

CETACEANS FROM THE LESSER ANTILLEAN ISLAND OF ST. VINCENT

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ABSTRACT

A preliminary list of cetaceans collected and observed during the course of a fishery for blackfish or pilot whales (*Globicephala*) in the waters of the Lesser Antillean island of St. Vincent is presented and includes: *Megaptera novaeangliae*, *Steno bredanensis*, *Tursiops truncatus*, *Grampus griseus*, two species of *Stenella* to which specific names are not formally applied, *Feresa attenuata*, *Pseudorca crassidens*, *Globicephala macrorhyncha*, *Orcinus orca*, *Physeter catodon*, and *Ziphius cavirostris*. Nearest published records in the western Atlantic are given, as well as limited biological notes on some of the species. The taxonomic relationships of the two forms of *Stenella* are suggested and both species are illustrated. Landings of pilot whales in the fishery over a period of 9 years are included.

There is a small but active fishery for blackfish or pilot whales (*Globicephala*) centered around the village of Barrouallie on the western or lee side of the Lesser Antillean island of St. Vincent. While the major direction of this fishery is the pursuit of blackfish, intensive studies made by the writers independently and cooperatively over the past several years have shown that a number of other small cetaceans are captured as well. The primary purpose of the fishery is the production of meat and cooking oil, both used locally, and the species taken is not especially important to the fishermen, except that the larger animals are the more profitable. Hence the concentration on blackfish. Anything that is seen is pursued except the larger and fast baleen whales. The techniques and history of the blackfish fishery have been discussed by Brown (1945, 1947), Hickling (1950), Morice (1958), Allen (1966),⁵ Morris (1966),⁶ Jackson

(1967),⁷ Rathjen and Sullivan (1970), Caldwell and Caldwell (in press), and others. In brief it is conducted from small open boats launched daily from shore and powered primarily by sail and oar (see Rathjen and Sullivan, 1970). One motor launch recently has been employed and it produces the majority of the catches of the faster swimming small dolphins. Other motor launches, both inboard and outboard, are planned (Caldwell and Caldwell, in press). The cetaceans are taken both by hand harpoon and by small gun harpoons fired from a fixed stand on the bow of the boat.

We present here a summary of our findings to date regarding species taken in the fishery. The records of odontocetes are supported by skeletal remains and/or recognizable photographs of carcasses or parts of carcasses. Copies of all of the photographs mentioned below are in the Caldwell's files with duplicates of some in those of Rathjen and Sullivan. The skeletal material, unless otherwise stated, presently is being studied by the Caldwell's at the Florida State Museum, Gainesville. The "SV" numbers associated with records discussed in the text are field numbers in the Caldwell's files. With more collecting and analysis of the results,

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⁵ Allen, W. O. 1966. The fishing industry in St. Vincent. St. Vincent Teachers College, Kingstown, St. Vincent, Unpublished report (file no. 50), 42 p.

⁶ Morris, E. L. 1966. A brief history of Barrouallie from 1719 to present day (1966). St. Vincent Teachers

College, Kingstown, St. Vincent, Unpublished report (file no. 39), 51 p.

⁷ Jackson, L. R. 1967. The blackfish industry of Barrouallie, St. Vincent. St. Vincent Teachers College, Kingstown, St. Vincent, Unpublished report (file no. 26), 38 p.

both of which are ongoing, it should be possible to say more about some of the St. Vincent faunal elements than is appropriate now. Our purpose here is only to provide an annotated summary of the existing records for this island in order to give for the first time a relatively complete list of such a fauna from one specific locality in the Antilles and to provide a firmer basis for zoogeographic statements required for ongoing studies in this and other disciplines in the West Indies and Caribbean.

Although there are a number of individual records of cetaceans from the West Indies (in part summarized by Hershkovitz, 1966), or reports which include as many as three or four species, there are few reports which include enough of the expected species to give sufficient data for evaluating the local cetacean fauna. The best of these are from the northern Antilles (from Cuba by Cuni, 1918, and Aguayo, 1954; and from Puerto Rico to Antigua by Erdman, 1970).

