers as referring to the period ending March 3, 1921, while its records come to an end on January 29.

The Companies are not equally satisfactory with regard to their Returns. The Norge Company send no foetal records Messrs. Chr. Salvesen & Co send one only, and the Sydhavet Company very few. Messrs. Bryde and Dahl represent a certain number of females as having been pregnant, but owing to the omission of any record of the length of the respective foetuses, their information is quite useless. This is the only  
Company

Company which records females as having been accompanied by young. Further information on this subject would be desirable, but the mere fact of the record is presumably an admission that a Regulation has been broken.

11. In accordance with the request contained in the letter (27445/1921) June 14, 1921, from the Colonial Office, Mr. Hamilton's Report is now returned, a copy having been made for use in the Museum.

I have etc.,

(Sgd) S.F. Harmer,  
Director.



54260/1921

Downing Street,

30<sup>th</sup> January, 1922.

Sir,

I am directed by Mr. Secretary Churchill to acknowledge the receipt of your letter of 31st October, relative to Whaling and Sealing operations in the Southern Hemisphere.

2. As regards the Union of South Africa it is understood, as a result of recent semi-official correspondence, that the suggestion in paragraph 3 of your letter as to the prohibition of the killing of the Sperm Whale will now be made to the High Commissioner direct, and in these circumstances no official action will be taken by this Department in the matter.

3. With further reference to the same paragraph of your letter, I am to explain that prohibition of the killing of Right, Sperm and Humpback Whales in the South Shetlands has now been applied

by

THE DIRECTOR  
BRITISH MUSEUM  
(NATURAL HISTORY)

Ordinance by inserting the prohibition as a condition in the licences issued for the Dependency. The prohibition does not apply to South Georgia where operations are carried on from shore stations and the existing leases are free from any stipulation as to the species of whale caught.

4. As regards the use of floating factories, it can be pointed out that, as stated in the report of the Interdepartmental Committee on Research and Development in the Dependencies of the Falkland Islands, with one partial exception it has not been practicable to establish any shore stations in the South Shetlands, owing to the lack of convenient sites and to the extended area over which whaling is carried on in that Dependency. The bulk of the whaling, therefore, continues to be carried on by floating factories; but the policy of the Government in this matter is in substance that recommended by the Inter-Departmental Committee, i.e. to permit the use of such factories no more than is absolutely necessary. Any effective discouragement or prohibition

prohibition of the use of floating factories would in practice mean the almost total abandonment of the South Shetlands field, with the consequent loss of an important source of revenue towards the cost of the researches proposed by the Committee; and, apart from this particular consideration, such a reversal of policy could only be justified by some conclusive evidence that operations on the scale now authorised were seriously threatening the stock of whales and consequently, the continuance of the industry. While recognising that the prevention of unnecessary waste is eminently desirable, it appears to Mr. Churchill that no such conclusive evidence has yet been produced and in fact unlikely to be forthcoming at any rate pending the suggested researches; and in these circumstances the question whether, having regard to the preservation of the stock of whales and the interests of the whaling industry, operations in the Dependencies of the Falkland Islands should be curtailed or might even safely be increased, must necessarily remain to a

large

large extent a debatable matter. This view is supported generally by the opinion of the Inter-Departmental Committee that it would be premature to make detailed recommendations as to policy, pending the contemplated researches; and also, in regard to the South Shetlands, by the view of Mr. Hamilton, to which reference is made in the enclosure to your letter, that it is impossible, without further data, to make a definite statement as to whether the Blue and Fin Whales are being reduced in numbers or not, and that there is, in his opinion, some hope that so far as Blue and Fin Whales are concerned, the present fishing is merely attacking the fringe of a vast herd. As regards the other species, the prohibition of the take of the Right, Sperm and Humpback Whale has already been mentioned. With regard to the waste of Whale matter, the further measures recently adopted in the South Shetlands are recognised in paragraph 4 of your letter, and, as regards South Georgia it will be observed from paragraph 2 of the letter

from

from this Department of 5th January that the matter has been receiving and will continue to receive careful consideration.

5. In all the circumstances, Mr. Churchill sees no alternative at the present time to continuing the policy of control as described in paragraphs 26 to 30 of the report of the Inter-Departmental Committee, with such modifications as may from time to time be shown to be practicable and necessary.

6. As regards paragraph 10 of your letter, Mr. Churchill has no information as to the record of females accompanied by young, and presumes that it is contained in returns sent to the Natural History Museum direct from the Colony. A copy of this correspondence is, however, being sent to the Governor, whose attention will be drawn to this point and also to the further suggestions contained in the papers which are not specifically referred to in this letter.

I am,

Sir,

Your most obedient Servant,  
(Signed) G. GRINDLE



1. Director's Office  
 British Museum.  
 Natural History.  
 Sept. 28 1921.

Sir Sidney Harner has the honour of reporting to the Trustees, in continuation of his Report, May 23, 1921, on certain papers which have been received on the subject of Whales and Whaling in South Africa and the South Shetland Islands, and on the Seals of the latter locality.

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III	<u>Summary and Recommendations</u>	

Sept. 28 1921.

List of the more important papers considered in this Report.

Registered Number	Number in file	
		<u>I. South Africa.</u>
1847/21	198	<u>Statistical Returns (Form 132). Natal, 1920.</u>
		(a) High Commissioner, May 19, 1921
		(b) Statistics, Brimwood Whaling Co. Jan. 13-Dec. 21
		(c) Premier Whaling Co. June 2-Nov 19
	202	Acknowledgement, May 31 1921, of the above papers.
2352/21	206	Provincial Secretary, Cape Town, June 1, 1921; asking for a Report on S. African Whales.
	207	Reply to the above, June 27, 1921.
		<u>South Shetland Islands, 1920-21.</u>
2265/21	204	(a) Colonial Office, June 14, 1921.
		(b) Governor of the Falkland Islands Apr. 26, 1921.
		(c) Report by Mr. J. S. Hamilton, Specially Magistrate, South Shetlands, on the Whaling Season 1920/21.

## I. South Africa.

### A. Whaling in Natal, Season 1920.

No Report has been received on African Whaling, 1919. For information in Natal and Cape Colony, 1918, see the Reports dated respectively July 21, 1919 and Oct. 16, 1919.

None of the Reports hitherto received from South Africa have been really satisfactory; and in acknowledging (202) the papers ~~now~~ now under consideration the attention of the High Commissioner has been called to some of the shortcomings.

The more important are these:-

(i) The entire omission of foetal records. These are greatly desired, since whaling is carried on during the months June-September, when little or no whaling is done in the far South. Evidence of the length of foetuses during these months is urgently required, in order to verify or correct the results which have been arrived at from the study of the Southern foetuses.

(ii) The Premier Whaling Company omitted to record the sexes of the whales captured.

(iii) General summaries of the results of the season, with tables of the numbers of each species, the monthly catches, the average oil production per whale, and so on, would greatly add to the value of the information given.

The Summaries given below for the Natal Season 1920 are based on an analysis of the Whalers' Statistics (No. 198).

It is unfortunate that they cannot be compared satisfactorily with those referring to any other year. Although the figures were received for 1918, these were obtained from two sources, and as explained in the Report Oct. 16, 1919 there were serious discrepancies in the records.

#### (a) Total catch, Natal, 1920.

Species	Males	Females	Sex not Recorded	Total	Percentage of total
Fin Whale	34	15	110	159	22.6
Blue Whale	14	10	47	71	10.1
Humpback	25	25	98	148	21.0
Sci (Y-Bryde's					
Whale	4	1	10	15	2.1
Sperm Whale	63	47	181	311	44.2
Totals	160	98	446	704	100.0

The most striking feature of these figures is the large proportion of Sperm Whales; in general agreement with Mr. Bell-Marley's figure (51.4 per cent of the whole catch) for Natal 1918 but widely different from that (23.8 p.c.) obtained from the Whalers' statistics for the same year (See Reports, Oct 16 and July 21, 1919). Humpbacks were also relatively numerous, but Fin Whales scarcely exceeded the Humpbacks in numbers, and Blue Whales were scarce.

It will be noticed from the table on p. 2 that the sex of the whales captured was recorded in but a small proportion of

of instances. In the case of Fin Whales definitely recorded as to sex, there is a marked preponderance of males over females. It is worth while to draw attention to this point, since on two previous occasions an excess of males has been noticed in the African records. In his notes on the 1917 season off Cape Colony Mr Carl Eliesen stated that the number of male Blue Whales caught always largely exceeds that of females (Report, June 10, 1918, p.3). The Southern Whaling and Sealing Company, dealing with the figures for 1918 in the same locality, stated that out of 330 whales of all species caught 120 were females and the rest (210) were males (Report, July 21 1919, p.6). These statements may indicate different lines of migration for male and female whales.

Although a similar preponderance of males is shown in the Sperm Whale, Natal 1920, it must be remembered that in this species though not in the Whalebone Whales, the male greatly exceeds the female in size, and would naturally be caught in preference.

(b) Monthly catches, Natal, 1918, 1920.

An analysis of the statistics for the two years seems to indicate that the various species \*\*\* of whalebone whales are caught in the greatest numbers during the period June-August, and that the maximum for the Sperm Whales falls later, in September and October.

(c) Capture of undersized Whales, Natal, 1920.

As shown by the following table, there is evidence of the capture of an unduly large proportion of undersized individuals, particularly in the case of the Sperm Whale, the Humpback and the Blue Whale.

Frequency of Sizes Natal 1920.

4

Frequency of Sizes Natal, 1920.

Species	Lengths in feet.									
	100	99-90	89-80	79-70	69-60	59-50	49-40	39-30	29-20	
Fin Whale	-	-	1	22	77	47	9	2	-	159(15)
Blue Whale	1	4	10	19	27	9	1	-	-	71
Humpback	-	-	-	-	-	2	43	95	7	148 (14)
Sei Whale	2	-	-	-	-	2	8	2	3	15
Sperm Whale	-	-	-	-	-	39	56	163	62	311

(note, also one Humpback between 19 and 10 feet, and one Fin Whale length not given)

Out of a total of

71 Blue Whales 37 or 52.1 per cent were less than 70 feet long  
 148 Humpbacks 103 or 69.6 per cent were less than 40 feet long  
 311 Sperm Whales 225 or 72.3 per cent were less than 40 feet long.

The meaning of the figures referring to the Sperm Whale involves a further analysis of the statistics, and the following table gives the length-frequencies of the 130 individuals whose sexes recorded

Sperm Whale	Lengths feet	Male	Female	Total.
Natal 1920	56-50	10	-	10
	49-40	19	-	19
	39-30	32	29	61
	29-25	22	18	40
Totals		83	47	130

Sperm Whale, Natal, 1920.

Male, largest captured 56 feet, smallest 25 feet.  
 Female do. do. 38 feet, do. 26 feet.  
 Male average length of 83 specimens 36.7 feet.  
 Female do. do. 47 do. 31.0 feet.

The size (38') of the largest Sperm Whale definitely recorded as a female is probably not far from the largest size ordinarily attained by this sex. It is thus probable that the greater number of the 86 specimens of 40' or over were males.

Of the 101 Sperm Whales of known sex, between the limits of 39' and 25', 54, or about 54 per cent were recorded males.

If ~~the sexes~~ occurred in the same proportions in the 120 specimens of unknown sex, within the same limits of size, 66 of those were also males, making a total of 120 males less than 40 feet long, or 38.6 per cent of the total catch of 311. So large a proportion of undersized males must be considered very regrettable.

It would seem possible to take advantage of the great difference in size between male and female Sperm Whales to afford efficient protection to the species. If it were made illegal to capture Sperm Whales less than about 40 feet in length not only would the undersized males be saved from destruction but practically all females as well. As this whale is partly

part

partly polygamous the killing of males, if not carried to excess would presumably be relatively unimportant to the welfare of the species.

It is worthy of notice that Mr. A. F. Bearpark (No 212) has recently sent a record from South Africa, of a pregnant Sperm Whale only 29 feet 6 inches in length.

(d) Bryde's Whale.

An enquiry (No 206) has been received from the Provincial Secretary, Cape Town, as to the possibility of receiving at once the Report on this species which had been promised by the Museum (Report, Jan. 10, 1921, pp. 2, 3). The disorganisation of the sand pits used for cleaning Cetacean bones, due to the commencement of the new Spirit Building, has made it impossible to begin the preparation of the skeleton of Bryde's Whale recently presented by the Union Government of South Africa. It has accordingly been necessary to send a reply (No 207) to the effect that the Report asked for cannot be furnished at present.

II. South Shetland Islands, Season 1920-21.

In his despatch dated Apr. 26 1921 (No 204.b) the Governor of the Falkland Islands states that he has given effect to certain recommendations made by Mr. J. E. Hamilton (No 204.c) by providing that:-

(a) The taking of Sperm, Right and Humpback Whales is prohibited.

(b) The proportion which the total production of pressed oil shall bear to the total production of <sup>blubber</sup> oil shall not be less than one barrel of press oil to two and a half barrels of blubber oil.

With regard to (a) it is not clear whether <sup>The</sup> prohibition refers to South Shetlands only. The attention of the Colonial Office might be drawn to this point, with the suggestion that the enactment be extended to South Georgia if this has not already been done.

The prohibition of the capture of Right Whales and Humpbacks may certainly be welcomed. Both these species are in urgent need of protection in the area in question. Sir Sidney is not sure that the inclusion of the Sperm Whale is important. This species is a straggler from warmer water, as Mr. Hamilton himself admits. The number of individuals caught is insignificant, at both South Georgia and the South Shetlands, and they are practically all males of moderate or large size. A more effective way of protecting Sperm Whales would be to impose a size-limit at the South African Stations, where these animals are killed in considerable quantities, and thereby to protect nearly all the females and the undersized males, as explained on p. 6. It is recommended that the Colonial Office be asked whether a suggestion of this kind can be made to the Union Government of South Africa.



The enactment (b) is an attempt to check the waste of material which has occurred so lamentably in the past, and it will be an experiment to be watched with great interest. The first stage in the extracting or "trying out" the oil is the treatment by steam, in open boilers, of the blubber cut into pieces of convenient size. In a well regulated factory the residual masses from the open boilers are then submitted, with the tongues and other parts of the flesh, to the action of a digester, a closed boiler in which the extraction takes place under a pressure of 40-50 lbs to the square inch.

