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A HISTORY OF SEALING
IN THE FALKLAND ISLANDS AND DEPENDENCIES,
1764 to 1972

by

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THESIS SUMMARY

Title: A history of sealing in the Falkland Islands and Dependencies, 1764 to 1972

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Seven species of seals were hunted in the Falkland Islands and Dependencies in the 18th to 20th centuries. Sealing probably began in the Falkland Islands in 1766 after French settlers arrived in 1764. The potential of an industry was not realized until American whalers arrived by 1774. Continued sealing was prevented by the War of Independence, except for an unsuccessful American attempt to establish a wartime fleet at the islands, shipping oil to London. Postwar economic depression prevented Americans returning, sealing instead being done by British southern whale fishery vessels from 1786. Oil was taken from hair seals, and skins from fur seals. Both were shipped to London. Americans returned by 1792 for fur seal skins for the expanding Canton fur trade. This they subsequently monopolized, British merchants being constrained by the East India Company's trading monopoly. Unregulated killing to supply Canton and London markets virtually exterminated fur seals on the Falkland Islands and South Georgia by the late 18th-early 19th centuries. Increased oil demand in America caused elephant seals to be depleted by the mid 19th century. Discovery of the South Shetland, South Orkney Islands and South Sandwich Islands resulted in stocks on these islands also quickly depleted, particularly to supply an American market.

Lack of permanent government and settlement in the Falkland Islands in the 18th and early 19th centuries prevented control being exerted over sealers, although attempts were made by colonists from 1828 and by a British administration from 1833. Lack of patrol vessels prevented enforcement. Sealing legislation was introduced by 1881, but stocks and markets had declined to the point where a domestic sealing industry was difficult to establish. This was exacerbated by Canadian and Chilean pelagic sealing and poaching from 1902 to 1911. Stocks gained some respite during World War I. Fur sealing was prohibited from 1915 in South Georgia and 1921 in the Falkland Islands, where a sea lion oil industry was developed in 1929. This operated sporadically until 1951. Production costs, fluctuating oil prices, and distance from markets are seen as contributory reasons preventing establishment of an industry. The last sealing licence for the Colony was issued in 1967.

Elephant seals increased in the late 19th and early 20th centuries at South Georgia to the point where they could again be utilized. The Compañía Argentina de Pesca began sealing in 1909, beginning an industry which continued successfully until the licences left the island after the 1964 season due to the poor economics of whaling. 250 000 seals were taken in a well regulated industry, providing an important contribution to the company's revenue from the island.

The numbers of elephant seals and fur seals on South Georgia have increased since whaling and sealing ended. Present anti-sealing concerns, lack of markets, exploitation costs and potential tourist attraction make future sealing in the Falkland Islands and Dependencies unlikely.

PREFACE

The work presented in this thesis was carried out at Scott Polar Research Institute, University of Cambridge, in 1983-84 and 1985-86, and at Memorial University of Newfoundland in 1984-85.

The Director of Scott Polar Research Institute, Dr D.J. Drewry, Archivist R.K. Headland and Librarian V.J. Galpin and staff are thanked for their advice and assistance in matters relating to the preparation of this thesis.

Dr B. Stonehouse acted as my supervisor. His comments provided a point of focus and made the writing task more pleasurable. I am deeply indebted to him for his patience and guidance.

The typing skills of Pat Little have been greatly appreciated; word processors do not necessarily reign supreme.

This dissertation exceeds the regulations in length, with the approval of appropriate authorities. It has not been submitted for a degree at any other university. It is the result of my own work, and does not include anything which is the outcome of work done in collaboration with others.

ABSTRACT

This thesis presents a history of sealing in the Falkland Islands and Dependencies from settlement in 1764 to the last advertisement of sealing licences in 1972.

The exploitation of seven pinniped species is discussed in the context of hunting methods, catch sizes, products and markets, and the development of government and conservation legislation in the Colony and Dependencies. Unregulated sealing during the mid 18th to early 20th centuries is further related to fluctuations in maritime trade and southern hemisphere whaling. Efforts to develop a controlled indigenous sealing industry in the Falkland Islands during the present century are assessed, and conclusions drawn on reasons for lack of success. The successful controlled elephant sealing industry at South Georgia from 1909 to 1964 is described. The importance of this industry to the whaling company licensee and the revenue of the Colony and island is discussed.

The feasibility of reopening sealing is considered, particularly exploiting elephant seal and fur seal stocks which have increased at South Georgia under protective legislation and the ending of sealing and whaling. It is concluded that it would not be possible to revive the industry.

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PART I

INTRODUCTION

Chapter 1

The Falkland Islands and Dependencies

1.1 Historical review

The Falkland Islands (51°-52°40'S, 57°30'-61°31'W) consist of the islands of East and West Falkland and about 400 smaller islets.

The first European sighting of the islands was made by Capt. John Davis in Desire on 14 August 1592. They were not settled until Louis Antoine de Bougainville and a party of settlers from St. Malo on Eagle and Sphinx established the settlement of Port Louis at Berkeley Sound, East Falkland Island, on 17 February 1764. They took possession of the islands for France on 5 April 1764 as Les Malouines, sending a cargo of skins and oil to St. Malo in 1766 (Bougainville 1772).

Anson (1748) proposed that Great Britain establish a base on the islands for use by British vessels passing around Cape Horn; however, not until July 1764 was a surveying expedition sent to the islands under Capt. John Byron. Byron arrived off West Falkland Island on 15 January 1765, and landed at Saunders Island on 23 January 1765. He established the settlement of Port Egmont and took possession of the islands for the Crown. Capt. John MacBride was left to do the survey, whereupon the Port Louis settlement was discovered. MacBride told the settlers to leave, and sailed for England to report the situation. Byron returned to Port Egmont with more settlers in January 1766.

France transferred Port Louis to Spain in the same year, Spain claiming the islands under the 1494 Treaty of Tordesillas with Portugal whereby some lands west of the Cape Verde Islands were considered Spanish territory. Port Louis was renamed Puerto Soledad and placed under the jurisdiction of the Imperial Governor of Buenos Aires.

Britain and Spain were initially unaware of each other's settlements, however later allegations of mutual trespass led to the Spanish capture of Port Egmont on 10 June 1770, the British settlers leaving on 14 July 1770. Port Egmont was returned to Britain on 16 September 1771, but was abandoned by the British Government on 20 May 1774 on economic grounds. An inscribed plaque was left to indicate that the islands were British possessions.

American sealers were at the islands by 1774 (Chapter 3), beginning an industry which continued probably uncontrolled by Spain until they abandoned Puerto Soledad in June 1811 (Boyson 1924). The islands were without permanent inhabitants for the next 15 years, when the seal stocks were virtually destroyed.

The Government of the United Provinces of Rio de la Plata was formed on 9 May 1816. On the presumption that the new republic inherited territory previously claimed by Spain, the islands were annexed by Col. Daniel Jewitt in Heroína on 6 November 1820. Sealers were told that they could no longer operate, but continued to do so (Chapter 4).

The islands were recolonized in 1826 when a Buenos Aires merchant, Louis Vernet, established another settlement at Puerto Soledad. Vernet was appointed Governor by the United Provinces Government in 1828, becoming the first person

to attempt to control the sealers (Chapter 4).

The settlement lasted until 3 January 1833, when HMS Clio (Cmdr. J.J. Onslow) reasserted British claim by removing the Argentinian garrison. The remaining settlers were left under the control of William Dickson, Vernet's former storekeeper, until he and several others including Capt. Mathew Brisbane, former master of Beaufoy under Capt. James Weddell (Chapter 5), were murdered on 23 August 1833.

A naval administration was set up in 1834, further attempts being made to control sealing (Chapter 4). The first British civilian administration was formed under Lieut. R.C. Moody in 1842, the seat of government being transferred to Stanley (51°41'S, 57°51'W) in 1844 because of improved shipping access. The first legislation to control sealing was introduced as the Seal Fishery Ordinance 1881 (Falkland Islands 1881).

The Dependencies of South Georgia (53°30'-55°00'S, 35°30'-38°39'W), South Sandwich Islands (56°18'-59°28'S, 26°14'-28°11'W), South Shetland Islands (61°00'-62°22'S, 53°50'-62°50'W) and South Orkney Islands (60°30'-60°50'S, 44°15'-46°15'W) were discovered in 1675, 1775, 1819 and 1821 respectively (Chapters 5 and 6).

The Government of:

Past and future settlements in the Falkland Islands and their Dependencies

and the position of the Governor of the Falkland Islands and Dependencies were constituted by Letters Patent of 23 June 1843 (Letters Patent 1843). The extent of the Dependencies was formally defined by Letters Patent of 21 July 1908 (Falkland Island 1908a) as:

The group of islands known as South Georgia, the South Orkneys, the South Shetlands and the Sandwich Islands, and the territory known as Graham's Land, situated in the South Atlantic Ocean to the South of the 50th parallel of south latitude and lying between the 20th and 80th degrees of west longitude.

The Letters Patent did not:

Necessarily bring into force in the Dependencies the whole of the existing legislation of the Colony, and some difficulties might arise as to the applicability of particular Ordinances if no further provisions were made (Grant 1908a),

and statutes in force in England on 22 May 1900 were extended to the Dependencies:

But only so far the circumstances of the Dependencies and their inhabitants and limits of the Colonial jurisdiction permit, and subject to such qualifications as local circumstances render necessary,

by 'An Ordinance to regulate the legal position of the Dependencies of the Colony of the Falkland Islands' (Falkland Islands 1908b).

The Ordinance also provided for appointment of Stipendiary Magistrates to administer the Dependencies, necessitated by the developing whaling industry, and the growth of semi-permanent populations. 720 people were recorded at South Georgia on 31 December 1909 (Dickinson 1986). From 1909 to 1964, Stipendiary Magistrates played an important role in regulating sealing at South Georgia by the *Compañía Argentina de Pesca*, Albion Star (South Georgia) Ltd, and the International Fishery Co., Ltd.

On 28 March 1917 further Letters Patent were issued:

For the purpose of clarifying the extent of the Antarctic mainland, together with its coastal archipelagoes which were comprised with the designation 'territory of Graham Land' used in the earlier Letters Patent (International Court of Justice 1955),

and the Dependencies were redefined as:

All islands and territories whatsoever between the 20th degree of west longitude and the 50th degree of west longitude which are situated south of the 50th parallel of south latitude; and all islands and territories whatsoever between the 50th degree of west longitude and the 80th degree of west longitude which are situated south of the 58th parallel of south latitude (Falkland Islands 1917).

No more changes were made in territorial boundaries until after the Antarctic Treaty was signed on 1 December 1959. The new Colony of British Antarctic Territory was created on 3 March 1962, and defined as:

All islands and territories whatsoever between the 20th degree of west longitude and the 80th degree of west longitude which are situated south of the 60th parallel of south latitude (British Antarctic Territory 1962).

The Governor and Commander-in-Chief of the Falkland Islands and Dependencies was to administer the Territory as High Commissioner. The limits of the Dependencies were redefined as:

All islands and territories whatsoever between the 20th degree of west longitude which are situated between the 50th parallel of south latitude and the 60th parallel of south latitude, and all islands and territories whatsoever between the 50th degree of west longitude and the 80th degree of west longitude which are situated between the 58th parallel of south latitude and the 60th parallel of south latitude,

comprising South Georgia, the associated Clerke and Shag Rocks, and the South Sandwich Islands.

The Falkland Islands and Dependencies (Interim Administration) Order came into effect on 18 June 1982 after the Argentinian invasion of the Falkland Islands and South Georgia. The Colony and Dependencies were temporarily administered by both a Civil

and a Military Commissioner. The office of Governor and Commander-in-Chief was suspended and its functions taken over by the Civil Commissioner. The Military Commissioner had the right to take part in Executive Council Meetings, but without voting powers (Falkland Islands 1982).

On 3 October 1985 the Dependencies ceased to exist as such, being accorded separate identities and administered directly from London. The distinction between Civil and Military Commissioner was removed, and the post of Governor of the Falkland Islands and High Commissioner of the British Antarctic Territory was restored. The Governor has the additional responsibility of Commissioner for South Georgia and the South Sandwich Islands.

The designation 'Falkland Islands and Dependencies' will continue to be used in this thesis for descriptive convenience, since most sealing occurred when both Colony and Dependencies existed as described in the Letters Patent 1908.

The history and settlement of the Colony is described by Boyson (1924), Goebel (1927), Cawkell, Maling & Cawkell (1960) and Strange (1983). Headland (1984a) provides similar information for South Georgia. British sovereignty arguments based on discovery, annexation for the Crown and continuation of occupation and administration are presented by the International Court of Justice (1955). Argentinian perspectives are given by Molano & Homet (1948), Azpiri (1966) and Hope (1983).

1.2 Objectives and information sources

Sealing took place in the Colony and Dependencies from 1766 to 1968. Aspects of the industry have been described by several

authors, notably Bonner & Laws (1964), Bonner (1982), Strange (1983), Headland (1984a) and Jones (1985a & b). This thesis presents a comprehensive history of the industry in the Falkland Islands and Dependencies. Chronologies of vessels visiting the islands are available in Clark (1887a), Roberts (1958) and Headland (in press). Biological information on the species involved is documented for example in Laws (1984). Particular use has been made of primary sources in the Public Record Office, Kew, especially miscellaneous Colonial Office correspondence PRO CO 78 [269 vols, 1831 to 1951], and Falkland Islands Annual Reports, PRO CO 81 [99 vols, 1864 to 1944]. The Grytviken archives of the Compañía Argentina de Pesca and the South Georgia archives from King Edward Point are available at Scott Polar Research Institute [MS 1213 and MS 1228] and provide details of 20th century sealing at South Georgia. Canadian 20th century pelagic sealing is described from PRO CO 78, extracts of the Stanley Shipping Register, and correspondence from the Falkland Islands Company Archives provided by Mr Eric D. Lawson of Bowen Island, British Columbia. Material is also available in contemporary Canadian newspapers and Vessel Registers examined at the Maritime History Centre Archives and Queen Elizabeth II Library of Memorial University of Newfoundland. Secondary materials have been located in the libraries of the University of Cambridge, Scott Polar Research Institute, or Memorial University of Newfoundland.

1.3 Summary and conclusions

The Falkland Islands were discovered in 1592 and settled in 1764. They came successively under French, British and Spanish control until a permanent British presence was established

under a naval administration from 1834 and civilian government from 1843. The first cargo of seal skins and oil was exported by French settlers in 1766, beginning an industry which continued intermittently until 1968. Visiting sealers seriously depleted stocks by the end of the 18th century in the absence of permanent administration and control. Attempts were made from 1820 to prevent foreign sealing and develop an indigenous industry. These efforts became more concerted and effective under British naval and civilian government and resulted in the first stock conservation legislation being introduced in 1881.

The Dependencies (South Georgia, South Sandwich Islands, South Shetland Islands, South Orkney Islands) were discovered between 1675 and 1821, although their extent was not formally described until Letters Patent of 1908. Sealers destroyed the stocks in the first quarter of the 19th century, and sporadically visited the islands in search of stock remnants until the turn of the 20th century. Administrative control was extended from the Falkland Islands to the Dependencies by legislation of 1908, and a Stipendiary Magistrate was stationed at South Georgia from 1909 to control the settlement and whaling and sealing industries. Those companies whaling from Grytviken carried out licensed elephant sealing from 1909-64. There was no sealing in 1962 and after 1964 due to termination of whaling from the station.

The development of permanent British administration therefore changed the nature of sealing in the Colony and Dependencies. Uncontrolled exploitation and stock depletion was replaced by licensed industries operating under conservation legislation.

Chapter 2

Biology and use of seals

2.1 Introduction

Pinnipeds provide man with a variety of products without major hunting risks. They are easily killed in large numbers when onshore during the breeding season, and pelagic hunting during feeding and breeding migrations is also possible.

Subsistence sealing by northern hemisphere native peoples was followed by commercial hunting from the 16th century (Allen 1880). Southern hemisphere stocks were virtually undisturbed by man before the 18th century, except for some low level hunting by South African and Tasmanian natives (Bonner 1982). The first non native southern hemisphere sealing may have occurred when Uruguay was discovered in 1515 by Juan Diaz de Solfo, his crew taking a cargo of skins to be sold in Seville (Vas-Ferreira 1979). A Dutch expedition took 45 000 seals from the Cape of Good Hope in October 1610 (Best & Shaughnessy 1979), and the Dutch East India Company operated there from 1652 until about 1750 (Rand 1973). These were small industries, and it was not until the mid 18th century that Falkland Islands stocks began to be heavily exploited (Chapter 3). Some early records of the sighting of seals in the vicinity of Cape Horn are given in Parliamentary Papers (1893).

Uncontrolled sealing reduced stocks and catches at the Falkland Islands by the last quarter of the 18th century. Sealers therefore made exploratory voyages in search of new islands and stocks. Islands discovered by earlier navigators were also revisited (Table 2.1).

Table 2.1: Years of discovery and first sealing for circum Antarctic islands
(Headland in press)

Island	Discovery year	First sealing year
Falkland Islands	1592	1766
South Georgia	1675	1786
St.Paul/Amsterdam Islands	1599	1789
Tristan da Cunha	1506	1790
Îles Crozet	1772	1791
Îles Kerguelen	1772	1792
Prince Edward Islands	1663	1799
Gough Island	1739	1799
Auckland Islands	1805	1807
Campbell Island	1809	1809
Macquarie Island	1810	1810
South Sandwich Islands	1775	1816
South Shetland Islands	1819	1819
South Orkney Islands	1821	1821
Bouvetøya	1739	1822
Heard Island	1853	1855

18th and 19th century sealing was mainly done by American and British crews. Their vessels varied in size from the 1 000 ton United States (Chapter 3) to the 65 ton Beaufoy (Chapter 5) and smaller shallops constructed on the sealing beaches. Many combined whaling and sealing, 15 such British vessels at South Georgia from 1786-1819 averaging 400 tons (Jones 1973) similar in size to Greenland whalers. Longer southern voyages meant increased costs, vessel sizes were reduced, and try works established on shore wherever possible (Jackson 1978). Consequently, 18th century American whaling/sealing vessels averaged 240 tons, carried a crew of about 17 and had a capacity for some 1 800 barrels of oil (Marvin 1902). Tonnages decreased further by the mid 19th century,

vessels primarily sealing at the South Shetland Islands in 1819-26 averaging 195 tons (Jones 1981). Those which made longer combined whaling and sealing voyages required more processing and storage capacity, and continued to be larger. Vessels sailing from New England to Îles Kerguelen and Heard Island from 1848-65 averaged 235 tons (Clark 1887a). Depleted late 19th century stocks and lower catches made it economically unsound to crew and provision larger vessels, and the remaining seals were probably in less accessible places which could only be reached by small shallow draught vessels. Six New London sealing vessels averaged 135 tons in 1875, and American sealing vessels in general averaged 195 tons from 1792 to 1880 (Clark 1887a). Their size allowed cargoes to be obtained from rookeries in smaller bays, which larger British vessels may not have been able to enter.

American sealing vessels were mainly schooners (Clark 1887a). They were highly manoeuvrable, being able to sail close to the wind in confined bays (Marvin 1902). These handling characteristics and 8 to 9 foot draught made them ideal vessels for inshore sealing, particularly in fur sealing where large hold space for barrel storage was unnecessary. Smaller crews were also needed than in larger square rigged vessels thus decreasing labour costs (Busch 1980a). From 1840-80, some 65% of American sealing vessels were schooners, the rest being barques or brigs (Clark 1887a). English vessels were mainly square rigged brigs, although some were schooners (Jones 1973, 1981).

Vessels were solidly constructed for use amongst ice and rocks. From 1780-90, most British vessels were Lloyds A1 classified and

relatively new, from seven to nine years old. Older vessels were later introduced, owners being unwilling to risk newer vessels in hazardous inshore sealing. Those belonging to Enderby Bros. of London averaged 23 years of age in 1791 (Jones 1981).

Sealing was a highly speculative trade done by small owners, some 300 being involved in British southern whaling and sealing from 1776-1846. Many had only one vessel, with few having over five. Only seven companies survived for more than 20 years. Southern whaling and sealing was usually only part of their general involvement in shipping related businesses (Jones 1981). American vessels were also owned by companies of varying longevity. The Norwich Sealing Company was founded in New London in 1799 with four vessels, one disappearing at sea and three being captured by pirates in 1799-1800 (Williams 1895). Others were more successful, notably the New London firms of Lawrence & Co. (1833-92) and that founded by Major Thomas Williams in 1798, ending business as C.A. Williams & Co. in 1892.

Sealers probably lived and worked in conditions worse than those experienced by other branches of the merchant marine. American laws introduced in 1790, and amended and expanded in 1820 and 1835, protected seamen from the assaults of officers, delineated the duties of officers, men and owners, and required that crews had a written contract. This legislation continued until the Shipping Commissioners Act of 1872, which collected and reinterpreted previous legislation. Sealing and other crews who participated in voyage profits were exempted from the legislation (Hohman 1928). From the 1830s, Americans began to desert the mercantile marine, and whaling and sealing in particular, as more lucrative and amenable employment developed on shore.

Vessel operating costs and profits were often spread over several individuals, inside and outside the company. In the 1880s, Francis Allyn was owned by a syndicate of seven, with 1/32 to 9/32 shares, Roswell King by 11 with 1/32 to 5/32 shares and Pilot's Bride by seven with 2/32 to 7/32 shares (Busch 1980a). In addition to having ownership shares, masters took a share or 'lay' in nett voyage profits. Unlike northern hemisphere whaling, all southern whaling and sealing crews were paid by lays (Jackson 1978), ostensibly to increase productivity on long voyages. In practice the system served to reduce losses to owners, since all voyage expenses were deducted before lays were paid. Profitable lays may have been made in the late 18th and early 19th centuries when large cargoes were taken, but crew members often returned in debt. Particularly unfortunate were apprentices, training to command a vessel. Their lays were split between the owner and master, Enderby Bros. benefitting by having 50 apprentices in nine vessels in 1790 (Jackson 1978). Those merchant seamen who did not work under a lay system were at least guaranteed a wage from their employer, whilst sealers were not. Merchant seamen sailing from Boston in the 1840s earned from US \$9-US \$16 per month, whilst whalers from New Bedford earned US \$3-US \$8 per month. The average whaler/sealer was also paid less than shore workers, earning about US \$0.20 per day compared to US \$0.45-US \$0.60 on shore (Hohman 1928). Sealers' pay was also affected by market conditions, Hetty returning to London from the South Shetland Islands in 1821 after a year's absence wherein seal skin prices decreased from 30/- to 6/- each. The owners therefore stored the cargo in the hope of higher prices, paying the crew considerably less than expected (Smith 1844).

The composition of sealing crews changed because of the poor

shipboard conditions and pay, and better employment prospects onshore. Late 18th century British vessels averaged some 25 crew, compared to about 40 on a larger Greenland whaler. Many Americans were in the crews because of their superior whaling abilities (Jones 1981). American vessels were crewed primarily from New England residents up to about 1825-30, thereafter becoming more cosmopolitan. The crew of Sarah W. Hunt on an 1883-84 sealing voyage to Campbell Island consisted of six Americans, five Germans, one Irish and one Swiss (Dorsett 1951). Seal stocks decreased from the early 19th century (Chapter 3) and longer lays were made. New Englanders left the industry, and crews became composed of often inexperienced and degenerate individuals (Hohman 1928). By the mid 19th century, sealing was done by those hoping for quick profit from the discovery of some previously unexploited stock, or by those unable to get alternative employment. Sealers were thus at the bottom of the occupational hierarchy in southern whaling and sealing (Jones 1981). Particularly wretched were the increasing number of Azore and Cape Verde Islanders, who were willing to tolerate the harsh conditions and low pay for the chance of small savings. 17% of New London sealing crews were from these islands in 1830-39, to a maximum of 27% from 1860-79. Their long lays probably accounted for the survival of American sealing into the late 19th century (Busch 1985a).

18th and 19th century sealers were therefore exposed to living and working conditions inferior to those encountered elsewhere in the merchant marine or in free labour onshore. Pay decreased as stocks declined, and good crews became more difficult to obtain. Sealing became a 'sweated' industry by the mid 19th century, representing probably the lowest condition of American labour (Hohman 1928). Conditions on British vessels were possibly

not as depressed, since southern sealing ended by 1840 (Headland in press). The lay system and the foreign crews which it attracted probably allowed a marginal American industry to survive in spite of depleted stocks (Busch 1985a).

Conditions improved in the 20th century. Sealers at South Georgia were also involved in whaling, and were paid a basic salary and production bonuses (Chapter 11). Falkland Islands settlers were sealing in addition to other primary resource utilization activities, such as fishing and farming.

Seven pinniped species were thus exploited in the Falkland Islands and Dependencies.

2.2 Fur Seals

The fur seals of the genus Arctocephalus probably derived from an ancestral stock which spread down an east Pacific cold water corridor in the late Miocene or early Pleistocene (Davies 1958) to produce eight species. Seven show mainly allopatric distribution on southern hemisphere islands and the mainland of Australia, South Africa, South America and New Zealand.

A.townsendii [Merriam 1897] occurs on Isla Guadalupe in the northern hemisphere. Current distributions may represent relic stocks or new colonizations following earlier destruction by sealers. Animals are generally found on isolated rocks on more exposed coasts, possibly a recent phenomenon after the destruction of those on rookeries more accessible to man (Bonner 1981).

The South American Fur Seal A.australis [Zimmermann 1783] and the Antarctic Fur Seal A.gazella [Peters 1875] breed in the Falkland Islands and Dependencies. A.tropicalis [Gray 1872] the Subantarctic Fur Seal is sympatric with A.gazella at South

Georgia, but does not appear to breed there (Payne 1979) although possibly interbreeding on Marion Island (Condy 1978a).

Animals were taken when on shore for pupping and mating, although pelagic sealing also occurred (Chapter 8). From November, A.gazella adult bulls take up and defend territories on rocky shores, A.australis using sloping rock platforms. The polygynous breeding bulls do not collect females into harems, but attempt to prevent them leaving the breeding territory. Pups are born a day or two after the cows haul out, A.australis pupping in November and December and A.gazella mainly in December. Mating occurs six to eight days post partum, breeding groups starting to break up by mid January. Moulting occurs in February and March. A.australis is present on shore throughout the year, but A.gazella leaves in winter, possibly because of more extreme environmental conditions and low water temperatures. It is not known if there is directional migration (Bonner 1981, King 1983, Laws 1984).

Both species were hunted from the mid-18th to early 20th centuries for their skins, particularly valued for the luxuriant underfur. The pelt structure of A.gazella is described by Bonner (1968), whilst the:

Falkland Islands fur seal (A.falklandicus) [syn. A.australis (Scheffer 1958)] is noted for the evenness, shortness and elasticity of the fur, soft enough to wear without the removal of the longer hairs always removed in other seals (Bruce 1893a: 221).

Skins were used for fur clothing, imitation beaver skin hats, riding rugs and trunk covers, or tanned into leather. Guard hairs were removed to make clothing felt, upholstery stuffing or mixed into plaster (Clark 1887a, Stevenson 1904a, Bonner 1982). A market developed in Canton in the late 18th century as a consequence

of the sea otter skin trade from the northwest Pacific Ocean (Chapter 3). Skins were imported into Great Britain from the late 19th century (Appendix 1, Chapter 3) a method of removing the guard hairs being introduced in 1799 (Appendix 2, Chapter 3). Imports into the United States began by the second decade of the 19th century, a processing method being developed there in 1823 (Chapter 4).

Fur sealing did not require investment in specialized equipment and crew, and was highly profitable while stocks and markets were available. Animals were driven between rows of men armed with clubs, stunned by a blow on the head and reputedly stabbed in the heart to ensure death. They were skinned from the mid ventral surface, skins being removed at about 50 per day per man. A crew of some 20 sealers was therefore able to rapidly eradicate a local stock.

Sealers categorized animals according to sex and age, recognizing black and grey pups, yearlings, adult males or 'wigs' and 'bulls', and cows or 'clapmatches', so called from the noise made when moving over stones, likened to that of a flint match (Morrell 1832). Cows were killed first, males being left initially to retain the cows. Young animals were preferred for their superior skin quality, old 'wigs' being least preferred, taking more time to skin and prepare. American auction records indicate that about 64% of skins sold were from females, being in greater numbers on the rookeries, 20% were from bulls, the rest being from yearlings and pups (Appendix 3).

Skin was taken off with some blubber attached, excess being later removed during 'beaming'. They were washed to remove blood and dirt, and pegged out to dry if destined for Canton. Damp weather conditions at the Falkland Islands meant that drying there could take up to three weeks. Precipitation at Stanley averaged

26.43 inches in 1874-1920, compared to 23.80 inches at Kew. Cape Pembroke averaged 253 precipitation days per year, with mean monthly humidity from 80% (January) to 88% (June-July) (Brooks 1919). Skins were therefore often taken to the Patagonian coast for drying. Dried skins were stacked in the ship's hold, stacks being opened during the voyage to allow air circulation and prevent decay. The hot humid weather encountered during voyages to Canton probably caused many skins to deteriorate, being subsequently fit only for hair removal and tanning into leather.

Skins destined for Great Britain or America were preserved with salt brought from the home port or the Cape Verde Islands. They were tied into bundles or 'books' and packed separately in the hold or in barrels. Further salting was necessary when passing through the tropics, four months being considered the maximum preservation time.

The method of fur sealing remained essentially unchanged throughout the 18th and 19th centuries, and has been described by several authors, particularly Delano (1817), Fanning (1838) and Townsend (1888). Summaries are available in Clark (1887a) and Bonner (1968).

Canadian fur sealers operated on and around the Falkland Islands from about 1902-11 (Chapter 8). Pelagic sealing was done, animals being shot from small boats when swimming to or from their rookeries. Carcasses were skinned on the boats prior to being returned to the parent vessel for further preparation and salting (Mattsson 1942, 1943). Because of shooting and retrieval difficulties, many skins were damaged, and animals lost before they could be recovered. Pelagic sealing was therefore an extremely wasteful technique.

Skin processing and drying methods (for example Poland 1892, Stevenson 1904a, Petersen 1914), and subsequent use, will be discussed in later appropriate chapters.

It is difficult to reasonably estimate the number of fur seals killed. Some examples of catch sizes are given in the following chapters, however the exact origin of cargoes was often only vaguely described. Stevenson (1904a) estimated that 13 000 000 skins were taken since the mid 18th century, 8 000 000 coming from 'southern oceans'. Present stocks may thus represent only a small part of those existing prior to commercial sealing (Bonner 1981).

A. australis survived on reserves in the Falkland Islands (Chapter 9) where the stock is most recently estimated at 15 000 to 16 000 (Strange 1973). They have not been reported from the important Beauchêne Islands rookeries (Fanning 1838) since the 1930s (Lewis Smith 1984). 11 caught on the islands in 1919 are considered to be the last of the earlier rookeries (Strange 1972) although the British Graham Land Expedition saw some swimming in adjacent waters in 1936 (Strange 1965). Some may have been taken by poachers since the 1930s, Laws (1953a) recording that fur seal skins from the Falkland Islands were earlier processed [undated] in the United States. Vas-Ferreira (Bonner 1981) suggests a South American stock of 307 000. 146 066 have been taken commercially from 1970 to 1982, some 2.7% of the world seal catch of 5 145 990. All have been taken from Chile and Uruguay (F.A.O. 1979, 1983).

A. gazella survived on Bird, Willis and the South Sandwich Islands (Bonner 1964). Sightings became more frequent around South Georgia (Rayner 1933, Marr 1936) the stock being estimated at some 12 000 in 1956 (Bonner 1968). Payne (1979) estimated an increase to 369 000 by 1976, with a 16.5% growth rate from 1958

to 1972, declining thereafter to 14.5% until 1975 (Bonner 1981). Annual rates of increase of 27.1% and 22.1% were recorded for 1959 and 1960 (Bonner 1964). The stock was estimated at 930 000 in 1982 (Laws 1984), and now over 1 000 000 (Mc Cann 1986 personal communication). The high productivity of South Georgia waters and depleted baleen whale stocks has produced a surplus of krill, the main reason for the rapid stock increase (Payne 1977).

The Dependencies have been recolonized from South Georgia (Bonner 1958, 1964, 1981). A breeding colony of 111 animals at the South Orkney Islands in 1960 (Gritsland 1960) increased to an estimated 2 035 in 1971 (Laws 1973). Signy Island has an estimated summer population of 11 000, mostly young males from South Georgia (McCann 1986 personal communication). 42 were seen at Livingstone Island in the South Shetland Islands in 1960, and a breeding colony of some 400 was observed at Viskoi Island in the South Sandwich Islands (O'Gorman 1961). The South Shetland Island stock was estimated at 7 000 in 1973 (Aguayo 1978) with about 5 000 on the South Sandwich Islands (Bonner 1979). The latter may have derived from the remnants of a relic population (Bonner 1964). Other estimates are given in King (1983). Laws (1984) estimates a world A.gasella stock of some 4 000 000 by AD 2 000. Increased inter-specific competition with other krill feeders and decreased krill supply because of commercial fishing, at least 1 685 742 metric tons being taken from 1980 to 1983 (F.A.O. 1984), could prevent this from happening.

2.3. Southern Elephant Seal

The Southern Elephant Seal Mirounga leonina [Linnaeus 1758] is circumpolar on Antarctic and sub-Antarctic islands to 78°S,

and on continental Australasia, South Africa and South America, with occasional sightings north to St. Helena and Mauritius.

Breeding normally occurs from 40°S to 62°S in the south Atlantic and south Indian Oceans. Three main breeding stocks are centered on South Georgia (including South America, the Falkland Islands and Scotia Arc islands south to the South Shetland Islands), Kerguelen and Heard Islands, and Macquarie Island (King 1983, Laws 1984). Different growth rates, maximum sizes and puberty ages of South Georgia and Macquarie Island animals indicates that interchange between the stocks may not occur (Laws 1981, Ling & Bryden 1981).

Elephant seals are pelagic, but come ashore to breed and moult. Breeding bulls begin to haul out in August, followed by pregnant cows in September and October. Harems are formed, pups being mostly born in October about a week after cow haul out. Oestrus occurs about 18 days post partum, lasting for some four days (McCann 1980) when mating occurs. Most breeding animals leave the beaches by the end of November. Moulting haul out begins in late November, successive age groups hauling out throughout the summer and autumn, ending with breeding bulls in March and April. Greatest numbers are on shore from December to February. The animals return to sea after moulting until the next breeding season. Juveniles and pregnant females occasionally come ashore in the winter. Laws (1956, 1960) described their annual cycle at South Georgia.

Elephant seals were hunted during the breeding and moulting seasons. Slow moving and gregarious, they occur in large concentrations where they can be easily and quickly killed without the use of expensive specialist equipment and manpower.

Animals of both sexes and all ages were taken in the 18th and 19th centuries. The hides were processed for blubber oil, used

as an inodorous smokeless lamp oil (Taylor 1858), as a waterproofing material for ships' sides when mixed with pitch (Anson 1748), for dressing leather and softening wool during cloth manufacture (Stevenson 1904b), and lubricating steel springs (Cleveland 1909). The oil was of a quality similar to high grade whale oil, selling in 1832 for US \$0.40 per gallon compared to US \$0.32 per gallon for whale oil and US \$0.75 for sperm whale oil (Busch 1960a). The hide was sometimes used to cover trunks, make harnesses (Peron 1816) and belts, wallets and jewellers' buffing wheels (Cleveland 1909).

Elephant seals are markedly dimorphic, males being larger than females from birth, the difference increasing with age (Laws 1953b, Bryden 1972). Greatest oil yields are obtained from bulls, particularly those killed in September before blubber reserves are depleted in the breeding fast. Blubber thickness varies seasonally from three to six inches in a large bull, exceptionally up to eight inches, and comprises about 33% of total body weight (Laws 1953b). Ichihara & Nishiwaki (1966) showed that, exclusive of blood, 23.3% of the body weight of a six year old male consists of blubber, containing from 52.1% to 76.9% oil depending on body location. Although oil loss must have occurred during handling, early sealers seem to have processed blubber efficiently with the techniques then available.

Leard (1788) recorded that 108 tons of blubber from 11 000 seals produced at least 70 tons of oil, about 65% production efficiency. At six 40-gallon barrels of oil per ton (Falkland Islands 1918a), some 15 [Imperial] gallons of oil was produced per seal. Stevenson (1904b) also suggested an average yield of 15 [US] gallons per seal. American sealers used 31.5 gallon barrels (Kellogg 1942), although they were often constructed in varying sizes to optimize space use

in the ship's hold (Bockstoe 1986). Newly hauled out bulls are said to have produced one ton of oil (Morrell 1832) [= 252 gallons (Hohman 1928)], 300 [U.S.] gallons (Lanman 1879), 10 barrels (Watson 1931) and up to eight barrels (Busch 1980a). Yields obtained during the more efficient 20th century industry [see below] invalidate such claims, even allowing for then slightly larger bulls (Laws 1960).

18th and 19th century elephant sealing techniques are described by, for example, Péron (1816), Fanning (1838), Taylor (1858), Lanman (1879) and Clark (1887a). Young animals were killed by clubbing, older ones being shot or lanced. Skin and blubber was removed in strips or 'horse pieces' up to two feet square. The blubber was removed from the skin, and minced before cooking in try pots on the beach or parent vessel. The try pot fires were fuelled with penguin skins or blubber scraps from which most oil had been removed in a blubber press (Taylor 1858). Remains of sealers' try works at South Georgia are described by Headland (1984a). Blubber which could not be immediately processed was buried to prevent birds from eating it, or stored in barrels. Barrels were generally shipped dismantled to the sealing beaches, for assembly by the ship's cooper. Some initially contained drinking water, and were refilled with oil when empty (Cleveland 1909). Barrels were repeatedly filled with hot oil to shrink the staves and eliminate leakage in transit.

Oil could also be produced under pressure without heat. Weights were placed on blubber on a strainer, oil being forced out into a tank below (Portlock 1789).

18th and 19th century catch estimates can only be made from sparse and inexact records, some of which are given in later chapters.

At least 242 000 barrels of 7 623 000 gallons [US?] of oil valued at US \$5 420 000 were imported into the United States from 'all the southern islands' during 1803 to 1900 (Stevenson 1904b).

At a minimum average yield of 15 gallons per seal, at least 5 082 000 animals were killed; however numbers taken from the Falkland Islands and Dependencies cannot be reasonably estimated.