Studies similar to ours on small cetaceans, but more detailed, have been conducted on the Atlantic coast of Africa in the vicinity of Senegal and to some lesser degree the Ivory Coast and the Cape Verde Islands. The odontocete cetacean fauna in those similar latitudes is remarkably similar to that of St. Vincent even though the two areas lie some 5000 km apart across the open sea. This similarity extends even to forms such as *Steno* and *Feresa* that are generally rare in collections. Cadenat and others have published a series of reports on their studies of the African fauna, but a list of the species found can be had by consulting a combination of two of these (Cadenat, 1949, 1959). The latter also summarizes much of the other literature on the cetaceans of the area. Van Bree and Cadenat (1968) in addition recorded *Pepo-nocephala electra* from Senegal.

SPECIES ACCOUNTS

With the exception of a spotted dolphin, we follow Rice and Scheffer (1968) in our arrangement of species and in the scientific and/or common names applied to them.

Megaptera novaeangliae (BOROWSKI)— HUMPBACK WHALE

In early May 1968, an individual of adult size slowly passed close along the lee shore of St. Vincent in a southward direction. Several of the St. Vincent whalers, familiar with this species from seeing it in a nearby humpback fishery at Bequia, observed this individual from boats but made no effort to harpoon it. The St. Vincent whalers tell us that they see a few individuals of this species each year but that they never try to harpoon one because of the large size of these whales.

A few humpbacks are usually taken each year (mostly from February to April) in the Bequia fishery just to the south in the St. Vincent Grenadines which utilizes bomb guns in addition to hand harpoons. Accounts of the latter fishery were given by Brown (1945), Fenger (1958), Mitchell (1965), and Quashie (1966).^{*} An early account of New England whaling vessels hunting humpbacks in the region was included by Lindeman (1880), but Clark (1887: pl. 183) for as early as 1880 included waters near St. Vincent on a map showing abandoned humpback whaling grounds. These and other reports mention *Megaptera* in St. Vincent and/or nearby waters.

Steno bredanensis (LESSON)— ROUGH-TOOTHED DOLPHIN

A skull (SV-1-SB) of a specimen of unknown size and sex was obtained from the fishery in the spring of 1969. This is the first record for this species from St. Vincent and from the Caribbean. We find no prior and contemporary basis for Kellogg's (1940: 69) inclusion of this species in the Caribbean fauna, nor for the indication by Hall and Kelson (1959: 819) that its range is continuous in the western Atlantic from Virginia to South America.

The records closest to St. Vincent in the western Atlantic are from off Havana, Cuba (and thus non-Caribbean) to the north, as *S. rostratus* (see Aguayo, 1954), and from an unstated locality off the Brazilian coast to the south (Ham-

^{*} Quashie, I. N. 1966. The whale industry in Bequia. St. Vincent Teachers College, Kingstown, St. Vincent, Unpublished report (file no. 30), 32 p.

ilton, 1945). *S. fuscus* Gray, from an un-stated area in Cuban waters, may be this species (True, 1889: 27) and if so would represent another Cuban record. However, the unique type of this latter species, a preserved fetus, apparently was lost even in True's time and the record cannot be substantiated. Presumably the previous Caribbean records of this species (see above) have been based on this Cuban material.

Tursiops truncatus (MONTAGU)—
BOTTLENOSED DOLPHIN

The Caldwelles have color photographs of the head of an immature specimen of unknown size and sex taken in the fishery on 17 May 1968. The head was obtained from a market where it had been split longitudinally in order to get to the brains, which are eaten. The skull (SV-1-TT) is also split but complete.

This species has not been reported from St. Vincent before, but Turner (1912: 135) listed the mandible (as *Tursiops tursio*) of a specimen from nearby Barbados.

Grampus griseus (G. CUVIER)—
RISSO'S DOLPHIN OR GRAY GRAMPUS

The Caldwelles have the skull (SV-1-GG) and color photographs of the intact head of a specimen of unknown size and sex taken in the fishery in the summer of 1968. They also have the skulls of two more specimens (SV-2-GG, SV-3-GG), of unknown size and sex, taken during the summer of 1970.

In addition, the Caldwelles have black and white photographs (SV-4-GG) of an individual (also of unknown size and sex) taken in September or October 1967.