If whales are unduly plentiful this second operation may not be carried out properly, and ~~the~~ enormous quantities of valuable material have been wasted by this omission. Mr. Hamilton's suggestion which is here acted on, seems to be well calculated to put a stop to some of this waste.

Mr. J. E. Hamilton's Report (204.c) records the results of his observations made during a visit he paid to the South Shetlands between Nov. 20, 1920 and March 26, 1921. It contains much that is of interest, and it deserves special attention owing to the fact that the writer is a trained Ecologist.

Mr. Hamilton records the incidents of his journey in some detail, but it is not necessary to summarize this part of his Report, or to comment on certain other parts, such as his Topographical notes and his suggestions with regard to lights on the coast. The parts which specially concern the Museum are those referring to Whales and Seals.

#### A. Whaling Season, 1920-1921, South Shetlands.

(i) 8 Whaling Companies operated during the season, employing 26 whale catchers. Most of the work is carried out by floating factories, but the Hektor Company has 36 large press boilers on the land-station at Deception Island.

(ii) Operations are greatly hampered by weather conditions. Up to Christmas the fresh water was frequently frozen, seriously interfering with the "trying out" of the oil. Rough weather, fog and ice naturally affect the hunting adversely. Propellers are often lost by contact with floating ice.

(iii) The season was a very good one, resulting in the capture of 4754 whales, which yielded 208,269 barrels of oil. The general results are shown in the following table:-

Ships (Floating Factories)	Whales taken			Oil produced			
	Blue Whale	Fin Whale	Hump- back	Total	Blubber Press	Total	
Bombay	193	220	18	431	13713	4487	18,200
Neto	172	340	46	558	14280	4720	19,000
Grandifoyu I	250	269	13	532	17820	6980	24,800
Grand Foyu I	183	408	11	602	18570	6930	25,500
Thor I	175	369	15	559	14914	10986	25,900
Solstreif	240	269	34	543	18941	8059	27,000
Governoren	191	518	14*	725	21824	6045	27,869
Ronald	351	445	8	804	28200	11800	40,000
Totals	1755	2838	159	4754	148262	60007	208,269

\* and two Bottlenoses.

The following table enables the catch to be compared with earlier years, the figures for which are taken from p. 7 of the Report, May 19 1921:-

South Shetlands, Total catch, 1915/16-1920/21.

Season	Hump- back	Fin Whale	Blue Whale	Right Whale	Sperm Whale	Bottle- nosed Whale	Piked Whale	Totals
1915/16	219	2,358	1,845	6	3	-	-	4,431
1916/17	21	602	1,380	-	-	-	-	2,003
1917/18	71	627	397	13	-	1	5	1,114
1918/19	57	1,296	716	7	-	3	-	2,079
1919/20	179	1,541	871	-	2	-	-	2,593
1920/21	159	2,838	1,755	-	-	2	-	4,754

(iv) Monthly catches. Mr Hamilton gives no information on this subject.

(v) Oil production. The average production per whale was 43.8 barrels, consisting of 31.18 barrels of blubber oil and 12.62 barrels of press-oil. The average production of Blue Whales plus Fin Whales is 44.73 barrels per whale. The ratio of blubber oil to press oil is worked out for the individual floating factories (each belonging to a separate Company), and this ratio varies from from 3.6:1 to 1.55:1. The ~~factory~~ factory ("Gubernoren") with the highest ratio had an insufficient number of press-boilers, and Mr. Hamilton recommends that the Company in question be induced to increase the number

The Companies individually varied from 34.05 to 49.75 barrels per whale.

(vi) Baleen. 120 tons were cleared; but as the production of a single factory ("Ronald") was 100 tons, it is obvious that most of the Companies did not consider it worth while to prepare this product

(vii) No mention is made of this product, and it may be inferred that none was manufactured.

(viii) Waste of material. A good deal of waste occurred. The middle part of the back and the internal organs are nearly always allowed to drift away; and when whales are plentiful a certain number of carcasses are wasted entirely.

It is the practice to fill the press boilers with oil, and



then if possible the open boilers, before the production of blubber oil is stopped. This entails the entire waste of the last carcasses of the season. In mitigation of this procedure, <sup>Mr. Hamilton</sup> that some of the boilers have to be filled with oil in order to trim the ship for the bad weather which may be expected on the return journey to the Fallow Islands.

(ix) Occurrence of Whales. In the earlier part of the season, which began on Nov. 26, Blue Whales were plentiful and in the best condition, while Fin Whales were in poor condition. This is said to be normal, the Fin Whales increasing in fatness during the season and being at their best at the end of it. Humpbacks were small throughout the season and were apparently not numerous. No Right Whales or Sperm Whales were seen. Lesser Porpoises and Killers were abundant. The Killers do some damage to floating carcasses one catcher lost a whale altogether from their attacks, and another brought in a small Blue Whale half eaten. No evidence was obtained that Killers attack uninjured Blue Whales or Fin Whales, and it seems unnecessary to reduce their numbers.

Mr. Hamilton adds some notes on the behaviour of hunted Whales. Humpbacks and Fin Whales can generally be approached with reasonable ease. When a Humpback is frightened it rushes away in a straight line, slowing frequently, and is easily run down by steaming hard. Blue Whales are generally nervous and are alarmed by a noise. Female Whales with large calves were observed to be shy, but there was no opportunity of noticing their behaviour when accompanied by small calves.

The gun sight is usually fixed for 50 metres, and the time available for sighting and shooting was estimated as  $\frac{1}{2}$  second for a Fin Whale and 3 seconds for a Blue Whale. Misses are common but there is no great difficulty in hunting or shooting.

(x) Whale Meat. The meat of the Fin Whale constitutes the principal press food of the entire fleet. It is usually taken from the dorsal part of the tail, and is excellent if obtained within 24 hours of death. It will keep for many days in the cold atmosphere of the South Shetlands when it has become cold.

(xi) Regulation of the industry. Among Mr. Hamilton's recommendations are those to which effect has already been given by the Governor (see p. 5). Further investigation is required as a preliminary to limiting the number of whales or the total oil production.

Mr. Hamilton thinks that there is at present no evidence of the approaching extermination of Blue Whales or Fin Whales, though he urges the importance of the greatest economy of material. He obviously has some sympathy with the contention of those interested that "the present fishery is merely attacking the fringe of a vast herd".

He states that the annual cost of an ordinary 25,000-26,000 barrel Expedition is estimated at £175,000 and that the risks are very great. Consideration is due to the Norwegians, who created the industry.

## B. Seals.

Fur Seal. One was reported to Mr. Hamilton as having been seen about 5 years ago.

Elephant Seals Occur frequently, but no large rookeries have been reported.

Weddell's Seals . These are the commonest kind, and are found on every suitable beach, often in small flocks, when the snow has melted.

They were seen on the ice in Deception Id. Harbour when the ice field was breaking up. The hair is shed in the early part of the summer, and at the beginning of February at Port Lockroy all the adults had good coats. Only one seal pup was seen, probably of this species.

Ross's Seal. One was captured in Peltier Channel, and a few were reported from Andvord Bay.

Crescent Seal, the "Silver Seal" of the whalers. 5 were seen of which 3 were captured. The skin is most beautiful, a creamy grey with a brilliant gloss.

Sea Leopard. One killed by Mr. Hamilton was 11'1" long. These animals were seen tearing off and eating lumps from the tongue of a moored whale carcass.

3 good Weddell's Seals or 3 Sea Leopards were estimated to yield a barrel of oil.

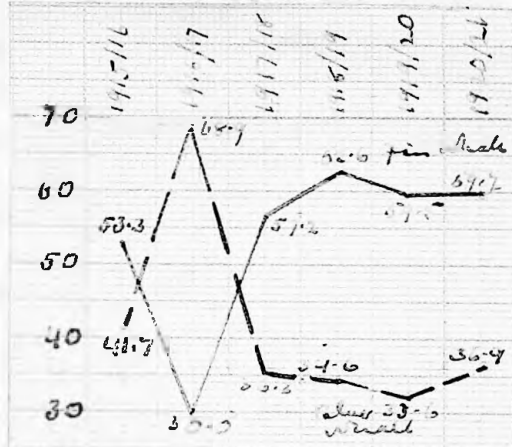
Mr. Hamilton thinks that an extensive Seal industry could not be carried on in the South Shetlands, but that it might be profitable further to the South, where they are specially numerous round the Biscoe Is.

Large numbers have been reported on the large islands to the North of Deception Island.

Mr. Hamilton's Report contains much that is of interest and his further observations will be welcome. It would add greatly to the value of future reports if he would include in them a table showing the catches of each species of whale during each month of the Whaling Season; and the Colonial Office should be asked to request him to furnish this information. He gives no information whatever about foetuses, or about pregnancy; and it is desirable to ask him to devote attention to these points, and to endeavour to ascertain whether there is any evidence of pairing between whales during the South Shetland season.

It is evident that the Season 1920/21 was a specially good one, the total number of whales captured being the largest recorded during the period since 1915/16, in which detailed statistics have been available (see table on p. In commenting on Mr. Hamilton's statement that there is no evidence of the reduction in numbers of Blue Whales or Fin Whales, Sir Sidney begs to refer to p. of his report, May 19, 1921, where considerable anxiety was expressed on this subject. It was there pointed out on the evidence of three separate sets of statistics (South Georgia

Georgia, summer season; South Georgia, winter season; South Shetland that in or about 1917 the Blue Whale rose, in each case to over 60 per cent of the total catch of the three principal species, the Fin Whale having of course a correspondingly low percentage; that in the next succeeding season, in each case, the Blue Whale sank below the Fin Whale; and that it has so far remained at a lower level.



In spite of the fact that the total catch (4754) for 1920/21 was widely different from that (2593) for the preceding year and from those of the years from 1916/17 to 1918/19 (see tables on p. 7), it is not a little striking that the relative proportions of Fin Whales and Blue Whales remain almost the same from 1917/18 to 1920/21, whether the season was good or bad for whaling in general. The figures for 1920/21 are in fact entirely confirmatory of the result reached in the Report May 19, 1921 that the Blue Whale has passed its maximum and that the Fin Whale, in spite of its inferior size and productiveness, is the one which the whalers are obliged to catch in the largest numbers.

*whales* Oil production. As usually happens, an abundance of was associated with a relaxation of efforts to make the most of the material. This follows from a comparison of Mr. Hamilton's figure, 43.8 barrels per whale for 1920/21 with the 47.8 barrels recorded in ~~the~~ 1919/20 (Report, May 19, 1921 p. 7). The inferior productivity of floating factories is shown by comparing these figures with those from South Georgia, as recorded on p. 5 of the Report just quoted. Of the five seasons there noticed, the worst was 46.9 barrels in 1915/16, a particularly good season when 5517 whales were killed. The best was 66.6 barrels in 1911/12 with only 2751 whales, almost exactly half the number for 1915/16.

It is worth while to examine what is the practical effect of the inferior productivity of the floating factories.

The average numbers of barrels per whale have been estimated as follows (Report July 17, 1920, p. 31):  
 Blue Whale, 75. Fin Whale, 42.5 Humpback, 36.

If the whales actually captured at the South Shetlands in 1920/21 had actually yielded oil at these rates, the total oil production would have been 257,010 barrels, or 48,741 barrels in excess of the actual yield, corresponding with an average production of just over 54 barrels per whale. This rate is al-

most exactly the average rate of the 5 South Georgia seasons noticed on the last page, and is far inferior to the best of the five. But even at this rate, which is shown to represent no impossibly high standard, the 48,741 barrels by which the South Shetland figure for 1920/21 fall short of the average yield for South Georgia represents the total average production of about 650 Blue Whales or of about 1150 Fin Whales.

The deficiency of oil is made more serious by the fact that steps cannot be taken for manufacturing "guano" another most valuable whale product, on the floating factories, or at any rate to no more than a small extent.

The lamentable waste of material which occurs at <sup>the</sup> South Shetlands seems to be one of the most serious aspects of the situation. The lessons of history are so clear that it needs no great amount of foresight to predict that Sub-Antarctic whaling cannot continue at its present rate. It is worth while to consider seriously the question whether an effort should not be made to reduce the amount of whaling at the South Shetlands, in view of the fact that an incalculable amount of slaughter is necessitated by the wasteful methods resulting from the use of the floating factories. It would probably be advantageous to prohibit the use of floating factories altogether, and to restrict the catch to those whales whose carcasses could be entirely utilized by the ~~shore~~ shore stations on Deception Island.

It may be true that vast herds of whales occur in inaccessible parts of the Antarctic Ocean. But if it should prove to be the case that these herds make extensive circumpolar migrations - a by no means improbable hypothesis - they would be bound to concentrate themselves into the narrow strait between Cape Horn and the Antarctic Continent at certain periods. The South Shetlands and South Georgia lie across this narrow belt of the Antarctic Sea, and the whaling operations may thus intercept these vast herds which are scattered in inaccessible regions at other periods of the year. The reduction of whaling in the South Shetlands might go far towards prolonging the life of the South Georgia industry and would remove from this country the reproach of permitting the annual slaughter of large numbers of whales which could be spared, without diminishing the quantity of oil or guano produced, if less wasteful methods of manufacture were made obligatory. Sir Sidney recommends that the <sup>special</sup> attention of the Colonial Office be called to the desirability or, discouraging or, better, of prohibiting the use of floating factories.



### III. Summary and Recommendations.

1. The present Report deals with the returns from Natal for the Season 1920 and with Mr. J. E. Hamilton's observations on the Whales and Seals of the South Shetlands during 1920/21.

2. The papers received from Natal (pp. 2-6) have already been acknowledged to the High Commissioner for the Union of South Africa, with a request for information in future Reports, on certain questions not discussed in the papers now under consideration. A further reply to the High Commissioner is thus not required, but the whole of the present Report, including the portion referring to South Africa, should be sent to the Colonial Office for their information.