During controlled sealing at South Georgia from 1909 to 1964 (Part V) 259 076 bulls were taken (King 1983), the blubber being processed in the whaling plant for an average of 1.97 barrels of oil per seal. Headland (1984a) records 260 950 bulls producing 498 800 barrels of oil, 1.91 barrels per seal. About 2.30 barrels per seal were obtained from newly hauled out September bulls (Bonner & Vaughan 1961), much less than 19th century production estimates quoted previously. The oil was exported by tanker to Europe, sold at a price similar to No.1 grade whale oil, and hydrogenated prior to use in the manufacture of edible fats and soap.

20th century elephant sealing techniques used at South Georgia are described by Matthews (1952), Laws (1960) and Bonner (1982). Bulls were driven to the water's edge and shot. Skin and blubber was removed in strips until 1935, thereafter in one piece to reduce labour costs and oil loss. The strips were towed to the parent vessel, a redundant whale catcher, and taken to the whaling station at Grytviken for processing in a manner similar to whale blubber (Bennet 1931, McLaughlin 1962). The blubber and skins were either chopped and water boiled at atmospheric pressure, or loaded entire into a Kvaerner cooker and steam cooked under pressure. Oil loss was low, small amounts being pumped out in the grax or solid residue left after boiling, and in the glue water, a non oily fluid residue. This lost oil was incorporated into whale meal.

Although oil extraction was efficient, blubber sealing was wasteful. Carcasses were left on the beach to rot. Experiments were done to determine the oil and meal yields possible from processing of the entire carcass. The carcasses were minced in a rotary cutter and the pieces cooked under steam and 90°C heat in treatment tubes equipped with internal rotating screws and surrounded by hot water jackets. The cooked meat fell on to a vibrating screen, where most of the liquid was separated from the solids. These were passed through a press to recover more liquid, and the dried residue ground and bagged. The liquid was passed through a centrifugal separator to remove small solid particles prior to the oil being removed in a further separator and purified (Bonner 1957a). Whole carcass processing was never practised commercially, although becoming a condition of the sealing licence from the 1965 season (Chapter 12).

Hides were unsuccessfully experimentally marketed, and since an estimated 1 400 kg of meat is available from a harem bull carcass (Bryden 1970) meat and meat extract marketing was also done, again unsuccessfully (Chapter 12).

The elephant seal oiling industry at Grytviken was highly profitable to the licensee. Some 2 000 tons of superior quality oil could be obtained annually for little financial outlay other than that already invested in whaling crews and equipment (Chapter 12). The cessation of sealing after the 1964 season was solely due to the failure of the associated whaling industry.

The structure and social organization of the South Georgia stock has changed since sealing ended, and has become similar to the Macquarie Island stock which was not exploited in the 20th century.

Animals here grew more slowly, attained smaller adult size and bred later than those at South Georgia (Carrick et al. 1962). Exploitation at South Georgia may have reduced intraspecific competition for food, and caused increased growth rates and breeding precocity. The differences were also ascribed to suckling disturbances on crowded Macquarie Island beaches. Pups there possibly received less milk and grew more slowly, attaining 94% of the size of males and 60% of the size of females at South Georgia (Bryden 1968). The breeding season at South Georgia has also lengthened, haul out beginning by 10 August (McCann 1980) compared to 5 September (Laws 1956). The adult sex ratio has decreased from some 25 cows per bull on sealed beaches in the 1950s (Laws 1960) to about nine cows per bull in 1977 (McCann 1980). This is comparable to about 11 cows per bull at Macquarie Island (Carrick & Ingham 1962) and 13 cows per bull on a South Georgia reserve in 1951 (Laws 1960). The number and mean age of adult bulls has increased at South Georgia, but there is no evidence that more cows are coming ashore to pup. Cows are still pupping earlier than at Macquarie Island, 75% by age four at South Georgia compared to 70% by age six at Macquarie Island (McCann 1980).

Laws (1960) estimated a world stock of 600 000 \pm 100 000 with 315 100 at South Georgia, 3 200 at the Falkland Islands and 300 each from the South Orkney and South Shetland Islands. Migrants from South Georgia have produced summer populations estimated at 11 000 at the Falkland Islands and 10 000 at the South Orkney and South Shetland Islands.

The world stock is most recently estimated at 750 000,

including 350 000 at South Georgia, 3 500 at the Falkland Islands, 1 050 at the South Shetland Islands and 350 at the South Orkney Islands (McCann 1985). The small population here may result from the occasional need to breed on ice (Bonner 1985), break up and pupping sometimes coinciding (Laws 1960).

Laws (1984) considers that the world stock is now fairly stable. Whether or not this corresponds to the size of pre-exploited stocks cannot be determined, although the current size of the Falkland Islands stocks would not appear to support the cargoes described in later chapters. Stock recovery has been assisted by the ending of sealing, and increased food availability due to decreased whale stocks.

Some local stocks are again being reduced by man. Those at Marion Island have decreased by 4.8% per year from 1971 to 1977 (Condy 1978b), at Îles Crozet by some 5.8% per year (Barratt & Mougín 1978) and bull stocks at Îles Kerguelen by 8.2% from 1971 to 1977 (Van Aarde 1980). The Heard Island stock has decreased by 60% from 1949 (McCann 1986 personal communication). These decreases are considered to be partly due to increased commercial fishing on the feeding grounds (Condy 1979, Van Aarde 1980). Stock increases at South Georgia may have been affected by commercial fishing for *Nototheniidae*, particularly *Notothenia rossii*, which has been reduced to less than 10% of its estimated biomass before the fishery began (Scientific Committee of the Convention for the Conservation of Antarctic Marine Living Resources 1984). A resolution of 19 September 1985, effective 22 March 1986, which prohibits direct fishing for *N.rossii* around South Georgia and restricts its by-catch when fishing for other species (Commission for the Conservation of Antarctic Marine Living Resources 1985) may make more food available for further stock increases.

2.4 Southern Sea Lion

Known to navigators since about 1520 (Kellogg 1942) the Southern Sea Lion Otaria byronia [Blainville 1820] occurs on the Atlantic and Pacific coasts of South America from Uruguay to Peru, including the Falkland Islands (Scheffer 1958, Vaz-Ferreira 1981, King 1983).

They are not pelagic, colonies being partially maintained throughout the year on the Falkland Islands, with some local movements. The colonies break up into breeding rookeries and non-breeding groups during the breeding season. Pupping occurs from mid December to the end of January with a peak in mid January. Mating takes place about one week post partum until the end of January (Hamilton 1939).

They were taken for meat, skins and oil by visiting sealers and islanders in the 18th and 19th centuries. Skins from young animals were tanned into soft leather, those from older ones being used to make silversmith's polishing wheels (Poland 1892). Skins were removed with 1/2 inch of blubber attached, and salted. According to Allen (1892: 371):

The pelage is harsh and without underfur, and their skins possess small commercial value, being useful for the preparation of a poor quality of leather. They are, however, very fat, and consequently immense numbers have been killed for their oil.

Controlled utilization for oil began at the Falkland Islands in 1928, continuing sporadically and unsuccessfully until 1967 (Chapter 9). The oil is similar to elephant seal oil (Stevenson 1904b), some 12.3 [Imperial] gallons being produced per seal to a maximum of 14.3 gallons in September (Hamilton 1938).

The world stock is estimated at 313 000 (Vaz-Ferreira 1981). The Falkland Islands stock has decreased from 380 000 in 1937 (Hamilton 1939) and 400 000 (Laws 1953a) to about 30 000 (Strange 1969, 1972a). Decreases have also been reported from Isla Verde, Uruguay, but these have been due to culling by local fishermen (Pilleri & Gahr 1977). This is not done at the Falkland Islands, and reasons for the decline are unknown. Strange (1969) suggests that earlier estimates may have been made at a peak in possible long term cyclic fluctuation, or that an unidentified environmental change has occurred. This apparent 92% stock decrease requires further monitoring (Laws 1973). 52 216 have been taken commercially in Chile and Uruguay from 1970 to 1982, 1.0% of the world catch of 5 145 990 seals (F.A.O. 1979, 1983).

2.5 Weddell Seal

First described on 13 January 1823 from Saddle Island in the South Orkney Islands (Weddell 1825), the Weddell Seal Leptonychotes weddellii [Lesson 1826] forms circumpolar colonies on inshore fast ice around the Antarctic continent and islands north to the South Orkney Islands (Kooyman 1981a, Laws 1981, King 1983) with a small breeding colony at Larsen Harbour, South Georgia (Wilson 1914) and occasional sightings from the Falkland Islands (Matthews 1929).

Pupping occurs at South Georgia in mid September (Vaughan 1968) but up to mid October with increased latitude and ice break up date (Smith & Burton 1970). Matthews (1929) erroneously reported January pupping at South Georgia.

Probably taken for oil in the 18th and 19th centuries,

they were taken commercially in the 20th century at South Georgia under the sealing licence of the Compañia Argentina de Pesca (Chapter 10).

First reports estimated a South Georgia stock of 30 (Wilson 1914), later increasing to 64 (Bonner 1956). Counts of the Larsen Harbour colony and sighting records elsewhere on the island are given by Vaughan (1968). McCann (1986 personal communication) reports 54 pups in the 1985 breeding season, the colony having expanded on to previously unpopulated beaches in Larsen Harbour. Laws (1984) suggests a world stock of 800 000.

2.6 Leopard Seal

Leopard seals Hydrurga leptonyx [Blainville 1820] are solitary circumpolar animals (Kooyman 1981b) the world stock being estimated at 220 000 to 440 000 in 1982 (Laws 1984).

They occur year round at South Georgia (Matthews 1929) and are found in spring and early summer on the Falkland Islands (Hamilton 1939) although uncommon and rare breeders (Strange 1972a). Laws (1953a) estimated some 40 000 in the Falkland Islands and Dependencies.

Their breeding organization is virtually unknown (Laws 1981) although they come ashore to breed in late August and early September at South Georgia (Matthews 1929).

The numbers taken in the 18th and 19th centuries cannot be determined, but 752 were taken at South Georgia from 1910 to 1927 (Chapter 10). They were taken for oil, a large animal producing about 20 gallons [Imperial?] similar in quality to elephant seal oil (Webster 1834).

2.7 The Crabeater Seal

The Crabeater Seal Lobodon carcinophagus [Hambron & Jacquinet 1842] is the most abundant seal in the world, stocks being estimated at 30-40 million animals (Laws 1984). Distribution is circumpolar and pelagic on drifting pack ice, particularly in coastal waters off west Graham Land and the southern part of the Ross Sea (King 1983).

Few records are available of crabeater seals being taken commercially in the Dependencies or British Antarctic Territory.

In 1892-93 Jason (Capt. C.A. Larsen) sailed for Antarctica to hunt right whales. None were found, but 6 335 seal skins and 1 800 barrels of blubber were taken off Graham Land. In 1894, Jason (Capt. C.A. Larsen), Castor (Capt. M. Pedersen) and Hertha (Capt. J. Eversen) returned, taking 26 223 skins and 4 110 barrels of blubber. The catch locations and numbers taken suggest that crabeater seals were exploited, although one fur seal was taken by Hertha. The venture was regarded as a failure (Lie 1956).

Stocks may not have been exploited again until the Norwegian Polarhav took 1 127 seals off pack ice adjacent to the South Orkney and South Shetland Islands from 15 August to 31 October 1964 (Øritsland 1970), demonstrating their vulnerability to pelagic exploitation (Section 2.8). 84.7% of the catch consisted of crabeater seals.

2.8 Current conservation measures

Recent seal conservation measures in the Falkland Islands have concentrated on establishing protected areas on Crown and private lands, to supplement reserves set up under the Seal Fishery Ordinance 1921, (Chapter 9).

Complete protection on reserves is given by the Nature Reserves Ordinance 1964, land being:

Reserved for the purpose of protecting, and of providing, under suitable conditions and control, special opportunities for the study of, and research into, matters relating to the flora and fauna of the Colony (Falkland Islands 1964a).

Hunting, vegetation destruction, grazing and access is restricted in 14 reserves on some 5 424 acres of Crown land islands.

Less complete protection is provided on Wild Animal and Bird Sanctuaries established under the Wild Animals and Birds Protection Ordinance 1964 (Falkland Islands 1964b). Eight sanctuaries have been designated on Crown and private land. Hunting is prohibited, but the land can still be used for farming (Strange 1973, 1985).

16 islets have been purchased by conservation organizations from 1971. These were transferred to the control of the Falkland Islands Foundation in 1984, established in 1980 as a charitable body coordinating protection of the wildlife and maritime heritage of the Falkland Islands (Lyster 1984).

Private individuals have also set land aside as reserves. Steeple and Grand Jason Islands were bought by the Birdland Zoological Gardens in 1970 (Hill 1970) and the New Island Preservation Society purchased that island in 1971 (Strange 1983).

A list of all conservation areas is given by Strange (1985). Further sanctuaries were inadvertently established when beaches mined by Argentina during the 1982 war were closed (Strange 1984).

The need to conserve living resources south of 60°S was recognized in the Antarctic Treaty. Arising out of the Treaty,

the Agreed Measures for the Conservation of Antarctic Fauna and Flora were ratified in 1964. Unlicensed sealing was prohibited, and fur and Ross seals Ommatophoca rossii [Gray 1844] were fully protected. Protection was only given on land or fast ice (Great Britain 1965).

The vulnerability of seals to pelagic sealing was demonstrated by the voyage of the Norwegian Polarhav (Section 2.7). Consequently an agreement was needed to protect seals at sea or on the pack ice, and which governments could agree to without signing the Antarctic Treaty (Roberts 1977).

The Antarctic Treaty signatories ratified the Convention for the Conservation of Antarctic Seals in 1972 (Great Britain 1973), which became effective on 11 March 1978. Fur, Ross and southern elephant seals were completely protected, and conservative potential annual catch limits of 175 000, 12 000, and 5 000 were imposed on crabeater, leopard and Weddell seals. The sealing season extends from 1 September to the last day of February, except for Weddell seals which can only be taken in February. Six sealing zones are specified, one being closed on rotation each year. Three reserve areas of breeding or long-term research potential are established, one being adjacent to the South Orkney Islands at 60°21' 60°56'S, 44°05' 46°25'W. Specially Protected Areas and Sites of Special Scientific Interest were later created to include fur, southern elephant and Weddell seal colonies (Antarctic Treaty Consultative Committee 1979, Bonner & Lewis Smith 1985, SCAR 1986). This Convention provides the means for regulating any possible future sealing industry.

The Convention may be sufficiently limiting to prevent sealing occurring (Sitwell 1972), although Auburn (1981) considers

that if national requirements conflict with ecological interests, the former would likely prevail.

Conservation of seal stocks on South Georgia and the South Sandwich Islands is legislated for by the Falkland Islands Dependencies Conservation Ordinance (Falkland Islands 1975). The Ordinance became effective on 19 February 1975, and is based on the Agreed Measures arising out of the Antarctic Treaty. Seals can only be taken with a permit. Commercial sealing is not specified as grounds for obtaining one. Access to South Georgia is controlled, and Sites of Specific Scientific Interest are recognized, including Bird Island (54°00'S, 38°03'W) and its fur seal stocks.

Krill depletion may threaten further expansion of seal stocks. In an attempt to regulate krill catches in line with their possible effect on other ecosystem components (Bonner 1984), the Convention on the Conservation of Antarctic Marine Living Resources was agreed to in May 1980, becoming effective on 7 April 1982. It applies to living resources south of the Antarctic Convergence, including South Georgia and the South Sandwich Islands. The Convention established a Commission and Scientific Committee, and aims to ensure that harvesting does not deplete populations below levels which ensure stable recruitment. Auburn (1982) argues that since the Convention is based on decision making and consensus, it will be unable to conserve the Antarctic ecosystem, becoming instead a fisheries management treaty dominated by the interest of the harvesting nations.

Further discussion of seal conservation south of 60°S is provided by Roberts (1966, 1977), Holdgate (1970), Bonner (1982) and Sage (1985).

2.9 Summary and conclusions

Concerted exploitation of southern hemisphere pinnipeds began when American and British vessels visited the Falkland Islands in the mid 18th century on combined whaling and sealing voyages. Seven species of seals were hunted in the Colony and Dependencies until 1968, particularly the South American and Antarctic fur seals and the southern elephant seal. The hunting methods and season were determined by the animals' reproductive biology, making them especially vulnerable in spring and summer when on shore in large polygynous rookeries for breeding and moulting. Some pelagic fur sealing also occurred in the early 20th century as animals migrated to and from breeding rookeries. Fur seal and some sea lion skins were taken for garment manufacture and tanning. Oil of comparable quality to high grade whale oil was produced, mainly from elephant seals but also from sea lions and occasionally crabeater, leopard and Weddell seals. Sealing methods and equipment were simple, and the process could be done by whaling crews to supplement whale oil production.

Some sealing was done by Falkland Islands settlers in the 18th and 19th centuries; however, most was done by American and British crews. Their vessels were built large enough to accommodate tryworks, barrels and skin storage space, but could be operated by small crews in confined bays. Little financial investment was necessary, and large profits were possible. Living and working conditions for crews were poor, and their expenses were minimal. Pay was lower than that of other maritime and shore industries, wages being calculated on a lay system whereby expenses were deducted before payments were made. The system was ostensibly designed to increase crew productivity, but worked more for

the benefit of owners who were able to pass their expenses on to the crews. Men left the industry from the 1830s for more amenable employment on shore. Overexploitation caused stocks, catches and profits to decline, and vessels were crewed by increasing numbers of misfits and impoverished native labour, whose willingness to work for extremely low pay ensured the tenuous survival of the industry into the late 19th century when elephant, and particularly fur seals were scarce.

Original stock sizes cannot be accurately assessed from catch records; however some 8 000 000 fur seals and 5 000 000 elephant seals were taken from southern oceans until 1900. Catches of these magnitudes could probably only have been made from stocks at least the size of the currently estimated 1 000 000 Antarctic fur seals and 750 000 elephant seals.

Sea lion and elephant seal stocks recovered in the late 19th/early 20th century at the Falkland Islands and sporadic controlled exploitation occurred until 1968. A breeding stock of some 3 500 elephant seals is recently estimated. Sea lion numbers declined for unidentified reasons from an estimated 380 000 in 1937 to some 30 000 in 1969. Recovery of the South American fur seal stock has been poor, most recently estimated at some 16 000.

The Antarctic fur seal stock on South Georgia has rapidly increased in the present century, annual growth rates of up to 27% producing an estimated stock of 1 000 000, with breeding space available for further increases. Elephant seal numbers have also increased, stabilizing at some 350 000 and supporting a successful controlled oil industry from 1909-64. This seal oiling revival was only possible because of the development of shore based whaling at South Georgia, continuing the 18th and 19th century tradition

of producing elephant seal oil as an ancillary to the whaling industry. Crews took animals before and during the whaling season, the hides and blubber being processed in the whaling factory. Methods were also developed, but not commercially used, to produce oil and meal from whole carcasses.

Pinnipeds in the Falkland Islands and Dependencies are currently protected from exploitation. Reserves have been declared on the Falkland Islands under the Nature Reserves and Wild Animals Protection Ordinances of 1964. Others have been established by individuals and conservation organizations since 1970. The Falkland Islands and Dependencies Conservation Ordinance of 1975 controls access to rookeries on South Georgia and the South Sandwich Islands. Hunting permits are required, and sites of Special Scientific Interest have been established, including Bird Island and its fur seal stocks. South of 60°S, pinnipeds are protected on land, ice and in the water by legislation under the Antarctic Treaty. A sealing voyage in 1964 showed that pelagic sealing from pack ice was possible, and resulted in the Convention for the Conservation of Antarctic Seals being introduced in 1972. This defines the conditions under which a pelagic sealing industry could operate, fully protects fur, Ross, and southern elephant seals wherever they occur, and establishes potential conservative annual catch limits for crabeater, leopard and Weddell seals. Catch zones, conservation areas and an annual sealing season are specified.

Seals have increased in numbers as more krill has become available due to declining whale stocks. Commercial harvesting of krill may reduce further expansion of pinniped stocks. The 1980 Convention on the Conservation of Antarctic Marine Living Resources therefore aims to ensure that krill catches are set at levels

which are estimated not to cause depletion of other populations, including pinnipeds, south of the Antarctic Convergence.

Elephant seal, Antarctic fur seal, Weddell seal, and crabeater seal stocks are at potentially exploitable levels in the Dependencies. The legislative framework exists within which controlled hunting could again occur. Current anti-sealing attitudes and declining markets for marine mammal products make commercial exploitation improbable.

PART II

SEALING IN THE FALKLAND ISLANDS, 1764 to 1881

Chapter 3

Settlement in 1764. to 1820

3.1 Settlement to 1775, the American War of Independence

Seal hunting in southern circumpolar regions probably began from the Falkland Islands (Raymond 1936).

The French settlers did some sealing, possibly to get oil for lighting and furs for domestic use. Between eight and nine hundred seals [species unidentified] were killed in one day in Berkeley Sound (Pernety 1773), a cargo of oil and tanned skins being shipped to St. Malo on Eagle in 1766 (Bougainville 1772). St.Malo vessels had visited the islands for water since 1698, and Spanish vessels had also been sealing on the South American coast, Diligent (Capt. Don Francesco de Medina) being at Rio de Janeiro in 1767 with a part cargo of skins from the River Plate (Bougainville 1772). Seal products may therefore have been taken from the islands before the settlers arrived.

Capt. John Byron described the beaches of Port Egmont and Saunders Island as crowded with fur seals (Gallagher 1964), and took sea lions [southern elephant seals] to replenish his oil supplies.

The importance of the islands as a potential centre for a whaling and sealing industry was recognized by Lieut. Samuel Clayton, appointed Governor of Port Egmont on 1 March 1773 (Clayton 1776). Others were less convinced, presuming that the islands could only be used for lawless activities (Johnson 1777).

Falkner (1774) described the poverty of the settlement, but did not record any sealing.

Intensive sealing in the Falkland Islands developed from the extension of American and British whaling into the southern hemisphere. Since many vessels combined whaling and sealing voyages, the sealing industry was also affected by those political and economic conditions which influenced whaling.

American offshore whaling began about 1712, blubber being processed in onshore try works. These were built on board vessels from about 1731, allowing oil to be produced at sea and longer voyages made (Stackpole 1972). American whalers went into the southern hemisphere from 1763, ten vessels being at the Falkland Islands in 1774 (Crèvecoeur 1787). Cargoes were obtained in six to eight weeks, indicating that seal oil may have been produced. New England oil was mainly exported to Great Britain, accounting for an estimated 53% of the sterling earned by the American Colonies from 1768-72. Of 32 492 tons of oil exported in 1772, 30 438 tons went to Great Britain (Shepherd & Walton 1972).

The British southern whale fishery (Stackpole 1953, 1972, Jackson 1978, Jones 1981) developed out of the Greenland whale fishery, which became established in 1759 under the stimulus of a vessel tonnage bounty system and fishing premiums (Scoresby 1820, Jenkins 1921). British southern whaling and sealing began in 1775, vessels probably arriving at the Falkland Islands that year (Beale 1835). Further southern voyages were encouraged by extending the Greenland whale fishery bounties to the southern hemisphere in 1776 (Jenkins 1921) including that pertaining to 'oil of other creatures living in the seas'. 25 vessels averaging 165 tons each left London for the southern hemisphere whale fishery in 1776-77 (Jackson 1978).

High quality seal oil could therefore be produced on American and British whaling vessels, using existing crews and try works. Extra investment was unnecessary.

Montague (Capt. Gamaliel Collins) from Boston and Thomas (Capt. David Smith) from Truro, Cape Cod, arrived at Port Egmont in February 1774, their masters being told to go there by Admiral Montague of the Royal Navy. Seals were abundant, oil, fur and hair seal skins being taken to New England. Skins were used as trunk coverings (Spears 1910). Montague possibly heard about the seal stocks when serving under Lord Anson in the English Channel Squadron, and may have publicized this information whilst Commander-in-Chief of the Royal Navy at Halifax from 1770 to 1776 (Charnock 1797).

Montague and Thomas were followed into Port Egmont on 19 May 1774 by King George from Rhode Island (Capt. Greenwood) after she lost her anchor in a gale (Snow 1857). New anchors were unavailable, since the settlers had loaded their supplies on to HMS Endeavour in readiness to leave the next day. Ten unidentified American vessels were at Port Egmont when the settlers left (Boyson 1924). King George spent the winter at Port Egmont until anchors could be obtained from visiting vessels. She returned to Rhode Island in 1775 with a small quantity of oil (Jarvis 1775).

Capt. Pascual Callejas visited Port Egmont during a coastal survey for the Spanish government, and found the settlement in disrepair. New England sealers were blamed. Two frigates were sent from Buenos Aires to notify sealers that Spain considered Great Britain to have abandoned the Falkland Islands, and they should stop destroying Spanish property. Little attention was paid to this request (Boyson 1924).

Americans were praised for their whaling and sealing skills

by Edmund Burke, who in a speech 'On Conciliation with America' in the House of Commons on 22 March 1775 observed that:

They have pierced into the opposite region of polar cold; that they are at the antipodes, and engaged under the frozen serpent of the South. Falkland Island, which seems too remote and too romantic an object for the grasp of national ambition, is but a stage and resting place for their victorious industry (Beale 1835: 41-42).

3.2 The fleet-in-exile, 1775 to 1776

Trade between America and Great Britain ended during the American War of Independence (1775-83). American ports were blockaded by British warships, and vessels were captured by privateers. American crews were impressed into service on British whaling vessels in an attempt to develop the British whaling industry and reduce dependence on American oil imports (Clark 1938, Stackpole 1972). Crews became difficult to obtain, preferring the greater profits from privateering against British vessels. Some 1 600 Massachusetts vessels were issued wartime Letters-of-Marque, 59 New London privateers capturing 500 British vessels. Most of the Nantucket whaling fleet was also destroyed by the Royal Navy (Morison 1921, Decker 1976), and the domestic oil market collapsed. Southern whaling and sealing virtually ended under these conditions. A New England fleet operated in wartime exile at the islands, attempting to send oil directly to the London market and circumvent the British blockade of New England ports.

The fleet was organized by Aaron Lopez, Francis Rotch, Leonard Jarvis and Richard Smith. It was to remain at the Falkland Islands for the duration of the war, whaling being the primary objective, but with sealing whenever possible.

On returning to Rhode Island in 1775, Capt. Greenwood of King George discussed the seal stocks with Leonard Jarvis, a boatbuilder from Dartmouth, Massachusetts. Jarvis was building a vessel for Aaron Lopez, a Jewish merchant of Portuguese extraction from Newport, Rhode Island. On 5 April 1775 Jarvis wrote to Lopez that:

I call'd on Mr Greenwood who was in the vessel lately arrived from Falkland Islands [King George] ... From the conversation I had with him I think there is a prospect in the fishery at those islands well worth attending, notwithstanding the small quantity of Oil this Vessell brought home, but then it must be pursued quite differently from what it has been. From knowing the rocks our predecessors have split upon I hope we may avoid them. Capt. Greenwood promis'd me to call on you shortly and I gave him some encouragement to expect a Vessell, but since I left him I have heard that he is not so temperate as he ought to be. I should therefore think it would not be for our interest to employ him in the Command of a Vessell, tho' as he is acquainted among the Islands, and is a man of ability, it might in so large an undertaking as the proposed one, be well worth the while of the concerned to make him such offers as be for his interest to accept (Jarvis 1775).

Lopez had the commercial background to organize the venture. Arriving at Newport in 1752, he became involved in Caribbean trading, slaving, and candle and barrel making, sending whalers south of the equator since the 1760s (Bigelow 1931). He also had extensive New England whaling contacts, including the Rotch firm of Nantucket, who provided him with equipment in exchange for rum and wine, and acted as purchasing agents for the United Company of Spermaceti Candles, a consortium of three Jewish businessmen including Aaron Lopez (Marcus 1961). Lopez, Jarvis and Francis Rotch therefore decided to enter into a whaling and sealing partnership at the Falkland Islands. It is unknown to the author what roles were played by the supposedly intemperate Capt. Greenwood and Richard Smith.

A business connection for the London oil market was required. Lopez had started trading in 1765 with Henry Cruger, a New Yorker who had gone to Bristol in 1757. He had become indebted to Cruger because of poor Caribbean trading conditions and inability to collect his own debts from American creditors (Bigelow 1931, Chyet 1970). Lopez obtained money from George Hayley of the London firm Hayley and Hopkins to pay off his debts to Cruger, and transferred his business to that firm from the early 1770s (Chyet 1970). Hayley and Hopkins were also the London agents for the Rotch family, thus the Lopez-Rotch partnership had an established London firm to market their oil.

Some £50 000 was spent to fit out vessels in New England (Stackpole 1972) possibly under guidance from Lopez, who had previously sent Leviathon (Capt. Lathrop) on a whaling voyage to the Falkland Islands, only to have her wrecked off Brazil in 1773 (Stackpole 1972). Five vessels in the fleet were registered to Francis Rotch, six to Rotch and Jarvis, two to Lopez and three to William Rotch (Stackpole 1953).

The British government allowed some Nantucket vessels to pass the blockade, preventing the Quaker loyalist island population from starving after the destruction of their whaling fleet (Macy 1835). The Massachusetts House of Representatives was petitioned on 21 September 1775 to allow the Rotch-Lopez-Jarvis fleet to leave for the Falkland Islands. Permission was granted on 27 September 1775 on condition that only enough food was taken for the voyage stated, and that a £2 000 bond be posted for each vessel to ensure that the cargo was brought back to Massachusetts (Massachusetts Historical Society 1982). Starbuck (1878) showed that 63 sailing petitions were filed in Massachusetts from April 1775

to January 1776. Those which appear relevant to the fleet are given in Table 3.1.

Table 3.1: Some Massachusetts vessels for which sailing petitions were requested, April 1775-January 1776 (Starbuck 1878)

Vessel	Master	Owners
Africa	Joseph Ripley	Lopez and Jarvis
Ann	Simeon Coffin	Rotch and Jarvis
Defiance	Jonathan Mitchell	Rotch and Jarvis
Enterprise	James Whippey	Rotch and Jarvis
Falkland	William Covell	Rotch and Jarvis
Fox	Silas Butler	Rotch and Jarvis
George	Thomas Banning	Rotch and Jarvis
Minerva	John Locke	Lopez and Jarvis
Royal Charlotte	William Roberts	Rotch and Jarvis

Abigail, Amazon, Britania, Diana, Lydia and Sally may also have been in the fleet, totally or partially owned by Francis Rotch (Stackpole 1972).

Instructions given to Capt. John Locke of Minerva stated that the fleet was to meet at the Falkland Islands after whaling on the Brazil Banks. They were to be met by Francis Rotch [how he was to get to the Falkland Islands is unknown to the author] and complete their oil cargoes from sealing. Progress reports were to be sent back to George Hayley in London on passing vessels (Stackpole 1953).

Though a bold idea to supply the London oil market, presumably for substantial profit, the expedition failed. Abigail was the only vessel to reach London with a cargo, others being captured by British vessels or sunk by enemy action or poor weather (Stackpole 1972). It is not clear how much oil was taken;

however Francis Rotch must have thought that it was possible to take profitable cargoes from the islands since he returned after the war (Section 3.3).

British vessels were more successful, an average of nine voyages per year being made for 1776-83 (Jackson 1978). Some 40 000 seal skins and 2 800 tons of elephant seal oil valued at £40 000 were imported into London in 1778 from the vicinity of the Magellan Straits (Mill 1908).

The partnership ended with the death of Charles Hayley in 1777 (Stackpole 1972) [although 1784 (Stackpole 1953, Bertrand 1971)] and the drowning of Aaron Lopez on 20 May 1782 (Massachusetts Historical Society 1915). Francis Rotch spent part of the War of Independence at the Falkland Islands (Stackpole 1953), probably returning to London in 1777 (Stackpole 1972). He became associated with Mary Hayley until 1785 (Bullard 1947), acting as business adviser for the company which she continued to operate on a reduced scale after her husband's death (Stackpole 1972).

3.3 The United States, 1784 to 1786

The period from the end of the War of Independence in 1783 to the establishment of the first United States federal government in 1789 saw the revival of the British southern whale and seal fishery and the stagnation of the American industry.

The American fleet could not be rebuilt in the depressed post war economy. The State of Massachusetts attempted to revive the whaling and sealing industry by awarding bounties for oil taken by Massachusetts vessels and landed in Massachusetts ports for subsequent export to London (Hohman 1928). New London was also declared a free port in 1784, income tax exemptions

being awarded to fishing, whaling and sealing crews if they served on their vessels for at least four months of the year (Martin 1974). The oil market was lost when the British government imposed an £18 per ton import duty on foreign oil by an 'Act [23 Geo III] for facilitating Trade and Intercourse'. The Act was intended to reduce British reliance on oil imports from New England, and encourage the development of the domestic whaling and sealing industry. Imported oil which sold in London for £30 per ton before the war now fetched only some £17 per ton. Since £25 per ton was the minimum required by American whalers to cover expenses, their industry continued to decline (Jenkins 1921). The decline was further exacerbated by a decreased domestic oil demand, Americans having become used to tallow candles for lighting during the war (Weeden 1890). Whaling crews also migrated to Nova Scotia, France and England (Stackpole 1972). Nevertheless, an attempt was made to take elephant seal oil from the Falkland Islands and ship it directly to London, profiting from that market and avoiding the restrictive import duty on foreign oil.

Francis Rotch and Mary Hayley planned the voyage to the Falkland Islands. United States (Capt. Scott) was registered in Mary Hayley's name, and left London for Boston in November 1784 with Francis Rotch and Mary Hayley on board, the latter ostensibly to negotiate the sale of some property she owned in New England. The vessel was probably registered in Hayley's name to give the impression of a British vessel and crew, allowing the oil to be sold in London as a product of the British southern fishery. It is unclear who funded the voyage, however it was probably the Rotch family who were anxious to get into the post war London oil market.

Francis Rotch and Mary Hayley left the ship at Boston, together with a company clerk whom Mary Hayley later married. United States sailed to Nantucket, where she was fitting out for sealing and embarked an experienced local crew. She sailed for the Falkland Islands under Capt. Benjamin Hussey, arriving towards the end of 1784.

Sealing soon started, and 130 tons of oil were shipped directly back to London on the Rotch vessel Maria (Capt. William Mooers). London merchants realized that the oil came from United States, whose crew were Americans, and informed the Board of Trade of the deception (Board of Trade 1786). The cargo was not allowed to be sold in London without paying duty, so Maria continued to Dunkirk where the oil was sold duty-free under an agreement between the French Government and the Rotch family, as part of the negotiations for establishing a Nantucket whaling fleet in France (Stackpole 1953, 1972).

The British southern whaling and sealing fleet was meanwhile expanding, assisted by the employment of experienced New England crews, the introduction of fishing premiums, and the passing of legislation in 1786 and 1788 which allowed vessels to pass around the Cape of Good Hope and Cape Horn with the permission of the East India and South Seas Companies. Some 46 vessels sailed annually from 1786-91 for the southern fishery (Jackson 1978). Oil and 14 280 seal skins [type unidentified] were taken in 1787-88 and imported duty free (Macpherson 1805). Fur sealing was a relatively unimportant part of the British southern whale and seal fishery, skins amounting to only 2.5% of the value of the industry being imported into London from 1788-1820 (Appendix 1). Skins were however also taken directly to Canton (Section 3.4).

The first British vessels to arrive at the Falkland Islands after the war may have been King George (Capt. Nathaniel Portlock) and Queen Charlotte (Capt. George Dixon), visiting Port Egmont on 5 January 1786 on their way to the north-west coast of North America. The crews killed some sea lions [possibly a misnomer for southern elephant seals] for lamp oil, and on 15 January met United States (Capt. Hussey), her tender Speedwell and Canton (Capt. Whippey) with some 450 tons of oil on board (Portlock 1789).

United States also had a part cargo of 6 000 to 7 000 fur seal skins, which Capt. Hussey intended to ship to Canton (Portlock 1789). She subsequently left the Falkland Islands for New York in March 1786 with about 13 000 skins (Townsend 1888). They were sold in New York for the low price of US \$0.50 each and shipped to Canton on Eleanora (Capt. Simon Metcalfe), starting the American fur seal trade with China (Section 3.4). It is unclear whether Rotch knew about the existence of the Canton market before he went to the Falkland Islands, or if he took the skins on simple speculation. Townsend (1888) makes the unlikely suggestion that they were mistakenly identified in New York as sea otter Enhydra lutris skins. Kirker (1970) states that the skins were collected by Eleanora from Calcutta, but how they got there is unspecified. Metcalfe may have purchased them from Rotch, since from the US \$65 000 proceeds of their sale he bought Fair American in Macao. She was placed under the command of his eldest son Thomas Humphrey Metcalfe, both vessels leaving Canton for the north-west Pacific Ocean on 5 June 1789. Thomas was killed in Hawaii in 1790, Simon and his youngest son Robert being killed in the north-west Pacific Ocean in 1794 (Howay 1925, Ross 1937).

4 000 fur seal skins and some oil from the Falkland Islands were also delivered to Falmouth in June 1786 by Canton (Bullard 1947). The cargo was redirected to Dunkirk, the skins being sold for US \$20 each to De Bauque Frères, Rotch's agents (Stackpole 1953).

The voyages of United States and General Knox (Capt. Frost), which arrived at Boston on 17 August 1784 with 600 barrels of oil and an unspecified number of fur seal skins (Robotti 1950), showed New England merchants that there was a ready supply of seal skins and oil at the Falkland Islands. The industry was cheap to run, since crews existed on meagre diets under spartan conditions (Péron 1816).

3.4 1786 to sovereignty claim by Buenos Aires in 1820

The period 1786-1820 saw the development of a highly lucrative American and British fur seal skin trade with Canton, the discovery of fresh sealing grounds (Table 2.1), subsequent stock overexploitation, and the replacement of fur sealing by elephant seal oiling.

American maritime trade to Canton began with the 1784-85 voyage of Empress of China from New York, returning with a cargo of teas and textiles which sold for US \$30 000 profit (Dulles 1930). Other vessels followed with cargoes of ginseng Panax schinseng, sandalwood Santalum sp. and bullion, to trade for the tea and textiles supplied to America before the War of Independence by the East India Company. The Canton ginseng market rapidly deteriorated from oversupply, and bullion exports constituted a heavy drain on then slender American financial resources as well as being subject to poor exchange rates. American merchants therefore had to find other trade articles (Dulles 1930, Kirker 1970).

