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THE EXISTENCE OF DIFFERENT FIN WHALE, *BALAENOPTERA PHYSALUS*, POPULATIONS IN SOUTH ATLANTIC WATERS

A PRELIMINARY STUDY BY MEANS OF MORPHOLOGICAL CHARACTERS

by

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SUMMARY

The southern hemisphere has been divided into six Areas for baleen whale management purposes. It was assumed that of the different baleen whale species one population lives in each Area. However, evidence exists which suggests that different Fin Whale populations intermingle on the feeding grounds of an Area. This obviously would have implications with respect to Fin Whale management.

Three different types of Fin Whales, distinguished by gunners and the second author of this paper, were visually observed in the South Atlantic catch of Fin Whales. It can be hypothesized that each type represents a different population. During the 1962/63 season on board the Dutch factory ship "Willem Barendsz", data of mainly the following variables were collected from 53 female Fin Whales (total catch of female Fin Whales 460): the length of a whale, the width, the length of a baleen plate series, the length of the longest baleen plate and the degree of pigmentation.

The type hypothesis could be tested by means of a multivariate analysis of variance on condition that, if the variables are age dependent, the age frequency distributions in the type subsamples must be similar. It turned out that most variables were age dependent and that the age frequency distributions were not similar. Only three variables were not correlated with the age of a whale, but no separation by type could be found with these remaining variables. It was concluded that presently the type hypothesis neither could be accepted nor rejected, and so has to be maintained. A preliminary analysis of the type distribution on the whaling grounds indicated a mixed distribution.

Analyses of mark recoveries (Brown, 1977) and blood-type frequencies (Fujino, 1964) suggest mixing of different populations on the feeding grounds of Area II (0-60°W) and Area III (0-70°E), respectively. At this moment the exploitation of the southern Fin Whale populations is prohibited, but when these populations will be recovered and a research catch will be allowed, the type hypothesis should be tested again. In this context the use of the isoenzyme frequency technique is recommended.

RÉSUMÉ

L'hémisphère méridional a été divisé en six Zones, dans des buts concernant la gestion des Mysticètes. Il a été supposé qu'une population de chacune des espèces de Mysticètes habite chaque Zone. Il existe cependant des observations suggérant que des populations différentes du Rorqual commun se côtoyent dans les parties d'une Zone où les animaux se nourrissent, ce qui devrait évidemment avoir des implications concernant la gestion du Rorqual commun.

Dans le produit de la chasse au Rorqual commun dans l'Atlantique Sud, les baleiniers et le second auteur du présent travail ont directement observé trois types distincts de Rorqual commun. On peut émettre l'hypothèse que chaque type représente une population distincte. Au cours de la campagne baleinière 1962/63 on a rassemblé, au bord du bateau-usine néerlandais ,,Willem Barendsz'', des données surtout sur les variables suivantes (sur 53 femelles de Rorqual commun, le nombre total des exemplaires femelles capturés étant de 460): longueur et largeur de l'exemplaire, longueur d'une série de fanons, longueur du fanon le plus long, et degré de pigmentation.

L'hypothèse des types a pu être vérifiée par une analyse de variance multivariée, à condition que si les variables sont dépendantes de l'âge, la distribution des fréquences d'âge dans le sous-échantillonnage des types doit être similaire. Or, il s'est avéré que la plupart des variables sont dépendantes de l'âge et que les distributions des fréquences d'âge ne sont pas similaires. Trois variables seulement ne montrent pas de corrélation avec l'âge de la baleine, mais dans le cas de ces variables une séparation par types n'a pas pu être observée. En conclusion, l'hypothèse des types ne peut actuellement être ni acceptée ni rejetée, et par conséquent elle doit être maintenue. Une analyse préliminaire de la distribution des types dans les régions de chasse aux baleines, indique une distribution mixte.

Des analyses des recaptures d'animaux marqués (Brown, 1977) ou des fréquences des types sanguins (Fujino, 1964) suggèrent qu'il y a un mélange de populations différentes dans les régions où les animaux se nourrissent appartenant à la Zone II (0-60°O) et à la Zone III (0-70°E) respectivement. Actuellement l'exploitation des populations méridionales de Rorqual commun est prohibée, mais l'hypothèse des types devrait être à nouveau vérifiée lorsque ces populations se seront refaites, une campagne baleinière dans des buts scientifiques étant permise. Dans ce contexte, on recommande l'utilisation de la technique des fréquences des isoenzymes.