3. The Natal catch is characterised principally by the large percentage of Sperm Whales. Attention is called to certain statements which indicate that the lines of migration of male and female whales along the South African Coasts may not be identical.

The large number of undersized whales recorded is a regrettable feature of these returns, and a suggestion is made that Sperm Whales should be protected by the imposition of a size limit calculated to prevent the capture of nearly all the females, as well as the immature males.

4. The Governor of the Falkland Islands has prohibited the capture of Sperm Whales, Right Whales and Humpbacks, but it is not clear whether this Ordinance refers to South Georgia as well as to the South Shetlands. Enquiry should be made on this point.

It is recommended that the Colonial Office be asked whether it can influence the Union Government of South Africa to consider the possibility of carrying out the suggestion made in Sect. 3 with regard to the protection of the smaller Sperm Whales.

5. The Governor of the Falkland Islands has also made an order that the amount of oil produced in high pressure boilers shall bear a certain proportion to the amount of oil produced in open boilers, a measure intended to check waste at the South Shetlands.

6. The more important parts of Mr. J. E. Hamilton's observations, during 1920/21, on the Whales and Seals of the South Shetlands are summarised.

7. The South Shetlands Whaling Season 1920/21 was an unusually good one, the total catch being 4754.

Details of the catch and of the production of oil are recorded in tables.

8. Mr. Hamilton thinks that it is unnecessary to attempt to reduce the number of Killers.

9. Information is given with regard to the occurrence of various species of Seals in the South Shetlands and adjoining localities.

Mr. Hamilton thinks that a sealing industry in the South Shetlands would not be profitable, but that it might be carried out further to the South.

10. It is recommended that Mr. Hamilton be asked to furnish information about the monthly catches in future Whaling Reports, and to devote

devote his attention if possible to questions connected with the breeding of whales, including the occurrence of foetal specimens

11. Although Mr. Hamilton thinks that there is no evidence of the reduction ~~of~~ in numbers of Fin Whales and Blue Whales, the figures he gives are confirmatory of the conclusion reached in an earlier Report that the Blue Whale may already have passed its maximum.

12. The waste of material which occurs at the South Shetlands owing to the use of floating factories is specially considered, and an attempt is made to show that the prohibition of the employment of floating factories is desirable in the interests of the whales and of the whaling industry. It is recommended that attention of the Colonial Office be called to this part of the Report.

(signed) S.F. Harmer.

#### Appendix to Report, Sept 28 1921, on Whales and Seals.

Since writing the above Report, the Whalers' Returns on the Whaling Season 1920-1921 have been received (South Shetlands): with a covering letter, July 30, 1921, from the Colonial Secretary, Falkland Islands. An analysis of these results yields the following results.

I. Total Catch. The number of whales recorded is 4215, or 539 fewer than the total (4754) given by Mr. Hamilton. Part, but probably not the whole of the discrepancy is apparently due to the fact that the Sydhavet Company supplied returns only to Jan. 29, while stating in their headings that they operated to March 3.

The relative proportions of the two principal species is not very different in the two sets of figures. If the Whalers' figures had been taken in constructing the graphical representation given on p. 10 of the Report, Sept. 28, 1921 (for the season 1920/21) the percentage of Fin Whales and Blue Whales would have been 57.6 and 39.6, instead of 59.7 and 36.9. These slight differences are not material.

The numbers actually recorded in the statistics are:-

Fin Whales	2429 (Mr. Hamilton's figure 2838)
Blue Whales	1666 (Mr. Hamilton's figure 1755)
Humpbacks	118 (Mr. Hamilton's figure 159)
Bottlenosed Whales	2 (Mr. Hamilton's figure 2)

II. Companies operating. Eight Companies furnished Returns, Messrs Bryde & Dahl not being mentioned in the covering letter. The Hektor Company gives the results of five Whale catchers, while only three are indicated in the covering letter for that Company.

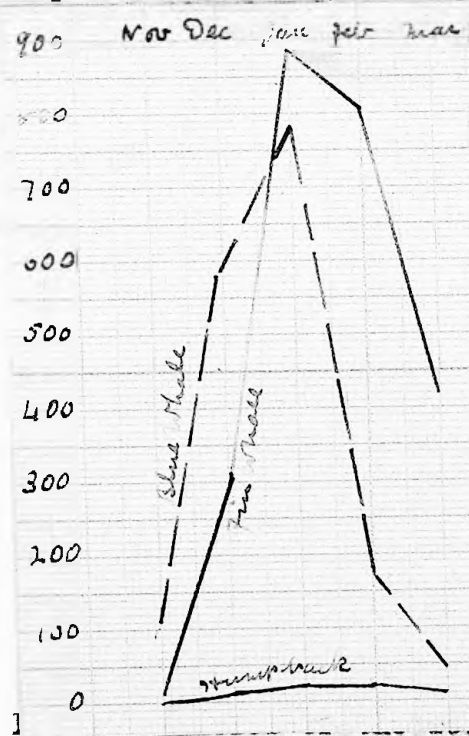
III. Duration of the Season. The extreme dates are Nov. 20 and March

March 26. The Norge Company commenced on Dec. 26, but all the others started operations from Nov. 20 to Dec. 3. The last returns are in all cases between March 3 and March 26.

IV. Monthly Catches. These were as shown in the following table

Month	Fin Whale	Blue Whale	Humpback	Total.
November	19	104	2	125
December	314	589	24	927
January	677	796	46	1719
February	811	187	25	1023
March	408	90	21	519
Total	2429	1666	118	4213

in addition two Bottlenosed Whales caught respectively in January and March.



The meaning of these figures becomes more clear when they are represented graphically, as here sketched.

The Blue Whale has generally been found to reach its maximum earlier in the season than the Fin Whale, at the South Shetlands. This is indicated in the graphs for the present season, but it comes out even more clearly in a further analysis of the statistics, showing that, when the figures are grouped in half-months, the Blue Whale has a very decided maximum (428) in the first half of January, while the equally pronounced maximum of the Fin Whale belongs to the second half of the month.

The most interesting result of the analysis is the evidence obtained of a marked excess of males in all three of the principal species. A possibility which has to be considered is that this result is due to inaccuracy in determining the sexes:—a mistake which may readily be made by the inexperienced. But in comparing results with those of earlier years it appeared probable that they are substantially correct, in view of the fact that there were marked resemblances.

Actual numbers for the period Dec. 1 to March 31.

	Fin Whale			Blue Whale		
	Male	Female	Total	Male	Female	Total
S. Shetlands, 1918/19	391	404	795	239	229	468
S. Georgia, do.	391	196	587	296	290	586
S. Shetlands, 1919/20	709	447	1156	393	277	670
S. Georgia, do.	648	618	1266	411	427	838
S. Shetlands, 1920/21	1510	897	2407	950	612	1562



Percentages.

	Fin Whale			Blue Whale		
	Male	Female	Total	Male	Female	Total
S. Shetlands 1918/19	49.3	50.7	100	51.0	49.0	100
SSS Montagu do.	66.6	33.4	100	50.5	49.5	100
S. Shetlands, 1919/20	61.4	38.6	100	58.6	41.4	100
S. Georgia, do.	51.5	48.8	100	49.0	51.0	100
S. Shetlands, 1920/21	62.8	37.2	100	69.8	39.2	100

The percentage table shows that the records can be assembled roughly in two groups; (a) those in which there is approximate equality between the two sexes; (b) those in which the males form about 50 per cent., or even more, of the total. Condition (a) is represented, for the Fin Whale, for the S. Shetlands 1918/19, and for South Georgia 1919/20; and, for the Blue Whale, for the S. Shetlands 1918/19, and for S. Georgia 1918/19 and 1919/20. The greatest disproportion between the sexes (condition (b)) is shown by S. Georgia 1918/19, where there were almost exactly two males to one female.

In two of the above seasons, figures are available from the localities. It may not be without significance that, in 1918/19 in the Fin Whale, the sexes were approximately equal at the S. Shetlands, while males were preponderant at S. Georgia; while in 1919/20 these conditions were reversed. In the Blue Whale, the sexes were in equal numbers at both localities, in 1918/19 but this condition obtained only at S. Georgia in 1919/20.

It may further be remarked that the monthly frequencien of the sexes, as revealed by the statistics, show a marked resemblance, usually throughout the season, to the general characteristics of the entire season.

It is hardly desirable to speculate on the meaning of these figures, which may have a definite relation to temperature ice-conditions, weather, food or some other factor. It seems sufficient for the present to record what seems to be an interesting fact bearing on the question of the probability of a difference in behaviour of males and females in their movements.

If this could be established and the causes understood, it might lead to some practical step towards the protection of the Whales.

V. Miscellaneous. The only other points to which attention need be called are:

Weather conditions. Much ice reported by two Companies.

Whale-food (plankton):-reported all over the whaling grounds by one Company.

Breeding. Pairing of Fin Whales stated to have been observed in Belgica Strait, in the middle of February, when many

many Female Fin Whales were reported to be accompanied by young (Sydhavet Co.). Messrs. Bryde & Dahl indicate that the female was accompanied by young in a good many cases, both in the Fin-Whale and in the Blue Whale.

Other species of Whales. The Sydhavet Company report plenty of Bottlenose Whales, which were not hunted. (Two were obtained by the Odd Company). Messrs. Salvesen & Co. report the occurrence of "Minke" which is no doubt the species supposed to be identical with the Northern Lesser Porpoise.

Whales far from Land. Messrs. Salvesen report Blue Whales under this heading, but so far as can be made out from their figures which are not very intelligible, the locality in question was close to the Falkland Islands.

(signed) S.F. Harmer.

(signed) S.F. Harmer.

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London, S.W. 7.

1. Specimens of skulls (with lower jaws) of any of the smaller whales would be specially acceptable. Each skull should be accompanied by the two paddles of the same individual. It is very desirable to record the external coloration of each specimen, and to state its total length and sex.
2. Directions for the preparation of specimens are given in the "Instructions for Collectors" No. 1. Animals, Part BB (1917). The total length should be taken as explained on p. 5 of this pamphlet. For the preparation of the paddles, see p. 7 of the skull, see p. 8, 2. The determination of the sex is assisted by measuring the distance between the vent and the opening of the reproductive organs (p. 4k).
3. The skull and paddles of the same individual should be labelled with the same number. Particular care should be taken to avoid losing any of the teeth; in order to avoid this result the gums should not be removed from the tooth bearing margins of the jaws.
4. The Antarctic "Bottlenosed Whales" are likely to be specially interesting. Every effort should be made to secure specimens of *Berardius*, a genus which is recognisable by the possession of two pairs of large teeth, two on each side of the lower jaw, near its front end. In some of the Bottlenosed Whales the teeth ~~\*\*\*\*\*~~ will probably be invisible during life, as they lie concealed beneath the gum of the lower jaw (See enclosed Leaflet, no 161.)
5. If opportunity offers, it would be very useful to have the pelvic bones ("Instructions", pp. 6, 7), the sternum or breast bone, and the neck vertebrae of any specimen collected as under par<sup>1</sup>.

(Signed) S.F. Harmer.

Registered Number

British Museum.  
Natural History.

Director's Office  
May 19, 1921.

Sir Sidney Harmer has the honour of reporting to the Trustees that a considerable number of papers referring to Whalin have been received, principally from the Colonial Office, since the date (July 17, 1920) of his last Report on this subject. The papers refer principally to South Georgia and the South Shetlands with Graham Land, but other branches of the subject are considered as indicated by the subjoined table of contents.

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Appendix (graphs)

List of the more important papers considered in this Report.

Registered Number	number	in file.	
2692/20	155	(a) Colonial Office, Sept 3, 1920.	Aircraft and Whaling.
3638/20	174	(a) Winter season 1917/18, Whale oil Reports 1919/20	
		(a) Colonial Office, Dec. 3 1920	
		(b) Barlas, Report Oct. 31 1918, on the Winter Season Apr. 1-Sept. 30, 1918.	
		(c) Binnie, E. B., Whale oil Report Jan.-June, '19	
		(d) do.	do. July-Dec, '19
		(e) do.	do Jan-June '20

## Registered Number

- number. in file. South Georgia, continued.
- 417/2/21 178 Summer Season, 1919/20  
 (a) Colonial Office, Feb. 4, 1920.  
 (b) Binnie, E. B., Report, April 21, 1920, on the Summer Season, Oct. 1, 1919-Mar. 31, 1920.
- 2552/20 162 Statistical Returns, 1919/20 (Form 132)  
 (a) Colonial Secretary, Falkland Islands, July 15, 1920  
 (b) Tønsoerg Whaling Company, Statistics, Aug. 7/19-Mar 30/20  
 (c) (Compania Argentina de Pesca, do. Oct. 2/19-Apr 26/20)
- 3156/20 170 Statistical Returns, 1918/19 and 1919/20 (Form 132)  
 (a) Colonial Secretary, Falkland Islands, Aug. 16, 1920  
 (b) Compania Argentina de Pesca, Statistics Jan. 22/19-Sept. 23/19.  
 (c) Ocean Whaling Co. Statistics June 4/19-Sept 30/19  
 (d) South Georgia Co. do. Aug. 11/19-Sept. 26/19  
 (e) Southern Whalg. & Sealg. Co. Stat. Oct. 24/19-Mar. 29/20  
 (f) Ocean Whaling Co. Statistics, Oct. 4/19-Mar. 29/20  
 (g) South Georgia Co. do. , Oct. 2/19-Mar. 31/20  
 (h) Sandefjord Co. do. , Jan. 1/20-Mar. 6/20  
South Shetlands. Season 1919/20
- 2771/20 158 (a) Colonial Office, Sept. 13, 1920.  
 (b) Riches, S. R., Report, Apr. 19, 1920, on the Season 1919/20.
- 2799/20 159 Statistical Returns (Form 132) (Form 154)  
 (a) Colonial Secretary, Falkland Islands, May 4, 1920.  
 (b) Norge Co. S. S. Solstreif, Statistics, Dec. 3/19-Mar 10/20.  
 (c) Ørnen Company, S. S. Ørn IB, do. Dec. 6/19-Mar. 16/20  
 (d) Nor. Co. S. S. Bombay, Statistics, Dec. 6/19-Mar. 19/20  
 (e) Bryde & DAHL S. S. Thor I, do. Jan. 3/20-Apr. 5/20.  
 (f) Sydhavet Co. S. S. Svend Foyn I, Statistics, Dec. 8/19-Apr. 1/20  
 (The Companies (b)(c) and (d) returned Form 154 as well as Form 132)
- Analysis of Whale products.
- 2737/20 156 Imperial Institute, Sept. 8, 1920; sending analysis of material sent from the South Shetlands by Mr. A. G. Bennett.
- South African Statistics.
- 1118/21 156 (a) High Commissioner, S. Africa, Mar. 31, 1921.  
 (b) Dept. of the Interior, Pretoria, Feb. 24, 1921.  
 (c) Bearpark, A. F., Jan. 21, 1921.  
 (d) Census and Statistics Office, Pretoria, Feb. 11, '21  
 (e) Schedule of Statistics suggested by A. F. Bearpark



1460/21	192	Colonial Office, Apr. 21, 1921. <u>Whale-marking Experiments.</u> Miscellaneous Correspondence. <u>British Stranded Whales</u>
3736/20	175	Board of Trade (Marine Department), Dec. 13, 1920. <u>Bunavener Whaling Station, Harris.</u> Visit on the Director to Harris, 1920. <u>Price of whale oil and closure of Whaling Stations.</u>
	190	(a) Allen, H. T. (Colonial Office) Apr. 14, 1921. (b) Extract from "The Oil and Colour Trades Journal", Apr. 2, 1921.