Russian traders had meanwhile been taking sea otter skins into China from 1742, to be used to make warm clothing and robe trimmings for the nobility (Ogden 1941). A possible American fur trade with Canton was first suggested by John Ledyard, an American on Capt. James Cook's expedition to the north-west Pacific Ocean. Ledyard (1783) published an account of the expedition on his return to New England, detailing the high prices obtained for sea otter skins. It was not until the official account of the voyage was published (Cook 1784) that merchants such as the Rotch family took Ledyard's suggestion seriously, and American vessels began to look for other supplies of skins to supplement the sea otter skins being sold in Canton for up to US \$120 each (Hill 1894, Fisher 1941, Ogden 1941). Fur seal skins were available from southern hemisphere islands (Table 2.1) in quantities large enough to make their exploitation worthwhile.

American merchants were however unable to enter the Canton fur market immediately and capitalize on the sale of skins from United States. The War of Independence had virtually destroyed the whaling and sealing fleet, that of Massachusetts decreasing from over 300 vessels to less than 100 in 1789 (Adams 1926). Large debts had accumulated (Pitkin 1835), and the British oil market been lost (Sections 3.2 and 3.3).

English whaling and sealing vessels were thus the first to arrive at the Falkland Islands after United States (Jones 1969, Stackpole 1972) looking for skins for Canton and oil to replace that previously obtained from New England (Steven 1983). Ramon Clairac, Governor of Puerto Soledad, recorded seven English and one American vessel at Port Egmont from 1788 to 1790, taking some 40 000 skins and 200 barrels of oil (Langenheim 1939).

The crew of the English vessel Audax established a profitable business from 1786 to 1789 selling oil and skins to other vessels. Clairac saw that profits could be made from sealing and whaling, and unsuccessfully urged the Spanish government to construct a processing plant at Puerto Soledad (Boyson 1924).

Incentive for American merchants to increase postwar vessel construction was provided in the Tariff and Navigation Act 1789, whereby American owned and built vessels could enter American ports on payment of a US \$0.06 per ton duty compared to US \$0.50 duty per ton on foreign vessels. Foreign trade vessel tonnage increased from 123 893 tons in 1789 to 411 438 tons in 1792 (Marvin 1902). American southern sealing and whaling resumed. At least 24 sealing vessels left New England ports from 1790-99, mainly from Nantucket and New York (Clark 1887a), and including the first from New London. Criterion returned to Sag Harbour, New York in 1792 after a mixed whaling and sealing voyage with 5 000 seal skins in her cargo (Decker 1976). The first American vessel to sail directly into the Pacific Ocean from Nantucket (Beaver, 240 tons, Capt. Worth) returned home in 1792 after a 17 months cruise, with 1 270 barrels of oil (Macy 1835).

The first American vessels to visit the islands after United States may have been Nancy (Capt. Daniel Greene) and Polly (Capt. Roswell Woodward). Leaving New Haven on 15 May and 20 June 1792, they took full cargoes of fur seal skins from the Falkland Islands and South Georgia (Chapter 5). Polly returned to New England and Nancy went to Canton, returning home in 1794 after a global circumnavigation. Her cargo was sold at a price high enough to purchase a return cargo on which US \$10 324 import duty was paid (Townsend 1888). Kirker (1970) gives a different version of the voyage,

suggesting that Polly alone went to South Georgia, leaving Nancy to work around the Falkland Islands. They later met to transfer skins from Polly to Nancy, the former presumably going sealing again before returning to New England. Josephus (Capt. Youte) and Betsy (Capt. Steele) were also at the Falkland Islands in 1792, the latter taking a 'full cargo' of skins from September 1792 to January 1793 (Fanning 1838) the largest number so far taken (Clark 1887a).

Sealers used the islands as a place to refit vessels and replenish supplies whilst on voyages elsewhere. Part cargoes of skins were often taken. Hope (Capt. Benjamin Page) of Providence, Rhode Island, arrived at Sydney on 24 December 1792 (Cumpston 1963) with some skins taken at the Falkland Islands during a voyage to Canton (Stackpole 1972).

Most sealing occurred on the windward side of the islands, north-west from Port Egmont to the Jason Islands and south-west to Swan Island. Vessels could therefore sail on to exploit the rookeries at Staten Island, Tierra del Fuego and Más Afuera (Kirker 1970).

Voyages often took more than a year to complete. Harbours were needed where vessels could anchor for refit and crew recuperation, especially since the Spanish government was restricting the entry of British vessels into their South American ports (Macpherson 1805). HMS Rattler (Capt. James Colnett) was sold to Enderby Bros. for conversion into a whaleship, and sailed from Portsmouth on 3 January 1793 to search for safe harbours. She put into the Falkland Islands to get fresh water, Colnett (1798) leaving a crew to get seal skins. Previous experience in the north-west Pacific Ocean probably made him aware of the

lucrative Canton market (Stackpole 1972). There is no record of the number of skins taken or their destiny. The East India Company's trading monopoly with Canton (Jackson 1978) subsequently prevented British sealers from becoming involved in the Canton trade to the same extent as the Americans.

Some sealers realized that a lucrative industry could be developed if stock conservation was practised, particularly by not hunting during the breeding season and stopping the killing of young and females (Leard 1788). Merchants ignored such suggestions in the search for quick profits, and destruction of fur seal stocks ensued. 102 vessels averaging 200 tons each and manned by 3 000 sealers took oil and fur seal skins in the southern oceans in 1791, their cargoes being valued at some £235 000 (Mill 1905).

18th century seal skin imports into Great Britain reached a peak in 1793. 361 903 skins arrived, valued at £15 079, some 9.9% of the total value of the southern whale fishery (Appendix 1). The number taken from the Falkland Islands is not given. Records of 12 vessels returning to London in 1794 indicate that only three were sealing in the south Atlantic Ocean, and thus possibly at the Falkland Islands. Others returned from the south Pacific Ocean, possibly from Más Afuera. Overexploitation of Falkland Islands stocks seems to have forced sealers to look to other islands for cargoes by the 1790s (Table 2.1).

The industry was also affected by the 1793-1801 war between Great Britain and France. American vessels were seized by both protagonists on the grounds that they were trading with opposing sides. The French oil market was lost to the Americans from 1792 because of excessive shipping costs (Jenkins 1921), part of Nantucket was destroyed by fire in 1797, and an outbreak of yellow fever occurred

in New London (Caulkins 1895, Spears 1910, Decker 1976). Sealing was further reduced by price decreases for seal skins in Canton, Capt. William R. Stewart only getting US \$16 000 for 38 000 skins taken there on Eliza in 1793 from Más Afuera. The Chinese were at war with Russia, and under the impression that the fur trade was influenced by Russians. Fur traders were banned from Canton, those that did succeed in entering being only able to sell their cargoes for low prices (Seaburg & Paterson 1971). Consequently no vessels left New England for the next two years specifically for fur sealing (Clark 1887a), although whaling masters fur sealing as a sideline continued to send skins to Canton. They brought back reports forecasting a price rise (Mitterling 1959), and specialized fur sealing voyages resumed in 1796 (Clark 1887a). Some 520 American voyages were made to Canton until trade ended around 1844, the majority being from New York (136), Boston (111), and Providence (17) (Latourette 1927).

Falkland Islands fur seal stocks were destroyed by the late 18th century. Betsey (Capt. Edmund Fanning) arrived at New Island on 19 October 1797, but found it difficult to get a full cargo. She left on 8 December 1797 with Olive Branch (Capt. Paddock) for Más Afuera (Fanning 1838) where the cargo was completed. Sold in Canton for US \$52 300, it brought lays of US \$2 160 for the master, first officer US \$1 000, second officer US \$960, carpenter and steward US \$600 each, cooper US \$480, blacksmith US \$360 and US \$240 to US \$120 for each of ten crew members (Kirker 1970).

Continued stock reduction is evident from the voyage records of Neptune (Capt. David Greene) which left New York on 22 November 1796, arriving at the Jason Islands on 22 February 1797. She remained there until 26 December 1797, taking 30 000 fur seal

skins from depleted stocks. After completing her cargo at Más Afuera, 80 000 skins were sold in Canton for US \$3 each, the return cargo of tea being auctioned for US \$280 000, a nett profit of US \$100 000 for the owners, US \$50 for the supercargo Townsend, and US \$70 000 for the master and crew (Townsend 1888, Dulles 1930).

At least 11 other sealing vessels were at the Falkland Islands in the 1796-97 seasons, taking not only the ever scarcer fur seal, but also hair seal skins [sea lion ?] and elephant seal oil, the latter valued at \$45 per ton (Townsend 1888).

Chinese furriers could remove the guard hairs for conversion into felt clothing and keep the underfur intact for fur garment manufacture. How this was done is unknown to the author. A similar method was unavailable in the west until 1799 (Chapman 1799). Fur seal skins taken prior to this time by American and British crews (Appendix 1) were either exported to Canton or tanned into leather, the fur being removed and wasted (Links 1956).

Thomas Chapman, a skinner and 'seal wool' manufacturer from Bermondsey introduced in 1799 a method for removing guard hairs from fur seal skins imported into England, the underfur being left in a condition suitable for making imitation beaver skin hats and the skin for tanning (Appendix 2). Chapman first did this in 1796 on 500 fur seal skins purchased at 1-1/2 pence each and used for lining trunks. A workman accidentally spilled a mug of beer into a lined trunk, the guard hairs coming away in his efforts to clean the skin! The underfur was revealed and induced Chapman to develop his method (Wilcox 1951). Although Chapman patented his process, he presumably first discussed it with other furriers who also began to use it. Chapman entered

into litigation to protect his patent, culminating in the unsuccessful presentation of his case to the House of Lords in 1810. In the same year he published a narrative of his problems, a copy requested from the library of the University of New South Wales not yet being available to this author.

Chapman's process revolutionized the British hat industry, and provided an alternative outlet for Falkland Islands skins other than the increasingly glutted Canton market. Expensive beaver fur was replaced by cheaper seal fur laid over a sheepskin hat body, a single 10/- fur seal skin covering three or four hat bodies which sold at over £1 in the finished state (Gill 1967, Hainsworth 1967). Alternatively, the underfur was cut from the skin and tossed by a beating string until the hairs matted together into a thin sheet. Several sheets were applied to each other until the desired thickness and strength was produced (Davey [1880]). The sheet was subsequently shaped into the 'beaver' hat (Saturday Magazine 1835).

A technique for removing guard hairs continued to be unavailable in America, hats being imported from Great Britain.

Concord (Capt. Wyer) and Minerva (Capt. Mayhew Folger) left Salem, Massachusetts in October 1799 on a sealing voyage for Canton, arriving at Grand Jason Island on 27 January 1800. They met Barclay (Capt. Griffin Barney) from New Bedford and Mars (Capt. Uriah Swain) from Nantucket (Raymond 1936) who had collectively taken some 7 000 fur seal skins from the island during a voyage to Canton via Más Afuera (Corning 1944). Sally (Capt. Nathaniel Storer) from New Haven also briefly visited the Falkland Islands in December 1800 on the way to South Georgia (Chapter 5) taking some fur seal skins (Clark 1887a). The crew

of Dispatch (Capt. Howard) from New London built a shallop to explore the coast for more fur seals, six sealers drifting for 35 days around Cape Horn (Moulton 1804).

The reduction in fur seal stocks at the Falkland Islands was also described by Amasa Delano (1817) who left Boston on 10 November 1799 on Perseverance. Arriving at New Island on 26 January 1800, he found Diana (Capt. John Lock) from London, but few seals of any kind.

1 083 087 fur seal and sea otter skins valued at US \$1 326 308 entered Canton in American vessels during 1801-03. 648 750 were fur seal skins valued at US \$630 985, about 47% of the value of all fur imports from the American trade (Pitkin 1835). Due to declining sea otter catches, fur seal skins assumed even greater importance in the American fur trade with Canton from 1803-13. Of 1 052 702 sea otter and fur seal skins imported from America, 945 397 (90%) were fur seal skins (Hunt's Merchant's Magazine 1845).

Estimates of the number reaching England or Canton from the Falkland Islands are unavailable.

Further war between Great Britain and France from 1803 again caused maritime trade to decline. Great British established a blockade of New England ports to prevent direct American trade with European countries from which British vessels were excluded, and both protagonists seized American vessels on the high seas. Crews captured by British vessels were impressed into service on British whalers. However, at least 18 sealing voyages were made from New England ports in 1803-06 (Clark 1887a). To avoid further seizures, the United States government introduced an Embargo Act in December 1807, prohibiting American vessels sailing from American ports to foreign countries. Although three sealing voyages

are recorded in 1807-08 (Clark 1887a) products could not be exported, making profits uncertain (Bartlett 1929). The number of American vessels sailing to Canton also declined, from some 150 in 1804 to eight in 1809 (Dulles 1930). American overseas trade decreased from US \$246 000 000 in 1807 to US \$79 000 000 in 1808. Severe economic distress occurred in New England, protests by merchants leading to repeal of the Act on 15 March 1809. France continued her seizures, 200 American vessels being taken in 1809-10 (Marvin 1902). Consequently only one sealing voyage was made during 1809-11 (Clark 1887a).

The British whaling fleet did not escape the effects of the war, only 25 surviving to the end of hostilities (Stackpole 1972). Increased demand for hats caused London fur seal skin prices to increase to 30/- per skin in 1804. Although many were imported from the southern whale fishery (Appendix 1), others came from New South Wales, 192 518 entering London in 1806-10 glutting the market by 1809. Demand and prices subsequently fell, exacerbated by decreased hat purchases in the general postwar economic depression and the loss of the export hat market from a trade embargo on American ports (Hainsworth 1967). 21 367 skins sold in London for 4/- to 8/- each (Poland 1892).

Hostilities between France and Great Britain from 1812-15 continued to affect sealing. New England crews and merchants continued their privateering on British and French vessels (Hill 1894), American vessels in turn being captured by both protagonists. Only two American sealing voyages are recorded (Clark 1887a). Manilla was captured by the English Tiger, five days' sail from Nantucket with a seal oil cargo from Patagonia. Nanina (Capt. Charles H. Barnard) left Hudson, New York on 12 April 1812 on what may have

been the only wartime sealing voyage to the Falkland Islands. Ordered to remain there until he got a full cargo for Canton from the depleted stocks, Barnard arrived on 7 September 1812 and began sealing. He met Hope (Capt. Obediah Chase) on 3 January 1813 with a party of castaways from Isabella, wrecked during passage from New South Wales to London. Barnard offered them passage, but unfortunately mentioned that Great Britain and the United States were at war. When Barnard and four crew were ashore, the castaways captured Nanina leaving Barnard and his companions marooned. They were rescued in December 1814 by the English vessels Asp (Capt. John Kenny) and Indispensable (Capt. William Buckle) which took them to Más Afuera. There, Barnard boarded an American vessel for Canton (Barnard 1829). Those crew members who had not been marooned were set adrift by their captors on the shallop Young Nanina, eventually reaching Argentina (Kirker 1970).

No sailings occurred in 1813-14 (Clark 1887a), a British blockade of New England ports reducing American overseas trade from US \$12 250 000 in 1811 to US \$209 000 in 1814 (Marvin 1902).

Wartime capital losses prevented many New England merchants rebuilding their fleets, the prewar Nantucket whaling/sealing fleet of 46 vessels being reduced to 23 at the end of hostilities (Starbuck 1914). Boston, Nantucket and New Haven reduced their investment in sealing, Mystic, New London and Stonington beginning to specialize in it. Some 165 sealing voyages were made from New London between 1820-80, 76 from Stonington and 21 from Mystic (Clark 1887a) including many to the Dependencies (Part III). American sealers brought home more elephant seal oil because of greater domestic oil demand in the increasingly populated and

industrialized United States, and scarcity of fur seals and price decreases for their skins in Canton.

The development of Connecticut ports as important sealing centres was largely due to the efforts of Capt. Edmund Fanning. Making at least five sealing voyages to the Falkland Islands and Dependencies from 1792-1818 (Fanning 1838), he commanded or acted as agent for over 70 sealing voyages until his death in New York on 23 April 1841 (Albion et al, 1972). Fanning coerced Connecticut and New York merchants into providing vessels and capital, and pressured the American government into backing expeditions in search of new seal rookeries, notably the Palmer-Pendleton expedition of 1829-31 and the United States Exploring Expedition of 1838-42 (Bertrand 1971).

Although criticisms were voiced about continued sealing on depleted stocks (Péron 1816) vessels still attempted to get cargoes. Capt. James Weddell (1825) described the arrival at Port Egmont in 1820 of an unidentified French vessel whose master was unable to take any seals, whereas his father had found large numbers there 42 years earlier. Details of French sealing voyages are given in Lacroix (1938) and Pasquière (1982).

Sealers' attentions were directed away from the depleted Falkland Islands fur seal stocks by the discovery of the South Shetland Islands in 1819 and South Orkney Islands in 1821 (Chapter 6). Vessels continued to use the Falkland Islands as a stop-over on voyages to these islands. Cargoes were taken from several places, Nancy arriving in Salem on 27 May 1822 with 100 barrels of oil and 1 800 skins from the Falkland and South Shetland Islands (Rebotti 1950).

Strange (1983) considers that some attempts at stock

conservation may have been made by the Spanish garrison before they left Puerto Soledad in June 1811 (Boyson 1924) but this would appear unlikely in view of sealers' general lack of respect for law and the probable inability of the garrison to enforce any regulations. After they left, conservation was totally impossible. The Spaniards cared little for the seals, being mainly concerned with announcing their purported sovereignty over the islands (Townsend 1888). Their sovereignty claims were reasserted on 9 November 1820, an act which led to the first attempt to regulate sealers' activities (Chapter 4).

3.5 Summary and conclusions

Seals were first taken for commerce from the Falkland Islands by French settlers in 1766. Concerted exploitation started in 1774 when American whalers began hunting from the islands. British whaling vessels also arrived in 1775 from the Greenland fishery. Mixed whale and seal oiling voyages were made, southern elephant seals and sea lions yielding abundant high quality oil by those processing methods used in whaling. Killing and processing seals on land was also easier than for whales at sea, and sealers could work onshore while their vessels continued whaling elsewhere. Large quantities of oil could therefore be obtained at little expense. Oil taken by American vessels was exported to Great Britain from New England. Small numbers of seal skins were taken by British vessels and sold in London for tanning.

Sealing was interrupted by the American War of Independence (1775-83). The British Government introduced a blockade of New England ports, preventing many whaling and sealing vessels from leaving. Those which eluded the blockade were often destroyed,

their crews being forced to serve on British vessels and develop the British whaling industry. However, prewar reports by whalers of excellent seal oil production at the Falkland Islands encouraged a group of Massachusetts merchants led by Francis Rotch to send a fleet to the islands in 1775. Whale and seal oil were to be produced and shipped directly to London, thereby avoiding the New England blockade and British import restrictions on oil imported from America. The enterprise was unsuccessful, only one of 15 vessels surviving bad weather and enemy action to reach London. This was the first American attempt to sell Falkland Islands oil on the London market.

Nevertheless, Francis Rotch made a further attempt in 1784 to take seal oil from the Falkland Islands and sell it on the more profitable London market. Direct shipment would have enabled him to avoid paying high postwar import duties imposed by the British Government on foreign produced oil in an attempt to further develop the British whaling industry. Rotch was again unsuccessful, British merchants informing their Government of this deception and preventing the oil from being landed. However, Rotch took what may have been a speculative cargo of fur seal skins from the Falkland Islands, possibly inspired by the publication in 1783 of Ledyard's account of the lucrative sea otter skin trade between the northwest Pacific Ocean and Canton. The cargo was sold at Canton in 1786, inaugurating the fur seal skin trade to China.

American maritime trade could not be revived after the war, the depressed economy reducing investment in shipbuilding. Consequently American sealing did not immediately recommence, and this market could not be exploited. British vessels returned to the islands in 1786 for whale and seal oil for the London market.

Some masters had previous experience in the sea otter skin trade from the north Pacific Ocean to Canton, and recognized the potential market there for fur seal skins. Therefore, the Canton market was first exploited by British merchants.

Legislation was introduced in the United States in 1789 to encourage vessel construction and trade, and New England sealing and whaling vessels returned to the Falkland Islands from 1792. Emphasis was placed on taking fur seal skins for Canton. British sealers could not compete with Americans in this market, their trade being subject to prices and profit margins dictated by the East India Company, holders of the British trade monopoly with Canton. Many fur seal skins taken by British sealers were sold in London, particularly from 1799 when a method was developed there to use fur seal skins in the manufacture of imitation beaver hats and felt. This demand increased with the export of hats from London to the United States, where a domestic fur seal skin processing industry did not develop until 1823. Decreased competition from the declining British southern whale fishery and lack of trade restrictions allowed American sealers to dominate the Canton fur seal skin trade until it ended with the development of the American domestic market.

The demand for fur seal skins led to the depletion of the Falkland Islands rookeries by the late 18th century. Elephant seal hunting became more common from about 1815, supplying oil for the increasingly industrialized United States.

The period 1774-1820 was therefore one of heavy pinniped exploitation, particularly after the War of Independence. In the absence of government, conservation measures could not be introduced and there was no self regulation by sealing crews in their search for quick profits.

Chapter 4

1820 to the first sealing legislation, 1881

4.1 1820 to British repossession in 1833

Col. Daniel Jewitt on the frigate Heroína of the United Provinces Marine took 'formal possession' of the islands on 9 November 1820. The masters of some 50 sealing and whaling vessels (Vernet 1832) were told that the laws of the United Provinces de la Plata were in force and prohibited fishing and hunting by foreigners, offenders being sent to Buenos Aires for trial (Boyson 1924). Later activities of Heroína, and the trial of her crew for piracy are given in Manning (1932).

General Knox (Capt. W.B. Orne) returned to Salem from the Falkland Islands on 6 June 1821 with 5 000 seal skins and 600 barrels of whale oil (Robotti 1950) and a copy of Jewitt's letter, published in the Salem Gazette (1821) as a warning to sealers who were about to depart.

Sealers may have respected Jewitt's order (Boyson 1924), but this is unlikely. Jewitt was probably unable to enforce his commands since Heroína had arrived in a dilapidated condition with 80 men from her crew of 200 suffering from scurvy (Weddell 1825). Seals were abundant on New, Beauchêne and Sea Lion Islands (Morrell 1832) and sealers would hardly miss an opportunity to take them.

Uncontrolled killing virtually destroyed Falkland Islands fur seal stocks by the second decade of the 19th century. The direct American fur seal skin trade with Canton declined. Skins were brought back to New England from about 1815 for transshipment to Canton (Laut 1921) since insufficient were obtained for direct full cargo shipment (Rydell 1952). A domestic fur seal skin market began to develop, and a greater oil demand occurred in

an increasingly industrialized and populated America. About 30 sealing voyages were made from New England in 1820-21 for skins and oil. Some were to the Falkland Islands; however the majority were to the newly discovered South Shetland and South Orkney Islands (Chapter 6) (Clark 1887a).

Wholesale American prices for salted 'clapmatch' skins were first quoted in 1821 (Shipping and Commercial List and New York Price Current 1815-54), earliest auction prices available to the author dating from 1824. Although probably incomplete, they indicate that at least 166 187 skins were sold from 1824-46, mainly in New York, but also in Boston, Jersey City and Stonington. Secrecy on sources of supply meant that skin origins were described in general terms, only one cargo being recorded specifically from the Falkland Islands and Dependencies, some 1 400 South Shetland Islands skins from Plutarch being sold in 1841 (Appendix 3).

The number of vessels in the British southern whaling and sealing industry declined by 50% from 1820/21-1824/25 (Jackson 1978). Introduction of coal gas street lighting from 1817 decreased the demand for oil, which fell from £46 per ton in 1817 to around £20 per ton in 1820 (Scoresby 1820) and British vessels found it difficult to get profitable cargoes in competition with the more numerous American fleet (Jackson 1978). The demand for 'beaver' hats also declined due to decreased availability of fur seal skins and increased demand for silk hats. Initially introduced by London hatter John Hetherington in 1797, these more stylish hats replaced 'beaver' hats as items of formal wear from about 1820, although the latter continued to be worn for informal occasions (Links 1956).

The development of the American fur seal skin preparation industry

may have been due to decreased hat imports as British southern whaling, sealing, and 'beaver' hat making declined, and to the enterprise of one Denison Williams, a hatter from Albany who had been making fur seal caps since about 1820. The guard hairs were left on and the caps sold primarily in the southern United States, presumably to less fashion conscious impoverished blacks. Williams succeeded in removing guard hairs in 1823 for use in upholstery stuffing and plaster, and dyeing skins in 1825. Details of the processes are unavailable to this author, although prior to 1835 most skins were dyed brown (Partridge 1873). Abundant supply (Chapter 6) and low wholesale prices, up to US \$4.25 per skin (Shipping and Commercial List and New York Price Current 1815-54) probably meant that imitation beaver hats could be made and sold cheaply, enabling Williams to make US \$60 000 and retire from the business in 1827 (Stevenson 1904a).

American sealers therefore continued to visit the Falkland Islands and Dependencies (Part III) and profit from this new fur seal skin market. Their activities were disrupted by the arrival of Louis Vernet and a party of settlers from the United Provinces de la Plata. Vernet established a settlement at Puerto Soledad in 1826, resolving to develop a sealing industry as a training ground for potential crewmembers for the United Provinces navy (Vernet 1832).

The Buenos Aires Government awarded Vernet exclusive sealing rights to the Falkland Islands and the coast of Patagonia south to the Rio Negro on 5 January 1828, appointing him Governor of the Falkland Islands and Tierra del Fuego on 10 June 1828 (Boyson 1924).

Continued uncontrolled American sealing made Vernet realize

that a potentially lucrative part of his concession was being destroyed, and he began a campaign to convince foreign sealers that in his view they were operating illegally (Goebel 1927). A letter was delivered to the masters of foreign sealing vessels on 1 August 1829, asking them to stop sealing or face possible seizure (Vernet 1829). Cattle shooting was also prohibited, sealing crews being able to buy them from the settlers on 'moderate terms'. Capt. John Biscoe attempted this when he visited the islands in 1830 for Enderby Bros., but the cattle were of poor quality and he did not buy any (Jones 1977).

Woodbine Parish (1831a), the British minister in Buenos Aires, recorded 44 visits to Puerto Soledad from June 1826 to March 1831 by British and American sealing vessels. Vernet's warning may have been temporarily successful, no arrivals being recorded in 1830 (Appendix 4). It is more likely that vessels proceeded directly to sealing grounds without entering Puerto Soledad, or that the list is inaccurate.

American wholesale fur seal skin prices increased from US \$5 in 1830 to US \$10 from 1831-41, reaching US \$12 in 1835-36 (Shipping and Commercial List and New York Price Current, 1815-54). More skins were placed on the market, peak sales of at least 25 491 occurring in 1832 (Appendix 3). There was therefore little chance that Vernet's command would be obeyed. The Stonington vessels Harriet (Capt. Gilbert R. Davison) and Breakwater (Capt. Daniel Carew) and the New York vessel Superior (Capt. Stephen Congar) were arrested in July and August 1831 for alleged illegal sealing. Vernet brought Harriet to Buenos Aires with Davison on board to argue the case in the courts. She was reportedly stripped of her provisions and skins when captured (Baylies 1832).

200 pup skins from Harriet were auctioned at Stonington in 1831 for US \$0.37 each (Appendix 3). Superior went sealing on the west coast of South America, the proceeds going to Vernet if the masters were judged guilty or to the owners if innocent (Vernet 1832). Breakwater's crew managed to recapture her, and sailed to the United States, leaving Capt. Carew and four others to be shipped to Rio de Janeiro on the British vessel Elbe (Vernet 1832). News of the sealers' arrest was published in the Boston Columbian Sentinel of 25 September 1832 (Goebel 1927).

Parish (1831b) and the British Government condemned the seizures, although Vernet did not capture English sealing vessels since their masters reputedly respected his request not to seal (Caillet-Bois 1948). This clemency towards English sealers appears to have been influenced by Woodbine Parish, who warned Vernet in 1830 that punitive action would be incurred if English vessels were arrested (Parish 1831c).

Harriet's arrival in Buenos Aires resulted in Puerto Soledad being destroyed by USS Lexington (Cmdr. Silas Duncan) who considered it his duty to protect American citizens and commerce (Duncan 1831). Vernet (1832) was unrepentant about his attempts to preserve the seal stocks, condemning continued indiscriminate hunting and suggesting that regulated killing be introduced to establish an industry with revenues going to the United Provinces de la Plata. Acrimonious diplomatic exchanges occurred (British and Foreign State Papers 1836, Goebel 1927, Manning 1932, Langenheim 1939, Caillet-Bois 1948) and diplomatic relations between Argentina and the United States were severed in September 1832.

Sealing continued, Sun (Capt. Trott) returning to New London on 27 September 1833 with 1 000 fur seal skins and some oil

(Decker 1976). Lively was wrecked on 25 July 1832 at Mackay's Island, her crew being rescued by Unicorn (Capt. Couzens) of Montevideo (Jones 1977).

The United States Government meanwhile claimed fishery rights in Falkland Islands waters because of similar freedom given to English vessels in North American waters, and on historical grounds from Burke's 1775 speech (Chapter 3). The British Consul in Buenos Aires reported that the British Government did not recognize this claim, and that American vessels might be restricted from sealing if a British settlement and administration were established (Fox 1832).

HMS Clio (Cmdr. J.J. Onslow) was sent to the islands to repossess them for the Crown. Arriving on 5 January 1833 Onslow expelled the Argentinian military garrison placed there after Vernet's departure and reported that American sealers had reduced stocks to the point where seals were very scarce (Wilson 1833). At least 25 491 skins were auctioned in the United States in 1832, fetching up to US \$11.75 each in the following year. It is not recorded if any came from the Falkland Islands (Appendix 3).

Onslow realized that a settlement could not prosper if foreign sealers continued to plunder the island's resources. He asked the British Government to station a force at the islands to maintain law and order and protect the settlers (Whittington 1840) but this was not done.

4.2 1833 to the first British civilian government in 1842

Sealers continued their destructions in the absence of government. The crews of two unidentified vessels killed 2 000 wild hogs, several hundred horses and large numbers of fur seal pups

whose skins were valued at only 1/- each compared to some £3 for older skins (Whittington 1834).

American demand for skins continued after an employee of the Treadwell Co. of Albany discovered in 1835 how to dye skins colours other than brown (United States 1889). Skins were thus auctioned for up to US \$20 that year (Appendix 3). Nevertheless, sealskin was not used to make high fashion garments. Processing methods [presumably still similar to Chapman's and Williams's, but unavailable to the author] left the skins hard and heavy. They were primarily used to make men's waistcoats, short jackets and gloves, riding rugs and trunk coverings (Ewing 1981).

Fur seals were now rarely seen (Mackinnon 1840), Hamilton (Capt. Pendleton) returning to New York with 1 150 fur seal skins in her cargo after two years at the islands (Weiss 1974). The American sealing industry continued however, elephant seals being heavily exploited in Îles Kerguelen, the Crozet and Prince Edward Islands due to a continued domestic demand for lighting oil (Busch 1985b, Headland in press).

Not all sealers had destructive attitudes, Capt. Fitzroy (1839) recording the arrival of Unicorn (Capt. William Low) in 1833 with the crew of Transport (Capt. Bray) wrecked at Hope Harbour, Tierra del Fuego on 12-13 January 1833. The son of a Scots land agent, Low was considered an intelligent, enterprising and law abiding sealer. Fitzroy bought Unicorn, renamed her Adventure and took on some of Low's crew. Others, including Low, remained at Port Louis [= Puerto Soledad] to do their own sealing. Fitzroy (1839) noted that fur and elephant seals were rare, suggesting that they would be exterminated if continued indiscriminate destruction was not prevented. He criticized the lawless

behaviour of sealers, and described a bleak picture of social conditions at Port Louis. Others were more charitable, considering sealers and whalers to be intelligent and competent men (Snow 1857).

Fortune was not always with the sealers, as shown by the fate of Mathew Brisbane, previously master of Beaufoy, the cutter which accompanied Jane (Capt. Weddell) on a sealing expedition to the Falkland Islands and Dependencies from 13 September 1822 to 20 June 1824. Brisbane returned to the Falkland Islands after a varied career (Jone 1975) and was shipwrecked on Tierra del Fuego in 1830 when sealing on Transport (Capt. Bray). The castaways built a shallop from the wreckage, left Hope Harbour on 22 April 1833 and rowed to the Falkland Islands. They arrived at Port Louis on 30 May 1833 (Fitzroy 1839) where Brisbane assumed a responsible position amongst the settlers. He was taken in chains on Lexington to Montevideo and Buenos Aires after the settlement was destroyed, however on returning to the Falkland Islands he became superintendent of Port Louis in Vernet's absence, running his sealing operation for him (Boyson 1924). A revolt occurred in the settlement on 26 August 1833 and Brisbane was murdered (Seymour [1834]). Capt. Low was away sealing, and survived. He took refuge at Kidney Island where he met Adventure on 6 February 1834 and signed on as pilot (Fitzroy 1839).

Reports of the revolt and murders left the Falkland Islands on the sealers Hopeful and Rose owned by Enderby Bros., which arrived in Berkeley Sound on 23 and 25 October 1833. Henry Rea, a naval officer attached to Hopeful, wrote to Rear Admiral Sir Michael Seymour, Commander-in-Chief of the British South American Squadron at Rio de Janeiro on 18 November 1833. Rea outlined the events and requested that a warship be sent to the islands

to prevent further massacres (Nautical Magazine 1834a).

Hopeful met the sealer Susannah Ann (Capt. Ferguson) and passed on the information. It was then transferred to Capt. Neilson of Swallow on 11 December 1833 (Boyson 1924). At London, the information was considered false, since of two Capt. Brisbane's in naval records, one had died in Florence and the other was on half-pay and presumably inactive (Nautical Magazine 1834b). Jones (1975) describes the efforts of John Brisbane to obtain information on his brother's murder.

When Rea's letter reached Rio de Janeiro, HMS Challenger was sent to the islands, reaching Port Louis on 9 January 1834. Lieut. Henry Smith was landed to act as naval Governor until 1838. Smith was determined to control sealing, and began by confining hunting on the Volunteer Rocks in Berkeley Sound to settlers (Smith 1834):

'Notice'

Port Louis, Berkeley Sound East Falkland.

The North and South Rocks at the entrance of this bay I consider as Fisheries directly belonging to this Colony.

As it is all the support that the persons who now reside at the settlement have, and as the islands abound in fur seal rookeries, it is my direction that these Privileges are not interfered with in any way.

Smith's notice had little effect, the Commander-in-Chief of the South Atlantic Station complaining to the Admiralty that English, French, and American sealers continued to ignore attempts to restrict their activities (Hammond 1835).

Smith's attempt to confine sealing to the settlers may have been for personal monetary gain. He organized some sealing

for his own account, possibly assisted by his son who was supervising Vernet's property after Brisbane's death. This included some seal skins, of which Smith confiscated about 1 000 (Boyson 1924). He asked the Admiralty for permission to sell them for his own benefit, since after 25 years' service with the Royal Navy he had only reached the rank of Lieutenant-Commander and was in financial distress due to insufficient salary (Smith 1835). Permission was refused, the Admiralty being unwilling to allow trading by officers and men on full pay (Barrow 1835).

The masters and owners of the sealer Susannah Ann complained about Smith's activities and the sealing ban in Berkeley Sound. They asked the Admiralty to recall Smith so that he could be sued for loss of earnings. According to the plaintiffs, when they received Smith's notice banning sealing, they respected his wishes and sailed elsewhere. Since sealing was poor they went to Rio de Janeiro to refit, where the British Consul told the master of Susannah Ann that Smith had no authority to ban sealing anywhere in the Falkland Islands. Returning to Port Louis in January 1835, mate Samuel Thompson went ashore to insist on being allowed to seal. Smith reportedly threatened to gag or shoot Thompson if he persisted in his demands, informing him that a government vessel sealing on the Volunteer Rocks had also been instructed to shoot unauthorized persons attempting to land. The owners of Susannah Ann argued that this was not a government vessel, but one belonging to the American sealer Eveline. Smith and her master had evidently decided to share the proceeds of the catch. Smith told the master of Susannah Ann that skins had already been shipped to England, and the same agreement could have been made with him if he had arrived before Eveline. Susannah Ann left later in January 1835.

her owners calculating that they had lost some 500 fur seal skins valued at £1 000 from Smith's ban on sealing (Public Record Office 1835).

The Admiralty did not take action, leaving Smith to carry on his duties, including repairing the damages caused to the settlement by sealers (Whitington 1840). The British Government did however take a positive step to encourage the development of a domestic sealing industry. By Acts 4 and 5, William IV cap.89, duty was paid on seal skins imported into Great Britain at the rate of 1d. per dozen if 'of British taking imported direct from the fishery of a British possession', or 1/- per dozen if from a foreign fishery. Seal skins taken by settlers were officially deemed to qualify for entry at the reduced rate by an Order-in-Council of 29 June 1836 (Pope 1838).

Smith sent another letter to sealers asking them to stop sealing, and informing them that they would be prosecuted after 1 June 1838 (Shipping and Commercial List and New York Price Current 1838):

To the Master of the American whale ship General Williams
By command of the Governor of the Falkland Islands
or Malvinas

Sir,

The British Governments having taken possession of the whole of these islands, it is their direction that all foreign vessels are not to fish or seal around or near them. You are hereby warned to leave the coast as soon as possible. After the 1st day of June 1838, all vessels found here or at any other part will be proceeded against, being regarded as trespassers

W.J. Scott
Master, H.B.M. Ketch Sparrow
(pro) Governor of the Malvinas

7 May 1838

Sealing continued, Charles Adams (Capt. Carew) from Stonington being wrecked, and Corvo (Capt. Beck) of Stonington taking 1 200 barrels of elephant seal oil (Clark 1887a). HMS Arrow also met the local vessels Alonzo and Montgomery sealing in Berkeley Sound on 16 October and 21 November 1839 (HMS Arrow 1839).

Meanwhile, Louis Vernet applied to return to farm and raise cattle so that sealers and whalers would have fresh food (Vernet 1836). The British Government was unimpressed by his concern, their Consul in Buenos Aires being told that no further correspondence was to be held with Vernet on the subject of his return to the islands (Palmerston 1837).

Smith was replaced by Lieut. Robert Lowcay in August 1838. Attempts to curtail sealing continued, Capt. Le Guen and Capt. Malarbe of the French La Perseverance and Eliza being told that if they worked within three miles of the coast they would be considered trespassers and not allowed to return the following season. How this was to be enforced is not recorded. This warning was presumably also given to the French John Cockridge and the American Hesper and General Williams at New Islands. All masters promised to obey the order (Lowcay 1838).