Until recently this species was considered a northern form in the western Atlantic, but specimens are now available from Florida (Paul, 1968) and there is a recent sight record from the Virgin Islands (Erdman, 1970). The records from St. Vincent seem to be the most southern in the western Atlantic, and the only West Indian ones supported by specimens. Mention of this species in the St. Vincent fishery was made by Caldwell and Caldwell (in press).

Stenella, SPECIES A—LONG-SNOUDED
OR SPINNER DOLPHIN

The Caldwelles have color photographs of the head of a specimen of unknown size and sex taken in the fishery on 17 May 1968. The skull (SV-1-SL) was saved but is split longitudinally (see *Tursiops* account above).

The Caldwelles measured three females (177.0 [SV-2-SL], 166.5 [SV-3-SL] and 150.0 [SV-4-SL] cm from tip of upper jaw to fluke notch) which were taken on 24 May 1968. They have black and white photographs (Figure 1) of the middle-sized animal taken from several angles, and the skulls of the two largest.

There is confusion in the literature regarding the systematics of the long-snouted spinning dolphins of the genus *Stenella*, and the group is badly in need of revision. The St. Vincent dolphins clearly spin, as observed by all of us at sea off the island, and our specimens (externally) and their skulls compare favorably with those reported from the northern Gulf of Mexico as *S. longirostris* (Gray) by Layne (1965), but neither we nor Layne made similar comparisons with *S. roseiventris* (Wagner) which Rice and Scheffer (1968) retained as a species separate from *S. longirostris* although many writers consider them to be synonyms. For the present we do not apply a specific name to our material but note only that the specimens from St. Vincent appear to belong to the "*longirostris-roseiventris*" group of *Stenella*.

The closest western Atlantic records for dolphins of this type are from the Bahamas near Miami, Fla., to the north (Moore, 1953) and (as *Delphinus microps*) from Brazil (no locality) to the south (Gray, 1850: 126).

Stenella, SPECIES B—SPOTTED OR
BRIDLED DOLPHIN

The Caldwelles measured a 172.5-cm male taken in the fishery on 24 May 1968, and have black and white photographs (Figure 2) taken from several angles and the skull (SV-1-SF). The photographs, taken under adverse lighting conditions, do not show the spotted pigmentation pattern of the specimen because in addition