In the subjoined observations on the papers under consideration, reference is made to the numbers in the files of papers referring to Whales and Whaling in the Department of Zoology (as given on pp. of this Report).

A. Aircraft and Whaling. (no. 155)

On p. 14 of his Report, July 17, 1920, the Director discouraged a suggestion to utilize aircraft in hunting whales off Bermuda, and the Trustees' endorsement of this view was communicated to the Colonial Office on July 31. A reply (155) has been received from that Office, stating that the question has been referred to the Air Council with an intimation that Lord Milner is not disposed to agree to the use of aircraft for the finding and ~~sustaining~~ killing of whales.

B. South Georgia. (nos. 174, 178, 162, 170.)

174(b) Mr. W. Barlas' Report on the Winter Season 1917/18.

On p. 17 of his Report, July 17, 1920, Sir Sidney called attention to the fact that the Report for the Winter Season 1918 (= 1917-18) had not been received, although a Report for the corresponding season of 1919 had been supplied. This omission has now been remedied.

The Season in question was not a successful one, the weather having been stormy and whales having been very scarce, particularly during June, July and August. A strike in June and July interfered with the production of oil, which was further affected by the fact that whales were only found at long distances from the factories and were thus seldom fresh on arrival. Most were caught N.W. of the islands, 20 miles or so from the nearest station. Whalencatchers were not employed by the Southern Whaling and Sealing Company from June to September.

There was a decrease of 394 whales as compared with the corresponding season of 1917, and of 56,921 barrels of oil; while the average production of oil per whale declined from 84.4 barrels to 45 barrels. For the complete season, Oct 1, 1917 to Sept. 30, 1918, the decrease was 65,824 barrels.

From

From information which had been supplied in the 1919 Return it was possible to include in the Report Dated July 17, 1920, on pp. 23, 24 the total catch (448) of whales for the Winter season of 1918, and the total number of each species captured, and the production of oil and guano, with the average numbers of barrels of oil per whale. It is thus merely necessary to record the monthly catches.

Monthly catches, winter season, 1918.

Month	Hump- back	Fin Whale	Blue Whale	SEI Whale	Right Whale	Sperm Whale	Total.
April	-	185	15	7	9	7	223
May	2	34	15	-	1	-	52
June	-	6	-	-	-	-	6
July	-	-	-	-	-	-	-
August	-	5	2	-	-	-	8
September	-	133	26	-	-	-	159
Total	2	364	58	7	10	7	448

The marked predominance of Fin Whales, which constitute 81 per cent of the total catch, is a striking feature of this table. The great majority of them belonged to the two ends of the season (April and September).

174.(c)-(e). Mr. E. B. Binnie's half yearly Whale oil Reports.

(Jan. 1919-June 1920).

These Reports are in a form not previously received, and to some extent they overlap the ordinary half yearly Reports. They give some valuable information with regard to the weather conditions, which are naturally important as bearing on the numbers of whales captured during particular months.

174.(c). Jan 1-June 30, 1919. Only four companies were at work.

The Southern Whaling and Sealing Company closed down at the beginning of April, on account of bad weather and the scarcity of whales, while the others carried on in a half-hearted manner. The weather "for the past nine months" is described as having been abnormal, continual storms at sea, with heavy swells and fog. The whole season was disheartening, owing to strikes, shortage of coal and bad weather.

174.(d). July 1 - Dec. 31, 1919. Six Companies operated during November and December, and four during the whole period. In July, August and part of September only a few of the whale catchers were at work. In October, 11 were engaged. During this month ice was reported to the NE., about 60 miles off, and there were large schools of whales in the vicinity. Good catching was made for a few days until ~~the~~ <sup>bad</sup> weather set in \*\*\*; and then nothing was done for the remainder of the month. Whaling recommenced on Nov. 1, but in a perfunctory manner, until the second week of the month, when Blue and Fin Whales returned. Since then whaling has been carried on with good results. In December there were large schools of Humpbacks, and 30 were taken, in excellent condition. As in the previous Report

(174(c)), the average number of barrels of oil per whale is stated for each Companies. These numbers range from 33.6 to 62.5:-apparently showing that some companies are much more wasteful than oth



others.

174(e). Jan. 1-June 30, 1920. Six companies operated. All whaling stopped about May 20, and is not to be recommenced before Sept. 1.

The representative of the Ocean Company died suddenly early in July, and no returns from that company were received, the figures given by Mr. Binnie being only approximate.

178(b) Mr. E. B. Binnie's Report on the summer season Oct. 1, '19-Mar 31/20 will be

Only one report \*\*\* furnished, annually, in future, in view of the close season which has now been established (See Report dated Mar. 24, 1920, where it was wrongly inferred that the close season June 1-Sept. 15, was to take effect for the first time in 1921.).

Six companies operated, with a total of 25 whale catchers, as compared with 37 in 1917/18. A reduction in the number of whale-catchers for the following season (1920-21) is specified.

The total catch was 2654, yielding 132,322 barrels of oil, an average of 49.8 barrels per whale. There was an increase over 1918/19 of 178 whales and 528 barrels. The total value, including 15,869 bags of guano and 17 1/2 tons of baleen was estimated at £1,400,000.

The average oil production (in barrels) is shown below.

<u>1915/16</u>	<u>1916/17</u>	<u>1917/18</u>	<u>1918/19</u>	<u>1919/20</u>
46.9	54.3	66.0	53.2	49.8

The low production in 1919/20 is said to have been due to the poor results of the South Georgia Company. (But it may be observed that all the companies show a lower average than in 1918/19) This company had a minimum of Blue Whales (the largest and most productive kind), but their workmen were young and inexperienced, showing little interest in the work and wanting more wages. The station of the Southern Whaling Company was partially destroyed by fire in February.

A guano factory is to be sent out shortly. The Sandefjord Company produced good results. The Tønaberg Company, with excellent plant, has always been one of the best in production. The Ocean Whaling Company had practically no waste and shows the best results (54.9 barrels). "The difference between this comparatively small station and that of the South Georgia Company is enormous"

The production of the South Georgia Company should be at least double.

In October the weather conditions were favourable (not in agreement with Mr. Barlas' account, p. 4), but whales were not plentiful.

In November the weather was bad, but there were numbers of Fin Whales. In December Blue Whales were numerous. January would have been a good month if it had not been for labour troubles.

In February and March there were only two months during which whaling could be done, but Fin Whales and Sei Whales were numerous.

"It is sad to note the number of Female whales killed---but this is impossible to control". The winter close season will probably do a certain amount of good.

Total

Season	Total Catch, summer seasons 1912/13 1919/20.							Totals
	Hump back Whale	Fin Whale	Blue Whale	Sei Whale	Right Whale	Sperm Whale	Bottle- nosed Whale	
1912/13	2251	1724	212	-	2	7	1	4197
1913/14	474	1417	651	90	63	15	-	2710
1914/15	631	1476	1936	-	4	1	-	4048
1915/16	1260	1852	2398	-	6	1	-	5517
1916/17	335	1345	1290	-	3	26	-	3629
1917/18	58	780	1816	42	25	30	-	2751
1918/19	64	1232	1160	3	4	13	-	2476
1919/20	80	1586	925	46	11	7	-	2655

Month.	Monthly catches, summer season 1919/20.						
	Hump's back Whale	Fin Whale	Blue Whale	Sei Whale	Right Whale	Sperm Whale	Totals
October	2	83	19	-	-	2	106
<i>November</i>	3	122	54	-	-	2	181
December	25	341	203	-	1	-	570
January	38	3880	394	-	1	-	813
February	10	290	153	10	1	-	464
March	2	370	102	36	8	3	521
Totals	80	1586	925	46	11	7	2655

The information contained in the above tables is of special value. The first table which grows longer year by year, is important as bearing on the question whether any particular species shows signs of becoming less plentiful as the result of the whaling operations. The second table, which can be compared with similar table for earlier years, recorded in previous reports, gives valuable information with regard to the frequency of the whales on the whaling grounds, at different ~~times~~ parts of the season, thus throwing some light on the migrations of the several species.

The results naturally have to be correlated, as far as possible, with weather conditions and other factors affecting the catch.

Sir Sidney desires to call attention to the fact that, for the first time, the figures on which these tables can be constructed have been omitted from the half-yearly report (176(b)); and to recommend that the Colonial Office be asked to take steps to secure the inclusion in future Reports of (a) a statement of the total number of each species of whale captured during the season; (b) a table showing the number of each species captured in each month.

The figures for 1919/20 given in table 2 above have been obtained principally from Mr. Binnie's Whale Oil Reports 174(d) and 174(e). As noted on p. 5, Mr. Binnie obtained no returns from the Ocean Company for the period Jan.-June, 1920; and his estimated numbers have been accordingly neglected (for that company). The actual figures for the Ocean Company have been taken from the statistical returns (170(f)) previously received. These have been added to the numbers recorded by Mr. Binnie (174(d)(e)), in arriving at the totals for Jan.-March 1920. (Note it may be observed that the total number

number

6a

number of whales thus arrived at is 2,653; while Mr. Binnie gives 2,654 as the total in No. 178(b). The difference is unimportant.

The Statistical Returns (160,170) are reserved for consideration on some future occasion. This will probably be done when the number of new foetal records has increased to such an extent as to make it worth while to take up their study with a view ascertaining how far they confirm or modify the conclusions arrived at in the Report dated Dec. 17, 1918.

of Odd II had a fractured thigh, due to heavy weather. Six companies operated, each with one floating factory and three whale catchers.

The total catch was 2593, yielding 123,930 barrel of oil.

These figures give an average production of 47.6 barrels per whale

The average catch per whale-catcher was 144, the highest being 173 and the lowest 90.

In the subjoined Table I, the figures for 1915/16-1918/19 are copied from the Report dated July 17, 1920, p. 28.

Season	Hump back Whale	Fin Whale	Blue Whale	Right Whale	Sperm Whale	Bottle nosed Whale	Piked Whale	Totals.
1915/16	219	2358	1843	6	3	-	-	4431
1916/17	22	602	1380	-	-	-	-	2003
1917/18	71	627	397	13	-	1	5	1114
1918/19	57	1296	716	7	-	3	-	2079
1919/20	179	1541	671	-	2	-	-	2593

The monthly catches were as follows:-

2. Monthly catches, season 1919/20

Month	Hump back Whale	Fin Whale	Blue Whale	Sperm Whale	Totals	no Bottlenosed or Right whale taken during this season.
November	-	-	-	-	-	
December	44	104	294	-	442	
January	87	652	200	2	941	
February	43	444	228	-	715	
March	5	325	147	-	477	
April	-	16	2	-	18	
Totals	179	1541	671	2	2593	

The Statistical Returns (159) are reserved for consideration on a future occasion (ss p. 6a)

D. Analysis of Whale Products.

156. Among the specimens sent from the South Shetland Islands (Report, Feb. 20, 1920) Mr. A. G. Bennett sent certain whale-products (calcined whale bones, skin of penis of Blue Whale) to be examined with the view of their economic possibilities. A Report on the subject was prepared by the Imperial Institute and was sent to the Governor of the Falkland Islands. The Report indicated ~~that~~ (a) that the bones might

might be used either as a phosphatic manure or for the manufacture of calcium superphosphate; (b) that the penis skin would not be of much use as leather, but that it might be valuable as a source of glue.

#### E. East African Statistics. (Nos. 186-192.)

186. These papers included a letter (186(c)); from Mr. A. F. Bearpark, an experienced whaling officer belonging to the staff of Messrs Irvin and Johnson Ltd., who considered that the museum Form 132 was not altogether convenient for the purpose of collecting South African Statistics, and suggested certain amendments in the Form. A letter, Apr. 5, 1921 (no. 188) was sent to the Colonial Office, stating that the Museum would not be likely to object to Mr. Bearpark's suggestions if the concurrence of that Department were given. On receiving an affirmative reply (1 (192) from the Colonial Office, a letter, May 2, 1921 (194) was sent to the High Commissioner for the Union of South Africa, expressing the view that Mr. Bearpark's suggestions were reasonable and that the authorities of the British Museum would be anxious to meet his views in every way possible, with the view of securing the continuation of the reports on South African Whaling.

#### F. Whale harpoon Experiments.

This subject has been discussed in a considerable amount of correspondence with the Colonial Office, the Admiralty and various individuals who have taken an interest in the subject.