The settlers had a successful season, taking 500 skins from the Volunteer Rocks where fur seals were now abundant (Mackinnon 1840). However if the domestic industry were to develop further, rookery protection would be necessary, requiring:

Five vessels of the Sparrow's size and complement; one to cruise during the season between Grantham Sound and Fannings Harbour which places are the resort of American vessels when they require fresh beef, the others for the protection of the Seal Rookeries and Fisheries at the Western Islands with an old 20 gun ship or Bomb stationed as a guard ship at Port Louis as a depot for provisions and stores to supply the cruisers, with a complement of 40 men to be employed in gardening, building, etc.

With this force the Islands could be effectually protected from trespassers and the seals in the Rookeries would again become abundant (Lowcay 1838: 19-20).

Protection was not provided, sealers continuing their destructions despite further warnings from the Governor and the crew of HMS Arrow (Whittington 1841). Only Americans were now sealing. Shipment of southern fur seal skins into Great Britain had virtually ceased by 1840, London furriers using mainly skins of the northern fur seal Callorhinus ursinus [Linnaeus 1758] from the Pribilof Islands (Poland 1892). The British southern whaling and sealing industry had almost ended due to increased coal gas street lighting and continued inability to compete with the more abundant and experienced American crews (Jones 1981). The last southern voyage by a British sealing vessel, George Howe (Capt. Alex Distant) was made to Îles Kerguelen in 1839-40 (Headland in press). Fur seal skin 'beaver' hats were replaced by silk hats from 1840 in both Great Britain and America (Amphlett 1974). American wholesale prices for southern fur seal skins fell to some US \$4.25 each, remaining at that level until quotes ended in 1854 (Shipping and Commercial List and New York Price Current 1815-54).

One American vessel still sealing in defiance of British requests (Robinson 1839) was Benjamin de Wolf (Capt. William Horton Smyley) which left Newport, Rhode Island, on 2 April 1839 and arrived at Port Egmont on 1 June 1839. Smyley hunted around Patagonia and the Falkland Islands, and arrived in Newport on 27 March 1840 with only 1 375 fur and 150 hair seal skins (Bertrand 1971). Smyley returned in 1840-41, taking some 2 000 skins (Clark 1887a). The number of skins taken from the Falkland

Islands on these voyages is unrecorded. Smyley had previously been sealing at the islands in 1836-37 as master of Sailor's Return, also from Newport, and had been imprisoned by Louis Vernet after he arrested Belville (Capt. Bray) of Portland, Maine in 1831 (Baylies 1832).

Governor Lieut. Tysson issued the first sealing licence to the settlers in 1840. Charles Melville, master of Montgomery, requested a three-year exclusive sealing contract for the Volunteer Rocks at £100 per year (Melville 1840). This was agreed to by the Admiralty on condition that the rookery was rested every third year for stock recovery, and that skins were sold to the Government at 30/- to 50/- each depending on market conditions (Stephen 1840). The licensing system was not well received, some merchants complaining that they were unfairly banned from the best fur sealing rookeries on the island (Whittington 1841). Whittington requested a similar concession for all other rookeries at a fee of £200 per year. This was not approved, the Admiralty and Board of Trade arguing that such exclusive rights could be claimed only if shown that they had been exercised by the sovereign and her predecessors from time immemorial with the consent of foreign nations, a condition that could not be applied to the Falkland Islands' seal fishery (MacGregor 1844). Introduction of this monopoly was thought to create an undesirable precedent, possibly leading to future administrative difficulties out of proportion to the value of the industry (Committee for the Privy Council for Trade 1845).

Lack of naval protection prevented the licensing system from being effective. Melville ceased operations before the end of his contract after continued competition from foreign vessels (Moore 1840).

A properly protected domestic industry would produce some £1 000 annual revenue to the Colony (Moore 1840) therefore:

The fisheries may have to be followed up to great advantage, both fur seal, whale and sea-elephant. The Volunteer Rocks off the mouth of Berkeley Sound, are always covered with the fur seal; also the South Sea Rocks, a little to the southward, which are far superior in point of numbers and extent to the small island of Lobus [sic], in the Rio de la Plata, for which is paid (as rental) the sum of eighty thousand dollars per annum, and is found very successful [This statement was later retracted (Mackinnon 1852: 177) "having fallen into an exaggeration"] ... The best proof I can give of the goodness of this fishery is, that Mr Melville, late a seaman in her Majesty's navy, has, by dint of skill and industry in that fishery, made money sufficient to procure two schooners with which he is now carrying on a most profitable trade. There is no doubt that if this fishery was properly protected, it would become much more productive; but several sealing vessels, particularly American, make a point of killing, not only the full grown and legitimate game, but destroy a future chance by sacrificing the pups ... All these depredations are now being stopped, as Lieut. Lowcay, the governor, is warning off all foreign vessels (Mackinnon 1840: 42-43).

The crew of HMS Arrow continued attempts at stock protection, banning Enterprise from Stonington for one year from 19 December 1840. The ban went unheeded and unenforced, the vessel being observed sealing in Berkeley Sound on 2 February 1841 (Tysson 1841). On her next voyage from 10 August 1842 to 30 May 1844 she went to the coast of Chile, possibly because of the ban, and took 500 fur and 1 000 hair seal skins (Clark 1887a).

Therefore by the time the island's naval administration was replaced by a civil administration in 1842, attempts were being made to control sealing by settlers and foreigners.

4.3 1842 to the introduction of sealing legislation in 1881

When he was appointed Governor on 14 August 1841 (Boyson 1924),

Lieut. R.C. Moody was instructed by the Colonial Office to administer and enforce English law in the Colony (Russell 1841). Moody (1842a) recorded that the hair and fur seal stocks were depleted, but suggested that hair seal stocks would increase if protected to allow settlers to develop a seal oil industry. This could only occur if a licensing system was introduced for all rookeries, citing as evidence an apparent stock increase on the Volunteer Rocks after their lease to George Melville. Moody proposed licensing sealing on the Jason and New Islands rookeries and requested that an armed vessel be stationed there (Moody 1842b) to intimidate American ships often seen waiting for local sealers to leave. They would then send crews ashore to work unhindered and unreported (Cawkell, Maling & Cawkell 1960). Frances from New London was wrecked there on 15 February 1842 (Clark 1887a), White Oak (Capt. Daniel Fitch) (Moody 1842c) returning home on 15 March 1843 with oil and 500 skins (Starbuck 1878). The Admiralty again refused, considering it economically infeasible to station a protection vessel at the islands.

Moody (1843) recorded 28 foreign vessels at the Falkland Islands from 15 January 1842 to 29 July 1843. Only three domestic vessels were officially described as sealers (Table 4.1) taking hair and fur seal skins valued at 2/- and £2. 10.0d. each respectively (Appendix 5). At least 166 187 fur seal skins were auctioned in the United States from 1824 to 1846 (Appendix 3) but the number coming from the Falkland Islands cannot be identified.

Table 4.1: Falkland Island domestic sealing vessels, 1842-43
(Moody 1843)

Vessel	Tons	Master	Owner	Registry
Alonzo	55	F. Giaume	F. Giaume	Port Louis
Montgomery	75	F. Perry	F. Perry	Port Louis
Susan	150	-. Allyn	Whittington & Co.	London

Three American vessels were at the Falkland Islands on 12 July 1844 (Table 4.2). Richard Henry was lost at the South Shetland Islands in 1845 (Clark 1887a) after a voyage from the Falkland Islands.

Table 4.2: Some American whaling/sealing vessels at the Falkland Islands, 1844
(Whalemens' Shipping List and Merchants' Transcript 1844)

Vessel	Master	Owner	Registry
Pavilion	Adams	Calvin C. Adams	Edgartown
Richard Henry	Beck	John F. Trumbull	Stonington
Sarah Louise	Plaskett	Wm. F. Rodman	New Bedford

The long term advantages of controlled exploitation became apparent to commercial concerns outside the Colony. George Cram (1848) from Liverpool proposed building a sealing and whaling factory and settlement at Port Edgar on West Falkland Island, financed by government loans repayable after five years if successful. The British Government vetoed the plan on the grounds that public funds could not be used to finance private ventures (Grey 1848).

A prospectus was issued in London in 1849 by Alexander and Samuel Fisher Lafone of Montevideo, then in debt to their London

financiers Messrs. Ricketts, Boucher & Co. (Falkland Islands Company [1951]). They proposed establishing the Royal Falkland Land, Cattle, Seal and Whale Fishery Company, eliminating the debt partly from sealing in East Falkland since:

A very important product of the rocks and islets of the Falklands is the FUR-SEAL, and for quality of fur the seal of these islands is admitted to be richest in the world. The island of Beauchêne, the Sea-Lion group and its adjacent rocks, all in the Company's grant, are favorite resorts of these valuable animals, as are the Jasons on the northwest extremity of the West Falkland. Hitherto, these valuable Rookeries have been so much poached by French and American adventurers, and fished in so indiscriminate a manner, that on some of the best grounds the animals are becoming shy and scarce; a few years' preserving would however repair this mischief and secure an abundant supply. It is well known that the fur-seal will return to their favorite haunts if a respite be given to them. The profit attaching to such an undertaking where, as in this case, the ground is favourable, is too well known to need much demonstration, suffice it to say, that a barren island in the same seas, well protected [the Lobos Islands, leased by the Lafone's from the Uruguayan government] is producing a very large revenue to the present Grantee of the south peninsula of the East Falkland (Royal Falkland Land, Cattle, Seal and Whale Fishery Company 1850: 12).

The British Government was again unwilling to grant a sealing monopoly, although it would consider rights to specific rookeries if stocks could be protected from overhunting (Grey 1849).

A Committee of Investigation was established to assess the feasibility of the Prospectus, resulting in the incorporation and charter of the Falkland Islands Company on 10 January 1852 (Miller 1979).

Despite Moody's and Lafone's optimism, domestic sealing was slow to develop. The annual value of seal products exported was less than £500, or 12% of the Colony's exports from 1849-52, and the Volunteer Rocks licence fee was reduced to £8 per annum in 1851 in an effort to attract local sealers although Governor George Rennie

complained to the Colonial Office that American vessels had destroyed the stocks, and that sealing should be prohibited for some years to allow recovery (Falkland Island Reports 1851-53) (Appendices 5 and 6).

The United States Government was informed in May 1853 that continued American sealing would result in British warships being sent to the Falkland Islands to protect the domestic industry, and prevent an [over-?] estimated annual revenue loss of £10 000 to £15 000. United States Secretary of State March responded that Americans would be warned that they could be penalized for further destructions (Cawkell, Maling & Cawkell 1960). Presumably such warnings were to be delivered to owners and masters before their vessels sailed, or by Capt. William Horton Smyley on arrival at Stanley.

Smyley was born in 1792 in Providence, Rhode Island (Whidden 1908) becoming involved in illegal sealing and piracy, such as when:

Some years previously, the master of the Sparrow whilst on a voyage round the islands to warn foreign vessels not to seal within three miles of the island discovered a depot of skins covered in Bullocks hide in Robinson Bay, West Falkland, and brought them back to Lieutenant Lowcay. Smyley later arrived in his schooner Dandy Wolf [= Benjamin de Wolf] dressed in an American Lieutenant's uniform and went on to the Sparrow ... told Lieut. Robinson (Commander) that although he received the warning not to seal, he would seal where and when he wanted. He demanded return of the skins, and took them away in defiance of Robinson (Moore 1840).

According to Governor Moody (1845) Smyley had:

Commanded and I have reason to believe commands, an armed schooner with a good complement of men, sealers of all nations. He is ... better acquainted with every port, creek and inlet of the Falkland Islands than any person existing, having sealed and whaled there for about fifteen years ... besides dwelling

on shore for a few years in secluded parts which it is reported he made much money by slaughtering cattle and salting beef and hides, besides many other circumstances which induced Captain Grey in command of H.M.S. Cleopatra to go in pursuit of him, but without any further success than destroying a shallop belonging to him found high up a creek near which spot he was at the time concealed. He is also known at Montevideo from having robbed the Lobos Islands.

Smyley eventually embarked on a more respectable maritime career, running a mail service from Stanley to Montevideo (Cawkell, Maling & Cawkell 1960) and unsuccessfully attempting to rescue Cmdr. Allen Gardner RN, the founder of the South American Missionary Society, from starvation on Picton Island off Tierra del Fuego in October 1851 (Marsh & Stirling 1867). United States Secretary of State Daniel Webster appointed Smyley the United States Commercial Agent at Stanley on 12 September 1850. He initially set himself up unofficially in this position (Cawkell, Maling & Cawkell 1960), and was not recognized by the British Government until 19 February 1863 (Falkland Islands Annual Reports 1863).

Smyley participated in an incident in 1853-54 when the United States vessels Hudson (Capt. Hiram Clift) and Washington (Capt. W. Eldridge) were arrested by HMS Express (Capt. Henry Boys) for illegal hunting of wild hogs and hair seals [sea lions?] at New Island. After bitter accusations, diplomatic correspondence, and the arrival of USS Germantown in a show of strength, the offending vessels left for Mystic on 13 March 1854, their owners presenting the British Government with damage claims for US \$39 000, which were unpaid (Whidden 1908, Boyson 1924, Cawkell, Maling & Cawkell 1960, Miller 1980).

Smyley's services and disservices to Falkland Islands sealing ended when he died of cholera at Montevideo on 15 February 1868

(Bertrand 1971). A glowing obituary in the Buenos Aires Standard recorded that:

... For upwards of forty years he acted as Commercial Agent for the United States at the Falkland Islands, where he established his headquarters. Although not belonging to the United States Navy, so highly did his country prize his services, that his little barque Kate Sargent carried her own guns, and her worthy commander wore the uniform of the service which his name adorned, yet not in commission ... Men like Smyley pass from among us, but they leave their footprints (Whidden 1908).

Domestic sealing recommenced in 1856 after three seasons of inactivity. Two ships and five small boats took 5 000 hair or fur seal skins and 470 barrels of oil values at about £2 000 (Appendix 5), 17% of the value of all exports from the Colony in that year (Appendix 6).

Settlers hired 20-30 ton boats from wealthier persons in Stanley, or from the Falkland Islands Company, and went on three to four month voyages around the islands. Oil and skins were exported to England by either John Bull Whittington or the Falkland Islands Company (Snow 1857, Abbot and Sclater 1868).

Skins appear to have been shipped through Rio de Janeiro, since by an Order-in-Council of 8 January 1839 those taken by British persons in the Falkland Islands and shipped to London via Rio de Janeiro on British vessels could be imported at the lower duty of 1d per dozen (Pope 1844). Import duties on raw skins were abolished in 1845 (Poland 1892) presumably to stimulate the development of the British fur processing industry. Exported oil may have been used in the rapidly expanding Dundee jute spinning industry, fibres being soaked in whale and seal oil to soften them before spinning into sacking and linoleum backing (Jackson 1978).

The use of seal fur for women's garments became fashionable in England by about 1855. Processing techniques had improved over Chapman's method, and lighter, pliable, attractively coloured skins could be produced, particularly valued for full length sealskin coats (Links 1962). These were first marketed in Paris in 1847, initially shapeless sack-like objects with armholes. Nevertheless they were successful, spreading throughout Europe by 1860 (Sexé 1923). The popularity of these coats was probably due to greater economic prosperity and an influx of Jewish clothiers escaping persecution in Eastern Europe, where coats with the fur on the outside were common (Ewing 1981).

A layer was shaved off the underside of the skin, increasing its pliability and loosening the deeply inserted guard hairs. These were removed by warming the skin, then scraping the fur side with a blunt knife. Guard hairs which eluded this treatment were removed by dividing the underfur with a hot air current, those hairs left standing being cut off. The fur was dyed by treading in a ground colour, followed by 12 to 14 coats of dye applied with a brush. Brush treatment was replaced by dipping the skin in hot dye, if vegetable dyes were being used which did not harm the leather. The pelt was finally scraped and shaved again, and cleaned in a revolving drum of sawdust. The entire processing and dyeing procedure took some three to four months (Partridge 1873, Petersen 1914).

The London fur seal skin market was now mainly supplied from the Lobos and Pribilof Islands, 10-12 000 salted Northern Fur Seal skins valued at some 10/- each being annually shipped in 1858-64 to J.M. Oppenheim & Co., the leading British skin dressers. This was increased to 20 000 annually until American purchase

of the Pribilof Islands from Russia in 1867 (Poland 1892). Hair seal skins were also imported from Newfoundland and Davis Strait (Jackson 1978).

American sealers no longer came to the Falkland Islands, although continuing to visit the Dependencies (Part III). The development of law and order on the islands may have been partly responsible, however the inability of the Falkland Islands Government to enforce its laws makes this unlikely. More probably they stopped coming because seriously depleted stocks made sealing economically unfeasible, and because the American sealing and whaling industry was now in general decline. Their fur seal skin processing industry had ended due to lack of skilled workers (United States 1889), wholesale prices being last quoted in 1854 (Shipping and Commercial List and New York Price Current 1815-54).

Elephant sealing declined due to overexploitation of stocks and decreased oil demand with the introduction of petroleum products for lighting and heating. Investment capital became increasingly transferred from sealing and whaling into shore industries. Crews were lost to the California gold fields where they could earn up to US \$1 000 a month compared to some US \$100 on a whaler or sealer, and costs of fitting out vessels increased. A vessel costing US \$12 000 to equip in 1790 cost US \$65 000 in 1858 (Marvin 1902). Ten sealing voyages were made from New England in each of 1857-58, decreasing to some three per year in the 1860s. None are recorded to the Falkland Islands, most being to Îles Kerguelen and Heard Island (Clark 1887a).

The Civil War of 1861-65 hastened this decline in the American merchant marine. Foreign trade tonnage decreased from 2 496 894 tons in 1861 to 1 518 350 tons in 1865 due to destruction of vessels

by Confederate cruisers, and continued withdrawal of capital into less speculative investments, particularly railways and mines (Marvin 1902). Some sealing vessels still left New England ports, Clark (1887a) recording 15 wartime voyages, however these continued to be mainly to Îles Kerguelen and Heard Island.

With competition removed, settlers extended their sealing to Patagonia and Tierra del Fuego (Appendix 5) and the value of seal products exported from the Colony increased to some 27% of annual exports from 1859 to 1871 (Appendix 6). This must be considered inexact, whale and penguin oil being included from 1860 to 1880 under 'oil - seal, whale and penguin' (Appendix 5). Sea lion skins weighed up to 240 lbs., being valued at 10/- each in 1859 (Abbott & Sclater 1868).

Domestic sealing began to decline, fur seals recorded as 'scarce' in 1871 being almost unobtainable by 1873. The industry was officially recorded as collapsed in the following year. Skins that could be obtained were valued at £4 each, and oil at 1/9d-2/6d per gallon. The collapse was probably due to previous oversealing and increased involvement of sealers and their vessels in the more lucrative shipping trade which had developed between Stanley and West Falkland Island farms (Appendix 5). The value of seal products exported fell to some 3% of total exports from 1873-81 (Appendix 6) and the industry ended (Appendix 5).

The Falkland Islands Government was therefore forced to enact legislation to protect the few remaining seals, and introduced an Ordinance in 1881 which was to form the basis for future sealing legislation in the Colony and Dependencies (Chapter 7).

4.4 Summary and conclusions

Fewer sealing vessels visited the Falkland Islands after 1820 compared to the previous two decades. Catch records indicate depleted fur and hair seal stocks, and sealers primarily visited the islands during voyages to the South Shetland Islands. American vessels predominated in the industry, British southern hemisphere sealing declining due to decreased oil and fur seal skin markets in London.

Jewitt's claim of 1820 brought the Falkland Islands under the laws of the United Provinces de la Plata, and masters of foreign vessels were told to stop sealing. This demand was unenforcible, fur sealing continuing for the British and American markets. American wholesale prices for fur seal skins were first quoted in 1821, demand being further stimulated in 1823 by the development of a method of removing guard hairs, the fur being used to make imitation beaver hats. Seal oil was also produced, supplying demand in the increasingly industrialized United States.

The United Provinces Government reasserted its claim in 1826 and allowed Louis Vernet to establish a settlement on the islands, appointing him Governor in 1828 with exclusive sealing rights. Vernet's letters show his desire to conserve the fur seals and develop a controlled domestic sealing industry to provide employment for settlers and revenue for himself and the United Provinces. American fur sealers ignored Vernet's requests to stop hunting since skin prices were increasing in the United States because of continued demand by hat manufacturers. Vernet attempted to enforce his demands by arresting American sealers, and the settlement was destroyed in retribution by a United States naval vessel. Vernet left the islands in 1831 and did not return. This first attempt

to stop foreign sealing and develop a domestic industry was unsuccessful. Enforcement was impossible and the United States Government refused to prohibit American vessels sailing to the islands, arguing that they had historical sealing rights. Nevertheless, Vernet's actions may have had some effect. Correspondence between the British and United States Governments in 1832 on presumed American sealing rights shows that the former recognized the need to prevent foreign sealing if settlers began an industry when the islands returned to British control.

This control was resumed when Cmdr. J.J. Onslow repossessed the Falkland Islands for Great Britain 1833. He asked the British Government to station a garrison on the islands to stop American sealing, so that settlers could develop their own industry. Despite its earlier recognition that such control was necessary, the British Government refused assistance on the grounds that enforcement costs could not be recovered from skin and oil sales. This argument continued to be used throughout the mid and late 19th century, Government unwillingness to protect the stocks against foreign sealers being a major obstacle to the development of the domestic industry. American sealers were therefore able to continue destroying the seriously depleted fur seal stock, stimulated by increased skin demand and prices as processing methods improved in the United States.

Social deterioration in the settlement culminated in the murder of some settlers in 1833, and a British naval administration was established on the islands in the following year to restore order and improve the settlers' living conditions. The Governor made the first British attempt to ban American sealers, so that settlers could hunt fur seals without competition. Although

a naval vessel visited the settlement, the ban could not be enforced. The armed force available was insufficient, and sealing areas were remote. American sealing continued, although British sealers no longer visited the islands, the few remaining vessels hunting principally at Îles Kerguelen.

A licensing system was introduced in 1840 to reduce competition between settlers and to make them responsible for stock conservation in their licence area. The British Government also encouraged shipment of fur seal skins to London by allowing their importation at low rates of duty. Only small catches were possible because of the depleted stock and continued American sealing, and the market was also reduced by the increased sales of silk hats. The American fur seal skin processing industry ended in the mid 1850s due to lack of skilled personnel, and American sealers stopped visiting the islands. The London fur seal skin market improved at about the same time, due to increased demand for ladies fur seal skin coats. This market improvement, absence of competition and removal of import duties did not stimulate the domestic industry. The fur seal stock and catch continued to be low and sporadic until 1881 when sealing temporarily ended and the Falkland Islands Government introduced the first legislation aimed at stock recovery, banning sealing during the breeding season. Unsuccessful attempts were also made to improve the industry by producing elephant seal and sea lion oil for export to Great Britain and France.

Imprecise records make it difficult to estimate accurately the value of the sealing industry to the Colony's economy. Although providing important income for some settlers, the value of seal products exported during 1873-81 amounted to only 3% of the value of all exports.

During the period 1820-81, sealing in the Falkland Islands was transformed from an uncontrolled foreign dominated industry into a sporadic domestic industry under rudimentary Government control. Expansion into an industry producing substantial revenue for the Colony was prevented by low stocks and catches and increased involvement of settlers in other employment.

PART III

SEALING IN THE DEPENDENCIES, 1786 to 1899

Chapter 5

South Georgia

5.1 The industry

The island was probably first sighted by British merchant Anthony de la Roche in 1675 (Headland 1984a), the first landing being by Capt. James Cook (1777) on 17 January 1755 when large numbers of fur seals were observed. Forster (1777) was sceptical of the need to utilize them, considering that they were more numerous and could be obtained more cheaply from the Falkland Islands and South America.

London merchants sent sealing expeditions to the island after the American War of Independence (Chapter 3). Although the date of the first voyage is not established, English sealers arrived in 1786-87. Lord Hawkesbury (Capt. Thomas Delano Jr.) owned by Champion Bros., and Lucas (Capt. Thomas Smith) owned by Lucas and Spencer left England for the island in 1786 (Stackpole 1972). After an interval of six years, Ann (Capt. Pitman) owned by Francis Rotch left London for South Georgia on 18 June 1792 (Rotch 1794). Jones (1973) states without supporting evidence that British vessels generally went to the Falkland Islands from 1786 to 1790. They would be unlikely to leave the South Georgia stocks once discovered, therefore this interval probably reflects the incompleteness of available records. The voyage of Ann marked the beginning of annual voyages to the island by English vessels until 1801-02. In 1796-97, English vessels are again unsubstantiatedly considered to have operated mainly off the east coast of South America (Jones 1973).

An early report of sealing at South Georgia was made by Colnett (1798). During his voyage on Rattler from 1793-94 for Enderby Bros. (Chapter 3) Colnett learned that many profitable fur sealing voyages had previously been made to the island.

Evidence that sealing occurred at South Georgia in the late 18th century is available from a leopard seal skull presented to the Museum of the Royal College of Surgeons in the 1790s (Home 1822). At least 33 vessels took part cargoes from the island in 1790-91 (Stackpole 1972).

Weddell (1825) recorded that 18th century sealers generally took elephant seal oil, although cargo records of Lucas show that oil and skins were taken (Stackpole 1972). Similarly, Ann (Capt. Pitman) arrived at South Georgia on 13 November 1792, and took 50 tons of elephant seal oil prior to beginning fur sealing on 3 December. She took 50 000 skins before leaving on 2 March 1793. Pitman described the mixed nature of sealing in a letter to owner Francis Rotch:

... the small skins are of little value. They are chiefly used here [London] among the Tanners and recorded excellent for shoes, and the larger are the best. A vessel like the Betsy capable of bringing near 100 tons of oil may bring upwards of 30 000 good sizeable skins ... the skins packed in bulk have come out in much better order than those packed in Casks because they have an opportunity of examining them and salting them even if necessary. Other ships continued until the month of May and came away quite full (Rotch 1794).

The first visit by an American sealer was probably in 1792-93 when one or both of Nancy (Capt. Daniel Greene) and Polly (Capt. Roswell Woodward) arrived from the Falkland Islands (Chapter 3). Regulator sailed from New York in 1799 only to be wrecked at Sparrow Bay [= Right Whale Bay (Hattersley-Smith 1980)],

her 14 000 skins being sold to the crew of the rescuing English sealer Morse (Fanning 1838). Aspasia (Capt. Edmund Fanning) left New York on 11 May 1800 to search for Regulator and also to seal at South Georgia. Regulator's fate was determined when Morse was set at Woodward Harbour [= Antarctic Bay (Hattersley-Smith 1980)]. The crew of Aspasia took 57 000 fur seal skins from November 1800 to February 1801. 17 other sealing vessels were there (Fanning 1838) taking a further 65 000 skins for a season total of 112 000, probably the largest annual catch from the island. Allen (1892a) stated that 30 sealing vessels were there in the 1801 season, probably including Betsy (Capt. Cartwright) from Boston, Hope (Capt. Ray) from New Haven and an unidentified vessel from Hudson, New York under Capt. Pinkham. Betsy arrived at Canton on 18 October 1801 with 14 000 South Georgia skins, and Hope on 13 February 1802 with 34 000 skins, mainly from South Georgia. The unidentified vessel was lost, the time and place not being recorded (Corning 1942). Aspasia left the island on 8 February 1801, and arrived at Canton in September 1801, her salted skins being sold for US \$0.85 each. This was considered a high price, and may have been reached by Fanning's purchase of a return cargo of less popular Bohia tea, possibly tempting Chinese merchants to offer higher prices to reduce their stocks. According to Sullivan Dorr, an American trader resident in Canton, skins from South Georgia were superior to all others (Corning 1944).

Sally (Capt. Nathaniel Storer) left New Haven on 22 May 1800, took some skins at the Falkland Islands in December 1800, and went to South Georgia for the rest of her cargo. After the skins were dried on the Patagonian coast, she arrived at Canton in November 1802, selling 45 000 at US \$0.87-1/2 each (Clarke 1881).

Corning (1944) records that 52 000 skins sold for US \$1 each.

Elephant seals were also plentiful on South Georgia in the early 19th century, Peter Storer, the master's son, recalling running along the backs of closely packed animals (Clark 1887a).

Union (Capt. Isaac Pendleton) arrived in 1802, her master producing a map of the island published over a century later by the Italian geographer Faustini (1906).

Sealing entered a period of inactivity with a reduction in maritime trade during the European and American wars, and stock depletions to below economic exploitation level (Chapter 3). A Capt. Mudie wrote that few elephant seals were left in 1802, and that vessels were being sent to Îles Kerguelen for oil instead (Richards 1981).

The first vessel to return after the Anglo French conflicts (Chapter 3) appears to have been Recovery (Capt. William Beacon) in 1814, whose owner Daniel Bennet of Wapping, along with F. & J. Todrig of Shadwell, dominated English sealing at South Georgia for the next decade. Recovery did not return for the 1815-16 season, Jones (1973) attributing this to insufficient stock recovery. This seems unlikely, the stocks having been undisturbed for a decade. American vessels also began to return, the activity of English and American sealers causing fur seal stocks to be seriously depleted by the 1820s (Bonner 1968). American sealers began to take more elephant seal oil in response to increased domestic demand (Chapter 3), stocks being further reduced by the 1830s when fur seals were virtually extinct (Matthews 1931). Smith (1844) described sealing on the island in the early 19th century, after making three voyages from 1815 to 1817, two on Norfolk and one on Admiral Colpoys. Fur seals

were uncommon, most voyages being for elephant seal oil.

Mirnyi (Capt. Thadeus Bellingshausen) arrived on 27 December 1819 with Vostok (Capt. Michael Lazarev) during a southern global circumnavigation for Tsar Alexander I, meeting the English vessels Indispensable (Capt. Brown) and Mary Ann (Capt. Short) at Port Mary [= Undine Harbour (Debenham 1945)] where they had been working for four months. The sealers slept under upturned shallops, using penguin skins to fuel the troyots (Debenham 1945).

91 vessels had been sealing at South Georgia by the 1820-21 season (Christie 1950), some of which were wrecked there (Headland 1984b). The discovery of the South Shetland and South Orkney Islands stocks (Chapter 8) led to a subsequent decline in sealing at South Georgia.

Cpts. Benjamin Morrell and James Weddell also commented on the reduced fur seal stocks. Morrell (1832) left New York on 30 June 1820 in Wasp, accompanied by Henry (Capt. Robert Johnson). Arriving on 20 November 1822, his ship's boats allegedly circumnavigated the island in three days without seeing seals.

Jane (Capt. James Weddell) and Beaufoy (Capt. Mathew Brisbane) arrived at Adventure Bay on 12 March 1823. Weddell (1825) recorded that some 1 200 000 fur seal skins and 200 tons of elephant seal oil had been taken from the island since about 1786, fur seal stocks being now almost destroyed.

Kellogg (1942) suggests that 20 000 tons of oil represents the death of at least 62 000 animals.

Hope (Capt. Mathew Brisbane) returned in 1829 but was wrecked on 23 April. Her crew resourcefully built a shallop from the timbers, using an old cooper's adze and a saw made from a piece of iron hoop (Fitzroy 1839).

Sporadic sealing continued into the mid 1840s, the cargoes obtained reflecting the virtual absence of fur seals, decreased markets, continued reduction of elephant seal stocks, and movement of sealing vessels elsewhere (Table 2.1). Pacific (Capt. James Brown) from Portsmouth, Rhode Island arrived on 29 December 1829, only obtaining 256 fur seal skins and 1 800 gallons of elephant seal oil prior to leaving on 5 March 1830 (Clark 1887a). Her log in the Phillips Library of the Peabody Museum, Salem, describes sealing on the island (Busch 1985b). Mary Jane (Capt. Joseph E. Parsons) arrived from New York in 1830, taking only 500 skins (Bonner 1958) and again in 1838-39 for 600 skins (Bonner 1968). The presence of Mary Jane and an accompanying New York vessel Medina (Capt. Elijah Hallett) is verified by a grave marker at Prince Olav Harbour recording the burial of Iohn [= John] Anderson, mate of Mary Jane who died on Medina on 23 November 1838 (Murphy 1947).

Few sealing voyages are recorded for the next 30 years (Headland in press), probably due to the ending of the British southern whaling and sealing, and the decline in American fur seal skin and oil markets (Chapter 4). Some recovery of both fur and elephant seal stocks possibly occurred, although when sealing resumed, emphasis was placed on fur sealing because of the demand for fur seal skin coats in Europe (Chapter 4). Cargo records suggest that stocks were still low.

The first visit in this new sealing era was probably made by Capt. J.W. Budington in 1869, some 800 fur seals being taken, although only 86 were obtained from previously exploited rookeries (Budington 1892). Some 66 sealing voyages were made from New England in the 1870s (Clark 1887a) although not all to South Georgia and other Dependencies (Chapter 6). At least three vessels arrived

in 1870-71, the visit of Peru (Capt. T.K. Purdy) recorded by an inscribed piece of wood found in 1882 by the German contingent of the International Polar Year near the Nachtigal Glacier, Doris Bay (Headland 1984a). Peru returned to New London on 14 June 1872 with 2 730 fur seal skins and 187 barrels of elephant seal oil (Clark 1887a) although the amount that came from South Georgia is unspecified. Trinity (Capt. D. Rogers) sailed from New London on 23 July 1870 with Flying Fish, and returned on 21 April 1871 with 500 fur seal skins and 210 barrels of oil. Flying Fish returned empty on 18 April 1871 (Clark 1887a).

Capt. J.W. Budington revisited the island in 1874 on Franklin from New London and took 1 450 fur seal skins, possibly the last remnants of the stock. Five vessels there in 1875 took only 600 skins, and four could get only 110 in the following year (Budington 1892). An Austrian traveller, Heinrich W. Klutschak, arrived on Flying Fish, later recording that 'several hundred' skins valued at US \$6 to US \$7 had been obtained in January and February 1878 (Klutschak 1881).

Flying Fish (Capt. Dunbar) returned in 1878-79, her log recording that she was caught in a snowstorm which caused severe icing, leaking planks and crew frostbite. She was abandoned on 3 October 1878, her crew being picked up by the barque O. Kohan from Rostock (Busch 1985b). Trinity (Capt. B.N. Noyes) which had left New London as tender to Flying Fish, returned home safely on 24 March 1879 with only 250 barrels of oil (Clark 1887a).

The American whaling and sealing fleet was reduced to 170 vessels by 1880, southern hemisphere sealing virtually ending due to over-hunting, deterioration of the merchant marine and increased outfitting expenses (Clark 1887b, Marvin 1902).

In those states which still had sealing industries by 1880 [Alaska, California, Connecticut, Oregon and Washington], seal products accounted for some 90% of the combined value of their marine mammal products [US \$2 524 011] and almost 30% of the value of their fishing industries [US \$7 710 536]. However an estimated 91% of seal products were now obtained from the exploitation of Callorhinus ursinus stocks in the north Pacific Ocean, particularly from the Pribilof Islands (Goode 1887). Most skins were exported to C.M. Lampson & Co. of London for eventual sale to furriers for use in making women's sealskin coats, now in high demand after an unidentified London firm discovered a method of dyeing the skins black (Sexé 1923, Links 1956, Ewing 1981). English dyeing was considered superior to that of other European countries, attributed to reputedly purer water and atmosphere (Wilcox 1951). 825 000 skins were reimported into the United States from 1872-87 (Parliamentary Papers 1893) the domestic fur seal skin processing industry having ended (Chapters 4 and 6). Skins taken from South Georgia were thus presumably exported to London from New England.

The Connecticut ports of New London and Stonington were the only ones now engaged in southern hemisphere sealing; however the value of their seal products [US \$111 851] accounted for only 4.0% of the total product value of the American fishing industry [US \$7 710 536] (Goode 1887). Nevertheless, investment in sealing in the state [US \$91 900] exceeded investment in the whaling industry [US \$41 000]. Seal products accounted for some 78% [US \$111 851] of the value of all marine mammal products from the state [US \$143 899] and 28% of the fishing industry [US \$400 104]. 81% of the value of seal products was obtained from the sale of 9 275 fur seal skins at approximately US \$9.75 per skin.

42 000 gallons of elephant seal oil was also sold for US \$21 420 (Clark 1887b).

Seal products produced a 21.7% return on investment [US \$91 900 investment, US \$111 851 product value] compared to a 21.8% loss on investment in the whaling industry [US \$41 000 investment, US \$32 048 product value] (Clark 1887b). This ability of the sealing industry to show a profit from depleted stocks must have been due to the low overheads required to run small sealing schooners, particularly with cheap labour from the Cape Verde Islands on very long lays (Chapter 2). The importance of sealing to New London is illustrated by the fact that 25% of whaling vessels sailing from the port during 1840-90 took a part cargo of elephant seal oil (Decker 1973).

Seal stocks at South Georgia and the other Dependencies (Chapter 6) were probably now so low that sealing vessels were unable to make profitable voyages despite low overheads. Hegarty (1959) lists only 11 sealing voyages out of 1 061 whaling and sealing voyages made by New England vessels from 1875-1921, taking 87 255 skins and 3 100 barrels of oil. Most voyages were to Patagonia, presumably taking South American fur seal skins and Southern sea lion oil.

South Georgia was sporadically visited in the last two decades of the 19th century. Express from Stonington arrived in 1885-86, but only one fur seal was seen and none taken (Comer 1892). During her visit from 14 October 1885 to 11 February 1886, only 123 leopard and two elephant seals were obtained for 60 barrels of oil. A crew from the New London vessel Francis Allyn (Capt. Joseph Fuller) visited from 22 August 1888 to 23 January 1889 when the parent vessel was sealing at Gough and Kerguelen Islands.

Only three fur seal skins were taken (Comer 1892), although Verrill (1895) records 311.

The island was probably not worked again until 1891, when Sarah W. Hunt arrived. Her presence and that of Trinity in 1871 is verified from a marker in Grytviken cemetery on the grave of a crew member (Nordenskjöld 1905). She probably came after being banned from the Magellan Straits by Chile in 1889 for illegal sealing (Parliamentary Papers 1893).

The last sealing vessel to visit in the 19th century was probably Franklin (Capt. J.W. Budington) in 1892, when only 135 skins were obtained (Budington 1892).