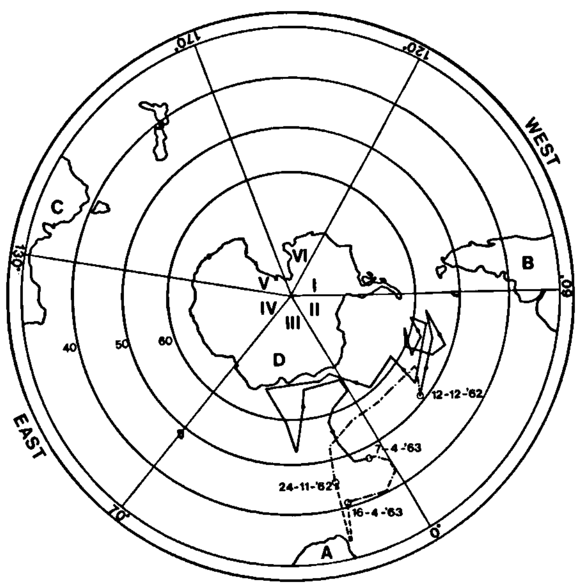

Fig. 1. The six baleen whale Areas (I-VI) in the southern hemisphere, and the sailing route of the "Willem Barendsz" on the whaling grounds in the season 1962/63 (—— route during baleen whale catch season, -.-.- route before and after this season during which 376 Sperm Whales were taken). A = South Africa, B = South America, C = Australia, and D = Antarctic continent.

INTRODUCTION

For baleen whale management purposes the southern hemisphere has been divided into six, rather arbitrary, Areas (fig. 1) (Chapman, 1974). From the catches in the Areas the number of whales in each Area and the yield were estimated using the number caught, the catch effort, and some biological parameters. However, in order to manage the whale resources properly, one must be sure that animals of a species in an Area can be considered as one population. A population in this context is defined as a group of whales which freely mate among each other, but not with conspecifics of another group. Fujino (1964) stated that concerning the Fin Whale, *Balaenoptera physalus* L., four different populations were present on the feeding grounds of Area III.

During the period 1946-1964 a Dutch whaling expedition operated in the southern oceans, mainly in the Areas II and III, close to the pack ice. Whale- and sperm-oil were the principal products of the Dutch whaling industry which were chiefly produced out of the blubber. The reproduction, age determination and baleen plate growth of Fin Whales were studied (Van Utrecht, 1965; Van Utrecht-Cock, 1965).

During the 1959/60 season on board the factory ship "Willem Barendsz", the second author of this article observed three types of Fin Whales in the South Atlantic catch, characterized by a typical combination of morphological characteristics. During the season 1962/63 more data were collected regarding these types. Van Utrecht-Cock (1965: 59) gives a description of the three types:

"1. Animals which are short, dumpy, dark coloured, with pigment running far out to the ventral side, with a high head and a big girth. They may attain sexual maturity at an early age. They probably attain sexual maturity when about 60 feet long. These animals have a thick layer of blubber consisting of much fat. [...]
2. The normal type of Fin Whale [i.e., animals with intermediate characters].
3. Animals which are very long, slender, and light coloured, with a flat, low head and a thin layer of blubber. Probably they attain sexual maturity some years later than the animals described under 1., and when about 71 feet long [...]."

Due to the cessation of the Dutch whaling activities in 1964 no more data were collected. From the occurrence of different types of Fin Whales in the South Atlantic it can be hypothesized that three distinct populations are present in that region. In this article the data on the presence of Fin Whale types are presented and analyzed.

MATERIAL AND METHODS

In 1962/63 the baleen whale season lasted from 14 December till 7 April, and catching took place between 50-70° southern latitude and 50° eastern and 50° western longitude (fig. 1). Apart from 19 Blue and 87 Sei Whales, 848 Fin Whales were caught, among which 460 females. Catch data from 53 randomly chosen female Fin Whales were noted: registration number, date of capture, catch position (= noon position of factory ship), catcher boat and the sequence number of that animal for that boat on the specified day (table I).

The following biological data were collected from this sample: the type of the sampled whale, the length, two indices of the width, the length of a baleen plate series, the length of the longest baleen plate within a series, the degree of pigmentation, the thickness of the blubber layer and the presence or absence of a foetus.

The length of an animal was measured from the tip of the snout to the notch between the flukes. The first index of the width of an animal was twice the distance between the condylus occipitalis and the lateral edge of the skull. The second width index was obtained from photographs made of each sampled whale on the flensing deck at the

TABLE I

Catch data of the sampled Fin Whales taken by the Dutch factory ship "Willem Barendsz" in South Atlantic waters in 1962-63. Abbreviations used: a = registration number; b = type of Fin Whale; c = date of capture; d = noon position of factory ship; e = catcher boat; f = whale sequence for the catcher on that day; E = East; S = South; W = West.