The Admiralty had submitted a design (Report, July 17, 1920 p. 7) for a dart which appeared to be unnecessarily complicated and expensive. A simpler design was subsequently received from the Admiralty as an enclosure in a Colonial Office letter, March 16, 1921 (no. 181 (a)); but this also seemed to have shortcomings of the same nature. On April 2, 1921 (no. 185), Sir Sidney wrote to Mr. C. V. Boys, F.R.S., who had kindly taken much interest in the proposed experiments, enclosing a much simpler design for a projectile in the form of an arrow, which he had himself tested with the assistance of members of the Royal Torophillite Society. The design was considered and approved at a meeting held at the Colonial Office on April 7, at which the Colonial Office and the Admiralty were represented, while Mr. Boys and the Director also attended. Sir Sidney is at present engaged with experiments to test the possibility of using this projectile.

#### G. British Stranded Whales.

175. The Board of Trade (Marine Department) have distributed to Receivers of Wreck and Coastguard Officers the second editions of Leaflets 123, 135 and 136, and the new leaflet 161 (Report, Oct. 15, 1920) which had been prepared in order to facilitate the continuation of the enquiry with regard to the species of Cetacea stranded on the British Coasts.

#### H. Bunavener Whaling Station, Harris.

In the course of last summer the Director received a suggestion, through the Colonial Office, that he should visit this Whaling Station. The invitation was accepted, and he spent a most instructive week



week, at the end of August, in Harris, where he was received with the utmost ~~cordial~~ courtesy by Mr. Carl F. Herlofson, the manager of the Whaling Station. He was able to acquaint himself personally with practically all the details of a modern whaling station, while he had the opportunity of taking part in a short whaling cruise during which three Fin Whales were captured. Most of the whales are captured about 20-30 miles to the westward of St. Kilda, which lies about 50 miles W of Harris. It appears that the Humpback Whales follow a migration route which corresponds closely with the 100 fathom line, to the west of the British Islands, while Sperr Whales are obtainable some 200 miles further out, in the neighbourhood of Rockall (See Report no 7 on Cetacea Stranded on the British Coasts, p. 18). 198 whales of 5 species were captured at the Harris Station during the summer of 1920 (i.e.c.)

#### I. Price of Whale oil and closure of Whaling Stations.

1908. An extract from "The Oil and Colour Trades Journal", Apr. 2, 1921, has been received from the Colonial Office, stating that the proprietors of all the Northern Whaling Stations, including those in Ireland, Harris, Shetland and the Farøe Islands, have decided to carry on no whaling during the present year, and that it may be necessary to bring those in South Georgia and the South Shetlands to a standstill.

The protection which thus seems likely to be afforded to the whales, for one season at least, cannot be regarded as anything but gratifying.

#### J. Observations on some of the papers reported above.

##### (1) Waste of material.

This subject received special attention on pp. 29-32 of the Report dated July 17, 1920. It is obvious that a wasteful use of material has been continued by certain companies, and Mr. Binnie's remarks, quoted on p. 6, on the poor results of the South Georgia Company may be specially noted. He can hardly have meant, however, that this company ought to have obtained twice as much oil from the whales actually captured, since its average production per whale is given as 43 2 and twice that figure would have been too much to expect. The criticism apparently <sup>means</sup> ~~is~~ that a larger number of whales should have been captured, giving, with increased efficiency in the methods of production of the oil an amount twice as large as that actually obtained. Differences in the efficiency of the various companies are also noted on p. 4 (under 174(d)). Waste of material is further indicated, for 1918/19 and 1919/20 (South Georgia), by comparing these seasons with 1917/18 (p. 6).

##### (i.) Seasonal catches, 1919/20.

The South Georgia figures (p. 6) show a slight improvement, for

for the principal (summer) season, on those for 1918/19; the increase in the total number of whales captured being 1. . . The results seem to have been regarded as satisfactory, on the whole. The South Shetlands show an increase, over 1918/19, of 514 whales. It must be remembered that, owing to the War, the earlier year was not a normal one.

South Georgia. The percentage catch for 1916/17 to 1918/17 of each of the three most important whales, in relation to the total Humpback+Fin Whale+Blue Whale, is shown on p.24 of the Appendix to the Report dated Dec.17, 1918, and on p.1 of the Appendix to the present Report, the following figures continue the comparison.

SOUTH GEORGIA. Summer Seasons, Oct.-March.

Season	Total of the three species	Percentages.			Totals
		Humpback	Fin Whale	Blue Whale	
1917/18	2654	2.2	29.4	68.4	100
1918/19	2456	2.6	56.2	47.2	100
1919/20	2591	3.1	61.2	35.7	100

South Shetlands. The figures in the subjoined table should be compared with those on p.25 of the Report dated Dec.17, 1918, as corrected (for 1917/18) on p.1 (Appendix) of the Report dated July 17, 1920. See also p. of the Appendix to the present Report.

SOUTH SHETLANDS. Summer Seasons, Dec.-April.

Season	Total of the three species	Percentages			Totals
		Humpback	Fin Whale	Blue Whale	
1917/18	1095	6.5	57.2	36.3	100
1918/19	2069	2.8	62.6	34.6	100
1919/20	2591	6.9	59.5	33.6	100

The above figures and those given in the Report Dec.17, 1918 may be the result of mere fluctuations and may be due principally to weather variations, or other causes outside the whales; but taken by themselves they show a result which may be regarded as ominous or at least one which should give rise to grave anxiety. It will be remembered (Report Dec.17, 1918, App.24, Report May 19, 1921, App.1) that in 1910/11 and 1911/12 the Humpback constituted over 90 per cent of the three species. From that point it fell suddenly, and the catch of this species has remained consistently low ever since. The larger whales began to receive special attention, with the collapse of the Humpback industry. The Fin Whale (the next largest species) was at first preferred, as it was of more manageable size. In two years its percentage rose from about 5 to about 55. The Blue Whale, the giant of the group, was rising simultaneously. In the Report, Feb.

26, 1916, p. 2 (in which the last figures dealt with were those for 1914/15) it was pointed out that the whaling boats are now "much larger and stronger than those used in previous years, and they are thus able to deal with the larger whales; while special inducements were offered to induce the hunters to pursue the Blue Whale (the largest species) in preference to the Seal or Humpback. The Blue Whale, as the most productive kind, has been the favorite object of pursuit for several years.

Returning to the graphs in the earlier Report (or in App. 1 of the present Report) it will be seen that in the season just referred to (1914/15) the Blue Whale for the first time had the highest percentage of the three species. The predominance which had been acquired by the Fin Whale was accordingly lost. Neglecting an unimportant fluctuation, (obviously due to the increased numbers of Humpbacks in 1915/16) the Blue Whale continued to rise for three further seasons, while almost pari passu the Fin Whale continued to sink. In 1917/18 the Blue Whale had risen to 66.4 per cent of the total, and the Fin Whale had fallen to 29.4. In the two succeeding seasons the Blue Whale has fallen at such a rate as to form an even descent, and the Fin Whale has similarly risen. The two lines crossed in 1918/19 and in the latest season recorded (1919/20) the Blue Whale stands at 33.7 and the Fin Whale at 61.2.

It is reasonable to fear, from these figures, that the Blue Whale has already passed its zenith and that it has started on a descent comparable with that of the Humpback after 1911/12. The inference may be incorrect, but it deserves to be recorded, though with the expression of a hope that the decline in the capture of Blue Whales may prove to have been merely a temporary fluctuation.

On p. 25 of the Appendix to the Report, Dec. 17, 1916, and in appendix 2 to the present Report, are given percentage graphs, referring to the South Shetlands, which had appeared very anomalous as compared with those of South Georgia. The addition of the figures for the two succeeding seasons made it possible to interpret these graphs as a confirmation of the suggestion made on the last page, with this difference, that the culminating point of the Blue Whale was reached a year earlier at the South Shetlands than at South Georgia. In 1916/17 66.5 per cent of the total catch of the three species (South Shetlands) consisted of Blue Whales and 30 per cent of Fin Whales.

The close correspondence between these figures and those for 1917/18 at South Georgia (respectively 66.4 and 29.4) may be a meaningless coincidence, but it is at any rate a striking one. In 1917/18 the two lines had already crossed at the South Shetlands, and in the two succeeding seasons the Fin Whale has maintained a decided predominance. The tables on p. 10 of this Report and the graphs in App. 2 show that in both localities the percentage of Fin Whales caught during 1919/20 is approximately 50 and that of Blue Whales is approximately 34-35.

The figures for the winter seasons give ~~approximately~~ corresponding results, as follows:—(See also graphs, App. p. 2)

SOUTH



SOUTH GEORGIA. Inter Seasons, April-September

Season.	Total of the three species.	Percentages			Totals
		Humpback	Fin Whale	Blue Whale	
1915	1033	18.6	44.9	36.5	100
1916	1836	17.3	46.5	34.2	100
1917	824	15.2	31.7	63.1	100
1918	424	5	85.8	13.7	100
1919	265	0	71.0	29.0	100

The figures from which the percentages in the preceding tables have been calculated will be found on p. 23 of the Report dated July 17, 1920.

As the principal or summer season commences on Oct. 1 in each year, it will be seen that the 1915 winter season, for instance immediately precedes the summer season 1915/16. The maximum 63.1 per cent of the Blue Whale and the corresponding minimum (31.7 per cent) of the Fin Whale thus precede the 1917/18 summer season, which is the one in which the corresponding phenomena are observable.

If the inference above indicated is well founded, it may be anticipated that the Fin Whale will in its turn, show evidence of over "fishing", as the attention of the whalers becomes more concentrated on it, in the absence of Blue Whales and Humpbacks. Perhaps the fall in the price of whale oil (see p. ) may postpone this result, by diminishing the intensity of the persecution to which the whales are exposed; but unless some check of this kind becomes operative the position seems full of anxiety.

The summer season 1919/20 (tables on p. ) at South Georgia shows some resemblance to those of 1913/14 and 1917/18 in the comparatively large numbers of Sei Whales, Right Whales and Sperm Whales particularly of the first two of these species. This would appear to indicate temperature conditions warmer than usual, this fact being definitely recorded with regard to the 1917/18 season (Report, July 17 1920, p. 33). The same three species were also relatively numerous at the beginning of the winter season of 1917/18 (this Report p. immediately succeeding the summer season of the previous year.

(iii) Monthly catches, 1919/20.

Fin Whale. This species shows two maxima, as usual, in the summer season at South Georgia; the table on p. 6 showing that these occurred in January and March. At the South Shetlands (p. there was only one maximum, January, in agreement with the results of previous years. See Report July 17, 1920, pp. 34, 35.

Blue Whale. Maximum in December at the South Shetlands (p. 7); February being however, somewhat larger than January. One maximum only (January, see p. 6) at South Georgia; the later maximum in this locality being in accordance with previous results (Report, July 17, 1920, p. 35).

X. Summary and Recommendations.

1. The use of Aircraft in Whaling has been discouraged by the Colonial Office (p. 6).

2. South Georgia. A Report on the Winter Season 1917/18 has been received (pp. 3-4), as the result of calling the attention of the Colonial Office to the fact that it did not come at the proper time. The season was not a successful one owing to bad weather and the scarcity of whales. It was considerably better, however, than the corresponding season 1918/19, previously Reported (July 17, 1920, pp. 23, 24). No less than 61 per cent of the total catch consisted of Fin Whales (p. 4) which formed 55 6 of the total of the three principal species (p. 12).

3. South Georgia, half yearly whale oil Reports (p. 4, 5). This is a new form of Report, but it is not altogether convenient as each report extends from January to June, or July to December, whereas the Reports previously received have included the months October to March or April to September. The Reports contain some useful information with regard to the number of companies operating, the weather conditions and the relative abundance of whales of different species in the several months of the year.

4. South Georgia, close time (p. 4). The close season during certain winter months came into operation in 1920, and is not to be deferred, as had previously been supposed, to 1921.

Only one, annual, Report is to be furnished in future, and it may be hoped that this will obviate the inconvenience alluded to under Sec. 3 of this page. It would be advisable, however, to draw the attention of the Colonial Office to the fact that it is not desirable to subdivide the year in two different ways in summarising the results of the whaling operations.

5. South Georgia. A Report has been received <sup>pp. 4-6</sup> on the summer season 1919/20, showing a slight increase over the corresponding season of 1918/19 in the total catch, but a reduced efficiency in the extraction of oil, due specially to the poor results of the South Georgia Company. It is recommended <sup>pp. 6</sup> that the attention of the Colonial Office be specially ~~called~~ called to the omission of certain important information in this report.

6. South Georgia and South Shetlands, Statistical Returns (pp. 6 a). Returns of this nature have been received for 1918/19 and 1919/20, but their detailed study is reserved for a future occasion.

7. South Shetlands and Graham Land. Season 1919/20. A Report on this season shows an increase in the total number of whales caught, in spite of weather conditions of exceptional severity (p. 7).

8. Analysis of Whale Products. Certain samples were analysed for Mr. A. G. Bennett by the Imperial Institute, but the results do not seem to be specially important.

9. South African statistics. A criticism, by Mr. A. F. Searpark (p. 8), of the Museum Form 132 is here referred to, and the High Commissioner for South Africa has been informed that there appears to be no difficulty in meeting the views expressed by him.

10. Whale marking experiments. (p. 8). Further progress

in these experiments is reported but the subject is still being investigated.

11. British Stranded Whales (p. 8). New editions of the old leaflets and a new leaflet have been distributed by the Board of Trade (Marine Department).

12. Harris Whaling Station (pp. 8, 9). A visit, by the Director to this station in the summer of 1920, is reported; and the lines of migration of certain whales along the British Coasts are noted.

13. Price of Whale Oil (pp. 9). A marked fall in the price of oil seems likely to result in the closing of whaling stations during the present season, and thus to afford much needed protection, for a time to the whales.

14. Waste material (p. 9). The continued waste of material in certain cases, is noted. Some companies are much more efficient in this respect than others.

15. Seasonal catches. (pp. 7-12).

(a) South Georgia, summer season 1919/20. A slight improvement as compared with the corresponding season of 1918/19, occurred in the total catch.

(b) South Shetlands, (summer) season 1919/20. The improvement in the total catch was more marked than at South Georgia.