Late 19th century voyages were so infrequent and unsuccessful that stocks had some respite. Elephant seals recovered to the extent that they could be exploited again in the 20th century (Part V). Concerns were expressed on the need to introduce stock protection legislation for a new industry (Williams 1889, Lonnberg 1908). The few remaining fur seals were protected in a successful attempt to assist their recovery (Chapter 2) and a successfully controlled elephant sealing industry was carried out from 1909-64 (Part V).

5.2 Summary and conclusions

South Georgia was first sighted in 1675 and visited in 1775, becoming thereafter an important sealing centre for almost two centuries.

Reports of the first landing described the presence of large numbers of fur seals on the island. These were not immediately exploited because of reduced British and American southern hemisphere whaling and sealing during the War of Independence (1775-83).

However, British southern whale fishery vessel owners may have read these descriptions of the island and realized that a profitable sealing industry could be developed. Their vessels began to arrive in 1786-87 during the postwar whaling revival, crews taking fur seal skins to be sold on the British and Canton fur markets. Some elephant seal oil was produced for sale in Great Britain. The depressed postwar American economy slowed rebuilding of the New England whaling fleet, these vessels first arriving at South Georgia in 1792-93. Their crews also took fur seal skins to be sold in Canton, the domestic market not developing until about 1820.

The lure of high profits and the absence of government and conservation legislation made controlled exploitation impossible. Cargo records show that fur seal catches decreased during the late 18th and early 19th centuries, indicating that the stock was seriously depleted by 1820. However, merchants continued to profit from sealing, their crews taking increased cargoes of elephant seal oil to supply industrial and domestic demand in America and Great Britain. An estimated 20 000 tons of oil, or 62 000 elephant seals, were taken between 1786 and 1825. Although the sizes of these original fur and elephant seal stocks are unknown, they must have compared favourably to the currently estimated 1 000 000 fur and 350 000 elephant seals in order to support catches of the magnitudes recorded.

The depleted fur seal stock caused sealers to search for profitable catches elsewhere, particularly at the South Shetland Islands. However, American sealing vessels continued to sporadically visit South Georgia into the mid 1840s, often during voyages to other islands. Small cargoes of fur seal skins and elephant seal oil were obtained, indicating continued low stocks. American and

British demand for skins and oil decreased, and sealing probably became uneconomical. Voyages to the island ceased until the British fur seal skin market revived, the first visit during this new sealing era being in 1869. Cargo records show that catches were still small, suggesting that the number of fur seals on the island had not increased much during this sealing respite. The stock must therefore have been drastically depleted by previous sealers. Renewed hunting further reduced the stock and catch, visits by sealing vessels becoming increasingly sporadic until 1892 when the industry temporarily ended. Sealing was now unprofitable despite the use of poorly paid crews from the Azore and Cape Verde Islands.

Elephant seals were exploited less than fur seals during the mid and late 19th century, the use of gas and petroleum products replacing whale and seal oil. The stock could therefore recover to the point where controlled exploitation was possible from 1909. Fur seals had been exploited more ruthlessly, and were unable to recover as quickly. Early 20th century numbers were insufficient to be hunted, and fur seals were subsequently protected at South Georgia.

Chapter 6

South Shetland, South Orkney
and South Sandwich Islands

6.1 South Shetland Islands

Capt. William Smith of Blyth saw the South Shetland Islands on 19 February 1819 when Williams was blown off course during a voyage from Montevideo to Valparaiso. He claimed them for the Crown as New South Britain on 16 October 1819 during a second visit, the name being later changed to New South Shetland (Miers 1820a & b).

Smith reported his first sighting to Capt. W.H. Shirreff, senior British naval officer on the Pacific coast of South America. There is no record of the report in Shirreff's letter book, presumably it was made verbally for secrecy (Jones 1971). Nevertheless, secrecy seems to have been ineffective, news of the discovery somehow preceding Smith's return to Montevideo. American sealers there realized the potential value of these new stocks (Literary Gazette 1820) as a source of skins for the developing domestic market (Chapter 4). Falkland Islands and South Georgia stocks were seriously depleted by overexploitation (Chapters 4 & 5).

Williams was chartered by Capt. Shirreff to verify the existence of the islands and to assess the abundance of seals and whales (Shirreff 1819). She left Valparaiso on 19 December 1819 with Edward Bransfield RN (Jones 1966) as master and Smith as pilot, and arrived on 16 January 1820. Many fur and elephant seals were seen, the fur seal skins being considered of superior quality and in potential demand (Young 1821). At least 90 fur seals were killed, and some elephant seal oil possibly taken (Literary Gazette 1821a & b). Bransfield charted the islands,

possibly making the first sighting of continental Antarctica (Gould 1925).

Other sealing vessels arrived as Bransfield and Smith made the survey. The first may have been San Juan Nepomuceno (Capt. Carlos Timblón) which sailed from Buenos Aires on 25 August 1819, and returned with 14 000 skins for British merchant Adam Grey, a possible associate of Smith (Stackpole 1955). It is unclear where these skins came from, the vessel's destination being variously given as Patagonia (Jones 1985a) or the South Shetland Islands (Jones 1982).

One Joseph Herring arrived at Buenos Aires on a Liverpool ship in 1818-19. Signing on as mate of an unidentified vessel, he sailed to high latitudes where land was sighted, but not visited, and large numbers of seals observed (Imperial Magazine 1820). Herring may have sailed with Smith on Williams. Returning to Buenos Aires, he convinced British merchants to send Espirito Santo to the islands with himself as master (Jones 1985a). She arrived on 25 December 1819 and large numbers of fur seals were killed in 33 days, the skins ultimately being sold in Buenos Aires for an unspecified low price. Herring returned to England after this voyage, taking a fur seal skin with him. British hatters considered the quality suitable for use in imitation beaver hat manufacture (Imperial Magazine 1820).

Espirito Santo visited the Falkland Islands during her voyage, meeting Nathaniel Palmer, mate of Hersilia (Capt. James P. Sheffield) from Stonington. Palmer had been left at Kidney Island to get eggs and meat while Hersilia went elsewhere. Invited on board Espirito Santo, Palmer learned that she was on a sealing voyage to newly discovered lands. Opinions differ as to whether Palmer

was given the location (Stevens 1977) or if Hersilia followed Espirito Santo when she returned to collect Palmer (Balch 1904, 1909). Fanning (1838) had also speculated about the existence of land to the south-west of South Georgia after seeing 'ice islands' arriving from that direction, and may have suggested to his brother William, supercargo on Hersilia, that a voyage to the south-west of South Georgia might prove worthwhile. Stackpole (1955) considers that Espirito Santo may have been San Juan Nepomuceno, her name being changed for unspecified reasons.

Hersilia began sealing on 23 January 1820, taking 8 868 fur seal skins until 26 February. She returned to Stonington on 21 May 1820, the skins being sold for US \$22 146 (Viator 1956). Clark (1887a) estimates that up to 50 000 skins could have been taken if more salt was available.

The return of Joseph Herring to England and Hersilia to Stonington, and published accounts of Smith's discovery in both American (Bertrand 1971) and British newspapers (Jones 1985a), prompted merchants to quickly send out vessels to exploit these new stocks.

A Stonington consortium headed by William Fanning sent Express (Capt. Ephraim Williams), Frederick (Capt. Benjamin Pendleton), Free Gift (Capt. Thomas Dunbar), Hero (Capt. Nathaniel Palmer) and Hersilia (Capt. James P. Sheffield) to the islands, where they met on 12 November 1820. Four returned to Stonington on 8 May 1821 with at least 65 000 skins (New London Gazette 1821) which sold for US \$120 000 (Stonington Yankee 1826). Fur seals were abundant, and 50 598 were killed in two months (Balch 1904). Hersilia was captured by pirates off the coast of Chile when looking for other stocks (Clark 1887a). 16 American vessels

returned home from the islands in 1821 with 160 000 skins, nine English vessels taking about 165 000 (Kellogg 1942).

Early arrivals from Britain included Jane (Capt. James Weddell) and Beaufoy (Capt. Michael McLeod). Jane was the first British vessel to exploit the stocks, returning to London on 6 April 1821 with skins, 17 tons of seal oil from about 2 000 seals and 22 tons of whale oil. Beaufoy may have stayed for another season (Weddell 1825, Jones 1985a). Capt. Richard Sherratt in Lady Trowbridge (Jones 1985a) arrived from Liverpool in the autumn of 1820. Large numbers of [elephant] seals were seen, however the vessel was wrecked and none were taken (Sherratt 1821). Weddell may have taken back to England an account of the voyage of George (Capt. John Richards) from Liverpool (Jones 1985a). Written by an unidentified officer on board, it recorded that although many fur seals were found and 9 000 taken, the number was less than expected before departure (Imperial Magazine 1821).

Kellogg (1942) estimates that 500 000 fur seals were taken in 1820-21. The stock could not withstand this pressure, although Robert Fildes visiting in the same season as master of Cora from Liverpool thought that plenty of [krill] was available to allow stock recovery if hunting was stopped for some years (Fildes 1820).

The 1821-22 season was less successful. 13 British vessels took only 18 730 skins valued at £25 000 (Jones 1985b), some 12 American vessels taking 12 900 skins (Clark 1887a). A Stonington fleet took only some 1 000 skins and 11 barrels of oil in 70 to 80 days, and left to complete their cargoes off South America (Fanning 1822). Weddell (1825) more optimistically recorded a season's catch of 320 000 skins and 940 tons of oil, whilst Capt. George Powell (1822) of Dove estimated that two seasons

of hunting had reduced stocks to the point where only enough fur seals were left to provide a cargo for one more vessel. Roberts (1958) states that at least 91 vessels were there that season, compared to some 44 in the previous season.

Weddell (1825) suggested that fur seal stocks should be conserved to yield annual cargoes of some 100 000 skins. Females should not be killed until pups had gone to sea, and only some bulls taken. He estimated that 100 000 pups died annually when females were killed prior to weaning, and observed that:

When these Shetland seals were first visited they had no apprehension of danger from meeting man, in fact they would be still while their neighbours were killed and skinned, but latterly they had acquired habits for counteracting danger, by placing themselves on rocks from they could, in a moment, precipitate themselves into the water (Weddell 1825: 140).

This is probably a reference to the presence of six or seven year old non harem bulls, which maintain territories on top of offshore rocks (Bonner 1968). They may have been the only animals left.

Imports of fur seal skins from the South Shetland Islands into London fell to about 16 038 in 1822-23, valued at £11 700. About 3 700 skins valued at £7 000 were imported in 1823-24, and 6 020 valued at £11 700 in 1825-26 (Jones 1985b). Latourette (1927) estimates that 17 Stonington vessels brought skins valued at US \$310 417 (Reynolds 1828) back to the United States from 1819 until August 1827 to supply the expanding hat market (Chapter 4). Many came from the South Shetland Islands.

Elephant seal oil was also taken, but estimates of quantity are imprecise. Weddell (1825) suggested 940 tons taken in 1821-22. Jones (1985a & b) gives cargoes of some vessels, variously expressed as tons, gallons, tanks or casks.

HMS Chanticleer (Capt. Henry Foster) visited the islands

from January to March 1829. Only leopard seals [possibly a misnomer for Weddell seals] were seen, the island's fur and elephant seal stocks having been destroyed (Webster 1834).

Several New England merchants organized a combined exploring and sealing expedition to the islands in 1829-30 in an attempt to revitalize the declining American sealing industry (Chapter 4). Anawan (Capt. Nathaniel B. Palmer), Penguin (Capt. Alexander S. Palmer) and Seraph (Capt. Benjamin Pendleton) left New York and Stonington from August to October 1829, visiting the South Shetland Islands from January to February 1830. Seals were scarce, and the crews threatened to mutiny when it became apparent that they could not take enough skins to compensate them for the dangers of the voyage. The expedition therefore left the islands, going sealing in South American waters. James Eights, one of three scientists with the expedition, described aspects of the islands' natural history (Bertrand 1971).

American sealers sporadically took skins and oil from the islands in the 1830s and 1840s, Charles Adams (Capt. Alexander S. Palmer) arriving at Stonington on 2 September 1833 with 1 000 skins and 2 100 barrels of oil (Clark 1887a, Balch 1904). High prices could now be obtained for skins, probably due to scarcity of supply (Table 6.1). 4 000 from Penguin fetched over US \$19 000 at auction in Stonington in July 1829 (Balch 1904).

Capt. John Biscoe arrived on 3 March 1832 in Tula with Lively (Capt. Avery) during his 1830-33 polar circumnavigation, hoping that he would be able to get elephant seal oil (Biscoe 1830-32). Working with the crew of Exquisite (Capt. Kellock) from London, he was only able to get 30 elephant seals and left on 11 March 1832 for the Falkland Islands.

Table 6.1: Some auction prices for fur seal skins from the South Shetland Islands (Shipping and Commercial List and New York Price Current 13 July 1831, 22 April 1841).

Skins	<u>Penguin</u> (July 1831, Stonington)		<u>Plutarch</u> (April 1841, New York)	
	Number	Price (US \$)	Number	Price (US \$)
Wigs	)		201	8.50 - 11.87½
Bulls	)		127	10.75 - 11.87½
Clapmatches	) 236	13.50	957	8.25 - 9.37½
Yearlings	)		12	4.00
Pups	228	0.35 - 1.82½	103	0.75 - 0.82½
Total	464	0.35 - 13.50	1 400	0.75 - 11.87½

Occasional visits were made until 1845 (Clark 1887a), and a brief revival occurred in 1852-54 when at least nine Stonington and Mystic vessels arrived (Roberts 1958). The reduced fur and elephant seal stocks possibly made these voyages uneconomical, and exploitation ceased until a new generation of American sealers arrived from 1871 (Clark 1887a) in response to increased skin demand in Europe (Chapter 4).

Capt. J.W. Budington visited several times on Sarah W. Hunt during this period of renewed activity, 13 000 skins being taken in 1871-72, 12 000 in 1872-73 and 5 000 in 1873-74. Thereafter some 100 to 200 were taken annually until 1880 (Budington 1892). A total catch of some 45 000 is estimated (Williams 1888). Stocks were again reduced to unprofitable levels, Thomas Hunt (Capt. Andrew J. Eldred) and Express (Capt. Thomas B. Lynch) from Stonington only obtaining 36 skins during a voyage in search of Charles Shearer (Capt. Appleman) which disappeared after leaving Stonington in 1879 (Clark 1887a). Clark (1887a) and Roberts (1958)

record 13 and 19 voyages from Stonington and New London to the South Shetland Islands between 1871 and 1880 when American sealing virtually ended (Chapter 5).

The German steam whaler Grønland (Capt. Eduard Dallman) was sent by the Polar Navigation Society of Hamburg to the South Shetland and South Orkney Islands from 17 November 1873 to 4 March 1874 to determine the feasibility of sealing. Seals were not seen at the South Shetland Islands (Schück 1882).

Sarah W. Hunt returned in 1888-89 for 39 skins, and 41 in 1892-93. Stocks were now virtually exterminated and vessels no longer went there (Lindahl 1892).

Related concerns were expressed about this stock destruction since:

In wretched waste and wanton destruction has gone out for ever from the southern seas a race of animals useful to man, and a possible industry connected with them, and it is plain that without the aid of a law to guide and control, no other result could have been expected (Williams 1892: 542).

Destruction of the South Shetland Island fur seal stocks seems to have been partly responsible for the demise of the seal skin curing and processing industry in the United States, since:

When the South Shetland supply was exhausted, those skilled in the art of preparing the rough salted skins for the market must have gone elsewhere into some other occupation, and the art or trade then faded out of existence ... As it is now, US \$6 000 is now paid annually to English workmen [for preparation of skins from the Pribilof Islands] ... Is there not some one living who used to work at this trade? And if so is there not some way by which it might be revived? (New York Times 1878: 4).

Further visits were probably not made until the early 20th century, the Canadian vessel Beatrice L. Corkum (Capt. Reuben Balcom) arriving on 14 January 1902 from the Falkland Islands (Chapter 8).

Details of other voyages to the islands are given in Clark (1887a), Stackpole (1955), Roberts (1958), Mitterling (1959), Bertrand (1971), Jones (1985a & b) and Headland (in press). Arguments concerning the first sighting of Antarctica by British or American sealers from the South Shetland Islands are presented by Hobbs (1939), Stackpole (1952), Bertrand (1971) and Jones (1982).

6.2 South Orkney Islands

The South Orkney Islands were discovered after declining fur seal stocks at the South Shetland Islands caused sealers to sail further afield in search of cargoes.

Dove (Capt. George Powell) of London and James Monroe (Capt. Nathaniel Palmer) of Stonington left Clarence Island in the South Shetland Islands on 4 December 1821. Powell sighted land on 6 December, landing the following day and naming it Coronation Island (Powell 1822) although assuming it to be part of the South Shetland Islands. Only a few leopard [or Weddell] seals were seen, and none were taken. Hobbs (1939) purports that a joint sighting and discovery was made.

Scanty records indicate that few seals were taken. Stocks may have been naturally low (Marr 1935) or catches may have been included in South Shetland Island records.

Beaufoy (Capt. Michael McLeod) arrived shortly after Powell and Palmer in December 1821 but the number of seals taken is not recorded. Capt. James Weddell had seen the islands from Jane in 1822. He named them the South Orkney Islands, but could not land since his vessel was fully loaded and he had no tender to make the landing for him. He returned in January 1823 accompanied by Beaufoy (Capt. Mathew Brisbane), taking only three fur seals

and about 16 leopard seals, including one later identified as the previously unknown Weddell seal. Weddell left on 22 January 1823, sailing to 74°15'S to look for new sealing grounds (Weddell 1825).

The islands may not have been visited again until 1838, when a French expedition in Astrolabe (Capt. Dumont D'Urville) and Zélee (Capt. J.S. Jacquinet) arrived. A seal catch is not recorded (Roberts 1958). Grønland (Capt. Eduard Dallman) arrived from the South Shetland Islands on 28 January 1874. About 145 fur seals were taken until 11 February from the south-western end of Coronation Island, possibly the last remnant of the stocks. Unspecified numbers of elephant seals were also taken (Marr 1935).

Still searching for the missing Charles Shearer. Express (Capt. Thomas B. Lynch) arrived from the South Shetland Islands in 1880, but again no catch is recorded (Balch 1904).

Further visits may not have been made until Canadian pelagic sealers arrived in the second decade of the 20th century (Chapter 8).

6.3 South Sandwich Islands

The South Sandwich Islands consist of 11 islands, the eight southernmost being discovered by Cook from 31 January 1775 to 3 February 1776 (Cook 1777) and the three northernmost by Bellingshausen in 1819 (Debenham 1945).

Little sealing was done on the islands, possibly because of small stocks (King 1983), frequent coastal pack ice (Kemp & Nelson 1931) and a heavy swell (Holdgate 1963). Wasp (Capt. Benjamin Morrell) and Henry (Capt. Robert Johnson) visited from 28 February to 6 March 1823, seeing about 400 elephant seals and no fur seals. None were taken (Morrell 1832). Pacific (Capt. James Brown) arrived at Zavodovsky Island in 1830 (Fanning 1838). A catch is not

specifically recorded from the islands, although she left South Georgia on 5 March 1830 with 250 skins and 1 800 gallons of oil (Clark 1887a). Tula (Capt. John Biscoe) and Lively (Capt. Avery) unsuccessfully searched the southern islands for fur and elephant seals in December 1830 (Biscoe 1830).

The islands were probably not worked from about 1840 to the fur sealing revival of the 1870s (Chapter 4). At least 12 vessels took about 6 500 skins from 1875 to 1877. The next year's catch was around 100. The islands were again visited in 1880-81, but no seals were taken and only 400 were obtained in 1891-92 (Budington 1892).

Thereafter, sealers may not have visited the islands until the 20th century. Capt. Spratt Balcom of Edith R. Balcom reported to the Governor of the Falkland Islands in July 1906 that he had taken seals there although none were seen by the crew of Undine visiting from South Georgia in 1908 with Capt. C.A. Larsen (Allardyce 1909a).

6.4 Summary and conclusions

Fur and elephant seals were discovered at the South Shetland Islands in 1819. Unsuccessful attempts were made to keep the discovery secret, possibly for the benefit of the discoverer and his associates. News of the discovery was published in Great Britain, and large numbers of British and American sealers arrived at the islands in 1820. The stocks were discovered at the time when those at the Falkland Islands and South Georgia were depleted from over exploitation. They provided a further source of skins and oil to supply continuing demand in Great Britain and the United States. An estimated stock of at least 1 000 000 fur seals

is inferred from catch records to 1823. Few records of oil production are available, hence the size of the elephant seal stock cannot be estimated.

Large catches destroyed the fur and elephant seal stocks by 1822-23, sealers looking elsewhere for profitable cargoes. The South Orkney Islands and their fur and elephant seal stocks were discovered and exploited from 1821. The South Sandwich Islands, discovered in 1775-76, were revisited for seals in 1823.

The three groups of islands were sporadically visited by American sealers until about 1845. No further visits are recorded until American fur sealing was revived from 1871 to 1892, supplying the demand in London for fur seal skins for ladies coats. Catch records indicate that the fur seal stock was again virtually destroyed, although some animals may have survived on the less accessible South Sandwich Islands. The stocks were not exploited again until Canadian pelagic sealers arrived in the first decade of the 20th century. Sealing did not occur thereafter, and the number of fur and elephant seals has increased by migration from South Georgia. South Shetland Islands stocks have not returned to a size which could support catches of the magnitude recorded from the 1820s. Insufficient 19th century catch data precludes comparison of present and past South Orkney and South Sandwich Island stocks. These two island groups probably did not support fur and elephant seal stocks as large as those at South Georgia and the South Shetland Islands, being near the southern limit of species distributions.

PART IV

SEALING IN THE FALKLAND ISLANDS, 1881 to 1967

Chapter 7

1881 to 1914

7.1 Sealing by islanders, 1881 to 1907

Although American sealers occasionally hunted in the Colony (Kerr 1881a) they concentrated their activities on South American fur seal stocks around Cape Horn from about 1875 (Clark 1887a). L.P. Simmons (Capt. J.W. Budington) from New London took 86 000 skins in 1878 (Hegarty 1959). This uncontrolled sealing, particularly by Sarah W. Hunt (Capt. S.S. Miner) and Martha Gale (Parliamentary Papers 1893) was thought to make animals leave their rookeries. Crews of local vessels sailing to Punta Arenas reported fur seals swimming from South America towards the Colony. Although possibly part of normal feeding or migration movements [the dates of the sighting are unavailable to the author] the Falkland Islands Government thought that these animals might re-stock local rookeries to exploitable levels (Falkland Islands 1880).

To encourage re-stocking, minimize disturbance during pupping and mating, and revive the industry, the Falkland Islands Government introduced the Seal Fishery Ordinance 1881. This established a closed season in the Colony and Dependencies from 1 October to 1 April inclusively, persons contravening the Ordinance being liable to fines up to £100, and £5 for each seal killed. The master or owner of an offending vessel could be fined up to £300 and forfeit the catch (Falkland Islands 1881).

The Ordinance was considered impractical without a means of enforcement (Hansen 1881). HMS Dwarf (Capt. Sir William Wiseman)

was dispatched from the South-East American Squadron at Montevideo on 9 December 1881 at the request of Governor Kerr to act as a seal protection vessel. She arrived at Stanley on 22 December 1881 (Kerr 1881b), eventually discovering a sealing camp at Bird Island belonging to the New Bedford vessel Adelia Chace (Capt. Simon Church) (Kerr 1882) whose low paid crew of 35 Portuguese [probably from the Azores or Cape Verde Islands (Chapter 2)] had taken 580 fur seal skins (HMS Dwarf 1882). Adelia Chace was the only vessel still sealing from New Bedford (Clark 1887a).

Two Sisters (Capt. Janson) of Stanley was also apprehended, Janson and Church later agreeing not to seal during the closed season. Such illegal sealing may have further reduced fur seal stocks, Charles Hansen taking only 17 skins from Carcass Island in 1882 (Kerr 1882). 16 were bought from him by the commander of HMS Dwarf for £2 each, compared to their £5 value in London (HMS Dwarf 1882).

The British Government expected that the United States Government would protest the need for American vessels to comply with the Ordinance, on the grounds of presumed traditional fishing rights at the islands (Foreign Office 1883). There is no evidence available to this author showing that a protest was made, presumably diminished American southern sealing made it not worthwhile.

Little domestic sealing took place from 1882-86, skins valued at £191 or 0.29% of the Colony's exports being shipped in 1884 (Appendix 6). Petersen (1914) overestimated contemporary catches from the Falkland Islands, recording 5 000 fur seal skins taken in 1886, some 2.6% of his suggested world fur seal catch of 189 000 animals. His estimate possibly includes skins illegally taken by American vessels or taken from Cape Horn.

A minor sealing resurgence occurred from 1887-90, skins valued at £1 435 being exported, although still only 0.33% of the Colony's exports (Appendix 6). The reasons for this resurgence are unclear. It may have been due to increased catching effort by local sealers, and improved stocks after the introduction of the Seal Fishery Ordinance 1881 and the lack of sealing in some years (Appendix 5). Increased numbers of seals were reported from the Jason Islands in 1888, 250 being taken (Kerr 1888a). In his report to the Bering Sea Fur Seal Arbitration Commission, Budington (1892) considered however that this hunting was continuing to decrease stocks. His contention is supported by Lindahl (1892) who described an unsuccessful sealing voyage to the Falkland Islands on Hancock in 1891-92 for some 20 skins.

Charles Hansen was granted another sealing licence for Carcass Island from 2 April 1888 to 30 September 1892 at an annual fee of £80. The Falkland Islands Government presumed that a long-term licence would encourage Hansen to conserve the stocks (Kerr 1888b). A one year licence for the Volunteer Rocks was also awarded on 18 June 1888 to James Docherty of Stanley for £10. Hansen took approximately 1 000 skins and Docherty 58. The latter were sold for £87 to a local shipper (Kerr 1888a), possibly the Falkland Islands Company, for shipment to the London market (Chapter 5).

Some illegal sealing by unidentified foreign vessels still occurred (Bruce 1893b) although the Seal Fishery Ordinance 1881 was enforced by visits from Royal Navy vessels at South America. Ships found between West Falkland Island and Beauchêne Island were warned or arrested. These were probably South American or domestic vessels, the American industry having ended (Chapter 5). An unidentified vessel arrived in Stanley in November 1891

with 600 skins to be trans-shipped to London, some of which may have been taken from the Jason Islands (Goldsworthy 1891).

A notice was placed in the Falkland Islands Gazette (Falkland Islands 1891) requesting tenders for hunting in one or all of five sealing districts in 1891 (Table 7.1).

Table 7.1: Falkland Islands Sealing districts, 1891
(Falkland Islands 1891).

District No.	Boundaries
1	Volunteer, Seal and Wolf Rocks
2	Jason Islands (including West Cay, North and South Fur Islands, Carcass, Sedge and Wreck Islands)
3	New and Beaver Islands, and the coast line as far as Smylie's Channel, including Sea Dog Island
4	Cape Orford to Port Edgar including Bird Island, Islands and Coasts in Port Stephens, and all the Islets and Coasts between the first mentioned points
5	All other places not enumerated in the above districts

Sealing appears to have been done only on the Carcass and Jason Islands. Charles Hansen, licensee of these islands since 11 September 1872 (Grey-Wilson 1898) drowned in 1891 when he fell overboard from his schooner Result. His widow Sarah inherited the remaining three years of the sealing licence for Steeple, Grand, Elephant, South and Flat Jason Islands, North Fur and Carcass Islands (Kerr 1890) taking 464 skins in 1891 compared to 411 in 1890 (Grey-Wilson 1898).

During 1881-89 the value of the domestic sealing industry reached its lowest level since annual export records were started.

Skins valued at £2 719 were exported, only 0.24% of total exports (Appendix 6). The Falkland Islands Executive Council therefore decided that sealing should be prohibited in 1892 to allow stock recovery (Goldsworthy 1893a).

A.E. Baillon, the Falkland Islands Company Colonial Manager in 1891-98 (Falkland Islands Company [1951]), appears to have realized that there was no legislation requiring sealers to take out licences. The Seal Fishery Ordinance 1881 only required that sealing did not take place during a closed season. Baillon told the Falkland Islands Government that if Mrs Hansen was not exempted from the 1892 sealing ban she could prevent any revival of the industry by considering seals as ferae naturae and driving them off her leased land, as permitted under her pastoral lease (Goldsworthy 1892).

The Government did not accede to this demand and refused permission for Mrs Hansen to seal in 1892. She ignored their order, presumably at Baillon's instigation. 532 skins were shipped from the Jason Islands to Stanley in Result under the guise of 'general cargo', thence on the Kosmos Lines vessel Pentaur to London in November 1892 as 'barrels of hides and skins' (Goldsworthy 1893b). The Government heard that Sarah Hansen had operated against their instructions and asked her to provide a satisfactory explanation of her actions or lose her licence (Routledge 1893). Any reply is unavailable to this author. Baillon's motives are unclear. He may have acted out of a genuine concern for Mrs Hansen's wellbeing, perhaps feeling that she was unjustly prevented from sealing by Goldsworthy's apparent animosity towards her (Baillon 1893a). He may also have been simply concerned with procuring more skins for the Falkland Islands Company who purchased and exported those taken by Mrs Hansen.

Notice of Tender for a new licence for the Carcass and Jason Islands was placed in the Falkland Islands Gazette (Falkland Islands 1893). Despite protests from the Falkland Islands Company that Sarah Hansen would be financially ruined (Cobb 1893) the licence for 1893-94 and 1894-95 was awarded to Niels Luchtenborg for £100. It was renewable for a third season if enough seals were killed to produce royalty payments "satisfactory to the government". The licence fee would be refunded if the Government suspended sealing, but no other claims would be considered (Falkland Islands 1893).

Luchtenborg's licence was cancelled when the Falkland Islands Government realized that seals could be considered ferae naturae under a pastoral lease, and that legislation did not prohibit unlicensed sealing outside the closed season (Goldsworthy 1893b). The Governor had improperly awarded the licence to Luchtenborg, the Colonial Office (1893) requiring that Sarah Hansen's licence be renewed until its original termination date of 11 September 1893.

Luchtenborg refused to return the licence, presuming that this would prejudice possible future claims against the Falkland Islands Government for loss of income. He took 104 fur seals (Baillon 1893b) including 16 from Elephant Jason Island. The Falkland Islands Government impounded these from 13 July to 5 August 1893 (Melville 1893) eventually giving them to Sarah Hansen as their "rightful owner". Goldsworthy (1893) blamed the Falkland Islands Company for instigating the affair in their attempt to reduce the late Charles Hansen's debts owed them. Others blamed Goldsworthy for his ignorance of Sarah Hansen's rights (Foreign Office 1894). Nevertheless, Goldsworthy (1893) had the foresight to realize that legislation was necessary to require sealers to be licensed.

When Sarah Hansen's licence expired on 11 September 1893 it was renewed for a further 21 years at £40 annual rent with the right to take up to 500 fur and 500 hair seals on land or at sea within the three-mile limit. Royalties of 3/- per fur and 2/- per hair seal taken were to be paid to the Colonial Treasury under the Seal Fishery Ordinance 1881, and as in the earlier licence enough penguins could be taken to produce 16 000 gallons of oil (Goldsworthy 1894).

Earliest records of penguin oiling by settlers date from 1863. Oil production is unavailable, being combined with that for seal and whale oil (Appendix 5). Vallentin (1904) records that 'before the island was inhabited' sealers herded rockhopper penguins into a corral where they were asphyxiated. About one pint of oil was produced per bird, valued at some £20 per ton and sent to France for use in soap manufacture. Strange (1983) describes the penguin oil industry, estimating that some 2 500 000 birds were killed in 1864-80. Penguin skins were also used by 18th and 19th century elephant sealers at South Georgia and elsewhere to fuel trypot fires (Chapters 2 and 5). Klutschak (1881) commented that there may have been penguin oiling at South Georgia, but could not confirm it.

Sealing Notices continued to appear in the Falkland Islands Gazette. They no longer requested "licence applications", but applications for the "right to take seals". John Kirwan was granted this "right" for the Volunteer, Seal and Wolf Rocks and Bird Island (Table 7.2) for the 1894-95 season (Falkland Islands 1894).

The format of the Falkland Islands Gazette Sealing Notice was further revised in 1895. The boundaries of the three sealing

Table 7.2: Falkland Islands Sealing Districts, 1893-94
(Falkland Islands 1893a)

District No.	Boundaries
1	Volunteer, Seal, and Wolf Rocks
2	New Island, Beaver Island and coast line as far as Smylie's Channel, including Sea Dog Island
3	Cape Orford to Port Edgar, including Bird Island; Islands and coasts in Port Stephens and all the islets and coasts between the first mentioned points

districts were redescribed (Tables 7.2 and 7.3) and reference to the "right to take seals" was omitted. Applicants were required to state what royalties they would pay for a predetermined [but unspecified] catch size (Falkland Islands 1895).

Table 7.3: Falkland Islands Sealing Districts, 1895
(Falkland Islands 1895)

District No.	Boundaries
1	The West and Northwest District, extending to all unleased Islets and Rocks from Cape Orford to Pebble Island
2	Southern District. All unleased Islets and Rocks in Port Edgar, Albemarle and Port Stephens
3	Beauchêne Islands

The importance of fur seal skin exports to the Colony's economy began to increase in 1892-94, although still remaining low. Skins valued at £4 150 or 0.65% of total exports were shipped (Appendix 6), possibly because of increased sealing efficiency,

improved stocks or greater demand (Chapter 5). Sarah Hansen also applied for compensation for loss of income when her Jason Islands licence was cancelled in 1893. Governor Grey-Wilson recommended an award of £100 (Grey-Wilson 1898) but the Colonial Office considered the claim settled by the reinstatement of her lease (Colonial Office 1898).

The Falkland Islands Government repealed the Seal Fishery Ordinance 1881 on 30 March 1899. The Seal Fishery Ordinance 1899 was introduced, wherein sealers were required to purchase licences at £10 each and pay royalties of 4/- per fur seal, 2/- per hair seal and 3/- per "every other seal"*. The existing closed season was retained and a fine of up to £100 and catch forfeiture was specified for offences against the new Ordinance (Falkland Islands 1899).

The export value of seal skins improved, increasing to 1.15% of the value of the Colony's exports from 1897-1900 (Appendix 6) although accounting for only £491 or 0.63% of revenue from 1899-1903 (Table 7.4). Seal oil valued at £155 was produced during 1890-97 (Appendix 5). Since the size of a 'cask' is unrecorded, the number of gallons exported is unknown to this author. It may have been sea lion oil, elephant seals being now extremely rare, only one having been seen there since the islands 'passed into British hands' (Vallentin 1900). This is erroneous, some were taken for oil in 1858 (Appendix 5). Distant (1899) also recorded that an adult elephant seal killed on 6 February 1898 was possibly the only one taken in 25 years.

This sealing resurgence did not persist, a further decline occurring due to illegal hunting by Canadian and Chilean sealers

* a reference to the 'Sea Otter, Sea Bear and Sea Dog'.

Table 7.4: Revenue received by the Colonial Treasury from domestic sealing, 1899-1903
 (Falkland Islands Annual Reports 1899-1903, Grey-Wilson 1904a)

Year	Month	Licence fees (£)	Sealing royalties (£)	Total sealing revenue (£)	Total Colony revenue (£)	Sealing revenue as a % of total Colony revenue
1899	June	10	16	126	13 219	0.95
	August		100			
	November					
1900	April	10	8 4 0	151 8 0	15 510	0.97
	August		18 4 0			
	October November		115 0 0			
1901	June	10	10 4 0	126 16 0	15 475	0.81
	August		106 12 0			
	November					
1902	June	10	17 4 0	28 12 0	16 070	0.18
	August		1 8 0			
	November					
1903	April	10	7 12 0	58 12 0	17 393	0.33
	May	10				
	August		17 6 0			
	December		13 4 0			
Total		60	431 8 0	491 8 0	77 668	0.63

from 1902-12 (Chapter 8). Stocks were reduced to the point where local sealers caught few fur seals (Table 7.5). Sarah Hansen consequently stopped sealing on the Jason Islands in 1902 (Table 7.6) until her lease expired on 11 September 1904, although the lease was renewed for a further ten years (Seabright 1912). After she resumed sealing she only contributed £15 to the Colonial Treasury for the 1905 season (Table 7.6) rather than the £140 possible under her licence [500 fur seals annually at 4/- per seal; £40 annual licence fee]. Her licence produced only £703. 10. Od. revenue from 1897 to 1905 (Table 7.6), some 41% of that theoretically possible (Thompson 1908). Punitive action could not be taken since she was not required to pay fixed annual royalties to the Treasury or take the maximum permitted catch (Colonial Office 1908). Most of her deficit was incurred after Canadian and Chilean sealing began in 1902. She previously contributed £688. 10. Od, about 98% of the maximum possible revenue (Table 7.6). The Falkland Islands Government argued that stock protection was not their responsibility, suggesting that Sarah Hansen could increase her revenue payments by taking a more active [but unspecified] protection role (Allardyce 1908a). Those contravening the Seal Fishery Ordinance 1899 could be arrested by her under the Seal Fishery Amendment Ordinance 1904 (Falkland Islands 1904a).

7.2 Commercial organizations and sealing, 1907 to 1914

Sarah Hansen attempted to take this more active role by purchasing part of her pastoral leasehold of Jason and Carcass Islands from the Falkland Islands Government in 1907. They decided not to sell her the main rookeries, intending to lease them to a local company, preferably a whaling company (Colonial Office 1912)

Table 7.5: Sealing licences issued in the Falkland Islands, 1900-04⁽¹⁾ (Grey-Wilson 1904a)

Year	Licensee	Location	Catch limit	Number killed
1900	Axel Nilsson	Volunteer Rocks	300	-
		Beauchêne Islands	-	-
1901	Axel Nilsson	Volunteer Rocks	-	-
1902	Axel Nilsson	Volunteer Rocks	300	91
1903	Axel Nilsson	Volunteer Rocks	none	86
	C. Wessell	Passage Islands	none	-
	Arthur Hervey	Cape Meredith to West Island (Bird Island)	none	66
1904	Arthur Hervey	Cape Meredith to West Island (Bird Island)	none	none yet
	Axel Nilsson	Volunteer Rocks Beauchêne Islands	none	103

(1) Excluding Mrs Hansen's licence for the Jason Islands

Table 7.6: Revenue paid into the Colonial Treasury by Mrs S. Hansen, 1897-1905 (Thompson 1908)

Year	Month	Amount (£)	Annual Total (£)
1897	May	125 0 0	250 5 0
	November	125 5 0	
1898	October	123 5 0	123 5 0
1899	November	100 0 0	100 0 0
1900	October	36 4 0	115 0 0
	November	78 16 0	
1901	November	100 0 0	100 0 0
1902	-	-	-
1903	-	-	-
1904	-	-	-
1905	January	8 0 0	15 0 0
	March	7 0 0	
Total			703 10 0

such as Chr. Salvesen & Co. who started whaling at New Island in 1908 (Vamplen 1975). There is no record available to this author to indicate that Salvesen's were asked to apply for a lease.