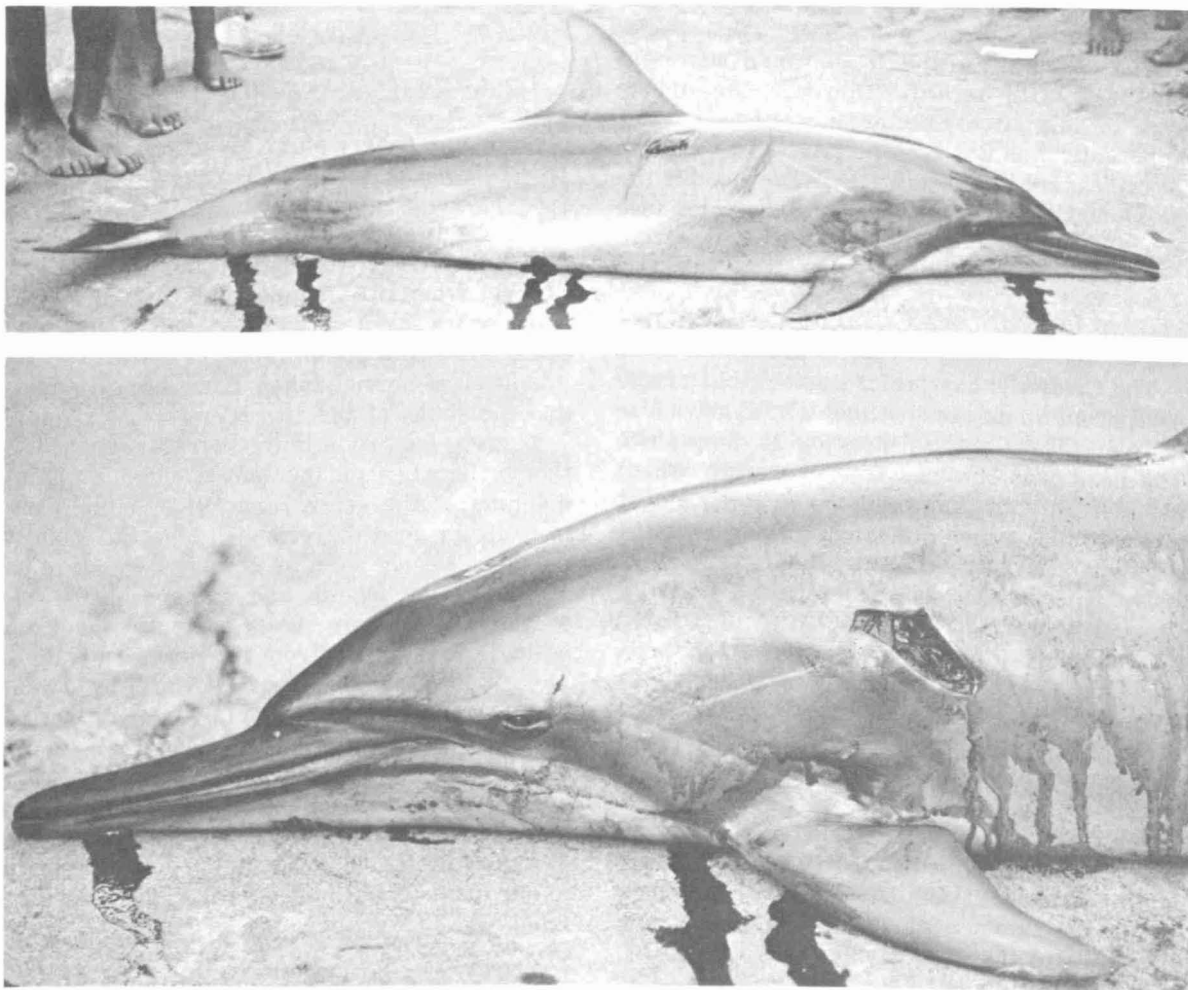


FIGURE 1.—*Stenella*, species A, 166.5-cm female spinner dolphin (SV-3-SL) landed at Barrouallie, St. Vincent, on 24 May 1968. UPPER: lateral view of entire carcass; LOWER: view of head and pectoral region showing prominent features of pigmentation. Photographs made under conditions of adverse lighting several hours after the animal had been harpooned and kept in the sun in an open boat at sea. (Photographs by William A. Huck.)

it had been in the sun most of the day and had turned essentially black as dolphins often do under such circumstances. The underlying spotted pigmentation was, however, like that in the photographs noted below.

The Caldwell's also have a color lateral photograph of the anterior part of the body and one of most of the ventral side of a male, apparently an adult (SV-2-SF), taken in early June 1967. Both of these photographs show details of the

spotted pigmentation, and a black and white reproduction of the one of the head clearly shows this (Figure 3).

The St. Vincent spotted dolphins we have seen seem best to fit Fraser's (1950b) and Nishiwaki's (1965) discussions and illustrations of *S. frontalis* (G. Cuvier). We tentatively would assign the St. Vincent records to that species were it not better to refrain from doing so at this time because of the already chaotic taxo-



FIGURE 2.—*Stenella*, species B, 172.5-cm male spotted dolphin (SV-1-SF) landed at Barrouallie, St. Vincent, on 24 May 1968. Photograph made under conditions of adverse lighting several hours after the animal had been harpooned and kept in the sun in an open boat at sea. (Photograph by William A. Huck.)

onomic situation in which one finds the spotted dolphins of this genus.

The Caldwells have had considerable experience in Florida with carcasses and live specimens of the spotted species *S. plagiodon* (Cope) (see D. K. Caldwell and M. C. Caldwell, 1966) and do not believe that that species as they understand it is the same as the St. Vincent form. Perrin (1970) concurred that *S. plagiodon* is separable from *S. frontalis* at least on the basis of color pattern. We concur with Mitchell (1970: pl. 5) that the spotted dolphin he pictured as having been taken from continental shelf waters near Trinidad is best assigned to the species *S. plagiodon*. Despite the relatively close proximity of the Trinidad record to St. Vincent (some 275 km), we believe that two species of spotted dolphins are involved and that Mitchell's record bears out an earlier contention by the Caldwells (D. K. Caldwell and M. C. Caldwell, 1966: 2) that *S. plagiodon* is a species found primarily in offshore waters near continents. Around the seemingly more isolated noncontinental islands of the Antilles, at least, it appears in our experience to be replaced by *S. cf. frontalis* or some very similar spotted species. We believe, therefore, that Rice and

Scheffer (1968) were too conservative in their conclusions regarding spotted dolphins and that more than one species exists.