A comparison of the percentage catches of the three principal species at both localities, during a succession of years, brings out a fact which gives rise to grave anxiety (see graphs, App. pp. 12.) During the years 1917-18, and slightly earlier at the South Shetlands than at South Georgia, the percentage of Blue Whales rose to a figure (more than 60) which had never previously been reached, while that of Fin Whale sank to a correspondingly low figure. The agreement between these different sets of figures was remarkably close, as will be seen by the subjoined table:-

	Blue Whale	Fin Whale
South Shetlands, Dec. 1916-Apr. 1917	68.9	30.0
South Georgia, Apr. 1917-Sept. 1917	63.1	31.7
do. do. Oct. 1917-Mar. 1918	68.4	29.4

In the seasons which have followed, the percentage of Blue Whales has fallen greatly, while that of Fin Whales has risen to a corresponding extent.

It is well known that the Blue Whale is the preferred species of the Whalers, in consequence of its greater size and productivity.

Taking this into consideration, it is suggested that the marked fall in the catch of these whales, during later seasons, is an ominous fact, which may well indicate that a process has already commenced comparable with the rapid fall in the percentage numbers of Humpbacks which became evident after the season 1911/12.

It is recommended that the special attention of the Colonial Office be called to the suggestion that the Blue Whale may already have passed its zenith; and that, if this should prove to be a correct reading of the figures, the intensive capture which is now taking place of Fin Whales may before long result in a greatly diminished catch of that species as well.

of that species as well.

A resemblance between the summer season 1919/20 (South Georgia) and those of 1913/14 and 1917/18, in respect of the numbers of Sei Whales, Right Whales and Sperm Whales captured, is pointed out.

16. Monthly Catches. (p. 12 ) The occurrence of Fin Whale and Blue Whales, during the several months of the 1919/20 season, at South Georgia and the South Shetlands, conforms in general with the results recorded in earlier Reports.

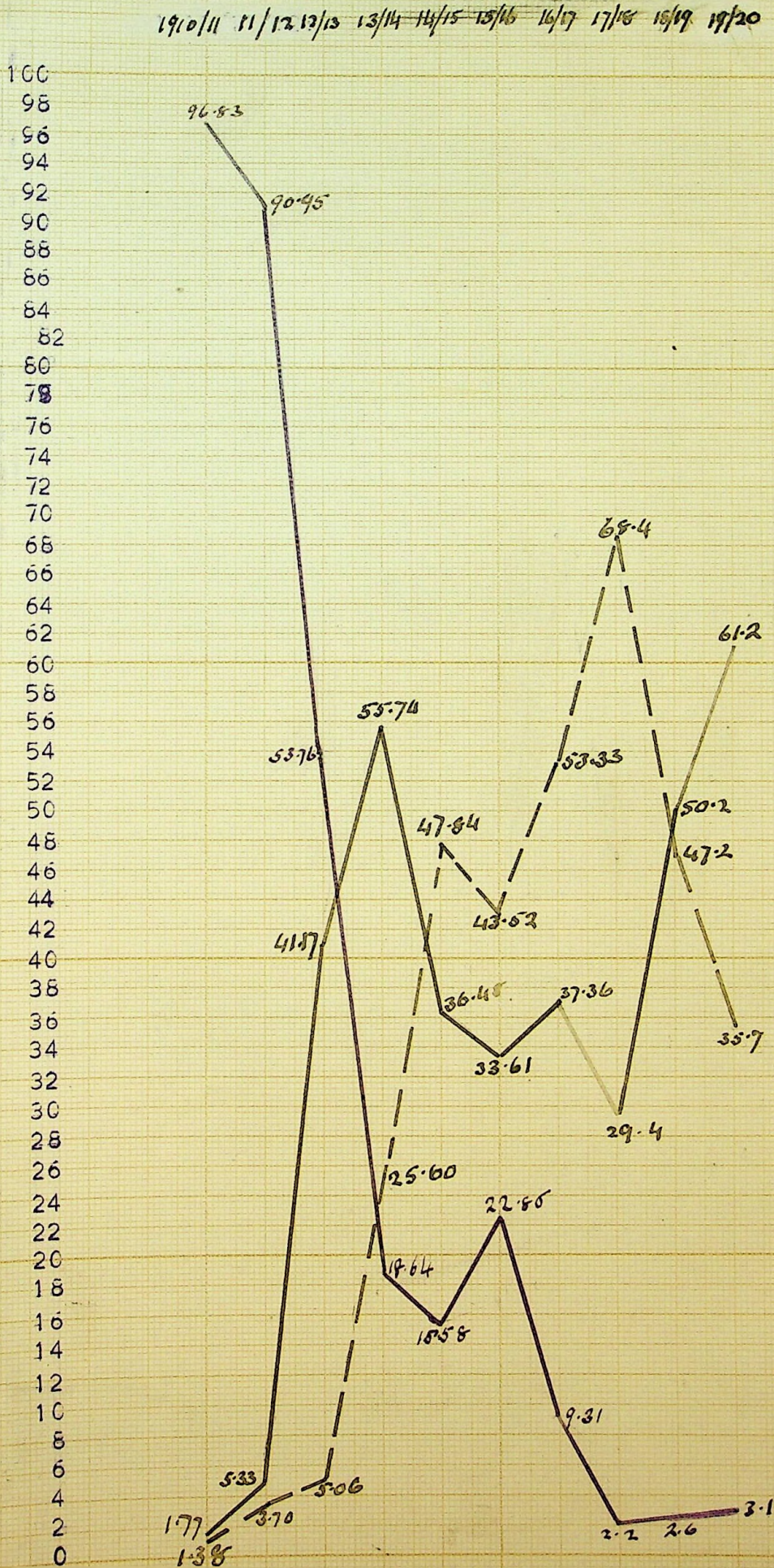
(signed) S.F. Harmer.



South Georgia. Whaling Seasons, October to March

Total catch expressed in percentages of the total

Humpback —  
 Fin Whale - - - -  
 Blue Whale - - - -



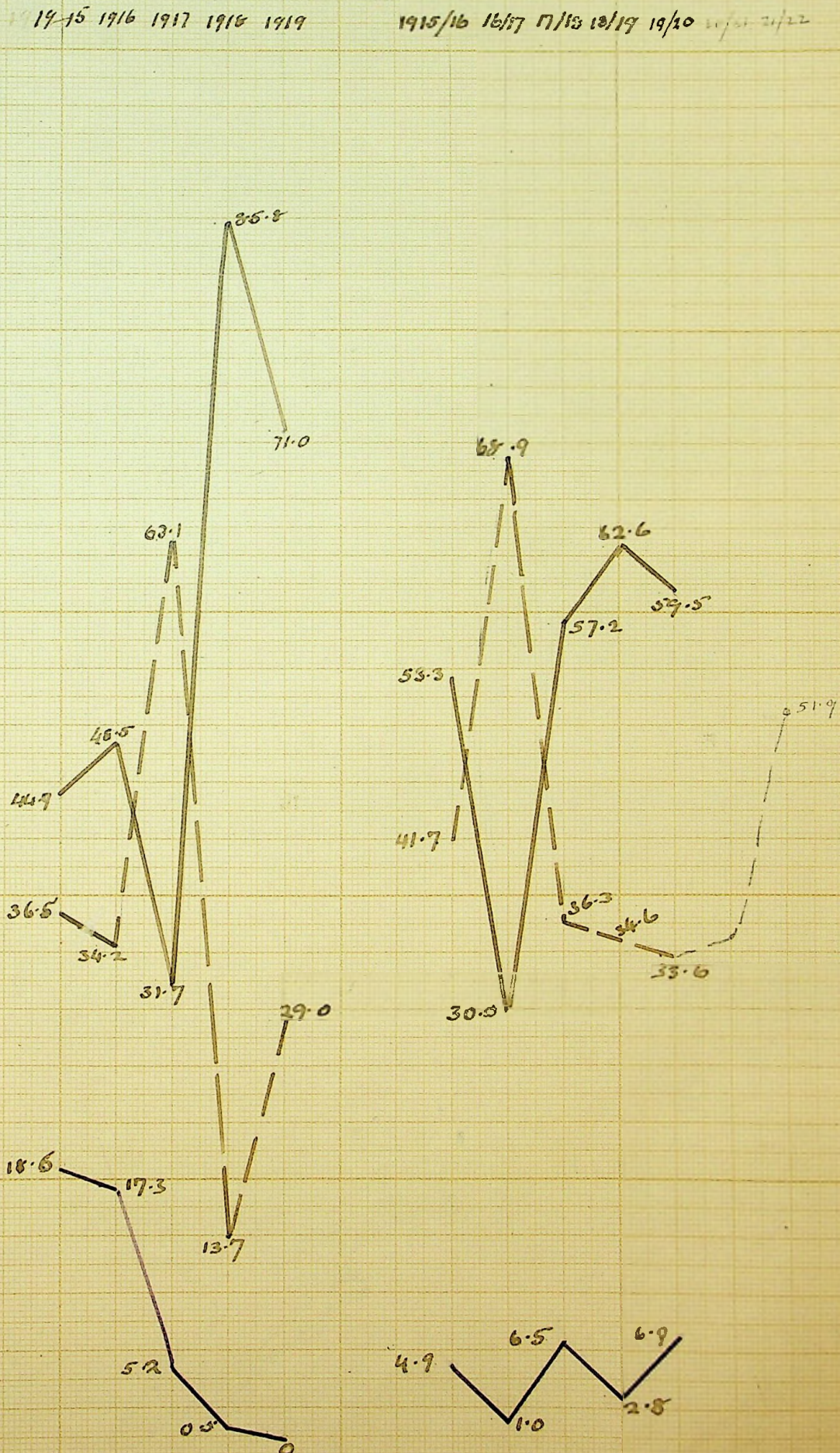


Total catch expressed in percentages of the total -- Humpback ---  
 -- Fin Whale ---  
 --- Blue Whale ---

SOUTH GEORGIA  
 Winter Seasons.  
 April-September

SOUTH SHETLANDS  
 December-April.

100  
98  
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British Museum (Natural History).

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Instructions for Collectors:

No. 1A.—MAMMALS, PART II.

SKELETONS, with Special Notes on the  
Collection of Specimens of CETACEA.

By S. F. HARMER, Sc.D., F.R.S.,

*Keeper of the Department of Zoology.*

LONDON :

1917.

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All communications should be addressed to the DIRECTOR.

NOTE.—Boxes of Specimens so addressed are not opened by  
the Customs Officers at the Docks, but are sent on to the  
Museum under seal.

# Instructions for Collectors.

No. 1A.

## Mammals, Part II.

SKELETONS, with Special Notes on the  
Collection of Specimens of CETACEA.

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### I.—Mammals other than Cetacea.

#### 1. PRELIMINARY HINTS.

The preparation of skeletons in the field should go no further than the removal of sufficient flesh to ensure freedom from putrefaction. Every care should be taken to leave the bones naturally attached to each other, and with this object in view it will be sufficient, after removing the internal organs—heart, lungs, liver, intestines and so on—to cut the flesh roughly from the body and legs, and to expose the carcass thus cleaned to the sun. In small animals the limbs should not be separated from the rest of the skeleton. In those of larger size, the fore legs should be removed *with* the blade-bone, and the hind legs should be detached at the hip-joint. If not too large, the limbs should then be tied firmly to the rest of the skeleton. This is most important, especially where several skeletons are packed in the same case. To save space and to facilitate packing, each limb should be folded on itself. In very large skeletons, it may be necessary to separate the fore leg from the shoulder-blade, and even to subdivide the limbs; care being taken to cut the principal joints without injuring the bones. The tail should be turned forwards so as to lie inside the body. On no account should any preservative be used.

If the skin of the animal is being prepared as well as the skeleton, the bones of the feet should be left in the skin, unless the specimen is of large size. If the entire skin is not being

\* In drawing up these Instructions I have received much valuable assistance from my colleagues Mr. O. Thomas, F.R.S., and Mr. W. P. Pyecraft.

kept, it may be desirable to leave the hands and feet covered by skin, in order to avoid the loss of any of the small bones, and to prevent those of different limbs from being mixed. If these bones are brought back loose, it is impossible to arrange some of them (particularly those of the fingers and toes) with any certainty that they are being placed in their proper order. Whenever possible, skeletons should be secured of male, female and young animals. In every case in which the species is not definitely known, care should be taken to attach to the skeleton a characteristic piece of the skin, showing the colour of its fur or wool. This must belong to the particular individual whose skeleton is being prepared. It is very desirable to indicate what species the skeleton probably belongs to by reference to the collector's number of skins sent at the same time. In all cases, a label recording the precise locality in which the animal was killed, with altitude and date, and the sex of the specimen, should be tied to the bones. If the skeleton is sent in more than one piece, each part should be separately labelled, so that there can be no possibility of mixing the parts of different individuals.

## 2. MORE DETAILED INSTRUCTIONS.

After the removal of the skin, the abdomen should be cut open from the end of the breast-bone to the hip-girdle; and from the cavity thus exposed the whole of the contents should be removed. After the intestines, liver and stomach have been taken out, the "midriff," at the front end of the cavity, should be cut through to allow of the removal of the heart and lungs. The gullet and windpipe can be pulled out from the front of the neck. Special care must be taken to avoid injury to the hyoid bones or tongue-bones, which generally run from the region of each ear towards the lower surface of the larynx (at the front end of the windpipe) and back of the tongue, where the two series are joined by means of a bone in the middle line.

All superfluous flesh should next be cut away from the limbs, trunk and head. In small animals there is no need to remove any flesh from the ribs. Particular care should be taken, throughout the operation, to avoid cutting or breaking any of the bones.

The skull should be severed at the joint which connects it with the neck, and not by chopping through the neck-bones. In very small animals it may, however, be left in place. After the separation of the skull, as much as possible of the brain should be removed by stirring up the contents of the brain-case, through the opening at the back of the skull, with a blunt stick. This process will be facilitated by pouring water into the brain-case. The top of the skull should not be sawn off, and no attempt should be made to clean out the whole of the brain from the more inaccessible regions of the skull, since injury may easily be caused to the bones lining the brain-case if too much cleaning is attempted.

Unless the animal is of large size, the tongue may be left to dry up, and the tongue-bones already alluded to will thus be retained in place.