The Falkland Islands Government made further attempts to revive the industry by entering into negotiations with the Canada Sealing Company of Halifax. A request had been received in 1907 from Capt. Mathew Ryan, master of their schooner Alice Gertrude for monopoly fur sealing rights (Redden 1908).

The company had some £3 000 capital, its officers being a Mr G.A. Wootten, Secretary; Capt. Mathew Ryan; one unidentified person; and a Mr Redden, President. The latter was in the Halifax shoe and leather trade (Allardyce 1908b). Enquiries were made of the Governor General of Canada for further information on the company and whether or not Redden was a reputable individual (Allardyce 1908b). Presumably he was well regarded, since the Falkland Islands Government awarded the company exclusive five-year fur sealing rights at £100 per annum in addition to the £10 annual licence fee for each rookery and the 4/- per skin royalty payment required by the Seal Fishery Ordinance 1899. The lease would be renewed if the rookeries were properly managed. An annual quota of 500 skins was specified for the Jason Islands, and 100 each for the Bird Island, Volunteer Rocks, Beauchêne Island and North Island rookeries. Periodic visits were to be made by Government inspectors (Allardyce 1908c). If controlled leasing was not done the seals would be exterminated and a potentially valuable revenue source lost (Allardyce 1908d). The Jason Islands rookeries were still leased to Sarah Hansen until 11 September 1914 (Seabright 1912) and although Capt. Ryan offered her £125 per year to transfer the remaining five years of her sealing licence to his company

(Allardyce 1908b) she refused to do this, having bought a small boat to improve the efficiency of her operation (Allardyce 1909b). The Canada Sealing Company therefore withdrew from negotiations, anything other than an exclusive licence being considered uneconomic.

Three other licences were issued in 1908-09. Axel Nilsson was allowed to take 100 fur seals from the Volunteer Rocks with E.R. Gleadell and E. Schroder to take 200 each from Beauchêne and Bird Islands respectively (Allardyce 1909b).

South, Flat and Elephant Jason Islands and North and South Fur Islands were declared a Crown Reserve on 24 December 1912 (Falkland Islands 1913) to come into effect when Sarah Hansen's licence expired on 11 September 1914 (Seabright 1912). She was given permission to purchase the pastoral leases of Carcass, Grand and Steeple Jason Islands, which were outside the boundaries of the reserve (Colonial Office 1913a). £55 compensation for loss of sealing huts erected on the islands was also awarded (Young 1915).

The importance of the Jason Islands to the industry is shown by the fact that 45% of fur seals taken during 1910-12 came from their rookeries (Table 7.7).

Table 7.7: Licensed fur seal catch and location, Falkland Islands 1910-12 (Allardyce 1913a).

Year	Bird and Beauchêne Islands	Volunteer Rocks	Jason Islands	Total Catch
1910	79	48	-	127
1911	12	26	163	201
1912	30	38	25	93
Total	121	112	188	421

Having removed the rookeries from Sarah Hansen's control by designating them a Crown property, the Falkland Islands Government proposed leasing them (Colonial Office 1912) and:

As exception seems to have been taken in certain quarters to the granting of whaling licences to Norwegians [possibly a reference to the awarding of whaling licences for South Georgia to the Sandefjord Whaling Co. and Tønsbergs Havlfangeri rather than Chr. Salvesen & Co. in 1907 (Vamplew 1975)] ... let it be known to some of the disappointed British firms anxious to embark capital in this Colony and its Dependencies that there will shortly be an opportunity of obtaining the monopoly of the fur seal industry of the Falklands, subject to the provisions of the sealing law and on condition that proper precautions are taken for the adequate protection of the rookeries and for their inspection and control by Government (Allardyce 1912a).

Chr. Salvesen & Co. applied for such a monopoly lease on 18 February 1913 (Colonial Office 1913b). This was welcomed by the Falkland Islands Executive Council, presuming that the presence of the company's whaling crews and vessels would deter illegal [Canadian and Chilean (Chapter 8)] sealers (Allardyce 1913b).

A draft lease was produced effective for 21 years from 1 October 1914 at £150 per annum (Colonial Office 1913b). Salvesen's did not use it, closing their New Island factory in 1913 and transferring men and equipment to South Georgia where they had started whaling in the 1909-10 season at Leith Harbour (Vamplew 1975).

Sir Ernest Shackleton applied for a monopoly lease on 6 March 1914 being:

Led to understand that the lease of the Fur Seal rookeries in and around the Falkland Islands is about to lapse, and that the Government is desirous of obtaining an offer from a party who would be prepared to protect the same until such time as the Rookeries have recovered from the long continued and now very serious depletions they have been subjected to owing to inadequate protection (Shackleton 1914a).

It is unclear why Shackleton applied, especially since he announced on 13 January 1914 that funding had been obtained for his proposed Antarctic expedition (Shackleton 1919). He may have been thinking of future income after his return from the Antarctic, having heard from Lars Christensen of Sandefjord, from whom he purchased Endurance, of the potential profits in southern whaling and sealing (Huntford 1985). Shackleton proposed forming the Falkland Islands Fur Seal Company (Shackleton 1914b), and since Chr. Salvesen & Co. were not interested the Governor recommended that Shackleton be awarded the lease (Allardyce 1914). An Agreement was drawn up on 14 May 1914 (Falkland Islands 1914a) requiring that the company be formed within 12 months with £25 000 capital. A 21 year lease would then be awarded at £150 per annum from 1 April 1917, subject to the Seal Fishery Ordinance 1899 and with the annual catch being determined by a Government inspector at the beginning of each season. The Agreement was ratified by Shackleton (1914c) but the company was not established (Crown Agents 1915). Shackleton probably forgot the venture in his attempt to mobilize the expedition. The Agreement was cancelled because of the uncertainty of the sealing project (Young 1915).

Although the Falkland Islands Government had introduced stock management legislation and attempted to get commercial organizations interested in fur sealing, the Colonial Office was not completely satisfied with their attempts and:

After the war it will be incumbent on the Colonial Government to undertake protection of the fur seals even although considerable expense might be involved (Colonial Office 1917).

These initial attempts to interest commercial organizations in sealing in the Colony were nullified by World War I, and it was not until 1928 that some success was achieved (Chapter 9).

7.3 Summary and conclusions

The Falkland Islands Government introduced the Seal Fishery Ordinance 1881 to encourage growth of pinniped stocks in the Colony and Dependencies and the development of a domestic sealing industry. Hunting was prohibited during the breeding season, fines established for contravention of regulations, and a naval vessel stationed in the Colony to enforce the Ordinance. Enforcement did not extend to the Dependencies, consequently the Ordinance was of no value there. The Falkland Islands Government also required settlers to have sealing licences, although this was not legislated in the Ordinance. This discrepancy was revealed by an instance of unlicensed sealing, and remedied by the Seal Fishery Ordinance 1899 which also enabled the Falkland Islands Government to obtain revenue from catch royalties. Sealing districts were designated in the Colony and catch quotas arbitrarily set.

The seriously depleted stocks showed little recovery despite these conservation attempts and little sealing effort was made. Fur seal catches were low and only small quantities of sea lion oil produced. The industry continued to be of minor value to the island's economy, skin and oil shipments to Great Britain and France accounting for only 0.01% to 1.9% of the value of all exports from the Colony during 1882 to 1900. Improvement was impossible, rookery poaching and pelagic hunting by Canadian and Chilean sealers from 1901 to 1911 preventing fur seal recovery.

The Falkland Islands Government offered sealing licences to Chr. Salvesen & Co. and the Canada Sealing Company, presuming that increased manpower, expertise and equipment would produce greater catches and revenue. This was an unwise decision, since reports from licensees indicated that fur seal numbers continued to be low.

The companies did not accept the licences, Salvesen's moving their whaling operation to South Georgia and the Canada Sealing Company failing to get the licence monopoly they required for profitable sealing. A speculative venture proposed by Sir Ernest Shackleton did not materialize. Probable further fur seal stock depletion was therefore avoided.

The Falkland Islands Government attempted to develop a sealing industry within the confines of conservation legislation, providing employment for settlers and revenue for the Government. A viable industry was impossible due to depleted stocks and continued uncontrolled foreign sealing. Nevertheless, the conservation legislation introduced provided the basis for the development of further regulations to control the conduct of sealing in the Colony and Dependencies.

Chapter 8

Canadian and Chilean sealing, 1902 to 1912

8.1 Canadian sealing

8.11 Introduction

From about 1868 (Wright 1897) Canadian vessels hunted the Northern fur seal Callorhinus ursinus [Linnaeus 1758] around the Pribilof Islands from British Columbian ports. Pelagic hunting, where the seal was killed at sea from small dories working off the parent schooner, was a major factor in decline of the stock to an estimated 237 000 animals by 1910 when sealing ceased temporarily (Osgood et al. 1915, Paterson 1977).

The high catches increased demand for new vessels, particularly from Nova Scotia and New Brunswick where they could be built for about US \$50 per ton compared to US \$75-100 per ton in British Columbia (McDonald 1892). The first Nova Scotia built sealing vessel to round Cape Horn for British Columbia was Pathfinder (Capt. O'Leary) which arrived at Victoria in April 1886 (Wright 1897). She was followed by Viva (Capt. Wentworth Baker) in 1887 (Yarmouth Herald 1906) (Table 8.1). Fur seals were probably seen off Cape Horn, since the vessels:

Surely had old sealers on board, as ordinary seafaring men would not know the difference between fur seals and small sea lions in the water (Mattsson 1942: 155).

Canadians may also have learned about these southern stocks from New England mariners. High Bering Sea catches probably made it unnecessary to hunt them until northern stocks and catches decreased in the late 19th century.

The first Canadian vessel to take skins pelagically

Table 8.1: Three sealing vessels sailing from Halifax to British Columbia, 1885 to 1894 (Yarmouth Herald 1906, Mercantile Navy List and Maritime Directory 1906)

Vessel	Official Reg. No.	Port Registered	Port Built	Year Built	Tons	Owner
Director	96826	Victoria, B.C.	Lunenburg, N.S.	1890	87	Victoria Sealing Co. Ltd (Victoria, B.C.)
Pathfinder	61007	Victoria, B.C.	Kingston, N.B.	1897	66	William Munsie (Victoria, B.C.)
Viva	90863	Victoria, B.C.	Chester, N.S.	1885	92	Victoria Sealing Co. Ltd (Victoria, B.C.)

in southern waters was Director (Capt. Frederick W. Gilbert) (Table 8.1) which left Halifax for Victoria on 20 December 1894. Shortage of food and water when in the South Atlantic compelled Gilbert to alter course for the Falkland Islands. About 620 fur seals were taken in 36 days. Poor weather forced them to abandon sealing and continue to Victoria, where they arrived on 21 May 1895 (Allen 1892b, Wright 1897).

According to Mattsson (1942: 155):

Now there had been a number of Nova Scotians, Cape Bretonners, and Newfoundlanders sealing out west. When word got around that a new sealing ground had been found, some of these men returned east and got capital interested in Halifax, and the result was that one or two vessels were fitted out to go sealing.

The Stanley Shipping Register (1901-1912) shows that the first were Beatrice L. Corkum and Edward Roy. Leaving Stanley on 14 January and 1 February 1902, they returned to Halifax in May 1902 with 7 700 skins (Appendix 7).

These catches convinced sealing companies to send more vessels to the Falkland Islands (Smith 1903), beginning an industry which continued for the next decade. The vessels were owned by companies in Halifax or Victoria, although two were registered in Newfoundland (Appendix 8). How these became involved is unclear. It may have been from information obtained during the extensive maritime trade which existed between New England, Nova Scotia and Newfoundland. There is no information on these vessels in the Provincial Archives of Newfoundland, or the Maritime History Centre archives of Memorial University of Newfoundland.

The Canadian schooners were:

Very smart looking vessels, and as they carry lofty spars and a great spread of canvas there is no reason to doubt that they can sail along at 13 or 14 knots an hour. It may be convenient sometimes that they should be able to do this. Looked at under weigh, they are all graceful and dainty looking, more especially the Ola M. Balcom which is a new vessel and painted white (Falkland Islands Magazine 1903a).

Their success led to suggestions being made in the Falkland Islands that islanders should start a similar industry:

We are told they worked on the most modern methods of sealing to which must be ascribed their great success. Would it not be possible for Falkland Islanders to take up this? No doubt it needs capital in the first, but it pays about forty men to come all that distance necessitating probably (between coming and going) six months without earning anything, it would surely pay those who are on the spot so to speak (Falkland Islands Magazine 1902a).

and:

It is a great enterprise for which to leave home and travel several thousand miles. We again ask could not Falkland Island men do something in this way for themselves? The distance they would have to go would only be about one-eighth of the distance these strangers have come. One or two men from Stanley did join the sealers and have done very much to their satisfaction and made as much in the four months as they could have made in eight (or perhaps twelve) in the Falklands (Falkland Islands Magazine 1903b).

Islanders did not resort to pelagic sealing, except for the few employed on Canadian vessels.

Pelagic sealing was considered (Jordan 1898: 175):

A destructive and wasteful industry, ... suicidal in its nature. It is at best an insignificant industry. It threatens the destruction of vastly more important interests, and with them its own interests. Pelagic sealing preys upon its own capital. The more successful it is, the quicker will come its ruin.

8.12 The catches

Pelagic fur sealing began in late September, continuing until haul-out in early December, further cargoes being taken in the summer after rookery break-up. Skins were transhipped from Stanley to C.M. Lampson & Co. of London for auction (Harding 1902a). Attempts to find out more details on this company through the London Chamber of Commerce Business Registry and Company House, London, have been unsuccessful. Some were also transhipped through Montevideo and Punta Arenas after 1904. The methods and equipment of the sealers are described by Mattsson (1942, 1943). Crews were probably paid on a share basis similar to that in operation in the Bering Sea (Colonial Office 1891, Mason 1892).

The best season was 1903-04, when an estimated 22 803 skins were taken (Table 8.2). Some 26 000 may have been transhipped (Table 8.3), although 22 360 were officially recorded (Grey-Wilson 1904b). Catch declines occurred thereafter (Tables 8.2 and 8.3), probably because of overexploitation of stocks recovering from 18th and 19th century depletions.

Licensed Falkland Islands sealers were only able to take from 152 (Table 7.5) to 310 (Appendix 5) fur seal skins in 1903. The stock had thus possibly become reduced to a level which could not support the estimated Canadian catch (Tables 8.2 and 8.3). Most of the catch probably came from South American stocks, particularly at the Lobos Islands. This is supported by a description of a sealing voyage from the Falkland Islands to the Lobos Islands, the unidentified vessel being impounded there by Uruguayan authorities for illegal sealing (Mattsson 1942). She was probably Agnes G. Donahoe, arrested in 1904 (Pacific Fisherman 1906a), and later taking 2 100 fur seals from South American waters (Yarmouth Herald 1907a). Edith R. Balcom also took 936 skins off Cape Horn and 568 from the 'South Seas' in 1906 (Pacific Fisherman 1906a). Smith (1927) records a decreased licensed Uruguayan catch from the Lobos Islands, declining from 21 253 in 1902 to 5 633 in 1950, possibly further evidence of Canadian pelagic overexploitation and rookery poaching.

Voyages to the Dependencies began in 1902, Harding (1902) recording Beatrice L. Corkum (Capt. Sprott Balcom) in Stanley on 22 January preparing to leave for the South Shetland Islands. She also visited South Georgia, returning to Stanley on 10 March with 900 skins (Appendix 7). Edward Roy (Capt. F.W. Gilbert) visited the South Shetland Islands in 1902-03 (Harding 1902a).

Table 8.2: Canadian sealing vessel entries and cargoes, Stanley 1902 to 1911
(from Appendix 7)

Year	Number of recorded entries	Number of entries recorded with skins	Number of skins recorded	Mean number of skins per entry
1902	3	3	4 700	1 566
1903	14	12	22 803	1 900
1904	14	14	16 077	1 148
1905	-	-	-	-
1906	5	3	7 666	1 916
1907	6	5	5 422	1 084
1908	4	3	1 060	353
1909	1	-	-	-
1910	-	-	-	-
1911	6	3	435	1 145
Total	53	44	61 163	1 367

Table 8.3: Comparison of Canadian pelagic sealing vessels and catches in the Bering Sea and South Atlantic, 1902 to 1911

Year	Bering Sea (i)		South Atlantic (ii)		Total catch	South Atlantic catch as % total catch
	Catch	#vessels	Catch (estimated)	#vessels		
1902	16 883	35	4 700	3	21 583	21.7
1903	14 701*	26	16 503*	5	41 304	64.4
1904	14 646	22	16 077	11	30 723	52.4
1905	13 798+	18	-	-	-	-
1906	10 368	16	9 582*	5	19 950	48.0
1907	5 397	16	6 506*	6	11 903	54.6
1908	4 954	9	1 413	4	6 367	22.2
1909	3 742	5	-	1	3 742	-
1910	4 274	4	-	-	4 274	-
1911	-	-	6 870*	6	6 870	-
Total	74 965		71 651		146 616	48.8

Note (i) Paterson (1977) (ii) Table 8.2
 * recorded (Paterson 1977) at 20 496. However (Lawson 1985a) this includes 5 795 from the South Atlantic
 * estimated from Table 8.2 using the estimated annual catch per voyage for those voyages where cargo records unavailable
 + not included in the total Bering Sea catch

Baden-Powell (Capt. Anderson) returned to Stanley on 2 February 1906 from the South Sandwich Islands followed by Edith R. Balcom on 19 February from the South Orkney Islands with a record season's catch of 3 004 skins. This voyage is also recorded to the South Shetland Islands (Pacific Fisherman 1906a & b, Tønnessen 1967).

Comparison with their Bering Sea catch (Table 8.3) shows that Canadian southern pelagic sealing produced about 48% of the combined catch for the two areas, with an estimated peak of 65% in 1903.

The estimated southern catch in 1903, 1904 and 1907 exceeded the Bering Sea catch, indicating that greater pressure was placed on southern stocks as the northern catch decreased. The inability of southern stocks to withstand this pressure is shown by catch reduction to an estimated 1 400 in 1908 (Table 8.3). Some 60 000 (Table 8.2) to 70 000 (Table 8.3) skins were taken by Canadian vessels from the Falkland Islands and Dependencies and South American waters until 1911.

The catches recorded in cargo reports do not accurately reflect the number of seals killed. Animals often sank when wounded, and it is possible that 50% to 60% loss estimates for Bering Sea pelagic sealing (Kean 1892, Kiernan 1892) applied. Because of the difficulty in distinguishing between the sexes and ages of swimming seals, females were also taken, affecting stock recruitment. Although southern information is unrecorded, 95% of seals taken in the Bering Sea were pregnant cows, 4% were pups less than one year old, and only 1% were males (Liebes 1892).

Christie (1951) suggested that most of the transhipped skins were Northern fur seal skins brought to the Falkland Islands from the Bering Sea, where pelagic sealing was prohibited. They were shipped to London under the guise of fur seal skins from Cape Horn waters. Substantiating evidence is unavailable to this author. Although sealers were normally reticent about the origin of their catches, some islanders were employed on the schooners and it is difficult to see how such actions could be kept quiet in a small community and not reported in government correspondence.

8.13 Illegal sealing

Sealers would not disclose the exact location of the herds, although some sealing masters stated that seals were taken from feeding grounds adjacent to the Lobos Islands (Harding 1903a).

They may also have been illegally sealing on the Jason Islands, and:

Seem able to carry on this nefarious activity unmolested. The question has often been asked "What are the men-of-war about, spending nearly all their time in Stanley Harbour and why do they not go around the islands to protect the seal fisheries" (Falkland Islands Magazine 1902b).

According to another correspondent:

You will hear that there has been seal poaching on the Jason's to an awful extent last February and March (close season). It does seem hard that the Government has been so determined about the number to be killed every year, so that the seals should not be wholly destroyed ... and without the least effort at protection simply allow the schooners to take as many as they want. Surprise visits are needed from the gunboats during the close season, and then we would have no more seal poaching (Falkland Islands Magazine 1902c).

Others were less certain, since:

... There seems to be much truth in the statement that the skins have been mainly taken at sea though those who ought to know still insist on the certainty of the Jason Islands having been raided, the discovery of the dead pups and the wildness of the herds affording reason for belief (Harding 1903a).

The large Canadian catch in the 1903-04 season would also:

Go far to disabuse people's mind of the idea that they have been caught close around here. It is the general impression however that the skins are procured between here and Montevideo, and it remains to be seen whether the harvest now being reaped by these sealers will have a detrimental effect upon the catch another year. Meanwhile, there will be rejoicing in Nova Scotia and British Columbia (Falkland Islands Magazine 1903a).

The Governor, Executive Council and Commodore of the Royal Navy's South Atlantic Squadron met to discuss these concerns.

Their opinion was that:

As Commodore Finnish spent 2 years on the Pacific Station patrolling the Bering Sea [in HMS Nymphe, which prior to transfer to the Falkland Islands had ordered the E.B. Marvin to return to Victoria, British Columbia, after she had been arrested in 1891 by the United States Revenue Cutter Richard Rush in the Bering Sea (Wright 1897)] his views carry considerable weight. ... He thinks it unlikely that the Canadian sealers raided the Jason islands, but it is quite possible that pelagic sealing carried on by them even though a few hundred miles distant, may have considerably injured the rookery. ... The presence of dead pups on the rookery is not proof that they have been killed there. The mother goes away in search of food, and if shot or speared on the journey the pup dies from want of food. The Commodore says he has seen hundreds of instances of this on the Pribilof Islands. ... The only way of protecting the rookeries is to have a man living on the island (Harding 1903b).

It was considered unreasonable to use visiting naval vessels for rookery protection, and:

I doubt if the Admiral will send any gunboat to do any patrolling and now that the ships on the station are reduced to two, there is scarcely any chance of a surprise visit even. As the Commodore says, who will pay for the price of coal consumed by the gunboat? The value of the property is hardly equal to the cost of protection (Harding 1903b).

HMS Nymphe was dispatched from Stanley on 18 November 1903 to Jason, Carcass and New Islands. The only evidence of poaching was a report from New Island that unidentified schooners had been seen. Since the crew of HMS Nymphe mistakenly identified two rocks near Weddell Island for approaching schooners, such claims may be invalid (Falkland Islands Magazine 1903c).

Only 93 skins were taken by licensed domestic sealers in 1902 (Appendix 5), possibly indirect evidence of poaching. Direct confirmation of illegal sealing on the Jason Islands was obtained from a ship's log found in Stanley harbour (Strange 1972b). The log belonged to Baden-Powell (Appendix 8) wrecked at Elephant

Jason Island on 22 November 1907. A transcript of a January 1984 interview with Mr W. Hirtle, 12 Drury Street, Stanley, gives further details of the wrecking (Lawson 1985b):

His father from Hirtle Island, N.S. was on the Baden-Powell. He gave this account. Captain's name was Anderson, 1st mate Oswald Christian. Left Halifax, N.S. in September 1907, sealed off the River Plate, got 60 skins, arrived Falklands in October 1907. Hunted with the boats, 2 men to each. In November anchored in Gulch on North side of Elephant Jason Island. Mate was sure anchorage was safe. Wind arose from the North and the ship dragged onto a large rock and started to break up. Crew jumped onto this rock, passed food, guns, and the boats across and hauled these up the cliff. The ship sank in very deep water. Crew stayed on the island for ten days, then rowed to Pebble Island which took two days. They stayed there over Christmas helping with the farm work. The sister ship Alice Gertrude arrived three weeks after the wrecking. The crew were taken into Stanley in the Pebble Island boat Richard William. Of the crew of 17-20, three stayed in Stanley. One had a broken leg, he later left for Canada. Two married in Stanley, Robert Hirtle, a Canadian and Karl Lindenberg, a Russian-Finn. Also in crew a man named Corkum.

The vessel was blown ashore on the way from Halifax to the South Shetland Islands (Falkland Islands Magazine and Church Paper 1908a). Her crew were shipped from Stanley to Montevideo and then Liverpool, except for four who had earlier married and settled in the Falkland Islands.

Nevertheless:

There is strong reason to suppose that she was there for an illicit purpose, although there was not sufficient evidence for a police prosecution (Allardyce 1908d),

and that an:

Explanation that the Baden-Powell was at the Jason Islands to get shelter is untenable since it is a dangerous harbour (Allardyce 1908e).

In spite of the sinking of Baden-Powell,

Seal poaching around the Falklands appears to afford as great temptations as ever it did ... a Nova Scotian schooner rejoicing in a double name and commanded by a man well known in Stanley was recently very busy in the neighbourhood of Bird Island. Whilst deprecating in the strongest manner this unlawful trenching upon our colonial rights, a certain feeling of satisfaction we must confess to, namely that these ill gotten gains do not go into the pockets of foreigners [= Chileans] (Falkland Islands Magazine and Church Paper 1908b).

Others placed the blame elsewhere, presumably on Chilean sealers, since:

Neither Mrs Hansen nor any other person I have met in this Colony has for a moment suggested that the periodical poachers of our seal rookeries are the Masters and crews of Nova Scotian vessels. They are not that class of man ... (Allardyce 1906b).

Concerns were expressed that fur seal stocks in the Dependencies would be destroyed, protection from the Falkland Islands being impossible. The British Consul in Montevideo was instructed to warn:

The Masters of British and other nationality sealing vessels that a licence was to be obtained at the Colonial Secretaries' office in Stanley, since it is illegal to seal around the South Shetland and South Orkney Islands (Allardyce 1908f).

Illegal sealing was of particular concern at South Georgia, where sealing rights had been leased to the Compañía Argentina de Pesca in 1909 (Chapter 10). The South Georgia magistrate was asked to find out if Agnes G. Donahoe, Hilda R., Isabel May, Latooka, and Yolando were sealing there, crew mail at Stanley Post Office indicating they were active in the Dependencies (Thompson 1911a). Agnes G. Donahoe was sighted on 21 December 1910 by a catcher from the Compañía Argentina de Pesca, sailing towards

the South Sandwich Islands (Wilson 1911a). She may have met Village Belle who took 80 skins there in 1911 (Yarmouth Herald 1911a).

8.14 Financial concerns

The Seal Fishery Ordinance 1899 (Falkland Islands 1899) required that 4/- royalty be paid to the Colonial Treasury for every fur seal skin taken from rookeries on the Falkland Islands. This was applied to the Dependencies by the Seal Fishery (Dependencies) Ordinance 1909 (Falkland Islands 1909). Canadian sealers operated outside these regulations, avoiding royalty payments.

Financial input into the Colony was mainly in the form of Post Office money orders (Harding 1902a) and bank drafts against the account of C.M. Lampson & Co. in London to buy supplies and provide cash advances for crews (Harding 1903c).

Since specific information on the number of skins taken is unavailable, the revenue loss to the Colonial Treasury cannot be accurately estimated.

936 skins taken by Edith R. Balcom from the South Orkney Islands in 1906 (Kellogg 1942) sold for US \$15 each, about £3 at prevailing exchange rates (Pacific Fisherman 1906b). The same vessel also took skins from the South Shetland Islands during:

An expedition which was undertaken because seven skins taken there last year brought phenomenal prices in the London market and were pronounced the best skins put on sale ... the seals are large and the skins of great value. It is regarded as likely that this will prove to be the opening up of the best seal rookery in the world (Pacific Fisherman 1906a: 20).

588 skins were sold at £4. 6. Od. each (Pacific Fisherman

1906b). Assuming at least 60 000 skins shipped from 1902 to 1911 (Table 8.2) at a minimum sale price of £2 per skin, products valued at £120 000 left the colony, some 6% of total export values of £2 112 135 for the same period (Appendix 6). If the 4/- royalty had been paid, this would have produced some £12 000 for the Treasury, an estimated 7% of ordinary revenue of £176 499 for the same period (Falkland Islands Annual Reports 1902-1911). Royalty payments of at least 28% of ordinary revenue of £33 082 could have been made in the peak 1903-04 season.

The Tariff Ordinance 1900 was amended on 8 September 1903 by the Tariff (Amendment) Ordinance 1903 (Falkland Islands 1903) giving the Government power to set duty payments on skins trans-shipped from the Colony. The object of the new tax was to prevent seal poaching rather than raise revenue (Lyttleton 1905). The Ordinance was not brought into effect until 31 January 1904, allowing sealers to export their 1903-04 catch duty free (Harding 1903d). This may have contributed to the high catch (Tables 8.2 and 8.3), sealers increasing their efficiency to take advantage of the duty free period (Strange 1972b). It is impossible to determine if this happened, or if sealers increased the catch by finding new rookeries and pelagic herds during their second and third operational seasons.

The first tariffs under the new Ordinance were introduced on 13 June 1904. 10/- duty was levied on each skin taken during the November to February close season specified in the Seal Fishery Ordinance 1899. 1/- per skin duty was levied on skins taken at all other times (Falkland Islands 1904b). It is unclear how this distinction was to be made, but since most skins were taken in the close season the duty was effectively 10/- per skin.

If the 10/- duty had been in effect from 1902 to 1911, and assuming at least 60 000 skins exported (Table 8.3), some £30 000 revenue could have entered the Colonial Treasury, amounting to 17% of ordinary revenue of £176 499 for the same period (Falkland Islands Annual Reports 1902-1911). During the most productive 1902 to 1904 seasons (Table 8.2) at least £21 790, some 55% of ordinary revenue of £39 350 (Falkland Islands Annual Reports 1902-1904) would have been paid.

Imposition of the duty was unfavourably received:

Local feeling is very strong against the measure, as these men have been very liberal and have circulated a good deal of money in the place (Harding 1903d).

Opposition occurred because of fears among merchants that sealers would leave Stanley, and although:

The vessels may not be of much advantage to the Colony, they circulate a fair amount of money. The Governor has an idea that they dare not go to Montevideo to ship their skins, and would rather pay something than be debarred from shipping their catches from here, and desires to bleed them as much as he can (Harding 1903e).

C.M. Lampson & Co. (1903) also protested, albeit from probably ulterior motives, arguing that Canadians had contributed to the economy of the islands and:

It is they that would suffer most, driven as they will be to the South American ports, where the treatment they will meet with is likely to be problematical in the extreme.

Sealers protested, and discussions were held with the Governor wherein:

The Governor informed them that he proposed a tax of 10/- per skin if taken during the closed season and 1/- per skin if taken during the open season.

Seeing that these seals are taken in the open seas and at some latitude known only by the sealers themselves, it would be difficult to define a line between the open and closed seasons. Capt. Balcom informed the Governor that a protest had been made in Canada against the tax, which apparently was news to His Excellency, and he agreed that no tax should be imposed before the end of May, by which time they will have all returned with their catches (Harding 1904a).

Canadians maintained that skins were taken outside the jurisdiction of the Falkland Islands Government, and did not return to Stanley in 1905 (Appendix 7). Their skins were shipped duty free from Montevideo and Punta Arenas.

The first Canadian schooner to enter Stanley after imposition of the duty was Markland on 1 January 1906. She brought 1 000 skins which Capt. LeBlanc hoped to tranship, possibly to save time and allow him to make a further voyage. LeBlanc unsuccessfully:

Offered the Government a substantial amount to be allowed to tranship, but the terms of the Ordinance did not permit its consideration.

Also, he expressed a willingness on behalf of the sealing masters to pay a duty of 1/- per skin, stating that they felt bitter about the prohibitive 10/- duty imposed, much preferring also to come to a port under their own flag to winter over (Allardyce 1906c).

The skins were shipped from Punta Arenas (Falkland Islands Magazine 1906), the Governor feeling:

Such a brute to be turning away British ships and legitimate British trade from a British Colony into South American ports where they look upon us as semi-madmen (Allardyce 1906d).

The sealers complained to no avail, they:

Do not think it right to go to foreign ports since they are all taken on the high seas (Robbins 1906).

The Governor's failure to reduce or eliminate the duty upset islanders, who had hoped that Canadian crews would return to winter in Stanley since:

It is pleasing to know that this number of English speaking men are in a place for so many months, where there is comparatively little vice, and where they are in easy reach of the services of a church. Numbers of the men attended all the services regularly, and were generous subscribers to the different funds and charities. Were the ships to come here annually they would also afford an opening for some of the young men who wish to try for fortune elsewhere. Such openings are badly needed, work here is limited in scope and extent, and unless something happens we shall have to apply for State-aided emigration in the near future (Falkland Islands Magazine 1906: 5).

Vessels did return (Appendix 7) but less frequently.

At least eight were sold or wrecked by the end of 1907 (Table 8.4).

Fewer voyages were made, and catches declined (Appendix 7).

Merchants lost even more trade, and local opposition increased. The duty would:

Penalise if not altogether destroy an important industry, and drive away British ships and British trade from the Falkland Islands without any compensatory benefit whatsoever (Allardyce 1906c).

A petition was signed by the majority of residents, protesting that:

We who live in this isolated Colony have a right to have our wishes regarded in a question which so vitally affects our welfare. Probably this is the only Colony in the world where no facility exists for ventilating the wishes of the inhabitants, for we have no newspaper in which our views could be expressed ... we consider it the greatest injustice that a Governor and his three officials should have the power to pass a law setting at nought the opinion of the whole community ('Petition' 1906).

Table 8.4: Eventual fate of Canadian sealing vessels active in the Falkland Island and Dependencies from 1902-12
(Official Shipping Registers, [n.d.])

Vessel	Date original register closed	Reason
Agnes G. Donahoe	1913	Wrecked, Digby Gut N.S. 1913
Alice Gertrude	1913	Sold to Robert Irvin, Shelburne, N.S.
Annie E. Larder	1916	Lost at sea, North Atlantic 1906
Baden Powell	1908	Wrecked 23 November 1907 on Pebble Island [Elephant Jason Island?], Falkland Islands. Crew saved.
Beatrice L. Corkum	1907	Sold to Halifax (or Liverpool) N.S.
E.B. Marvin	1921	Lost at sea, East Coast of North America 1912
Edith R. Balcom	1908	Stranded, Argentine coast, 18 March 1908
Edward Roy	1926	Transferred 1905 to Andrew King, St. John's, Nfld.
Florence M. Munsie	1905	Sold to 'foreigners' at Punta Arenas, Chile, 1905
Florence M. Smith	?	?
Hattie L.M.	1908	Sold to Chile, 1906
Hilda R.	?	?
Ida M. Clark	1923	Transferred to Arthur Gillett, Twillingate, Nfld., 1923
Isabel May	1911	Transferred to Halifax, N.S. 1911 and Victoria, B.C. 1916
Latooka	1917	Transferred to Smith Company Ltd., St. John's, Nfld.
Leslie L.	1907	Lost at sea, 1907
Markland	1906	Transferred to Victoria, B.C.
Ola M. Balcom	1905	Stranded, St. Pierre-Miquelon, 31 October 1905
St. Clair	1905	Transferred to Robert K. Bishop, St. John's, Nfld., 1905
Village Belle	?	?
Yolando	?	?

With unanimous support from the Executive and Legislative Councils, Governor Allardyce asked the Colonial Office to reduce the duty to 2/- per skin or remove it altogether, especially since:

Argentine authorities had, through their officials there [Buenos Aires] notified the Canadian sealers that if they took their seal skins to Buenos Aires, they would be permitted to ship them without any restriction, and they were urged to take advantage of the superior facilities thus offered (Allardyce 1906e).

His request was treated unsympathetically since:

If these operations are such as the Colony need not hesitate to countenance, what is called for is not a reduction, but the abolition of the tax. That however I much regret, is not a step which as at present advised I can sanction (Lyttleton 1905),

particularly since the Canadian government had not protested.

In eventual deference to the residents' wishes the Tariff (Amendment) Ordinance was revoked on 14 May 1906 and replaced with a 1/- per skin duty (Falkland Islands 1906a). Sealers continued to go to Montevideo and Punta Arenas, so that:

I do not think we shall see any more of them as long as any export tax on sealskins is imposed. Some of these vessels have transhipped their catch at Montevideo without any sort of hindrance, in fact they have had facilities put in their way and these Captains have strongly recommended others to go to Montevideo in preference to the Falklands (Harding 1907).

Transhipment duty was completely removed on 30 August 1907 (Falkland Islands 1907) but still some sealers did not return. High prices for supplies, poor weather and navigation conditions, and preference for a large town rather than a small settlement for crew relaxation were additional factors preventing their return.

Allardyce (1908g) considered these invalid, although agreeing that there was:

Doubtless a good deal in what is stated, i.e., that a large seaport town has many more attractions to offer to Masters and seamen than a small settlement of 800 inhabitants, where indiscretions and peccadilloes are at times magnified into heinous crimes and assume abnormal proportions.

The loss of transshipment trade is shown by the activities of E.B. Marvin, transshipping 1 148 skins from Punta Arenas and 1 014 from her home port of Halifax to London in 1905-06 (Yarmouth Herald 1906). She transhipped only 640 skins from Stanley in 1907 (Yarmouth Herald 1907b). Some vessels sailed directly to London, Edith R. Balcom taking 1 100 skins there in 1907 (Yarmouth Herald 1907a). She was wrecked on the Argentinian coast on 18 March 1908 after landing 450 skins at Montevideo (Falkland Islands Magazine and Church Paper 1908c). The crew were saved, but the loss of 'The Queen of the Halifax fleet' was a financial setback for her owners (Yarmouth Herald 1908b).

Capt. Mathew Ryan of Alice Gertrude reported (Falkland Islands Company 1908) that six vessels entered Stanley with less than 500 seals after three months' work in 1907-08. Sealing was now becoming uneconomical since:

The seals have left the grounds upon which they have been found during the past few years, and it will be necessary to seek them elsewhere (Falkland Islands Company 1908).

It was also difficult to get experienced crews. Many with Bering Sea experience had already left the industry, dispirited by Japanese successes with guns, Canadians being required to use spears (Yarmouth Herald 1908a).