A mandible, reported as *Prodelphinus* sp., but probably of the same species as ours from St. Vincent, was listed from nearby Barbados by Turner (1912: 138). The next closest western Atlantic record (as *Prodelphinus froenatus*) is from southeastern Florida (Allen, 1925) to the north. It apparently has not been recorded to the south (see Hershkovitz, 1966: 36).

Feresa attenuata GRAY— PYGMY KILLER WHALE

An adult skull (SV-1-FA) of undetermined sex was obtained from the fishery in the spring of 1969. A detailed report on this specimen was prepared (Caldwell and Caldwell, 1971) as it then was the first record for the western Atlantic. After this report was accepted for publication, a record from Texas was published (James, Judd, and Moore, 1970). To our knowledge the St. Vincent specimen is still the only record from the Caribbean and West Indian region.

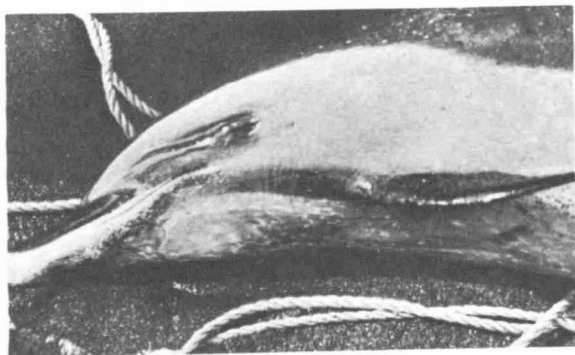


FIGURE 3.—*Stenella*, species B, apparently adult male spotted dolphin (SV-2-SF) landed at Barrouallie, St. Vincent, in early June 1967. Lateral view of head showing prominent features of pigmentation not shown (but present) in the animal depicted in Figure 2. Animal in freshly killed condition. (Photograph by John R. Sullivan.)

Pseudorca crassidens (OWEN)—
FALSE KILLER WHALE

The Caldwells have two adult skulls, a male (SV-1-PC) and a female (SV-2-PC), from animals of unstated size taken in the fishery on 10 September 1970.

Three individuals of this species were taken in the fishery on 9 March 1969, and the Caldwells have several teeth (SV-3-PC) said to have come from one or more of these animals. Five others had been taken on 12 February and seven more were obtained on 7 December 1969.

Except for a brief mention by Caldwell and Caldwell (in press), false killer whales have not been reported from St. Vincent previously. The closest record based on a specimen is from Aves Island off the Venezuelan coast some 675 km to the southwest (Miller, 1920). Bruyns (1969) included a sight record made at sea 115 km east of Tobago (some 280 km southeast of St. Vincent).

Globicephala macrorhyncha GRAY—SHORT-FINNED PILOT WHALE OR BLACKFISH

It is upon this species that the St. Vincent whale fishery is based and it is therefore by far the most abundant species in the overall landings in the fishery. From the fishery we have eight skulls: two from males measuring about 5 (SV-1-GM) and 6 (SV-2-GM) m in total

length collected in the second week of June 1967; two from females measuring about 4.5 (SV-3-GM) and 5 (SV-4-GM) m collected with the males; and four others (SV-5 to 8-GM) from adults or near adults of unknown size and sex collected in the summer of 1968.

We have seen many carcasses of fresh-caught animals and have various color and black and white photographs in our files. We also have examined many skulls on the St. Vincent beaches where the carcasses are butchered. The carcasses all have short pectoral flippers and the skulls have expanded premaxillary bones covering the maxillaries. These characters are typical of this species (see Fraser, 1950a).

A female taken on 20 May 1968 contained a male fetus measuring 69 cm in length in a straight line from the anteriormost part of the head to the fluke notch. The Caldwells did not have facilities to preserve this specimen, but have a color photograph (SV-9-GM) which shows it to be a light reddish brown.