If time permits, and there is an abundance of water at hand, it is well to remove the blood from the roughly cleaned skeleton by soaking it for a day or two in water, preferably running water. For safety's sake the carcass should be placed in a basket, or tied up in a sack. Special precautions may be required in places where there are predaceous animals such as Crocodiles or other aquatic carnivorous forms. But where the climate is unfavourable, or water scarce, this soaking may be dispensed with.

The further treatment of the skeleton must depend a good deal on the size of the animal. If it is small, there will be no great difficulty in getting it properly dried, and it can then be packed in one piece, taking the precaution of turning the end of the tail in so as to be protected by the backbone and ribs. If it is large, the limbs may be detached separately; removing the shoulder-blade, which carries the rest of the fore limb, from the ribs, and dividing each hind limb from the pelvis or hip at the articulation of the thigh-bone with that part.

It may further be necessary to cut the backbone into sections of convenient size for packing. This division can be effected at any point, provided it is made in such a way as to avoid injuring the vertebrae or constituent bones of the backbone. It will be found quite easy to separate two vertebrae from one another if the knife is inserted first on the lower side (that which comes nearest the cavity of the thorax or abdomen). The two parts of the backbone on either side of the cut are then bent upwards, away from the cut. The following may be indicated as convenient points for dividing the backbone:—junction of neck and thorax; junction of thorax and abdomen. If the cuts are made as above, the thorax, consisting of vertebral column, ribs and breast-bone, may be packed so as to contain the skull and some of the other parts of the skeleton.

The rough skeleton, or the parts into which it has been divided, should next be hung up in a dry place, where there is a free current of air, and protected, if necessary, from attack by predaceous animals. Before the parts become quite dry it will be advisable to fold them in a position convenient for packing.

When thoroughly dry, the skeletons may be packed in boxes. Sawdust, especially pine sawdust, may conveniently be used, as it absorbs moisture and prevents any unpleasant smell. Each skeleton should be wrapped separately in paper or canvas, to avoid the danger of getting its parts mixed with those of other specimens, which might happen, for instance, in a skeleton attacked by beetles on the way home. This precaution is specially important for skeletons of small size; but in every case the greatest care should be taken to label and pack the parts in such a way that no admixture of this kind is possible. The value of a

specimen is destroyed if there is any suspicion that all the bones may not be those of a single individual.

The skin of an animal prepared for permanent preservation should always be accompanied by *its own* skull, even if the rest of the skeleton has not been kept. But a skull by itself may be worth preserving if the collector gives every possible assistance in determining the species to which it belongs. This is best done by stating that it is of the same kind as some other specimen, obtained at the same time, whose skin is in the collection sent to the Museum. If this cannot be done, part of the skin can sometimes be sent to aid in the determination, and notes may be made of the coloration of the living animal.

In the males of Monkeys, Carnivora and Rodents there may be present a loose separate bone in the penis, which should also be preserved, dried and fastened to the rest of the skeleton. And in some few animals, notably the Cats, the collar-bone is rudimentary, and care should be taken that it is not thrown away if the limbs are taken off.

## II.—Cetacea (Whales, Dolphins and Porpoises).

The collection of Cetacea offers special difficulties, but useful work may be done if advantage is taken of suitable opportunities. Whales and Dolphins are not infrequently stranded on the coast, and smaller kinds are sometimes caught in fishermen's nets.

No satisfactory way of dealing with the skins of these animals is known, and it is accordingly not desirable to waste time in preparing skins which can neither be stuffed nor made much use of in any other way. The skeleton is the part which is most valuable from a scientific point of view, but it is important to have a record of the external appearance of the animal from which it was derived.

In collecting Cetacea, the first thing to do with any specimen is to make certain measurements and notes on its external appearance.

The more important measurements to be taken are those indicated in Fig. 1, B; but the length of the paddle or flipper (fore limb), measured along its lower border, and the distance between the vent and the opening of the reproductive organs should also be recorded.

It should be ascertained whether the mouth contains "Whalebone" (baleen) or teeth. In the former case, note the number of blades of baleen\* which grow on each side of the palate (Fig. 2), and, if possible, the length and breadth of the largest blade. The

\* The number of the larger blades—those which constitute the main series—should alone be counted.

colour of the baleen-plates and of the hairs which fringe their edges turned towards the cavity of the mouth should be carefully recorded, and it should be noted whether all the blades are of the

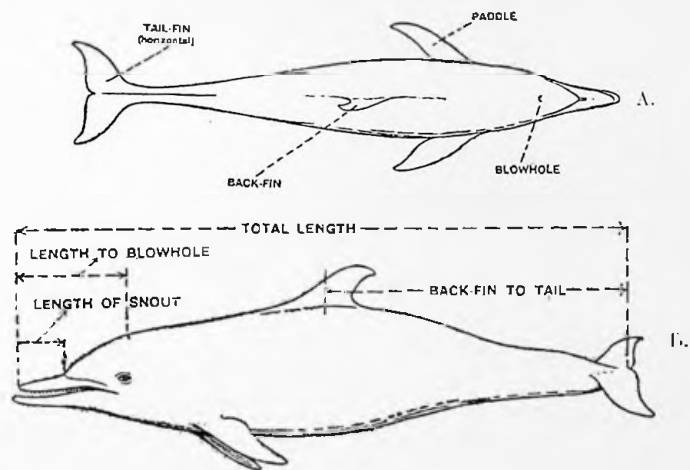


FIG. 1.—A, Back view, and B, side view of a Dolphin (a Toothed Whale), to show how the principal measurements should be taken.

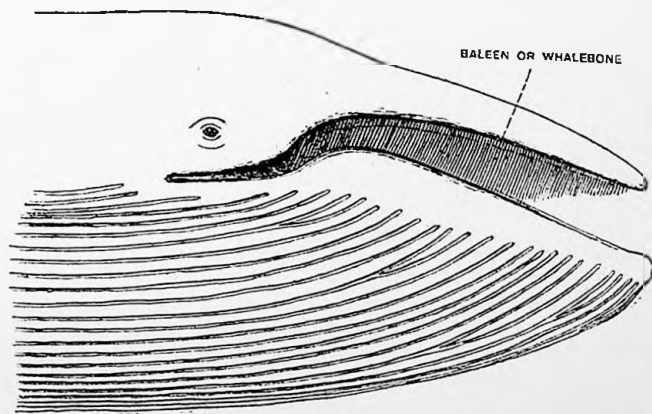


FIG. 2.—Head of Whalebone Whale, showing the whalebone or "baleen" of one side in place and the grooves on the skin of the throat.

same colour. The characters of the baleen are particularly important in distinguishing the species of the Whalebone Whales. In Whales of this kind, note further whether the skin of the throat

and lower part of the thorax is marked by a number of deep longitudinal grooves (Fig. 2).

If teeth are present, state their number, on each side of each jaw, recording also their average diameter at the base, their length and their shape. In several kinds of Whale the teeth are greatly reduced in number, even to a single pair (Fig. 3); or one or more

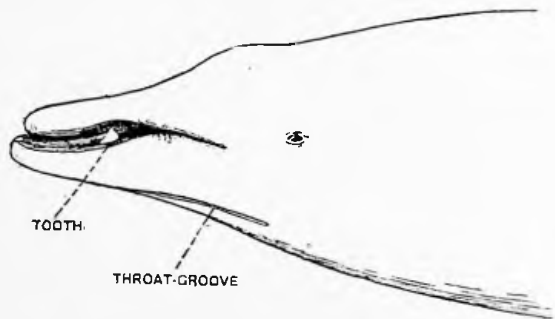


FIG. 3.—Head of a male Sowerby's Whale, in which only two teeth are present, one on each side of the lower jaw. In the females and young of this species, the teeth are concealed beneath the gum, and none are visible.

pairs of teeth may be present beneath the gum, the animal then appearing toothless. In Whales with only a few teeth or none visible, note whether there are a pair of longitudinal grooves on the skin of the lower side of the throat (Fig. 3).

The shape of the head should be described, and a sketch made of the profile (side view). In many kinds of Dolphin, the front part of the upper jaw is sharply marked off from the rest of the head (Fig. 1). The length of this snout or "beak" should be noted.

The external coloration should be recorded, special attention being given to the distribution of the dark and light colours respectively.

A large Whale is too bulky an object to be dealt with by an unaided collector. It will thus be sufficient to note the above particulars and to secure a blade of baleen or a tooth, as the case may be. If a whaling station is visited, there may be an opportunity of securing some of the remarkable shell-like ear-bones which are readily separated from the skull in Cetacea. Special care should be taken to ascertain what kind of Whale each such ear-bone belonged to.

The skeletons of Whales or Dolphins are prepared in the same way as those of other Mammals. In opening the abdominal cavity, to remove the viscera, look specially for the pelvic bones (Fig. 4, *p*), which represent the hip-bones of other Mammals. These are a pair of separate bones, perhaps six inches in length in a large Dolphin, which are embedded in the flesh near the vent, one on

each side of that aperture. They are not always easy to find, as they are not articulated with any other part of the skeleton. The hyoid or tongue-bones should be looked for, as in other Mammals; but they offer little difficulty, as they are of considerable size.

In commencing operations, the two lobes or flukes of the tail and the back-fin may be cut off, as they contain no part of the skeleton. It is generally advisable to cut through the blubber, and to remove it in strips, starting from the tail and working forwards along the body to the head.

The paddles or flippers should be cut off at the shoulder-joint; or, in the case of the smaller species, the shoulder-blade, with the flippers attached, may be removed from the body in one operation. The flippers should in all cases be preserved entire, no attempt being made to remove their skin or blubber or to separate the bones supporting them. They need practically no preparation, and may be left to dry up as far as their oily nature permits them to do so. Any ordinary disinfectant may be applied to their surface occasionally if signs of putrefaction should be noticed.

Complete paddles, with the skin intact, of the following species of the larger Whales are specially wanted:—the Greenland Right Whale (*Balaena mysticetus*), the Pacific Grey Whale (*Rhachianectes glaucus*), and the Southern Pigmy Right Whale (*Neobalaena marginata*).

After the removal of the blubber and flippers, and after the pelvic bones have been taken out, the intestines and other viscera may be removed, and the flesh cut away from the bones, in much the same way as in the case of any other Mammal.

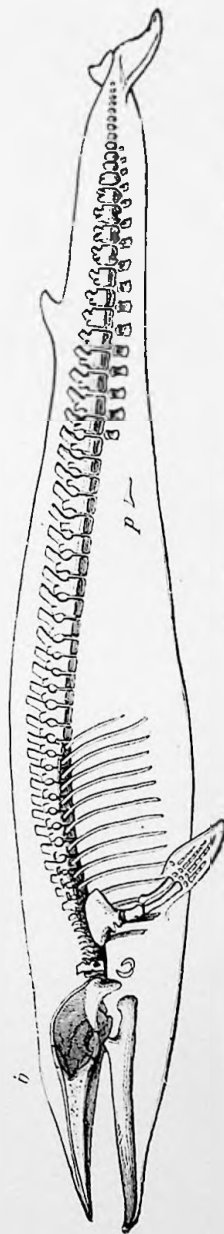


FIG. 4.—Skeleton and outline of the Common Rorqual or Fin-Whale (a Whalebone Whale). *b*, Position of blow-holes; *p*, pelvic bone. The tongue-bones are indicated, just below the lower jaw. The breast-bone is not represented. About  $\frac{1}{10}$  natural size.



The skull should be carefully disarticulated and the brain removed through the hole at its base, the flesh being cut away from the head so far as this can be done without injuring the bones. The backbone should be divided into sections, if necessary, the divisions recommended on p. 3 being equally suitable for Cetacea. In the case of large specimens it may be necessary to separate the ribs from one another. In doing this, avoid injury to the breast-bone, and disarticulate each rib from the backbone in such a way as not to damage it.

Many species of Cetacea have been described on the evidence of skulls or other bones, no information as to the external appearance of the living animals having been given. In other cases the reverse has been true, species having been described from their external characters without reference to the bones. It is accordingly specially important to make sketches or take photographs of the external appearance of a Cetacean before preparing its skeleton; and work of this kind may be important in helping to decide difficult questions relating to the species. It is specially desirable to obtain information, based on actual specimens, with regard to the species of Dolphin which inhabit the open ocean, far from land.

If the entire skeleton is not prepared, the skull and the two flippers (complete, with skin intact) should be secured, the external characters of the living animal being noted and sketched.

Every specimen should be carefully labelled with locality, date of capture, total length of specimen and sex. The male organ of Cetacea can be completely retracted, and when it is thus concealed it may be possible to mistake a male for a female. The female may be recognized as a rule by the occurrence of a longitudinal slit in the skin, on each side of the reproductive opening, this slit usually concealing the retracted nipple. The length of the interval between the vent and the opening of the reproductive organs should be stated in the measurements of the fresh specimen.

BRITISH MUSEUM (NATURAL HISTORY),  
CROMWELL ROAD,  
LONDON, S.W.  
March, 1917.

## INSTRUCTIONS FOR COLLECTORS.

Handbook of Instructions for Collectors, issued by the British Museum (Natural History). With Illustrations. Third Edition. Pp. 144. Index. 1906, 8vo. 1s. 6d. Postage 3½d.

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## BRITISH MUSEUM (NATURAL HISTORY).

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## DISTINGUISHING FEATURES

### OF THE

# “CAA'ING WHALE” AND OF “BOTTLE-NOSED WHALES.”

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#### 1. Caa'ing Whale (known also as “Pilot-Whale” or “Blackfish”).

This whale, which reaches a length of about twenty feet, is easily recognisable by the shape of its head, the length of its flippers and its colour. The head is remarkably swollen in front, where it is almost globular, with a very short “beak,” forming the tip of the upper jaw, but not projecting, or very slightly projecting, in front of the swollen part of the head.

The flippers are narrow and are much longer than in any other whale with which the Caa'ing Whale could be confused; their length exceeding three feet in adult specimens. The colour is black all over, except for a small amount of white on the under surface. About ten teeth, about half an inch thick, are present on each side of each jaw. This whale is not a “Royal Fish” in Scotland and any carcass washed ashore in that part of the British Islands should not be buried at the expense of the Board of Trade.