a	b	c	d		e	f	a	b	c	d		e	f
			S	W						S	W		
179	2	18/12	56	39	AM 21	1	694	1	22/1	56	39	AM 4	2
180	2	18/12	56	39	AM 20	1	700	1	22/1	56	39	AM 4	4
212	1	22/12	58	52	AM 21	1	702	1	22/1	56	39	AM 4	5
227	2	23/12	55	47	AM 3	1	722	1	23/1	57	37	AM 7	1
235	1	24/12	53	43	AM 4	1	726	3	23/1	57	37	AM 22	1
375	1	30/12	56	37	AM 7	1	747	3	24/1	58	38	AM 22	1
378	1	30/12	56	37	AM 20	1	748	3	24/1	58	38	AM 8	1
380	3	30/12	56	37	AM 21	2	749	1	24/1	58	38	AM 4	1
406	1	31/12	55	41	AM 22	1	759	1	25/1	59	42	AM 21	1
417	2	2/1	57	35	AM 21	1	761	1	25/1	59	42	AM 21	2
418	2	2/1	57	35	AM 6	1	817	3	30/1	59	39	AM 8	2
419	2	2/1	57	35	AM 4	1	818	1	30/1	59	39	AM 3	1
421	2	2/1	57	35	AM 4	2	824	1	30/1	59	39	AM 3	7
447	2	3/1	59	35	AM 7	2	852	1	30/1	59	39	AM 8	3
480	1	4/1	59	37	AM 7	1	855	1	30/1	59	39	AM 6	1
481	1	4/1	59	37	AM 6	1	869	2	1/2	62	37	AM 4	1
535	3	11/1	58	39	AM 6	1	870	2	1/2	62	37	AM 4	2
574	3	12/1	57	40	AM 4	1	873	3	1/2	62	37	AM 4	5
606	1	14/1	60	35	AM 21	1	928	3	9/2	56	37	AM 8	1
608	3	14/1	60	35	AM 21	2	929	3	9/2	56	37	AM 8	2
624	3	16/1	60	37	AM 22	1	951	2	13/2	53	25	AM 8	2
646	3	18/1	58	32	AM 22	1	1052	1	28/2	69	4E	AM 22	1
652	1	19/1	59	33	AM 4	1	1067	2	28/2	69	4E	AM 6	1
653	1	19/1	59	33	AM 20	1	1098	2	4/3	68	16E	AM 7	1
668	3	21/1	58	41	AM 21	1	1136	2	6/3	67	28E	AM 3	1
670	3	21/1	58	41	AM 20	1	1191	2	23/3	68	20E	AM 3	1
690	2	22/1	56	39	AM 21	1							

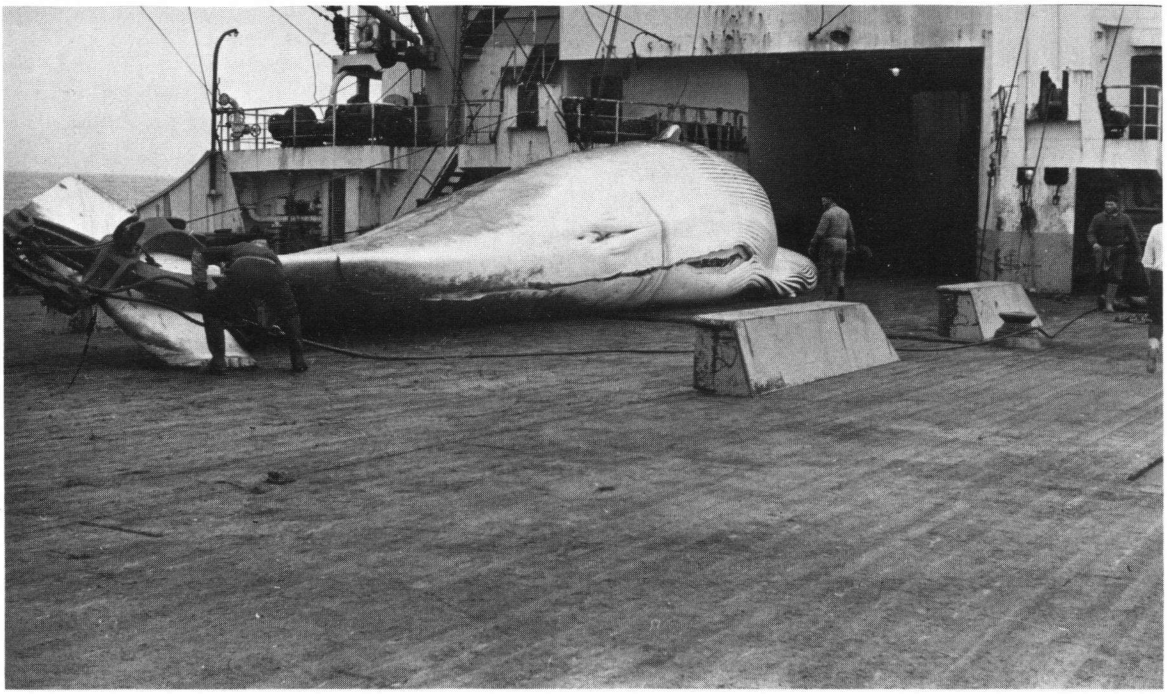

Fig. 2. Female Fin Whale, type 3, on the flensing deck of the "Willem Barendsz" in the South Atlantic in the season 1962/63. Registration number 646 (Photograph W. L. van Utrecht).

same place and in the same position and from a fixed distance (fig. 2). The height of the bridge which was covered by the whale provided an index of the width of the shoulder girdle.