A male measuring 4 m in total length that was taken on 21 May 1968 had several of the obligate cetacean barnacle (*Xenobalanus globicipitus*) on the trailing edge of its left flipper.

We have not examined stomach contents of pilot whales landed at St. Vincent, but the whalers tell us that they include both squid (including very large ones) and fish.

Cyamid parasites and remoras have been observed on blackfish landed at St. Vincent but no specimens so far have been collected.

Blackfish previously have been recorded from or near St. Vincent by Brown (1945, 1947), Hickling (1950), Fenger (1958), Morice (1958), Caldwell and Erdman (1963), Allen (see footnote 5), Morris (see footnote 6), Jackson (see footnote 7), Rathjen and Sullivan (1970), Caldwell and Caldwell (in press), and others. Although specific identifications were not always given, our experience has shown that only *G. macrorhyncha* likely is involved.

Obtained from the Barrouallie Fishermen's Cooperative Society, catch statistics for the period 1962-1970 are included in Table 1. These are pilot whales landed at Barrouallie, the main whaling port of St. Vincent. The monthly var-

TABLE 1.—Landings of blackfish (*Globicephala macrorhyncha*) at the port of Barrouallie, St. Vincent, for the period January 1962, through December 1970. Precise data concerning the following variables, in part affecting the numbers of blackfish landed, are not available: weather conditions, seasonal holidays, numbers of whaling boats operating that month, and more recently, the presence or absence of engines.

Month	1962	1963	1964	1965	1966	1967	1968	1969	1970	Total	Average
January	6	9	8	15	8	6	28	4	10	94	10.4
February	7	15	37	18	5	35	85	12	15	229	25.4
March	11	32	17	19	7	15	12	6	12	131	14.6
April	6	32	42	12	46	24	49	12	21	244	27.1
May	5	57	9	22	50	41	40	53	55	332	36.9
June	15	80	48	12	41	53	21	50	28	348	38.7
July	7	70	11	18	7	21	25	12	27	198	22.0
August	2	31	20	27	12	14	48	(¹)	5	² 159	² 19.9
September	4	55	43	24	67	16	27	(¹)	22	² 258	² 32.3
October	4	33	26	9	30	24	44	(¹)	14	² 184	² 23.0
November	25	10	7	4	40	17	2	24	23	152	16.9
December	5	1	7	3	10	3	6	3	0	² 38	² 4.8
Total	97	425	275	183	323	269	387	² 176	232	2367	

¹ No records kept, but blackfish taken.

² Based on landings for 8 years only.

³ Year incomplete.

iations reflect local weather conditions which affect the ability of the boats to go out and the whalers to see their quarry, more than the true abundance of whales. In addition, whaling usually almost or completely ceases for approximately 2 weeks before and 2 weeks after Christmas, in observance of the holidays. We are told that the blackfish are there year round.

Orcinus orca (LINNAEUS)—KILLER WHALE

On 13 May 1968, two females (an adult [SV-1-00] and subadult [SV-2-00] of unknown sizes) and one juvenile male (SV-3-00 of unknown size) were harpooned from a pod of six animals. The young male was harpooned first, and the other animals reportedly stood by (see M. C. Caldwell and D. K. Caldwell, 1966, regarding this kind of behavior) just as the St. Vincent whalers report the blackfish in that fishery often do when certain ones of their kind are harpooned. We have several color photographs of the carcasses which show the striking black and white color pattern characteristic of this species. The skulls of the three harpooned specimens are now in the possession of the Caldwells.

Sullivan noted that one of the larger animals had several cyamid parasites on the skin, but specimens were not collected. His photographs show only that the parasites are cyamids but as

Leung (1967) did not include *Orcinus* among the known hosts for cyamids the observation is noted. Caldwell and Caldwell (1969) reported that all three of these whales had eaten leatherback sea turtle (*Dermochelys coriacea*).

Three additional killer whales, including a 6-m male with very heavily worn teeth, were taken from a school of eight on 11 July 1968, but no specimens or photographs are available. One of the animals reportedly had cyamid parasites. The school was said to have been moving north about 10 km off the lee shore of the island. The fishermen's records show that four more were taken on 4 June 1969.