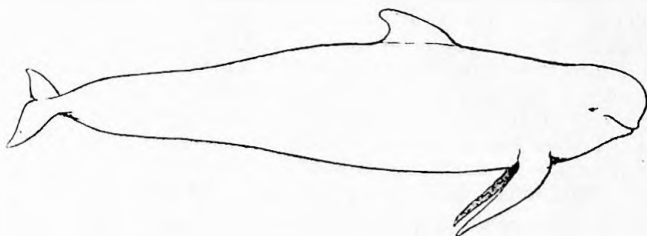


FIG. 1.—CAA'ING WHALE.

#### 2. Bottle-nosed Whale (or “Bottle-nose”).

This whale does not usually exceed a length of twenty-five feet. Old males, which, however, are very rarely met with in British waters, are larger, and may be as much as thirty feet long. The upper part of the head is swollen, but is less globular than in the “Caa'ing Whale.” In young specimens of either sex, and in females throughout life, it is comparatively little inflated; but in males it becomes more and more prominent as they grow older, and in old males it projects so much as to become almost vertical in front. The beak, which may be about six inches long, is a more distinct feature than in the Caa'ing Whale, from which the

Bottle-nose can easily be distinguished by three other characters:—(i) the flippers are small and short; (ii) the skin of the throat is marked by a pair of distinct grooves, forming a more or less  $\Lambda$ -shaped figure with the point in front; (iii) the jaws are not provided with a number of teeth, and usually appear to be quite toothless. A pair of fairly large teeth are, however, constantly present (occasionally two pairs) at the extreme front of the lower jaw, but they are in most cases completely concealed beneath the gum. In old specimens these teeth may project beyond the gums, particularly in old males. Some individuals show several very small and rudimentary teeth, which may project beyond the gums, further back in the lower jaw, or in the upper jaw.

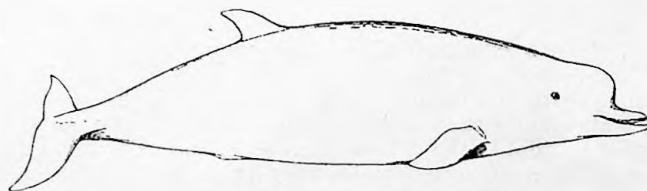


FIG. 2.—BOTTLE-NOSED WHALE.

The young Bottle-nosed Whale is said to be black, its colour becoming lighter with age; old individuals being almost yellow, with a greyish white belly, and sometimes with the

head and even the body quite white. Most specimens seem to be black or dark-coloured above, with a lighter belly. This whale is not a "Royal Fish" in *Scotland* and any carcass washed ashore in that part of the *British Islands* should not be buried at the expense of the Board of Trade.

### Other species which may be confused with the Bottle-nosed Whale.

The following three species, known in British waters, have a "Bottle-nosed" head more or less resembling that of a young specimen of the whale described above; and provided moreover with throat-grooves.

**3. Cuvier's Whale.**—This reaches about the same size as the Bottle-nosed Whale, but the characters by which it can be distinguished from it, in the living condition, are not well known. From evidence obtained by the British Museum (Natural History) there is some reason to believe that the position of the blow-hole gives a convenient means of distinguishing between the two species. It is merely necessary to measure (A) the entire length of the animal, (B) the distance of the blow-hole from the tip of the snout. In the Bottle-nosed Whale (A) appears to be from  $4\frac{1}{2}$  to 7 times as long as (B), while in Cuvier's Whale (A) is from 8 to 10 times as long as (B). The beak seems to be less sharply marked off from the rest of the head than in the Bottle-nosed Whale, which it resembles in having two teeth at the extreme front end of the lower jaw. These are apparently concealed beneath the gum, throughout life, in females; but in old males they are large and thick, with a diameter of an inch or more, and they form very conspicuous objects, standing out beyond the gums. The colour seems to be variable, some specimens being dark above and light below, while others have the upper part of the head and of the back, as far as the back fin, quite white. This whale is probably mistaken, not infrequently, for the Bottle-nosed Whale.

**4. Sowerby's Whale.**—A smaller whale, seldom exceeding fifteen feet in length. Males, unless very young, can be recognised by the presence of a single large, tusk-like tooth projecting upwards, in each half of the lower jaw, at about the middle of the length of the mouth. Females have similar teeth concealed beneath the gum, and they thus appear to be toothless. The colour of the skin may be black all over, sometimes with white, irregular blotches, but some individuals have a good deal of white on the body.

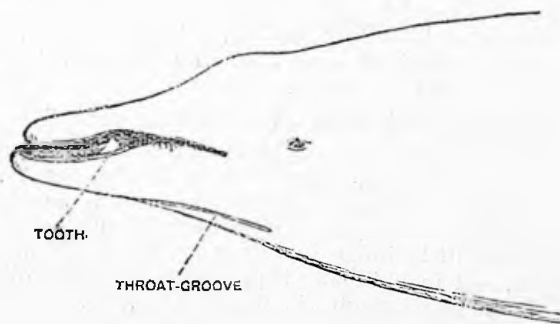


FIG. 3.—SOWERBY'S WHALE.

**5. True's Beaked Whale.**—A rare species, which seems to grow to a larger size (at least eighteen feet in length) than Sowerby's Whale. Its external appearance is not sufficiently known, but its most striking character is the position of the two teeth of the lower jaw, which are situated at the tip, as in the Bottle-nosed Whale. They appear to project beyond the gum in the old males, at least, and to be more flattened than those of the Bottle-nosed Whale; while in females they probably remain concealed throughout life, as in the species previously described.

Information regarding all three of these whales (3—5), and particularly True's Beaked Whale, is specially wanted by the British Museum (Natural History). Receivers of Wreck and Coast Guard Officers are requested to notify by telegraph ("Nathismus Southken London") the stranding of any of these whales, and to complete and forward by post Form 136, supplied by the Museum, to the Keeper of Zoology, British Museum (Natural History), Cromwell Road, London, S.W.7.

British Museum (Natural History),  
Cromwell Road,  
London, S.W.7.

October, 1920

Note on C.O. letter to the British Museum no. 54260/21 of 30th. Jan. 1922.  
para. 6. British Museum Form no. 132 on which foetal records are made is sent direct from the Colony to the Museum.

On the letter from the British Museum to the Colonial Office dated 31st. October 1921.

Para. 5 The lengths given by the whalers in the British Museum returns may be regarded as accurate within about five feet, or possibly less.

The difficulties in the way of an investigator of foetuses in South Shetland are considerable. Post mortem abortion during flensing is common, and I have been informed that it may even occur while a whale is being towed in, this would be partly due to the pressure arising from the air injected to make the whale float, but the violent death of the parent would almost certainly play a part in the occurrence. It is necessary to watch every whale during the process of flensing in order to prevent the foetuses expelled during that operation escaping notice.

Many whales were not opened at all in the past, but as a result of the Regulation (no. 11) which compels the use of the inside fat the opening of the body cavity is necessitated, so that if there is a contained foetus the chances of its being seen are greatly increased.

This seems a probable explanation of the truly remarkable number of foetal records in the British Museum forms for the past season (over 400).

As has just been mentioned many whales were not opened at the floating factories in the past, and even on the land station belonging to Hektor Co. where every whale brought up was opened the method in use, although good from the point of view of the whalers, could scarcely have been worse from that of a scientist, it was much inferior to that which I saw practised in Ireland.

It may be mentioned that the condition of an investigator of whales at any factory inevitably becomes nauseating to those with whom he is compelled to live, and who are not in such intimate contact with the carcasses.

On Sir Sidney Harmer's Report dated 28th September 1921.

## II. South Shetlands.

(b) This special condition was not embodied in the regulations of the 17th. October 1921. since it was considered that Regulations 10-14 and particularly no. 11 would be effective in controlling waste.



A.

iv. Monthly catches. Observations will be found in notes on the Appendix to the Report of 28th. September.

v. Oil production. The average production per whale was much increased in the 1921/22 season, being 57.1 barrels, an increase of 13.3 barrels per whale. Using the values per whale in estimated barrels of oil as follows Blue Whale 75, Fin Whale 42.5, Humpback 30, Sir Sidney Harmer indicates that the waste for the 1920/21 season was 48,741 barrels (or 23.4 %) On the same assumption the waste for the 1921/22 season was 14,070 barrels or 6.5 %. The waste being diminished by 16.9 % of the total. Had Pythia and Neko risen to the standard of Ørn II the next lowest, the estimated waste would have been reduced to 8,757 barrels or 4.2 % of the total which would then have been 208,436 instead of 203,123 barrels. The average (57.1 barrels per whale) for the season 1921/22 is well above the average for ~~xxx~~ four of the five South Georgia seasons with which Sir Sidney Harmer contrasts the 1920/21 average-

They are	1915/16	1916/17	1917/18	1918/19	1919/20
	46.9	54.3	66.0	53.2	49.8

Attention has been drawn in another paper (Observations on Report on the South Shetland Season 1921/22 para 7, in m.p. 351/22) to the point that whereas Sir Sidney Harmer suggests that the 1920/21 oil might have been derived from a catch diminished by 1150 Fin Whales, the oil of the 1921/22 season was actually yielded by a catch which was less by the comparable figure of 990 Fin Whales (although 87 more Blue Whales were taken) and the oil yield was less by the small amount of .92 %. If a Blue Whale is taken to have the value of 1.76 Fin Whales the net reduction of catch in terms of Fin Whales was 837. If the standard of production of 1920/21 had not been improved this would have entailed a lessening of the oil yield by 12 %, to a total of 183,159 barrels.

In the notes on the Report of May 19 1921 mention is made of the notable increase of the take of Blue Whales in 1921/22 as compared with the four preceding seasons

On the Appendix to the Report of September 28th. 1921.

IV. Discrepancies between Returns made by the Whalers to the Government of the Falkland Islands and those made to the British Museum.

I find on comparison of the monthly catches as returned to me at the end of the season, and those set forth in para. IV, which were taken from B.M. form no. 132, that the following differences appear.

Sydhavet Company during February and March caught 22 Blue, 210 Fin and 5 Humpback Whales, totalling 223, which accounts for nearly half the difference between the Museum figures and mine; when he came to clear his

his ship the manager of this company informed me that ~~that~~ he had found the supply of forms insufficient, but by that time it was too late for any action to be effective. The remainder of the deficiency in numbers is probably due partly to the same cause and partly to carelessness.

Although the fishing started in November there was no space for that month in the Government Forms, and except in the case of <sup>one</sup> Neko, that month, if included must be in the December returns.

The Museum forms give 44 more Blue Whales in the months of December and January than the Government forms.

I would suggest that it be impressed on the managers next season that all forms <sup>should</sup> be accurately filled up.

During the winter of 1921 a further supply of forms was obtained from the museum, but they were all used up during the last season and there was again a shortage. I have therefore suggested in another paper (C.S.O.352/22) that an ample stock be procured from the British Museum; this should obviate the possibility of the recurrence of such a shortage.

I have submitted in a separate minute paper suggestions for alterations to the Government form which would, I consider make it more accurate.

#### Frequencies of the sexes.

I do not consider that there is any reason to doubt the substantial accuracy of the sex determinations, since the experience of those concerned should be sufficient to preclude any serious error.

For purposes of comparison I give records obtained at Irish whaling stations in four seasons, in the last two of which I personally determined the sex of the specimens.

1909	Fin Whales,	total 56,	males 27,	females 29.
1911	do. do.	do. 53,	do. 25,	do. 21.
1913	do. do.	do. 37,	do. 20,	do. <del>17</del> 17.
1914	do. do.	do. 31,	do. 15,	do. 16.
<u>Totals</u>		<u>177</u>	<u>87</u>	<u>83</u>

It will be observed that in 1911 there were seven specimens of which the sex was not recorded, at least in the paper to which I have access, and this is a tolerably high number where so few whales are being taken into account.

V. Miscellaneous. These points have presumably been made from British Museum form no. 154. This form appears to present some difficulty to the whalers which may account for the poorness of the returns

turns made on it. It may be worth while to mention that it was very unlikely that Neko was at any time less than 500 miles from the Falkland Islands in her passages between South Georgia and South Shetland

On the Report of May 19th. 1921.

A. Aircraft and whaling. In June of 1919 a newspaper report appeared to the effect that use was being made of aircraft in whale fishing off the North-West Coast of North America. I understand that they are used in connection with the Newfoundland Sealing.

B. Observations on some of the papers reported.

ii. Seasonal catches. p.10. It seems to me at least doubtful if the increased size of the catchers was the real reason why Blue and Fin Whales began to be the principal quarry, rather than that the Hump-back had begun to disappear. These are only worth catching when numbers can be killed, or in the entire absence of other whales, because their size is small. There are still included in the whaling fleet a number of catchers which were used in South Shetland as long ago as 1910. Mr. A.G. Bennett is of the opinion that at first the whalers were afraid to attack the largest whales on account of their great size

South Shetlands, summer season December to April.

With regard to the apparent diminution in the numbers of the Blue Whale, it is interesting to observe from the Report of the Whaling Officer for the season 1921/22 that this species formed 51 % of the total catch, as against 36.9 % in the preceding season, and that the actual number taken was only three whales less than that for the highest Blue Whale year (1915/16) when 1845 were brought in: in both seasons the same number of catchers were operating—29.

1. During 1921 there was no whaling by companies belonging to the Norwegian Whaling Association in Iceland, Farø or the British Isles.

One Company (Wrangel of Haugesund) fished at Farø.

*J.E. Hamilton*

(J.E. Hamilton)

Government Naturalist.

25/6/22

FALKLAND ISLANDS.

No. 34.

GOVERNMENT HOUSE,

STANLEY,

24th June, 1922.

Sir,

I have the honour to acknowledge the receipt of your despatch No. 12 of the 30th of January, 1922, transmitting reports from the Director of the British Museum (Natural History) on the Whaling and Sealing operations in the Southern hemisphere. I have caused copies to be made of the reports, which are now returned in compliance with your request.

2. I enclose a copy of notes by the Government Naturalist on the reports.

In duplicate.

I have the honour to be,

Sir,

Your most obedient,

humble servant,

J. Middleton.

THE RIGHT HONOURABLE

W. L. S. CHURCHILL, M.P.,

SECRETARY OF STATE FOR THE COLONIES.