The length of a series of baleen plates was the distance between the first and last plate of a series. The length of the longest baleen plate of a series was the distance between the most distal part of the longest plate and the gum. The degree of pigmentation was also obtained from the photographs. The white and black parts of the ventrolateral side of a whale were drawn in a standard whale picture on standardized paper. Subsequently these parts were cut, weighted and converted to percentages.

The thickness of the blubber layer was measured just rostral to the dorsal fin and just in front of the anus, after the flensers had made the first slits in the carcass. This variable depends on a great number of factors such as age, state of pregnancy, time already spent on the feeding grounds that year, etc. (Lockyer, 1981). Due to these interactions and the limited number of observations (table II) this variable could not be used in our analysis.

Earplugs were collected from every sampled whale, by cutting out the complete external auditory meatus containing the earplug, from the base of the glove finger to the closed distal end. This was preserved in 5% neutralized formalin. At the institute the earplugs were carefully taken out. An earplug is a horny cone of varying size and shape, the core of which consists of alternating dark and light laminae. Every year the epithelium of the glove finger, which lies at the plug base, adds one growth layer, i.e. one dark and one light lamina, to the plug. All layers remain visible during the life span of a whale, so giving a clue to the age of an animal (International Whaling Commission, 1969). The number of layers in the earplugs of the sample were counted by the second author of this paper, and by several foreign whale biologists as well. Divergent results were obtained, which probably were due to different counting criteria used and an inadequate preparation of some plugs (Gambell, 1969).

TABLE II

Dorsal and ventral blubber layer thickness (in cm) in three types of female Fin Whales.

type	dorsal	ventral
1	18	15
1	20	11
1	16	11
1	21	13
1	31	16
2	22	13
3	30	18
3	30	21

Ovaries were collected and deep frozen. Corpora albicantia, which are corpora lutea in regression, remain present in the ovaries during the whole life span of a female Fin Whale. Assuming that the average ovulation rate does not change throughout the life span, the number of corpora counted in both ovaries provided a second age index of the females. This age index was used in our analysis, except for the estimation of the age at sexual maturity in females, in which the number of earplug layers, as counted by the second author, had to be used as an age index. Notwithstanding the above-mentioned divergent counts of the growth layer numbers, a strong correlation was found between the second author's counts and the corpora number, as demonstrated in fig. 3 and by the results of Kendall's rank correlation test: $T = 0.83$, $n = 43$, $P < 0.001$.

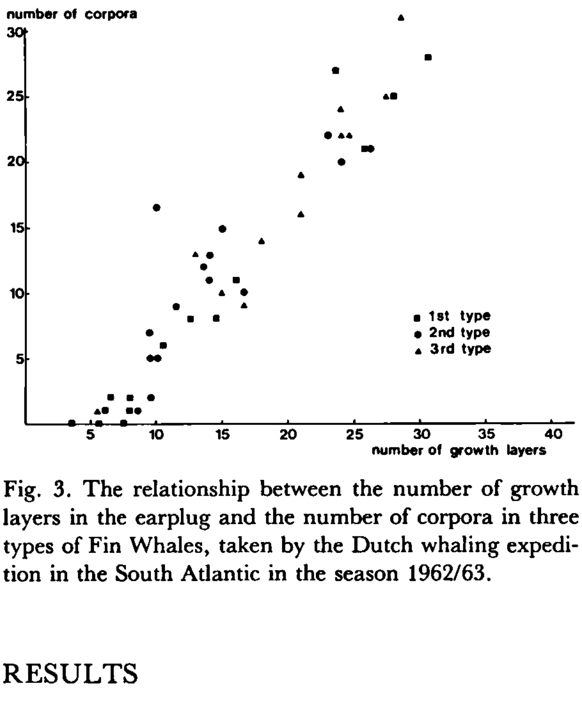

Fig. 3. The relationship between the number of growth layers in the earplug and the number of corpora in three types of Fin Whales, taken by the Dutch whaling expedition in the South Atlantic in the season 1962/63.

RESULTS

From the female Fin Whales sampled in 1962/63, the mean and standard deviation of the length, the width indices, the length of the baleen plate series, the length of the longest baleen plate and the degree of pigmentation are given per type in table III.

The type hypothesis can be tested with a multivariate analysis of variance (Sokal & Rohlf, 1969). However, one condition has to be met: if the variables are correlated with the age of the animals then either the age frequency distributions within the types must be similar or an age interval must be selected in which no age dependence occurs. Figs. 4A-F show the relation between the variables and age: all variables except the degree of pigmentation are positively correlated with age (up to a certain number of corpora), as is also revealed by a statistical test (table IV). The figures also show that as a Fin Whale becomes older, the growth rate of the body decreases, and that the length of a baleen plate already becomes more or less constant at a relatively early age due to wear at the apex of the plate (see also Van Utrecht-Cock, 1965).