Profitable voyages were still thought to be possible, unsuccessful negotiations beginning in 1907 on exclusive leasing of the Colony's fur seal rookeries to the Canada Sealing Company (Chapter 7).

Sealing declined further after 1908. Only one Canadian vessel entered Stanley in 1909. No entries and catches are recorded for 1910 (Appendix 7). A slight increase in activity occurred in 1911, six vessels which left Nova Scotia in 1910 taking an estimated 6 870 skins (Table 8.3). This may have been caused by a desire to take remaining stocks for quick profit when Bering Sea sealing temporarily ended after the 1910 season. Ida M. Clark (Capt. Frederick W. Gilbert) returned to Stanley empty, where a brief mutiny occurred:

The men have nothing coming to them, and of course that makes it pretty hard: we know that poverty is no disgrace, but it is very inconvenient (Yarmouth Herald 1911a).

Allardyce (1911a) unsuccessfully suggested that vessels might overwinter in Stanley if improved docking and repair facilities were constructed.

The 1911 North Pacific Fur Seal Convention prohibited sealing in the Bering Sea, and companies were probably unable to survive on decreased southern hemisphere catches. The last Canadian sealing vessels entered Stanley in ballast in 1912 (Appendix 7) precluding action being taken on the request (Allardyce 1911b) that Great Britain, Argentina, Uruguay and Chile should introduce similar cooperative legislation prohibiting pelagic fur sealing below 33°S and further depletion of already low stocks.

Some of the pelagic sealing vessels registered in Victoria were auctioned there for low [but unspecified] prices on 26 June 1912 (New York Times 1912).

The sealing companies' profits from hunting around the Falkland Islands and Dependencies are impossible to estimate accurately. There is no information on the companies in the Public Archives of Nova Scotia, and although the records of the Victoria Sealing Company are in the Public Archives of British Columbia there is little information relative to the Falkland Islands (Lawson 1985c).

Bendt (1892) estimated the total cost of a Bering Sea pelagic sealer at some US \$6 000. Liebes (1892) estimated the cost at US \$4 500 with US \$2 000 required for outfitting. Williams (1892) suggested a total investment of some US \$7 500. The E.B. Marvin valued at US \$9 500 (Myer 1892) was sold by its original owners on 7 November 1892 for US \$6 000 including equipment (Henry 1892).

Inflation and increased voyage time and expenses must have required investment in excess of US \$7 000 per vessel when sealing began at the Falkland Islands in 1902. When Edith R. Balcom was wrecked in 1908, vessel and gear were valued at US \$16 000, but only insured for US \$7 000 (Yarmouth Herald 1908b). Since some of the vessels were quite old by the time sealing began (Appendix 8) construction costs had probably already been recovered. Assuming some US \$5 000 fitting out and crew costs per season, it seems (Tables 8.5 and 8.6) that the industry was only marginally profitable up to 1906. The demise of the Victoria Sealing Company exemplifies this. Incorporated on 22 November 1900 from the British Columbia Sealing Association, a mutual assistance group formed in 1899, they were bought out by the Bank of British North America in 1908 to recover investment (Lawson 1985c). Some vessels found other activities more profitable.

Table 8.5: Approximate number and value of skins transhipped by E.B. Marvin from Stanley, 1903 to 1908 (Appendix 7)

Year	Approximate number of skins transhipped	Approximate cargo value (£) at £2 per skin
1903	3 953	7 906
1904	3 075	6 150
1905	-	-
1906	2 162	4 324
1907	640	1 280
1908	385	770

Table 8.6: Approximate skin transhipments and values for Victoria Sealing Company vessels, Stanley 1903 to 1908 (Appendices 7 and 8).

Year	Approximate number of skins transhipped	Approximate cargo value (£) at £2 per skin
1903	7 487	14 968
1904	3 075	6 150
1905	-	-
1906	3 162	6 324
1907	640	1 280
1908	385	770

Hattie L.M. (Capt. McCleod) left Halifax in 1903 to go sealing, but her crew found gold in Patagonia and decided to abandon sealing (Courier 1903).

8.2 Chilean sealing

Chilean vessels from Punta Arenas were also sealing on and around the islands, Elena (Capt. Leing) being at Stanley on 3 February 1903 to tranship large numbers of skins, allegedly taken off Argentina (Grey-Wilson 1904a).

Illegal hunting took place, particularly on the Jason

Islands where:

I regret to say that one of her sons [of Sarah Hansen, the licensee] found a party of men poaching at the rookeries. They were ten in all, evidently Chileans as they could not speak English. Armed with knives etc; and would not allow Stanley Hansen to go near the rookery. Upon receiving the news, the Governor got HMS Beagle, which was leaving for Montevideo to call at Carcass and Jason Islands on the way up. We have not yet heard as to the results (Harding 1904b).

The poachers may have been from Rapida (Capt. Charles Poole), seen around the islands in February and March 1904. Poole may also have been poaching around the Jason Islands in 1901-02 on Victoria (Allardyce 1905). The Jason Islands and Volunteer Rocks were again raided in 1906, Allardyce (1906f) complaining that since:

We have not got a ship in South American waters, this encourages men like Poole to raid a seal rookery almost within sight of the seat of government, with proportionate loss of prestige to our Flag throughout the adjacent republics, where in the course of a few weeks the escapade will become one of public notoriety.

Capt. Poole had a long police record in Stanley, being arrested 12 times from 1896 to 1902 on a variety of offences ranging from use of abusive language to unlawfully taking 67 fur seals from the Volunteer Rocks in 1902 (Allardyce 1905a). After this last offence, he left the Colony to live in Punta Arenas becoming:

A seal poacher, rookery raider and daring adventurer who from time to time has been a source of considerable annoyance to this Government (Allardyce 1908h).

Poole was killed at Puerto Madrin in 1908 after returning from an unsuccessful poaching voyage to the Falkland Islands

on Rapida, when only three skins were taken (Falkland Islands Magazine and Church Paper 1908d). A mutiny ensued, during which Poole threw several of the crew overboard. The mate then threw him overboard and shot him whilst in the water, one of the mutineers unsuccessfully attempting to remove a diamond ring from his finger as he sank (Allardyce 1908h).

Allardyce (1908h) appears to have had some admiration for Poole, who:

Despite his piratical and buccaneering propensities was a clever, civil spoken and daring mariner. ... He was invariably smart and well dressed, and in a land of apathetic, phlegmatic and more or less atrophied people, it was pleasing at times to come across a person of indomitable energy, though unfortunately misdirected, who in small schooners, often badly found, conjured with the elements and gaily defied the fiercest gales of this tempestuous latitude, thereby achieving success where less bold mariners with better found craft did not dare to venture.

Rapida was an ex-Canadian schooner, Hattie L.M. (Appendix 8) sold to unidentified Chilean interests in 1906 (Table 8.4). After Poole's death, she was bought by G.J. Lyse and W.D.N. Bettle of Pebble Island for coastal work (Falkland Islands Magazine and Church Paper 1909a), being wrecked on Bleaker Island on 11 July 1911 (Headland in press).

Further evidence of Chilean poaching is available in a letter from one Capt. Malcolm (1908) to Poole explaining how:

I got on in the ss Frithiof. I got a job of Navigator of her ... we sighted West Point Island, they [presumably the Chilean crew] asked me to take her into West Point. I told them No. I had no orders to enter into any port in the Falklands. Lay to all night, next day we went to the Elephant Jason ... landed and killed 162 seals ... went to Brett Harbour, landed men and they killed three lambs and one wether ... went back to Elephant Jason, killed 235 more seals.

An incident was also recorded in the same year (Falkland Islands Magazine and Church Paper 1908e) when a small steamer, her name covered, was observed signalling the Jason Islands. It is possible that this coal burning vessel may have also been the ss Frithjof [= Fritiof, sent in 1903-04 to rescue the Swedish South Polar Expedition from Snow Hill Island (Roberts 1956)]. The last available record of illegal Chilean sealing occurs in 1912, when one Oreste Grande, master of Antarctica, was fined £200. Where he committed the offence is not specified (Allardyce 1912b).

8.3 Summary and conclusions

Canadian pelagic fur sealing began from British Columbia in 1868, Northern fur seals being hunted in the north Pacific Ocean. The sealing schooners were often constructed at lower cost in Atlantic Canada, then sailed around Cape Horn. Crews observed fur seals during passage, making their first pelagic catch from South American waters in 1894-95. Concerted Canadian exploitation of the Falkland Islands fur seal stock began in 1902 to supplement reduced catches of Northern fur seals after late 19th century over-exploitation. Chilean sealers may have first visited the Falkland Islands in 1903, poaching fur seals from rookeries. Documentary evidence of vessel sightings, wreckings and arrest shows that Canadians were illegally sealing on rookeries and pelagically off the Falkland Islands, Dependencies, and the south-east coast of South America.

Canadian sealers took 60-70 000 fur seal skins from the Falkland Islands, Dependencies and South America until 1912. Many more were lost when they sank after death. Information on the number of fur seals killed by Chilean sealers is unavailable to the author.

The Canadian catch was mainly from South American waters and rookeries, unregulated 18th and 19th century fur sealing having seriously depleted the Falkland Islands stock. Further decreases probably occurred because of this additional sealing. The licensed Uruguayan catch from Lobos Islands rookeries also declined, the stock perhaps being reduced by Canadian poaching and pelagic sealing.

Canadian vessels brought fur seal skins to Stanley for transshipment to London where they were used to make ladies sealskin coats. Chilean crews took skins to Punta Arenas for sale on the domestic market. Canadian sealers put money into the Falkland Islands economy from the purchase of supplies, however revenue was lost to the Government from non payment of the 4/- per skin royalty required under the Seal Fishery Ordinance 1899 for fur seal skins obtained from the Colony. The sealers argued that the skins came from outside colonial waters and were exempt from the royalty. In an attempt to raise revenue, the Falkland Islands Government imposed a 10/- per skin transshipment duty in 1904. This action was unsuccessful, Canadian crews going to Montevideo and Punta Arenas in 1905 to tranship their skins duty free.

Merchants in Stanley protested to the Falkland Islands Government about their consequent loss of income, demanding that the duty be removed. The Government reduced the duty to 1/- per fur seal skin in 1906, and removed it the following year. Some Canadian sealing vessels returned, although less frequently than before 1905 due to high prices for supplies and fewer vessels in the industry because of the difficulty in getting profitable cargoes from depleted stocks. The deleterious effect of Canadian and Chilean pelagic sealing on the Falkland Islands stock and

the domestic sealing industry prompted the Governor of the Falkland Islands to suggest in 1911 that joint legislation be developed by Great Britain, Argentina, Chile and Uruguay to prohibit pelagic fur sealing below 33°S.

Southern pelagic sealing ended after 1911 because of low stocks and profits. No further action was taken on joint preventative legislation, and it is unlikely that it would have been successful since South American nations previously welcomed Canadian sealers avoiding payment of the Falkland Islands transshipment duty.

Northern fur seal skins taken pelagically and illegally in the North Pacific Ocean by Canadian sealers may have been shipped to the Falkland Islands and transhipped to London in an attempt to disguise their true origin. There is no evidence available to the author to indicate that this occurred.

Canadian and Chilean sealing contributed little to the Falkland Islands' economy, and further reduced the stock to the detriment of the domestic sealing industry.

Chapter 9

The Falkland Islands Sealing Industry, 1919 to 1967

9.1 Postwar stocks and their protection

Only two sealing licence applications were made during World War I. Local interest increased after the war (Table 9.1) but no licences were issued to the knowledge of the author.

Table 9.1: Sealing licence applications, Falkland Islands
October 1916 to January 1920 (St. Johnston 1920)

Applicant	Application date	Location	Catch limit (fur seals)
Jason Hansen	2 October 1916	Jason Islands	-
J.R. Carey	30 March 1918	Bird Island	-
R. Bailey	28 March 1919	Volunteer Rocks	150
J. Coleman	21 May 1919	Volunteer Rocks	-
W. Ratcliffe (Jr.)	22 November 1919	Bird Island	200
		Volunteer Rocks	100
G.E. Parrin	25 November 1919	Volunteer Rocks	100
A.C. Crichton	1 June 1920	Request by the Sociedad Frigorifico Punta Arenas for sealing licence for <u>Diana</u> and erection of a seal oil refinery (Crichton 1920).	

The first fur seal census was made from 9 November 1919 to 17 February 1920, Hamilton (1920) estimating 5 000 at the Jason Islands, 500 at Volunteer Rocks and 50 at the Beauchêne Islands.

There were no carcasses on the rookeries to indicate recent poaching, the presence of wartime naval vessels being regarded as a deterrent. It is unlikely that the Royal Navy would be interested in poachers, rather that poaching was no longer profitable. However Diana, owned by the Sociedad Frigorifico

Punta Arenas, sailed on 16 October 1920 to the Falkland Islands with a load of timber, the owner accompanying her to get a sealing licence and permission to erect a seal oil refinery (Crichton 1920). There is no evidence available to the author to indicate that a licence was awarded, 90 fur seal skins which she brought back to Punta Arenas presumably having been taken illegally. Señoret also left Punta Arenas on 24 December 1920, ostensibly for Diego Ramirez, returning 22 days later with 800 skins probably taken from New and Jason Islands (Betteridge 1920).

Canadian sealers still visited the islands occasionally.

Eva June (Capt. Mathew Ryan) from Halifax was in Colonial waters in 1920 (Martin 1920) whilst sealing in the "South Seas".

Her master was told before leaving Canada that all sealing laws were to be obeyed (Canada 1920). Some 12 000 skins were taken, reportedly from some 150 miles east of the Uruguayan coast (Middleton 1922a).

To discourage possible illegal sealing, Hamilton (1920) proposed that a 3-inch gun be mounted on Elephant Jason Island to fire warning shots at suspected poaching vessels. The Admiralty was wary of the associated practical and legal problems involved, preferring instead to station an armed patrol vessel in the Colony (Colonial Office 1920a). The Stanley harbourmaster was instructed to suggest possible protection options. After visiting the rookeries he recommended that a three-man guard equipped with Lewis guns and revolvers be stationed on each island. When necessary, smoke signals were to be sent to a mainland telephone station, and a message would be sent to Stanley to dispatch an armed vessel to arrest the miscreants. The cost was to be covered

by profits from a presumed fur sealing industry (Hockly 1921).

Fur sealing in the Colony and Dependencies was prohibited from 23 March 1921 (Falkland Islands 1921a) on penalty of a £100 fine and confiscation of skins taken (Falkland Islands 1921b). Sealing Officers were to be appointed with powers of inspection and arrest under the Seal Fishery (Consolidation) Ordinance 1921 (Falkland Islands 1921c) which repealed the Seal Fishery Ordinance 1899. Territorial waters, Elephant Jason, Beauchêne and Bird Islands and the Volunteer Rocks were declared Crown Reserves on 22 February 1922 (Falkland Islands 1922a) under the new Ordinance. An ex-Royal Navy drifter HMCS Afterglow was purchased for £1 000, refitted and sent to the Colony at a further £7 866. Her Hotchkiss and Lewis guns were sent on a commercial vessel via Montevideo, ostensibly to reduce sailing costs (Crown Agents 1921). Armed guards were stationed on Elephant Jason Island, with instructions on the preventive measures which they and the Afterglow could take (Middleton 1922b).

Although considered:

Necessary to protect [the rookeries], utmost discretion will be exercised dealing with raids, to prevent any serious international complications (Middleton 1921).

A further examination of the Bird and Elephant Jason Islands rookeries recorded 500 fur seals at the former and 'maximum' at the latter. It was suggested that rookery expansion could occur if sea lion stocks, estimated at a minimum of 6 000 on Elephant Jason Island (Bennett 1923) were reduced to decrease competition for space and food. 8 121 sea lions had been taken off the Lobos Islands from 1919 to 1922, their skins being converted into shoe

and bag leather (Smith 1927). It was hoped that profits from a similar operation in the Falkland Islands would contribute to the expense of fur seal protection (Hamilton 1922). Afterglow was fitted with a boiler to produce oil, a sample being sent to the Imperial Institute of London in March 1923. Analysis showed it to be of good quality, and an unidentified company offered £30 per ton for a trial shipment of 100-200 barrels delivered to Liverpool (Falkland Islands 1924).

Fur seal counts in 1922-23 estimated 1 544 animals on Elephant Jason Island, 500 on Bird Island and 193 on Volunteer Rocks, some 3 000 less than in 1919-20 (Hamilton 1923a). This apparent stock decline worried the Colonial Office. The rookery protection costs of Afterglow could not be covered if sealing was not possible from a decreasing stock (Colonial Office 1923).

The Colonial Office was advised on matters relating to sealing by the Trustees of the British Museum and its Director, Dr S.F. Harmer. They were more optimistic, realizing the probable inaccuracy of the estimates and suggesting that stocks could be restored to 18th and 19th century levels if proper protection was given. Recovery of protection costs from hunting was vetoed, as was marked reduction in the numbers of sea lions since gunfire might make the fur seals leave their rookeries (Harmer 1923). The Falkland Islands Government was sceptical of these recommendations, doubting:

Whether the authorities at the British Museum have any conception of the excessive number of sea lions ... or the serious damage done to food stocks for farms (Henniker-Heaton 1924).

The Colonial Office thought that Dr Harmer's:

Nervousness regarding sea lions is entirely misplaced ... we all know he is an extreme protectionist (Colonial Office 1924),

and left the decision on sea lion exploitation to the Governor.

9.2 The Falkland Islands and Dependencies Sealing Company

Fur seal stocks were estimated in 1924 at 8 134, increasing to 9 628 in 1925 (Bennett 1926). It was suggested that further increases might occur if sea lion hunting was prohibited during the 1925-26 season, quieter rookeries leading to decreased fur seal mortality (Middleton 1925). Positive reports were also received from England on the quality and market for sea lion oil (Falkland Islands 1924) and hunting was allowed.

Mr J. Davis of Stanley was authorized on 1 September 1925 to produce 100 barrels of sea lion oil for sale in England. Although details are unavailable from the Public Record Office, since No.1 grade whale oil sold for £30 per ton (Falkland Islands 1927) the experiment must have been successful, and Davis applied for a further licence to produce 1 000 barrels. A portable boiler was to be installed in his own vessel [unidentified], converting it into a floating factory. This was considered more efficient than rendering the oil in a tallow plant on a local farm as done in the trial (Beattie 1927). The licence was approved (Colonial Office 1927) under the Seal Fishery (Consolidation) Ordinance 1921 from 1 April to 31 October 1927. 15 000 sea lions and elephant seals were to be taken from New Island to Arch Island on the south coast of West Falkland Island, the whole carcass to be used as far as possible.

For reasons unknown to the author, Davis did not proceed with his operation, requesting that the licence be transferred to an unidentified newly-formed local company with £10 000 capital and employing Norwegian labour from South Georgia. A request was made to extend the licence to a three-year period, with 30 000 sea lions and elephant seals to be taken anywhere in the Colony. A further 20 000 were requested from the Dependencies other than South Georgia where the Compañia Argentina de Pesca held the licence (Part V). The Governor approved the licence transfer and change since:

This project has been conceived as a direct result of my policy of fostering outside interests, and submit that it promises to inaugurate a new epoch in the economic life of the Colony (Hodson 1927).

The company may have been the Falkland Islands and Dependencies Sealing Company, established in Stanley in 1928 under the directorship of Messrs G.J. Felton, J. Grierson, D.W. Roberts and D.R. Watson, the Company Secretary (Watson 1931a). Information is unavailable to the author about the role, if any, of Mr J. Davis in the company.

The company rented land at Northwest Arm, Port Albemarle, erected a jetty and storage sheds, and equipped Belleville with a portable boiler. Sealing took place from 23 June 1928 to 10 January 1929 although beset by several problems. Belleville was withdrawn from service from 29 July to 3 September with crew and engine troubles, and an eight day overland drive of some 800 sea lions to Albemarle ended with only 200 arriving, the others evading their drovers on the way! During capture (Dixon 1933):

Animals are driven by a plaited hide whip towards a central corral in groups of 20, and shot using .303 service rifles. The beach side gate is opened and they are gutted on the beach. The beach is cleaned every day. The carcasses are connected to a strop, and hove on board 30-40 at a time, then carried to the station for processing.

The company killed 3 908 seals (Table 9.2) for 230 tons [1 380 barrels] of oil (Watson 1929). Sealing was not always done legally, many of the elephant seals taken were undersized one or two year olds (Hamilton 1931).

Table 9.2: Catch distribution, Falkland Islands and Dependencies Sealing Company 1928-29 (Watson 1929)

Location	Catch of			Total
	Sea lions	Elephant seals	Leopard seals	
Albemarle	2 981	228	28	3 237
Barren Island	22	230		252
Colester Islands	12	12		24
East Island		28		28
Elephant Cays	124	179		303
Pleasant Point		30		30
Shag Island		24		24
Total	3 139	741	28	3 908

With highest London No.1 grade whale oil prices at £30 per ton (Tønnessen and Johnson 1982) the season's production had a gross value of £6 900, some 2.6% of the value of the Colony's total exports for 1929 (Appendix 6). £105 revenue would have

been produced for the Colonial Treasury from the 9/- per ton oil export duty (Falkland Islands 1918). None was exported, the company incurring a deficit of £2 253 (Watson 1931a) purportedly because they used Norwegian sealers who demanded high wages, overtime and production bonus payment, readily paid by Mr Petterzens the Norwegian station manager (Watson 1931b). Afterglow had been hired to carry carcasses to Belleville (Watson 1929) for processing, and the company was also:

Rushed into the extravagant purchase of the Belleville and Albemarle by advice from its Norwegian experts ... as to the integrity of one of whom [Mr Petterzens?] grave doubts are admissable (Hodson 1931).

3 169 sea lions (Hamilton 1939) and 1 961 elephant seals (Hamilton 1931) were taken in the following season, increasing oil production to 550 tons [3 300 barrels], only half the estimated production (Watson 1931b). 450 tons of the oil produced since 1928 were exported to England and sold at £27 per ton (Colonial Office 1931a), a gross value of £12 150, some 5.7% of total export values (Appendix 6). In spite of this sale, shipping and brokerage costs increased the company's debt to £6 322 (Watson 1931a).

The company intended building a guano plant at Albemarle to produce fertilizer for local farmers. Permission was sought to purchase a catcher to get whales in colonial waters and increase the plant's output (Hodson 1929a). A land factory was built to replace Belleville (Falkland Islands Annual Report 1931) but it is not known to the author if it produced guano. There is no record in the Colonial Office files at the Public Record Office to show that a whale catcher was purchased, although the Colonial Office was:

Willing to consider [issuing a whaling licence] if full particulars are sent by mail, including the name and antecedents of the proposed manager [presumably to exclude Norwegian interests] (Colonial Office 1929a).

The company was notified in June 1929 [by whom is unrecorded] that there was a demand for hair seal skins in London at 15/- each. They imported 50 tons of salt from Punta Arenas at £12 per ton, but by the time the first consignment of 154 salted sea lion skins reached London there had been a 50% decrease in the market price. Production, shipping and brokerage costs made it uneconomical to export more, and 320 large and 800 small skins remained stored at Albemarle (Watson 1931a).

A 1929 survey of Elephant Jason Island estimated some 6 000 fur seals (Bennett 1929). The Government awarded the company a licence for £200 to take 2 000 male fur seals from the island between 16 December 1929 and 31 January 1930, and:

All the hair seals which are a menace, and antagonise the fur seal (Hodson 1929b).

It was calculated [how is unknown to the author] that this catch could only be safely taken from a herd of at least 18 000 (Kemp 1929); consequently the Government delayed issuing the licence until Government naturalist J.E. Hamilton reported on the fur seal stock size (Colonial Office 1929b). This fur sealing licence was never issued. Hamilton's report is unavailable in the Public Record Office.

After their first licence expired on 31 October 1930, the company's licence was renewed for a further three years to 31 December 1933. A maximum catch of 30 000 was again specified, sea lions to be taken from 1 April to 15 December and elephant seals

from 1 March to 30 November. 8 541 seals were taken for some 530 tons of oil at an average cost of about £9. 0. Od. per ton [£1. 10. 8d. per barrel] (Table 9.3). Some oil was again obtained from illegally taken undersize and pregnant elephant seals (Hamilton 1936). 1 523 pup and female sea lions were also taken (Table 9.4), and:

Special permission was given at two places to kill all stages of the sea lion due to reported damage to pasture (Hamilton 1934)

although no dates and places are given.

200 tons of oil were exported to England. 100 tons were sold at £24 per ton and 100 tons at £20 per ton, a season's total sale of £4 400, some 2.1% of the value of the Colony's exports (Appendix 6). The market price for No.1 grade whale oil declined during the year to £15 per ton (Hodson 1931), so the remaining 330 tons of the season's production were stored at Albemarle. They were valued at a nominal £7 per ton (Watson 1931a) presumably because of shipping and brokerage expenses.

The Norwegian manager and labourers were replaced in June 1930 with 20 islanders, supervised by Mr Grierson, one of the directors. The wages bill was reduced from £6 143 in 1929 to £3 111 in 1930 (Watson 1931b). Average oil production cost decreased from £11. 8. Od. per ton [£1. 18. Od. per barrel] from April to June 1930 with Norwegian labour, to £8. 6. Od. per ton [£1. 7. 9d. per barrel] from July to December 1930 with local labour (Table 9.3). Using local labour from the beginning of the season may have reduced production cost from £4 850 (Table 9.3) to some £3 250. Since the gross value of oil sales for

Table 9.3: Production figures, Falkland Islands and Dependencies Sealing Company 1930
(Watson 1931a)

Month	Numbers of seals killed					Production details				
	Sea lions (bulls)	Sea lions (pups and females)	Elephant seals	Leopard seals	Total	Oil produced (barrels)	Oil per seal cost (£)	Oil production cost (£)	Approximate cost per barrel (£)	
April			249		249	340	1.36	515 0 6	1 10 0	
May	569	360	154		1 083	366	0.33	654 2 9	1 16 7	
June	359	361	1	2	723	133	0.18	429 7 9	3 5 0	
July	609	460	116		1 185	311	0.26	524 19 4	1 6 11	
August	1 811		10	3	1 824	532	0.29	760 9 7	1 7 10	
September	2 033				2 033	751	0.37	786 7 4	1 0 6	
October	475	342	16	7	840	160	0.19	469 11 4	2 18 2	
November			310		310	303	0.97	394 13 9	1 6 0	
December			294		294	272	0.92	315 18 10	1 3 3	
Total	5 746	1 523	1 150	12	8 541	3 168	0.37	4 850 9 2	1 10 8	

Table 9.4: Statement of Assets and Liabilities,
Falkland Islands and Dependencies Sealing Company 1930
 (Watson 1931c)

Item	Value (£)	Item	Value (£)
Floating property	7 883 0 5	Paid-up share capital	10 250 0 0
Albemarle shore station	3 080 0 0	Creditors	2 300 0 0
Drums	665 0 0	Falkland Islands Co., Ltd	12 131 14 5
Coal	390 0 0	D.R. Watson (Secretary)	559 0 0
Salted sealskins	200 0 0	Dean & Co.	248 8 6
Hunting equipment	100 0 0		
Tools	100 0 0		
Provisions	100 0 0		
330 tons oil @ £7 per ton	2 310 0 0		
Goodwill	1 500 0 0		
Total	16 343 0 5		25 409 2 11

the year was only £4 400, only £1 150 gross profit could have been made. Presumably this would not cover shipping and brokerage costs. The debt increased to £9 146. 2. 6d. by the end of 1930, due mainly to £12 131. 14. 5d. owing to the Falkland Islands Company (Table 9.4) for supplies, equipment and perhaps shipping expenses.

The plant closed early in 1931, although:

It can easily be reactivated when markets approach normal (Watson 1931b).

The company intended to re-open the plant for the 1931-32 season, again requesting a whaling licence for January to May when sealing activity was low.

Elephant seals were an important part of the catch because of their greater oil yields [0.92-1.36 barrels per seal; April, November and December 1930 (Table 9.3)]. The company took 4 438 since 1928, considered an indication that the islands were becoming restocked by animals from South Georgia (Hamilton 1931). The company therefore applied for the end of the elephant sealing season to be extended from 30 November to 15 January (Watson 1931b).

The Governor supported these requests, being:

Influenced in great measure by the desirability of encouraging, especially at the time of prevailing depression in the wool trade, a secondary industry within the Colony ... The sealing company has absorbed recently an appreciable amount of local labour which would otherwise be almost unemployable (Hodson 1931).

The Colonial Office was less sympathetic. The whaling licence would only be allowed on evidence of sufficient capital and resources, which could obviously not be provided, and the elephant

sealing season would only be extended if the company paid the bill for a Sealing Officer to accompany their vessel since there had been:

Evidence of certain abuses regarding the killing of elephant seals (Colonial Office 1932).

There is no evidence available to the author that any of these requests and recommendations were put into practice, although 2 819 sea lions were taken (Hamilton 1939). Production and export data are unavailable from Colonial Office files at the Public Record Office, but since No.1 grade whale oil had fallen to £13 per ton (Tønnessen & Johnsen 1982) it is unlikely that much, if any, was exported.

Although 17 315 sea lions were estimated on Elephant Jason in 1930 (Hamilton 1931), the price of No.1 grade whale oil further decreased to £12 per ton in 1932 (Tønnessen & Johnsen 1982) and the company did not operate. The price increased to £15 per ton (Tønnessen & Johnsen 1982) in 1933, and the company received an offer from an unidentified source for oil at £14 per ton. A one-year licence was issued from 1 July to 30 September 1933 to take 10 000 sea lions and 300 elephant seals since:

The fact that the company has been able to commence operations again has proved a great boon to the Colony (Craigie-Halkett 1933a).

7 512 seals were taken by Port Richard from 5 July to 29 September and 290 tons [1 740 barrels] of oil produced (Table 9.5) at £7 per ton.

Table 9.5: Monthly catch data, Falkland Islands and Dependencies
Sealing Company 1933 (Dixon 1933)

Month	Catch of			Oil production (barrels)	Oil production per seal (barrels)
	Sea lion	Elephant seal	Leopard seal		
July	2 353	17		420	0.18
August	2 516		1	642	0.18
September	2 618		7	678	0.26
Total	7 487	17	8	1 740	0.23

Oil sales reduced the now outstanding £15 000 debt to £12 000; but the amount sold is not recorded in Colonial Office files at the Public Record Office. Debt relief was requested from a refund of the 9/- per ton oil export duty. A one-third catch refund of £43. 10. Od. was agreed to by the Governor (Craigie-Halkett 1933b). Since £130. 10. Od. export duties must thus have been paid, all 290 tons of oil produced in 1933 must have been sold for some £4 000. The Colonial Office would not agree to this refund, presuming that a similar request would be made by the Compañia Argentina de Pesca from South Georgia. Instead they suggested reducing the oil duty to 1/- per barrel for all companies during the 1934 sealing and 1934-35 whaling seasons (Colonial Office 1934a). This reduction was not made, the duty remaining fixed at 9/- per ton [1/6d. per barrel] by the Tariff (Export Duties) Amendment Ordinance 1934 (Falkland Islands 1934).

The company was offered a market in Glasgow for their oil at £13 per ton in 1934. Considering that they would be unable to profit at this price, they applied to the Falkland Islands

Government for a £2. 10. Od. grant per ton of oil produced. The Government agreed to this proposition for reducing company overheads and stimulating employment. Of the estimated £1 000 cost to them, £33. 6d.8d. would be recovered from a pro rata-ed short season licence fee, £225 would come from oil export duties and £1 500 would be saved on unemployment relief payments (Ellis 1934). The Colonial Office were again unsupportive, arguing that other whaling and sealing companies could make similar demands (Colonial Office 1934b). No catch and production records are available in the Colonial Office files at the Public Record Office, and it appears from Hamilton (1939) that they did not operate.

The company were licensed to take 8 000 sea lions and 300 elephant seals (Henniker-Heaton 1935) in 1935. This was increased to 10 000 sea lions and 1 000 elephant seals (Colonial Office 1935) after subjective reports from the company and the Government naturalist of more seals on the beaches than in previous years. 9 219 sea lions (Hamilton 1939) and 565 elephant seals (Hamilton 1936) were taken, but again information is unavailable on oil production and exports. A further licence was issued from 22 March to 31 October 1936 for 6 000 sea lions and 500 elephant seals. This was increased to 11 000 sea lions and 1 000 elephant seals on the presumption that the estimated stock of 250 000 sea lions and presumed increased numbers of elephant seals could support this catch (Henniker-Heaton 1936). 10 000 sea lions were taken, for a total of 32 182 since 1928 (Hamilton 1939). Information on oil production, exports and the numbers of elephant seals taken in 1936 is again unavailable to the author.

Since it was proving impossible to develop a profitable seal oil industry, the Government attempted to find a market for hair seal skins. One elephant seal and two sea lions skins were sent to dealers Culverwell Brooks & Co. of London. They reported that small sea lion skins could be used by furriers, and large ones could be converted into cheap coarse-grained leather. With sale prices of 3/- to 4/- per pound, and pre-sale treatment costs of some 7/- per skin, marketing of sea lion skins was considered uneconomical. Elephant seal hides had a good natural grain but were spoiled by scars, and large numbers would have to be processed to obtain enough unspoilt skin to convert into glove leather. Preparation costs of some 30/- per skin and sale prices of 1d. to 1-1/2d. per pound also made treatment of these uneconomical (Culverwell Brooks 1935). Consequently, the idea of exporting hair seal skins was abandoned.

The sea lion stock was estimated at 370 000 to 390 000 animals by 1937, able to withstand an annual kill quota of 10 000 bulls (Hamilton 1939). However, the company was in its final stages of decline, ceasing operations temporarily in 1938 and finally in 1940, even though No.1 grade oil prices rose to £30 per ton (Tønnessen & Johnsen 1982). Only 4 513 were killed after 1935, 36 696 being taken from 1928 to 1940 (Strange 1983).

The company's failure can be attributed to low No.1 grade whale oil prices, particularly from 1931 to 1938 when extremely low prices made it impossible to clear their earlier debts. Using oil production data for 1930, Hamilton (1934) showed that an annual catch of 10 000 bull sea lions would produce some 450 tons of oil. At an average No.1 grade whale oil price of £20 per ton

from 1928 to 1940 (Tønnessen & Johnsen 1982) gross annual sales of some £8 550 could have been made. With production costs at some £8 per ton and oil export duties at 9/- per ton, this would have been reduced to some £4 750 exclusive of shipping and other costs, probably insufficient to pay off debts and finance a profitable operation.

9.3 British Sealing Industries Ltd

Commander F.A. Worsley applied for a sealing licence in 1928, presuming that women's fashion trends would create a demand for hair seal [presumably sea lion] skins, and:

To preserve the hair seals of the South from ruthless slaughter, and at the same time forward British interests, I suggest that the formation of a British Chartered Company should be encouraged, ... held responsible for policing the islands of the Southern Ocean, and the observance of the Regulations in the interests of Great Britain, the Falkland Islands Dependencies, New Zealand, Australia and South Africa (Worsley 1928a).

The company would be controlled by him, and receive financial support from the United Kingdom Treasury. Worsley (1928b) considered Belleville inefficient for rendering seal blubber and proposed that the company:

Use RRS Discovery at a nominal fee if she is not being used for something else, and will also annex islands, hoist the flag and visit islands [Bouvet, Gough, Heard, Marion, Prince Edward and Thompson!] as required, particularly those considered commercially valuable (Worsley 1928b).

The Admiralty was unimpressed by Worsley's offer to act as a sealer and sovereignty symbol since:

No useful purpose could be served in raising the flag on these islands without the possibility of raising counter claims (Admiralty 1928)

and the idea of:

Chartering Discovery to a private venture would require a great deal of justification. The ship was bought from Government funds for scientific and economic purposes (Foreign Office 1928).

Worsley continued his attempt to get a sealing licence, now to cover the Dependencies and the Antarctic peninsula, which:

Should receive urgent attention as I have definite knowledge that ships are being fitted out by other Nations to fish for seals in the Antarctic this year (Worsley 1928c).

The British Government remained unsympathetic since:

Commander Worsley's grandiose schemes are no doubt partly influenced by his desire to obtain congenial employment (Colonial Office 1928).

Worsley tried a different approach, suggesting the formation of British Sealing Industries Ltd [presumably the 'British Chartered Company' postulated earlier (Worsley 1928a)]. The company was to be under the chairmanship of ex-Governor Sir W.L. Allardyce who retired from the Colonial Service in 1928 (Falkland Islands 1928), and financed by £15 000 private capital and a £10 000 loan from the Colonial Development Fund. The ice-strengthened Madare was to be purchased in Sweden for £6 500, to be under the joint command of Worsley and Commander J. Stenhouse, previously master of RRS Discovery.

Although the company was to establish a factory at Stanley and inaugurate an Antarctic hair sealing industry, they were also:

Anxious to annexe on behalf of the British Empire all outlying islands in the Weddell Sea, ... it must not be overlooked that in addition to the new American interest displayed in the Antarctic, the German, Swedish and Norwegian flags have already been planted on the shores of the Weddell Sea, whilst the Union Jack has yet to find a place there (Smith 1930a).

The factory was to process whole carcasses, producing cattle food, cured skins and dehydrated livers, presumably for later extraction of vitamin A. The skins were to be sold by the Hudson's Bay Company Ltd who had applied to the Falkland Islands Government for a fur sealing licence in 1930 (Chadwick-Brooks 1930) but had been rejected on the grounds that stocks had not reached exploitable levels (Hodson 1930).

British Sealing Industries Ltd was:

Desperately afraid of being forestalled by the pelagic operations of either the USA or Norway. Not having the benefit of modern research work, either of these two nations might resort to the indiscriminate slaughter of the hair seal (Smith 1930b).

However:

If the Government are unable to assist us, I shall not blame them, I shall merely await the advent of our more virile competitors, the Norwegians (Smith 1930c).

The Falkland Islands Government welcomed the scheme, applying for an interest-free £10 000 loan from the Colonial Development Fund, to be re-lent to British Sealing Industries Ltd at 5% per annum interest and repayable over five years. The Fund agreed, and the company was approved to begin operations, albeit with a suggestion that they consider amalgamating with the Falkland Islands and Dependencies Sealing Company (Colonial Office 1930).

The company immediately experienced difficulties. The Hudson's Bay Company Ltd withdrew an offer to invest £5 000 in the scheme, since:

Due to recent changes in the administration of our company, it is now not practical to do this (O'Shaughnessy 1931).