Jackson (see footnote 7) noted that killer whales are taken in the St. Vincent fishery and included photographs of carcasses being butchered on shore. Rathjen and Sullivan (1970) and Caldwell and Caldwell (in press) also noted the occasional capture of individuals of this species by the St. Vincent whalers.

These records are the southernmost in the western North Atlantic for killer whales. Moore (1953) listed this species from off Miami, and Backus (1961) from the Bahamas. Erdman (1970) included several sight records from the general vicinity of the Virgin Islands. In the western South Atlantic, killer whales have not been reported north of Buenos Aires (as the type of *Orca magellanica* Burmeister—see Hershkovitz, 1966: 84).

Physeter catodon (LINNAEUS)—
SPERM WHALE

The Caldwells have the prepared lower jaw (SV-1-PCA) and color photographs of the entire carcass of a juvenile female (ca. 8 m in total length) taken in the fishery on 23 May 1968. The teeth were just beginning to erupt and their pulp cavities were completely open. Mention of the stump of the left pectoral flipper of this animal, possibly missing as the result of a shark bite, was made by Wood, Caldwell, and Caldwell (1970), and a photograph of the carcass on the beach was included by Caldwell and Caldwell (in press).

The Caldwells have partial sets of mandibular teeth from two other sperm whales taken in the fishery prior to 1968. In one set (SV-2-PCA) the pulp cavities are fully open, while in the other set (SV-3-PCA), actually smaller teeth, the cavities are fully closed.

The fishermen's records show the capture of three sperm whales on 19 April 1967, two on 2 January 1969, and two on 25 April 1969 (a third was harpooned on this latter occasion but was lost with the boat). Mr. Griffith Arrindell, a leader of the St. Vincent whale fishery, told us that sperm whales are seen most commonly in the region from October to late spring, although some appear to be present year round.

Jackson (see footnote 7) and Rathjen and Sullivan (1970) mentioned that sperm whales are sometimes taken in the St. Vincent fishery and the latter writers included a photograph of the head of an 8-m male. Townsend (1935: chart B) showed sperm whales between St. Vincent and Barbados in January and February, Brown (1942) noted that a few sperm whales once were taken off the lee (western) side of Barbados (toward St. Vincent) and Brown (1945) and Fenger (1958: 44) recorded the fact that this species sometimes is taken in the nearby waters of Bequia and other islands of the Grenadines. Clark (1887: pl. 183) showed active sperm whaling grounds, fished by New England whalers, all around the southern Lesser Antilles in 1880, and this whaling continued thereon into the first part of the 20th century.

Ziphius cavirostris G. CUVIER—GOOSE-BEAKED
WHALE OR CUVIER'S BEAKED WHALE

The Caldwells have color photographs of the head of a female (SV-1-ZC) and somewhat longer views of the carcass of her nearly term fetus calf (SV-2-ZC) of undetermined sex taken in the fishery in late summer 1967. Although it was recently reported from nearby Barbados (Caldwell, Rathjen, and Caldwell, in press), this species has not been reported previously from St. Vincent.

UNRECORDED
BUT EXPECTED SPECIES

Both the descriptions given us by the whalemen and distributional records from other localities in the region lead us to expect that several additional species eventually will be recorded from St. Vincent. It is beyond the scope of the present preliminary report to discuss these, but a summary of all known records of marine mammals from the West Indies and Caribbean that is in preparation by the Caldwells suggests that the list from St. Vincent might be expected to include any of several species of *Balaenoptera*, *Stenella caeruleoalba*, *Delphinus*, and *Mesoplodon*. *Kogia* and *Peponocephala* might also be expected, but the present suggestive evidence is not as strong.

ACKNOWLEDGMENTS

A number of people at Barrouallie, the principal and most active whaling port on St. Vincent, have been of tremendous help in our study in providing observations from their own direct experience, access to records of the Barrouallie Fishermen's Cooperative Society, and in the collection and shipping of specimens. In this regard Griffith Arrindell has given us unselfish and unswerving assistance despite our constant pressure and questions. Conrad Francis and William O'Garro of that town also have given much of their energy. Partial financial support for certain phases of the study has come to DKC from the American Philosophical So-

ciety (grant number 962—Johnson Fund) and the U.S. National Science Foundation (grant number GF-241). Marineland, Inc. has aided in the preparation of photographs and in providing temporary storage for specimens.

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