No similar age frequency distributions were present in the subsamples, as can be seen in fig. 5: 73% of the type 3 animals had 12 or more corpora, whilst this percentage was only 44 and 23 in the type 2 and type 1 animals, respectively. Although it is possible to select a time interval in which most variables are more or less constant with age, due to a decreased growth rate (fig. 4), for example animals with 10 corpora or more, such a subdivision would make the sample sizes unacceptably small: type 1 six, type 2 ten and type 3 twelve animals.

The body shape of a Fin Whale can be expressed with the ratios: 1st width index/length and 2nd width index/length, while the head shape can be expressed with the ratios: 1st width index/length of the baleen plate series and length of the longest baleen plate/length of the baleen plate series. In table III the mean and standard deviation of these ratios are also given, whereas the results of the correlation test are figured in table IV. Only the ratios of the head shape were not significantly correlated with age.

It would be possible to perform a trivariate analysis of variance with the variables degree of pigmentation and head shape ratios. Fig. 6 gives the scatter diagram for two of these variables showing a complete overlap in the types. The third variable, length of the longest baleen plate divided by the length of the baleen plate series, would not give a separation of the types, as can be inferred from the mean and standard deviation of this variable per type (table III). Neither did a statistical test reveal any indication for real type differences between the means of these variables (table IV). Due to these results it was concluded that it would not be worth while to perform a trivariate analysis of variance.

One of the presumed type differences was the age at sexual maturity in females, which is defined as the age of the cohort of which half of the females is mature. A female was considered

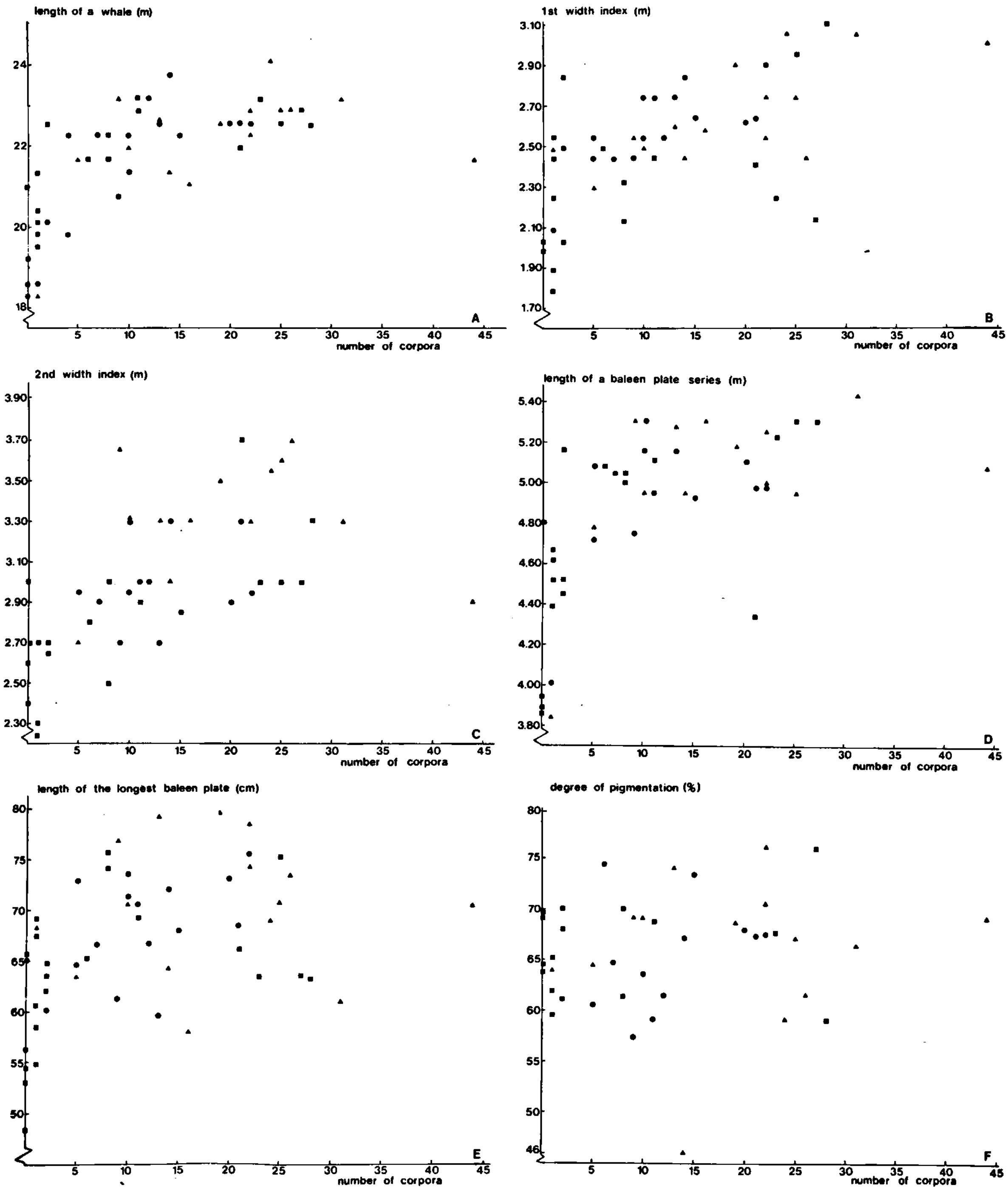

Fig. 4A-F. The relationship between the number of corpora and several morphological variables subdivided by type, in a Dutch Fin Whale sample from the season 1962/63. Type 1: ■, type 2: ●, type 3: ▲.

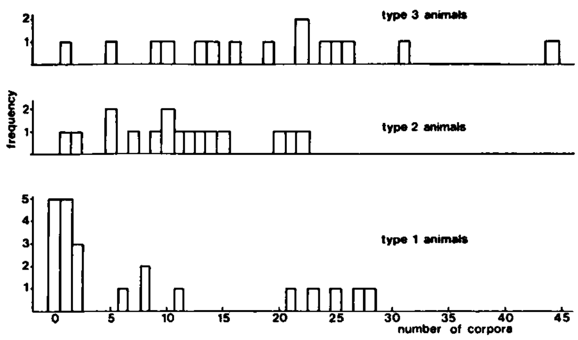

Fig. 5. Corpora frequency distribution in the three type subsamples.

mature if one or more corpora were present in the ovaries. In this context the number of growth layers in the earplugs had to be used as an age index. Five type 1 animals were immature with 8, 6, 4, 4 and an unknown number of layers; five animals had 1 corpus with 8, 8, 6, 6 and an unknown number of layers; three animals had 2 corpora with 8, 8 and 7 layers. All type 2 and type 3 animals of the sample were mature. One type 2 animal had 1 corpus and 9 layers, and one 2 corpora and 10 layers. One type 3 animal had 1 corpus and 6 layers.

TABLE III

Mean and standard deviation (SD) of some variables of female Fin Whales per type.

	type 1		type 2		type 3	
	mean	SD	mean	SD	mean	SD
a: length of a whale (m)	20.99	1.58	21.85	1.37	22.15	1.34
b: 1st width index (m)	2.31	0.35	2.59	0.20	2.66	0.24
c: 2nd width index (m)	2.80	0.35	2.98	0.20	3.10	0.86
d: length of the baleen plate series (m)	4.71	0.54	5.05	0.41	5.13	0.46
e: length of the longest baleen plate (cm)	64.6	10.0	68.1	5.0	70.5	6.7
f: degree of pigmentation (%)	66.4	4.8	64.6	4.7	66.2	7.3
g: b divided by a	0.109	0.013	0.118	0.007	0.120	0.011
h: c divided by a	0.134	0.012	0.133	0.009	0.143	0.015
j: b divided by d	0.486	0.054	0.515	0.034	0.521	0.054
k: e divided by d	0.135	0.013	0.137	0.012	0.139	0.018

TABLE IV

Values of Kendall's rank correlation test, *T*, and of Kruskal-Wallis's test, *H*, with corresponding probability levels, *P*. With Kendall's test the correlation between the corpora number and the variable was tested; with Kruskal-Wallis's test type differences in the variables were tested (*n* is number of observations).

Variable		Kendall		Kruskal-Wallis	
	n	*T*	$P \leq$	*H*	*P*
a: length of a whale	48	0.536	0.001		
b: 1st width index	47	0.441	0.001		
c: 2nd width index	41	0.496	0.001		
d: length of the baleen plate series	47	0.482	0.001		
e: length of the longest baleen plate	48	0.202	0.02		
f: degree of pigmentation	39	0.103	0.18	1.90	$0.10 < P < 0.50$
g: b divided by a	47	0.221	0.02		
h: c divided by a	41	0.319	0.01		
j: b divided by d	47	0.175	0.08	3.32	$0.10 < P < 0.50$
k: e divided by d	47	-0.154	0.13	0.547	$0.50 < P < 0.90$

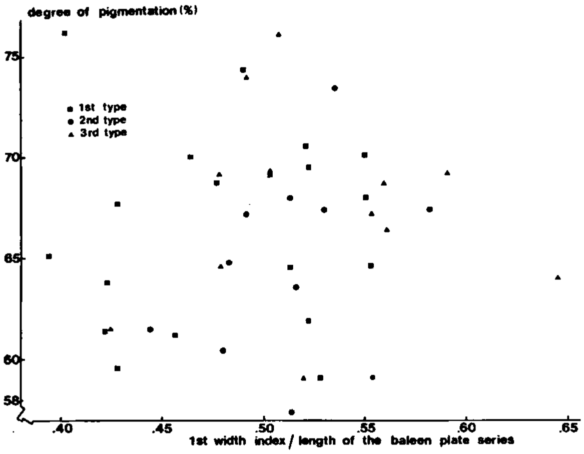

Fig. 6. The relationship between the ratio 1st width index/length of the baleen plate series and the degree of pigmentation in three types of Fin Whales.

These limited data suggest that the female age at sexual maturity is equal to or less than 6 layers.

Table V relates the length of the animals with the sexual state. The average length at sexual maturity, which is the length class of which 50% is mature, can be estimated at about 63 feet. The data set is too limited to estimate reliably the age and length at sexual maturity per type.

The apparent pregnancy rate, apparent due to the legal protection of lactating females, in the type 1, -2 and -3 animals was 94, 65, and 73%, respectively; on average 77%. These differences were not statistically significant (chi-square test, $0.05 < P < 0.10$).

Fig. 1 shows the route of the 1962/63 expedition, while the area where female Fin Whales were taken, plus the catch position of the sampled whales are given in fig. 7. Roughly two catch areas can be observed, viz. one west and one east of the Greenwich meridian. In the western part 387 females and in the eastern part 73 females were caught, of which 48 and 5 were sampled, respectivily. Fig. 7 shows that the three types can occur in the same localities.

More detailed information concerning the

Table V

The length (in feet) and the sexual state of female Fin Whales per type.

length	type 1 mature	type 1 immature	type 2 mature	type 2 immature	type 3 mature	type 3 immature
60		2			1	
61		1	1			
62						
63		1				
64	1					
65	1		1			
66	2		1			
67	1					
68	1		1			
69		1			1	
70	1		1		1	
71	2				2	
72	1				1	
73	1		4		1	
74	3		4		2	
75	1		1		3	
76	2		1		2	
77						
78			1			
79					1	
Total	17	5	16	0	15	0

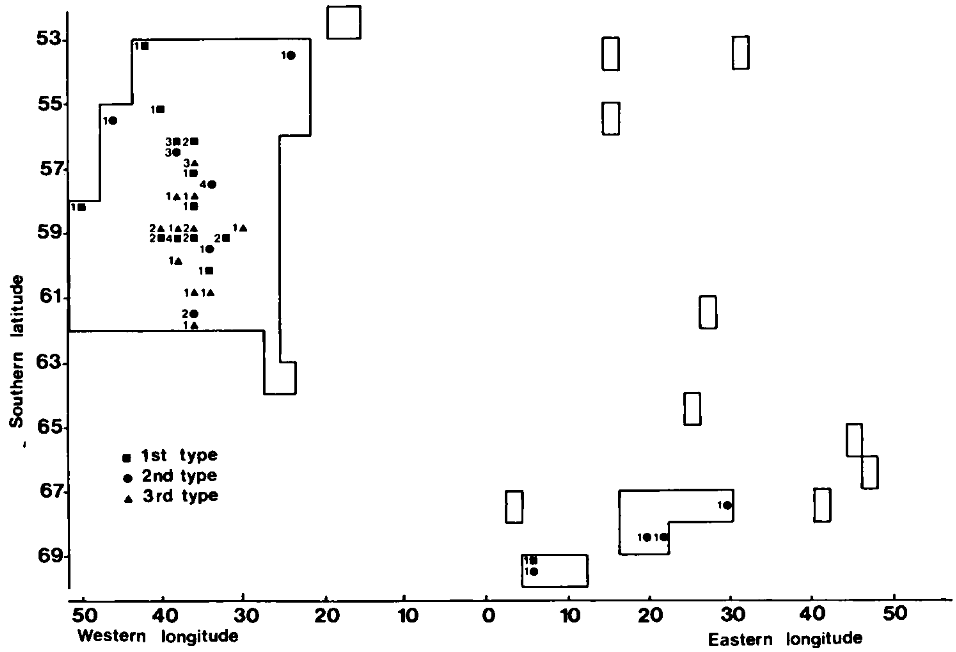

Fig. 7. Distribution on the grounds of the female Fin Whale catch in 1962-63, and the distribution of the samples. Geographical unit: 1° latitude and 2° longitude.

type distribution on the whaling grounds is summarized in table I. These data suggest that whales caught in the same period and roughly in the same place can belong to any of the three types. Also each type was present on the grounds during the whole sampling period. It is, however, striking that if the sample of one day contained more than one animal, these often belonged to the same type. A test described by Pielou (1967), revealed that the type sequence of the total sample (column b of table I) was not random: $G = 22.10$, $df = 4$, $P < 0.001$.

DISCUSSION

A stable and typical combination of certain morphological characteristics in individuals of a whale species was used to discern populations. However, such an association can also be found within a population if the genes controlling these characters are closely linked and an Hardy-Weinberg equilibrium cannot be reached (linkage disequilibrium). Examples of this phenomenon are the colour and banding patterns in the house snail, *Cepaea nemoralis* (L.), and the heterostylic forms of *Primula vulgaris* Huds. In house snails it decreases the bird predation and in primroses it promotes crossbreeding. In general, individuals have advantage of this phenomenon (Parkin, 1979). In the case of the southern Fin Whales a clear advantage of the occurrence of types is hard to imagine, therefore the possibility that the genes controlling the type characters are closely linked seems remote. So it is assumed that the presence of different types is due to the presence of populations which differ in some characters, and not to linkage disequilibrium within one population.

Van Utrecht-Cock (1965) gave a description of the types. Both the second author of this article, flensers on board "Willem Barendsz" and especially the gunners of the catcher boats were able to distinguish the types visually (Drost, 1951; Van Utrecht, personal observation). Gunners called the type 1 animals "Enderby Blacks". Therefore it was disappointing that most variables could not be used to test the type hypothesis due to different age distributions in the subsamples. The three morphological variables which showed no correlation with age did not give such a separation of the types to justify a complicated statistical test. Also the supposed type differences in age and length at sexual maturity and the blubber layer thickness could not be tested due to the small sample size. It can be concluded that at this moment the hypothesis of different Fin Whale types occurring in the South Atlantic can neither be accepted nor rejected and so must be maintained.

If several whale populations are present on the same feeding grounds, it is of great importance for a proper whale management to know the range of the populations and possible differences in population dynamic parameters. In the case of sympatric distribution all whales taken must be typified and assessments have to be made per type. With allopatric distributions a geographical subdivision of the grounds, within and across Areas, can be made.

Analysis of the type distribution, based on the data of fig. 7 and table I, indicates that (1) the types have a sympatric distribution pattern, and (2) within this pattern animals of a type are clustered. A more detailed analysis of place and time effects on the distribution needs more data.

Fujino (1964) stated that in Area III four different populations intermingle, viz. the one of Area II, that of Area IV and both a high and a low latitudinal Area III population. He used blood antigen frequencies as a variable. Brown (1962, 1970, 1972, 1977) has analyzed the whale mark recoveries for Fin Whales in the southern hemisphere. His analysis of the east-west movement from marks fired and recovered in Antarctic waters showed that in a considerable number of cases the location of placement and recovery were quite close, only a few degrees of longitude apart, even after years. Only a small number of marks was recovered in an Area different from that in which the mark was placed: of 2475 Fin Whales marked in Area II from 1932 till 1970, 175 marks were recovered in Area II, while only 8 and 3 were recovered in Areas III and I, respectively. In Areas I and III 277 and 1930 Fin Whales were marked of which 19 and 140 were recovered in the same Area, while 14 and 21, respectively, were recovered in Area II. However, not all marked whales which crossed the boundaries were caught. After correcting for these whales, Brown found a high dispersion rate across the boundaries.

A better understanding of intermingling populations in South Atlantic waters comes from Brown's analyses of returned marks illustrating migration. Most of the southern Fin Whales feed on krill in Antarctic waters during summer, and migrate to lower latitudes in autumn for their winter breeding activities. Through 1971, 15 marks have been recovered that show north-south migration. These marks demonstrate a southward migration from about latitude 30°S on the west coast (Area I) and the east coast (Area II) of South America and from Durban on the east coast of South Africa (Area III) into the southern part of Areas II and III, respectively (5 and 1 marks). Northward migration has been demonstrated from the southern part of Area III to both coasts of South Africa by 9 returned marks. The results clearly indicate that whales from the supposed Area I and II populations are present together in the Atlantic sector of the Antarctic feeding grounds.

Research on the population structure of another baleen whale species, the Humpback Whale *Megaptera novaeangliae* Borowski, revealed an inverse structure: in the North-West Atlantic, Humpback Whales have separate feeding grounds, but the same breeding ground (Katona & Whitehead, 1981; Balcomb, in press). Preliminary biochemical research on the population identity of the southern Minke Whale, *Balaenoptera acutorostrata* Lacépède, nowadays the only species which is exploited pelagically, suggested no intermingling of different populations in an Area (Wada & Numachi, 1979; Van Beek & Van Biezen, 1982).

In 1976, the International Whaling Commission prohibited the catch of Fin Whales in the southern hemisphere, after that it had already decreased the quota in the past decade. Assessments of the number of whales in the Areas showed that these numbers had heavily declined, being far below the maximum sustainable yield level (Allen, 1980). Therefore, it is unlikely that in the near future the Commission will permit Fin Whale catches in this region.

However, when the populations will have recovered and an initial research catch may be taken, the type hypothesis must be tested again; preferably with a much larger sample size, more morphological variables, especially those which discriminate strongly between the types, and biochemical characters such as isoenzymes. With the latter approach intermingling of different populations can be demonstrated, regardless of type discrimination, by means of the Wahlund effect (Solbrig & Solbrig, 1979). An analysis of the accumulated Fin Whale catches per 1° longitude and latitude could yield useful information about population identity as well (Van Beek, 1983).

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