Labour troubles in northern Sweden also prevented the purchase of Madare. The company proposed chartering a Newfoundland sealing vessel, however this led the Colonial Office to question the feasibility of the company's operations, since:

The proposed new vessel would only be chartered and not purchased, thus not available as security and the Colonial Office cannot reaffirm the recommendation made by the Colonial Development Fund. No further source of funds is available (Colonial Office 1931).

With much of the proposed funding now withdrawn, British Sealing Industries Ltd was unable to operate.

9.4 Ventures after World War II

No further attempts were made to establish a sealing industry until the South Atlantic Sealing Company was formed in 1949. Sponsored by the Colonial Development Corporation, their factory was erected at Port Albemarle in July 1950 at a cost of over £15 000. Full carcass utilization of elephant seals and sea lions began using Protector. A quota of 15 000 bulls was allocated for the first three years of the contract, followed by 10 000 annually thereafter. The first season was a failure due to faulty equipment, delayed delivery of machinery and the difficulty of getting local labour to remain on the job. Some 177 tons of oil was produced at a loss of £599. The sponsors took over the operation in December 1950, but most of the 1951 production was also lost due to shortages of local labour. Despite attempts [unsuccessful?] to recruit British labour, operations stopped in October 1951, only 65 tons of oil being produced rather than an estimated 300 tons. Intended oil shipment in 40 gallon drums proved

too expensive, and oil accumulated at the plant while unsuccessful investigations on the feasibility of bulk shipment were made. The company's debt now stood at £24 483, their 1951 annual report estimating that 450 tons of oil would have to be produced in 1952 and 650 tons in 1953 if they were to remain in business. The venture ended after the 1952 season, only 3 045 sea lions and unknown [to the author] numbers of elephant seals being taken since operations began. Part of the reason for an ultimate loss of £50 000 was given as the lack of sufficient elephant seals in the last two years of operation (Fishing News 1952, Cawkell, Maling & Cawkell 1960, Strange 1983).

The company was dissolved on 14 April 1975 (Falkland Islands 1975b). Information on them is unavailable in the Business Register of the London Chamber of Commerce or at Company House, nor on Couper Friend & Co., 33/35 Eastcheap, London, with whom P. Tilbury, manager of South Atlantic Sealing Company, appears to have been associated. The South Georgia magistrate had:

Not been favourably impressed by this man [Tilbury] and on 13 November 1947 endorsed an entry in the official log of Southern Harvester relative to killing and theft of two pigs in which Tilbury was implicated (Magistrate 1947).

In spite of this lack of success, whaling companies at South Georgia were interested in a sealing licence for the Colony.

On 23 November 1953, S.L. Bjelland, manager of Chr. Salvesen & Co. at Leith Harbour proposed using a factory ship to catch and process seals. The Falkland Islands Government were receptive to the idea, although worried that scarce local labour might be employed (Clifford 1954). The Falkland Islands Company agreed

to allow sealing on Lafonia for a "nominal consideration", and it was suggested that the Colonial Development Corporation be approached for the use of the defunct factory at Albemarle (Colonial Secretary 1954). A guarantee was given that local labour would not be used (Administrative Officer 1953a), and a draft licence prepared for full carcass utilization of 10 000 sea lions from 1 May to 30 September, 1 000 elephant seals from 1 November to 15 January and unrestricted numbers of leopard seals (Falkland Islands 1953). Further information on the venture is unavailable in the Scott Polar Research Institute and Public Record Office files.

Albion Star, whaling and sealing at Grytviken (Chapter 11) requested exclusive rights to take 9 000 sea lions and 1 000 elephant seals from the Colony (Pierce-Butler 1955). The Colonial Office gave approval in principle, contingent upon Albion Star becoming registered in either South Georgia or Stanley (Falkland Islands 1956a). The company registered in Grytviken (Falkland Islands 1956b) as Albion Star (South Georgia) Ltd, and a 15-year exclusive whole carcass licence was drawn up for 9 000 sea lions from 1 May to 30 September and 1 000 elephant seals from 1 November to 15 January, at an annual £200 fee. Sealing was allowed in all parts of the Colony except the Crown Reserves of Elephant Jason, Beauchêne, Bird and Volunteer Islands, and certain other leased lands described in an attached licence schedule (Falkland Islands [1957]).

Salvesen's and Albion Star probably applied for licences because of the high prices of £141 per ton and £93 per ton being paid for No.1 grade whale oil in the 1950-51 and 1951-52 seasons

(Tønnessen & Johnson 1982). Their later inability to use the licences was probably due to economic retrenchment during a period of declining whale catches and oil prices in the mid 1950s (Vamplew 1974).

The Falkland Islands Government erred in their attempt to re-establish the sealing industry in the 1950s. Quotas were set on outdated or non-existent information. The potential sea lion catch was obtained from Hamilton's (1939) estimate of some 380 000 animals in 1937, and a suggested annual quota of 10 000. A further census was not done, and the stock may have been declining during the 1950s to the 30 000 estimated by Strange (1969) (Chapter 2). Information on the size of the elephant seal stock was unavailable, although it must have been small. Some 5 000 were taken during 1928-35, and a breeding stock was only re-confirmed in 1934, later estimated at 3 200 (Laws 1960) and 3 500 (McCann 1985) (Chapter 2). A low elephant seal catch was given as one reason for the failure of the South Atlantic Sealing Company after the 1952 season. It is therefore fortuitous that a sealing industry could not become re-established, attainment of such quotas would possibly have seriously depleted the stocks.

An unidentified resident was licensed in 1962 to take 1 500 sea lion skins for tanning. 37 skins were shipped to London in 1964, the first year of operation. About 400 skins were taken in 1966, their second operational year (Strange 1983). The last licence was awarded in 1967, one Robert Bundes of Stanley being given a free licence to take up to 900 sea lions from 1 May 1967 to 30 December 1967 (Falkland Islands 1967a). Further information on these 1960s operations is unavailable to the author.

9.5 Summary and conclusions

The Falkland Islands Government decided that future sealing operations in the Colony must not deplete stocks further. The Government Naturalist therefore made the first census of the island's fur seal rookeries in 1919-20, estimating a stock of 5 500. This was considered insufficient to support an industry, particularly since Chilean fur seal poaching still occurred. Fur sealing was thus prohibited from March 1921 and the Seal Fishery (Consolidation) Ordinance 1921 was introduced, providing for the appointment of Seal Fishery Officers to inspect rookeries and arrest unlicensed sealers. Armed officers were stationed at the major rookeries during the breeding season, and an armed patrol vessel purchased, her crew having the power to impound vessels suspected of poaching. A census in 1922-23 estimated a fur seal stock of 2 237 animals, increasing to some 9 600 by 1925 but estimated at 6 000 in 1929. These fluctuations probably reflect inaccurate census methods. There is no evidence available to this author to indicate that illegal sealing occurred after 1921. The stock therefore increased under the protection of the 1921 Ordinance and the sealing ban.

6 000 sea lions were estimated on Elephant Jason Island in 1922-23, and a total stock of 380 000 in 1937. The Falkland Islands Government considered sea lion numbers to be excessive, the animals purportedly damaging farm land and competing with the expanding fur seal stock for breeding space. Although little interspecific competition occurs between fur seals and sea lions, the Government thought that the fur seal stock would increase further if sea lion numbers were reduced. Licensed sea lion hunting was therefore encouraged, oil to be produced from whole carcass utilization and sold in Great Britain. Oil duty revenue obtained

by the Falkland Islands Government was to be used to defray fur seal protection expenses. The first licence to hunt sea lions was issued in 1925, being transferred to the Falkland Islands and Dependencies Sealing Company in 1928. Annual quotas of up to 10 000 sea lions and 1 000 elephant seals were established. A venture proposed by British Sealing Industries Ltd in the same year failed due to lack of financing. The Falkland Islands and Dependencies Sealing Company operated sporadically and at a loss until 1940, taking some 37 000 sea lions and 4 500 elephant seals. At best their oil exports amounted to only 5.7% of the value of the Colony's exports. The company failed because of low oil prices, high shipping and labour costs and their inability to take more higher oil yielding elephant seals. Unsuccessful attempts were made by the company to increase revenue from skin sales, whaling, and a request for partial relief of oil duties.

Sealing recommenced in 1950, the South Atlantic Sealing Company producing oil from the annual whole carcass utilization of up to 10 000 sea lions and 1 000 elephant seals. Operations stopped after the 1952 season because of excessive production and transport costs and lack of local labour. The Falkland Islands Government offered sealing licences to Chr. Salvesen & Co. and Albion Star (South Georgia) Ltd in 1953-54 and 1957, presuming that their financial security would allow them to operate more effectively. The licences were not accepted, probably due to the companies' need to concentrate on whaling during a period of declining oil prices and markets. Sea lion licences were issued to private individuals in 1962 and 1967, however these were small operations and few animals were taken.

The Falkland Islands Government made laudable attempts

to develop a sealing industry, generate revenue and provide employment for islanders. However, they set catch quotas from inadequate stock information. 1930s census results were used to allocate annual sea lion quotas of 10 000 in the 1950s, potentially damaging to a stock which may have been declining to an estimated 30 000 in 1969. Annual elephant seal quotas of up to 1 000 were arbitrarily assigned from the 1920s, unjustifiable from a breeding colony only rediscovered in 1934 and recently estimated at only 3 500. The sealing companies could not fulfil their high quotas from these low stocks, and overexploitation may have occurred.

High operating costs and uneconomical catches from small stocks therefore made it impossible for companies to develop viable controlled sealing operations on the Falkland Islands in the 20th century.

PART V

20th CENTURY SEALING AT SOUTH GEORGIA

Chapter 10

Introduction of controlled sealing, 1900 to 1919

10.1 Sealing from 1900 to 1910

Controlled exploitation of the natural resources of South Georgia was precipitated by a request from a Dr Severo Salcedo (1900) of Punta Arenas to lease the island for 20 years and pay the Crown 2% of nett profits from sheep farming, mining and sealing. The request was refused although:

Leasing the island to a responsible individual or company is a good idea, it should however be advertised on the islands [Falkland Islands] first (Grey-Wilson 1900).

Accordingly, the Falkland Islands Government (1900) announced on 2 October 1900 that it would grant 21 year renewable mining and general leases for a £10 annual fee and a £200 security deposit to guarantee compliance with the terms of the lease.

The first such lease was taken out on 24 July 1905 by the South Georgia Exploration Company, including a £60 bond and requirement to take out an annual sealing licence (Allardyce 1905). Their vessel Consort arrived on 14 August 1905 from Punta Arenas, discovering a whaling station already at Grytviken operated by the Compañia Argentina de Pesca since November 1904 under the control of Capt. C.A. Larsen. The South Georgia Exploration Company protested to the Falkland Islands Government, and an observational visit was made by HMS Sappho in February 1906 (Paget 1906). The Compañia Argentina de Pesca was awarded

a 21-year 500 acre lease from 1 January 1906 at £250 per annum (Falkland Islands 1906b). The South Georgia Exploration Company was allowed to establish a station anywhere else on the island. Consort was to have originally taken seals to cover the operational expenses of the company. Profits (Swinhoe 1905a) from the sale of one third of the seals were to be used to pay for provisions, one third profits were to go to the crew and R. Lion, the vessel's owner in Punta Arenas (Milward 1905) with the remaining third presumably going to Ernest Swinhoe, the company's president. Consort did not seal, and the company did not establish a base on the island. Details of these early leases are given by Walton (1982).

The Compañía Argentina de Pesca admitted taking 80 seals in 1905 for 168 barrels of oil (Hodges 1906) before the Seal Fishery Ordinance 1899 and its 1904 Amendment were extended to the island by the 1908 Dependencies Ordinance (Falkland Islands 1908b). Swinhoe (1905b) recorded that 150 elephant seals and leopard seals were taken due to scarcity of whales inshore, the small catchers being unable to pursue them offshore. The company sent out an expedition on Undine in November 1908 to determine the feasibility of commercial sealing around South Georgia and the South Sandwich Islands, apparently ignorant of the extension of Colonial laws to South Georgia and the need to obtain a licence. The expedition was retrospectively licensed by the Governor (Schlieper 1908) and the company's views invited on the feasibility of establishing a sealing industry (Grant 1908b).

Operations from the South Sandwich Islands were considered impractical due to the lack of suitable places

for setting up a processing plant, however several good sealing beaches were noted around South Georgia. The Governor decided to start a controlled sealing industry at South Georgia (Allardyce 1909c) and a provisional sealing licence was issued to the Compañia Argentina de Pesca for 1909 under the conditions of the Seal Fishery Ordinance 1899. They were required to apply for the 1910 licence, or face a £10 fine.

John Innes Wilson "a most active and promising young man" was sent to the island on 20 November 1909 (Allardyce 1909d) as the first Stipendiary Magistrate, to administer the developing whaling and sealing industries. Much of the credit for their future success must be given to Wilson and then Governor William Lamond Allardyce. The latter was far-sighted enough to recognize the potentially beneficial impact of the industries on the island's economy, and the need to develop a conservationist exploitation policy.

The Compañia Argentina de Pesca were dissatisfied with their one-year licence, and:

We take the liberty to beg you be so kind as to grant such a licence with exclusive rights for our company to catch seals around South Georgia and the South Sandwich Islands for three years ... and by granting our company this right, it of course will be to our interest to prevent the extermination of seals, which would be the case if the right should be given to various, also it would not be profitable to keep a ship for that purpose unless the sole privilege is obtained, as the field is too small here for more than one sealing expedition at the same time (Larsen 1909a).

An extended sealing licence could not have been awarded, since there was:

No information as to the number and kind of seal it is possible to obtain around the island, but, by granting a provisional permission to the company

to find out, and report to me the results of a few days sealing ... I shall then have some knowledge on receipt of their report as to the terms and conditions in respect of the number and description of seals to be taken, and the territorial and marine limits within which they may be taken (Wilson 1909).

The licence continued to be awarded annually to prevent the company becoming complacent about the need to conserve stocks. They subsequently enjoyed a virtual monopoly over the industry (Table 10.1).

Table 10.1: Commercial Elephant Sealing Licences awarded in South Georgia
(Annual Sealing Reports, South Georgia 1910-65,
Annual Whaling Reports, South Georgia 1910-65)

Seasons	Company	Details
1909-1960	Compañia Argentina de Pesca	6 000 except 7 500 (1948) 9 000 (1949, 1950) 8 000 (1951)
1913	Capt. B.D. Cleveland	2 000 from Division II
1958	Chr. Salvesen & Co.	100 for whole carcass utilization experiments
1960-62	Albion Star (South Georgia) Ltd	6 000 annually
1962-63		no sealing
1963/64- 1964/65	International Fishery Co. Ltd	6 000 annually
1963/64	Nippon Suisan Kaisha Ltd	100 for experimental purposes
1965/66- 1966/67	Albion Star (South Georgia) Ltd	6 000 annually Licence not used, no whaling
1968/69	Run Company Ltd	6 000 5 individuals only taken

The first season's sealing was carried out from 15 to 24 December 1909, and:

I beg to inform you that the s.s. Undine has now examined the following harbours at South Georgia for seals: Elses Bay, Johan Harbour, Undine Harbour, and Coaling Bay, and in all these places together we only caught 592 hair seal and 3 sea leopards (Larsen 1909b).

The 1909 season produced royalties of £59. 10. Od. at 2/- per seal, plus the £50 licence fee for the 1910 season (Wilson 1910a). The company paid the royalties in error, since Allardyce (1910a):

In acknowledgement of your letter of 22 December 1909 concerning an application for sealing rights around South Georgia ... it will not however be possible to charge any royalties on the seals caught, as no power to do so is conferred by the Seal Fishery (Dependency) Ordinance, 1909, and the Seal Fishery Ordinance 1899 has never been applied to the Dependencies.

Wilson (1910b) requested that the royalties be refunded, but Allardyce (1910b) refused to do this:

Since the royalties were paid by a special arrangement between the magistrate and the company.

The company may have tried to minimize reporting the chance of a potentially successful industry since:

The s.s. Undine has been prepared for sealing, and is sent out for finding the places for the fur seal. I do not intend to catch many before the company is granted a full licence for sole privilege for three years, so that it might not be too expensive to take out the licence, but afterwards when the licence is granted, I will catch as much as possible ... the licence for sole privilege for seal here will cost about £50 to £100 a year, and no royalties after 1 January 1910 (Larsen 1909c).

They were awarded the 1910 licence (Wilson 1910c), continuing operations under the Seal Fishery (Dependencies)

Ordinance 1909 which became law on 1 January 1910 (Falkland Islands 1909). The Ordinance extended the provisions of the Seal Fishery Ordinance 1899 to the island, but abandoned the royalty system. The annual licence fee was increased from £10 to £20, seal reserves were proposed and a close season was introduced from 1 October to 31 December. Sealing was prohibited on parts of the island leased to other whaling companies, viz.: Leith Harbour (South Georgia Co., Ltd.), Stromness Bay (Sandefjord Whaling Co., Ltd.), Husvik Harbour (Tonsberg Whaling Co., Ltd.), New Fortune Bay (Ocean Whaling and Sealing Co., Ltd.), Allardyce Harbour (Chr. Salvesen & Co., Ltd.) and Godthull Harbour (Messrs Bryde & Dahl) (Wilson 1910d).

The coast was divided into three sealing divisions (Falkland Islands 1911) (Table 10.2). The coast from Cape Nuñez to Cape Disappointment was used as a seal reserve (Binnie 1918).

Table 10.2: Sealing Divisions at South Georgia, 1910
(Falkland Islands 1911)

Division	Extent
I	Cape Nuñez to Cape North, including Willis and Bird Islands
II	Cape Buller to Cape Saunders, which includes the Bay of Isles, etc. (Allardyce Harbour excepted)
III	Barff Point to Cape Disappointment, including Royal and Sandwich Bays, etc., Godthull Harbour, and New Fortune Bay excepted

Wilson (1910d) recommended divisional catch limits of 2 000 hair and 500 fur seals, and separate divisional licences.

These were all awarded to the Compañía Argentina de Pesca:

As they have done much to improve the knowledge of the coast, and thus deserve preference.

The £50 licence fee for sealing throughout the islands was increased to a divisional fee of £50 (Allardyce 1910e), which persisted until the close of the industry after the 1964-65 season (Annual Sealing Reports, South Georgia 1910-65).

Legal proceedings were instituted only once for unlicensed sealing. A £100 fine was imposed in 1958 on a sealing captain for taking 89 seals from Division III and including them in the Division IV catch returns (Bonner 1959). It is possible, and likely, that undetected poaching also occurred.

10.2 Conservation issues, 1909 to 1919

Soon after the Compañía Argentina de Pesca began sealing, conservation concerns were expressed by the Society for the Preservation of the Wild Fauna of the Empire. The Governor was asked to:

Consider the need for steps to be taken to preserve the sea-elephants and penguins at South Georgia (Allardyce 1909c).

He reported that they were not in danger since the lease granted to the Compañía Argentina de Pesca prohibited unlicensed:

Killing, appropriating or in any way using any product or animal whatsoever on the island of South Georgia.

Concerns continued to be raised, although:

Larsen is a decent fellow and he promised me solemnly not to kill too many sea-elephants as long as there was no competition (Lonnberg [1909]).

Wilson (1910e) suggested that there were enough elephant seals to grant licences without fear of extermination. He considered that stock preservation was ensured by the hazardous nature of sealing, the inaccessible places in which many seals were found, and the close season reducing disturbance in the breeding rookeries (Wilson 1910f).

Concern was expressed by an ex-whaling company doctor who:

... Was surgeon at one station. The Island is rich on fish and sealions and sealeopards and sea elephants, which the Argentine company is allowed to shoot alone. I heard that the Governor of Falkland has made a peace time for them, which is right or there won't be one left on or around the island (Norgren 1911).

Norgren was employed by the Ocean Whaling Company from 6 November 1910 to 15 January 1911, and:

Exhibited a melodramatic exaggeration and obvious lack of knowledge about South Georgia.

The letter was written:

Under the cloak of a personal grievance against the company by whom he was engaged, but was dismissed in the middle of the season (Wilson 1911b).

The Compañía Argentina de Pesca wanted to follow the regulations and conserve stocks, noting that:

In a little bay where we only caught three old seals, I counted 123 female seals and young seals which we did not catch as no oil can be boiled off the young seals, from this you will understand that we are careful to provide the preservation of female seals and young seals for the coming season (Jorgensen 1910a).

The concern for conservation was emphasized by Allardyce (1911c), informing the Secretary of State that:

There is not the slightest risk of extermination, the Sealing Ordinance No.VI of 1909, and the division of South Georgia into sealing districts provides adequate protection, and the government is highly sensible of its responsibilities and duties towards this most interesting animal.

As an additional safeguard, the close season was increased to provide a four-month undisturbed breeding period from 1 September to 31 December inclusive (Falkland Islands 1914b).

Colonial Secretary J. Quayle Dickson (1914) visited the island, and suggested that the regulation prohibiting killing of females and pups was ineffective, the blubber thickness on skins on the whaling plan at Grytviken appearing to him to be too thin to be from bulls. He recommended that an inspector go on each sealing trip to carry out a census, that sealing be suspended for "a few years", and that leopard and Weddell seals be protected.

Wilson (1914a) considered that this opinion of the ineffectiveness of the regulations was invalid, but agreed to send an inspector on each trip. He argued that census figures would be valueless, since many beaches would not be visited and most seals would not haul out until the close season. It was agreed to protect Weddell seals, but not the leopard seal:

Since although it has little commercial value, it is a vicious brute.

752 leopard seals were taken from 1910 to 1927 (Table 10.3).

Table 10.3: Leopard seal catch at South Georgia, 1910 to 1927
(Annual Sealing Reports, South Georgia 1910-65)

Year	Number	Year	Number	Year	Number
1910	35	1916	25	1922	61
1911	65	1917	77	1923	115
1912	87	1918	2	1924	35
1913	26	1919	3	1925	26
1914	33	1920	18	1926	111
1915	0	1921	24	1927	9

Although the company was asked not to kill Weddell seals after 1916 (Binnie 1920) it was not formally prohibited until 1921 after recommendations by the Interdepartmental Committee on Research and Development in the Dependencies of the Falkland Islands (Colonial Office 1920b). 97 were taken during 1910-16 (Table 10.4). Permission to take fur seals was deleted from the 1915 and subsequent licences (Annual Sealing Reports, South Georgia 1910-65) and prohibited by legislation in 1921 (Chapter 9).

Table 10.4: Weddell seal catch at South Georgia, 1910 to 1916
(Annual Sealing Reports, South Georgia 1910-65)

Year	Number	Year	Number
1910	5	1913	11
1911	9	1914	10
1912	48	1915	0
		1916	14

Wilson (1914b) praised the conservation measures after visiting a rookery adjacent to Husvik Harbour whaling station which:

... Did not appear to have suffered from the presence of man, nor have I seen any signs of a breach of the law for their preservation around this quarter. I merely mention this particular case to show up that the local protecting laws are respected by the usual habitués of the Dependency.

Conservation measures were relaxed during World War I to increase oil exports to the United Kingdom. Glycerine, a by-product in the manufacture of soap from seal and whale oil, was urgently required for explosives (Young 1916) and:

Sea elephant oil ... is a very good oil indeed, which we should like to have brought to this country. It is if anything better oil than No.1 whale (Bird 1916).

The Governor was subsequently informed that:

The Ministry of Munitions desire that sea elephant oil from South Georgia should be brought to the United Kingdom. If you see no objection, you should prohibit exportation to all other destinations. It is desirable that the catch should be increased as far as can be done without endangering the stock. You should consider shortening the close season (Colonial Office 1916).

The Compañia Argentina de Pesca was asked to increase its catch, and the close season reduced by one month for the 1916-18 seasons (Falkland Islands 1916a, 1917b, 1918b). It was also suggested (Falkland Islands 1916b) that an additional licence could be issued to another "local company". Binnie (1916) recommended against this after a winter sealing trip around the island on Undine yielded only 35 seals. The requirement to only ship oil to the United Kingdom was legislated for by the Whale and Seal Oil Export Ordinance, 1917 (Falkland Islands 1917c).

It was recommended that sealing be stopped after the war for a minimum of two years, and that a reserve be created in Cumberland Bay to remove the pressure from seals around Grytviken (Binnie 1917). This reserve was established as:

The point of land in Cumberland Bay, South Georgia, to the southeast of King Edward Cove, and the waters in the immediate neighbourhood (Falkland Islands 1918c).

Division IV from Cape Disappointment to Cape Nuyes was opened up (Binnie 1918), with sealing to be done on a divisional rotation basis. This was done from 1918 to 1961-62, thereafter all four divisions were worked simultaneously. From 1910 to 1964 most seals were taken from Division III (30.5%), followed by I (26.6%), IV (22.5%) and II (20.2%) (Annual Sealing Reports, South Georgia 1910-65).

After the war the close season was extended to include the moulting period, prohibiting sealing from 1 September to the end of February. This reduction in the sealing season was greeted unfavourably since most seals were in the water from March to August (Binnie 1919). To counteract this, early September sealing was proposed, before most breeding began. However this was vetoed by the Secretary of State (Colonial Secretary 1919).

10.3 The last American sealers

Some American sealing vessels visited the island at the beginning of this century, however:

The brave fleets of early days gave way to lonely prowling schooners which poached from the fur seal rookeries or reaped the meager harvest of a few seasons' repletion at South Georgia (Murphy 1918: 115).

Stranger (Capt. S. Church) arrived at Grytviken in 1908, her master reporting that he was:

Sealing around an island off the northwest coast, with his headquarters on the south side of South Georgia, in a well protected harbour exactly opposite the Bay of Islands (Allardyce 1908j).

The most notorious remnant of the New England sealing fleet was Daisy, built by and for William H. Swan and Sons, 32 South Street, New York for the West Indies fruit trade (New York Times 1908) (Table 10.5).

She was bought in 1907 by a group of 17 persons with Capt. Benjamin Dunham Cleveland as the major shareholder (Murphy 1947). US \$30 000 was spent to convert her for whaling and sealing (New York Times 1908). Daisy made at least six whaling and sealing

Table 10.5: Registry specifications of Daisy
(United States 1900)

Official Number	6752
Vessel type	Brigantine
Tons - gross	439
- nett	383
Dimensions - length	123 ft.
- breadth	31.6 ft.
- depth	17.1 ft.
Year Built	1872
Place built	Brookhaven, N.Y.
Home port	New York

voyages, generally under Capt. Cleveland (Hegarty 1959). She returned to merchant service at the beginning of World War I, sinking in the Atlantic on 29 October 1916 when a cargo of beans for Europe took on water, expanded and burst her planks (Murphy 1947).

Benjamin Cleveland was born at Martha's Vineyard on 19 October 1844. After a career as a builder and joiner (Cleveland & Cleveland 1899) he made at least 16 voyages as a whaling and sealing master over 30 years (Hegarty 1959). He developed a reputation as a master with little respect for the law, and:

Although a retiring sort of man, he was hell for efficiency and made life miserable for any man who could not fulfil his duties properly (Chippendale 1953: 70).

He had already annoyed the French Government after illegal sealing at Îles Kerguelen. Soon after Daisy left New Bedford on 12 May 1908 (Hegarty 1959) a letter was received by her former owners from Boissière et Cie (1908), holders of a 30-year sealing concession to the island from 1907 (Jackson 1938) stating that:

Being by decree of the French Government sole concessionaries of Kerguelenland, better known as Desolation Island, situated between Cape Colony and Australia, we beg to inform you that seal, sea-elephant and whale fishing on these islands is prohibited, and that anyone found in the waters of these islands without a licence will be arrested, together with products, gear and apparatus without prejudice to the fines the authorities of the islands, or courts of other countries may inflict.

Yours truly

Rene E. Boissière et Cie

Since Cleveland's crew of 38 was armed:

If the French government or anyone else tries to take anything away from Old Ben, there's going to be trouble, since ... [he was] as hard as steel, and a stranger to illness (New York Times 1908).

Cleveland visited South Georgia on this voyage, taking at least 170 seals and 1 000 barrels of oil from the Bay of Islands (Larsen 1920).

The British Government became concerned about the activities of Cleveland and others, requesting their Ambassador to:

Enlist the sympathy of the United States Government with a view to restraining United States citizens from unfettered destruction of sea elephants in South Georgia waters, and preventing the extermination of the species, especially in view of their desire to protect seals elsewhere [in the Bering Sea] (Foreign Office 1909).

Ambassador James Bryce's response was negative. If seals were taken on shore or within a three-mile limit, and if the islands were undisputed British possessions to which the United States did not claim sealing rights, regulations should instead be imposed by the Crown, prohibiting or restricting sealing by foreign vessels (Bryce 1909). These views may have contributed to introduction of the Seal Fishery (Dependencies) Ordinance, 1909.

Cleveland's knowledge of sub-Antarctic islands was used by the American Museum of Natural History and the Museum of the Brooklyn Institute of Arts and Sciences. Their representative, Robert Cushman Murphy, was to accompany Daisy to South Georgia and collect zoological specimens.

The United States Chargé d'Affaires in London requested that Cleveland be allowed to take:

A few sea elephants off St. Georges Island, under appropriate licensing conditions (Phillips 1911a),

later reinterpreted as South Georgia (Phillips 1911b). The Falkland Islands Government was told (Mallett 1911) to award him a licence from 1 January to 30 September 1912. The 1911 licences had already been issued to the Compañía Argentina de Pesca (Wilson 1911b). The Falkland Islands Government told the magistrate to issue the licence when Cleveland's application was received at South Georgia (Thompson 1911). Wilson (1911c) proposed issuing a Division II licence, which Cleveland could collect from King Edward Point on arrival. Cleveland was informed that he could take up to 2 000 hair seals and 500 fur seals on payment of the £50 divisional licence fee (Best 1911).

Daisy did not arrive at South Georgia by September 1912 and the Division II licence was transferred to the Compañía Argentina de Pesca for the remainder of the season, giving them their normal sole sealing rights for all three divisions (Binnie 1912). Cleveland was notified, and asked to inform the Falkland Islands Government if he wanted the 1913 Division II licence (Best 1912a).

The Compañía Argentina de Pesca was awarded the 1913 Division I and III licences, applying also for the Division II

licence offered to Cleveland. Wilson (1912a) suggested that all three licences should be awarded to the Compañía Argentina de Pesca:

Since they are more deserving, especially in view of the Government's decision to award the 1911 and 1912 licences to Mr Frederiksen [unknown - ed.] and Captain Cleveland respectively, and since the privilege was not accepted by either applicant.

Cleveland replied that he would arrive in late 1912 to take up the 1913 Division II licence (Best 1912b), having had:

Many orders from our museums for specimens from these regions (Cleveland 1911).

The Compañía Argentina de Pesca was only granted the 1913 Divisions I and III licences (Wilson 1912b), which understandably upset them since:

The Governor is well aware of the good work done by the Compañía Argentina de Pesca in pioneering and developing the whaling industry in the South Atlantic, and has every desire to assist the Company in carrying on the business to its best advantage (Larsen 1912a).

Daisy arrived at King Edward Point on 24 November 1912, when Cleveland was required to pay £10 port entry dues. He paid them under protest, being unaware that it was necessary when he agreed to collect the licence. He argued that no other payments should be required after the sealing licence had been paid for.

Wilson told Cleveland that Port of Entry regulations came into effect on 1 October 1912 (Falkland Islands 1912), and that granting a sealing licence did not exempt him from other dues. Daisy left King Edward Point for the Bay of Islands on 13 December 1912, remaining there until the end of February 1913 (Murphy 1914a). She then moved to Possession Bay until 15 March 1913.

Wilson (1914b) knew about Cleveland's activities at Îles Kerguelen, and doubted that he would comply with the licence. Daisy was allowed to leave King Edward Point on the unenforceable condition that sealing did not start until the stipulated 1 January 1913.

Cleveland ignored the licence conditions. Carcasses of females and pups killed by his crew were found by Compañía Argentina de Pesca sealers (Larsen 1913). 1 094 elephant seals were killed up to January 1913 (Murphy 1947). Cleveland (1913) did not mention this illegal hunting when he wrote to the magistrate that few large bulls were found, 1 300 elephant seals yielding less than 1 000 barrels of oil. The Compañía Argentina de Pesca was accused of overexploitation.

Wilson (1913a) told the Falkland Islands Government that Cleveland would probably not apply for another licence. They responded that the 1914 Division II licence should not be awarded, since the 1911 and 1912 catch returns for Divisions I and II showed 4 644 elephant seals killed and suggested overexploitation. The decision was ultimately left to the magistrate "based on his local knowledge" (Best 1913). Since only 313 seals had been taken in Division II in 1912 because of the late awarding of the licence to the Compañía Argentina de Pesca, and since no Division II licence had been awarded for 1911, Wilson (1913b) considered that over-exploitation was not occurring. He awarded the 1914 Division II licence to the Compañía Argentina de Pesca, reasoning that the industry would be better controlled with only one licensee.

Cleveland left South Georgia on 16 March 1913 without returning to King Edward Point to record his catch size or pay outstanding customs dues of £1 3s.0d., since he did not intend to revisit the island (Murphy 1947). He made three further sealing and whaling voyages, but not to South Georgia (Hegarty 1959).

10.4 Summary and conclusions

In 1910 a Chilean entrepreneur requested permission from the Falkland Islands Government to carry out mining, sheep farming and sealing on South Georgia. The Government denied this request, deciding to advertise natural resource leases to the island in the Falkland Islands Gazette so that Falkland Island residents could have the licence priority. There was no local interest, and a 21 year lease was awarded in 1905 to the South Georgia Exploration Co. of Punta Arenas. They were required to catch seals, paying royalties to the Falkland Islands Government under the Seal Fisheries Ordinance 1899. On arrival, they discovered a whaling station operating at Grytviken, the site chosen by the South Georgia Exploration Co. for their base. Although offered alternative sites by the Falkland Islands Government, the company left without taking seals.

The station was established in 1904 by the Compañia Argentina de Pesca of Buenos Aires in ignorance of the need to obtain a lease from the Falkland Islands Government. Company whaling crews took elephant seals in 1905, producing oil in the whaling factory and continuing the 18th and 19th century tradition of supplementing whale oil production with elephant seal oil. The Falkland Islands Government allowed the station to continue operations, royalties from whaling and sealing being a revenue source for the colony.

Manager C.A. Larsen visited beaches on South Georgia and the South Sandwich Islands to assess ease of access and the abundance of elephant seals. He considered the South Georgia stock large enough to support an industry, and the rookeries were easily accessible. Few elephant seals were seen at the South Sandwich Islands, and the beaches were small and difficult to land on. Since the Compañia Argentina de Pesca had the necessary men and

equipment, the Falkland Islands Government awarded them an experimental sealing licence in 1909 so that they could determine the feasibility of opening an elephant sealing industry. 595 elephant and leopard seals were taken during ten days in December, producing some 3.3% of the year's total oil production from Grytviken. Fur sealing was permitted in the licence, but none were found (Chapter 11). Correspondence between Larsen and the company president in Buenos Aires indicates that any found would have been killed.

After this successful experiment the company was awarded a licence for 1910 to take up to 2 000 male elephant seals and 500 fur seals from each of three sealing divisions established on the island. The quota was arbitrarily established by Stipendiary Magistrate J.I. Wilson, sent to South Georgia by the Falkland Islands Government in 1909 to administer the developing community and industry. Wilson's judgement on the sustainable yield from the elephant seal stock proved remarkably accurate, the 6 000 annual quota remaining virtually unchanged until sealing ended after 1964, except for seasons 1947-52 when it was unwisely increased (Chapter 11). Credit for the successful start of the industry must go to Wilson and Governor W.L. Allardyce, both realizing that a viable long term operation could only occur if stock conservation legislation existed and was enforced.

Some conservationist groups and individuals were concerned that this elephant sealing revival would reduce the stock after its recovery from 18th and 19th century depletion. The Falkland Islands Government considered that licence regulations, the presence of the Stipendiary Magistrate and the Compañía Argentina de Pesca's desire to conserve the stock for their future benefit invalidated such concerns. Permission to hunt fur seals was however removed

from the 1915 and subsequent licences, and Weddell sealing from the small Larsen Harbour colony was prohibited from 1917. Seal reserves were established, taking hunting pressure off elephant seal rookeries adjacent to whaling stations. Conservation regulations were only ignored by Capt. B.D. Cleveland of Daisy, awarded a divisional licence in 1913 to produce elephant seal oil using 19th century techniques.

Therefore, the cessation of sealing at South Georgia in the late 19th century had allowed the elephant seal stock to recover to the level where it could be exploited in a carefully controlled industry. The fur seal stock had not markedly increased after its mid 18th century destruction. Hunting continued to be prohibited until sealing ended at South Georgia after the 1964 season. Exploitation of any pinniped is currently prohibited under the 1975 Falkland Islands Dependencies Conservation Ordinance.

Chapter 11

Sealing from 1920 to 1968

11.1 1920 to 1951

The Report of the Interdepartmental Committee on Research and Development in the Dependencies of the Falkland Islands (Colonial Office 1920b) considered that biological studies were necessary to ensure growth and continued utilization of the elephant seal stock, although:

The Government is fully entitled to claim that the policy pursued since the passing of the Seal Fishery Ordinance, 1909; has successfully protected these animals, and ... there seems to be no reason to be apprehensive of any immediate danger to the herds, although vigilance should not of course be relaxed.

The Falkland Islands Government naturalist, J.E. Hamilton, was asked to report on the industry (Colonial Secretary 1920). Hamilton proposed reducing the close season to 1 September - 15 November, so that more oil could be produced from animals taken in the latter half of November and in December. This change was considered necessary for stock improvement, an assumed surplus of bulls causing excessive rookery disturbance, and:

In order to maintain a constant increase in the herd they should not be in a state of uproar (Hamilton & Binnie 1921).

The 1921 season was therefore extended subject to a requirement by the British Museum (Natural History) that:

The whole question will receive further consideration, and that the experiment of killing adult males during the breeding season will be carefully watched (Harmer 1922).

The Interdepartmental Committee's recommendations resulted in the Discovery Committee being established in March 1923, their marine laboratory operating at Grytviken from 1925 to 1931. The laboratory was primarily concerned with monitoring whale stocks, although Matthews (1929) produced the first comprehensive work on the natural history of the species. A stock of 100 000 animals was estimated, although recommendations on the future of the industry were not made.

Arising out of a suggestion by Bruce (1893b) the Interdepartmental Committee also proposed that a controlled fur sealing industry should be developed. Some animals had survived 18th and 19th century depredations on Bird and Willis Islands (Wilson 1910g), although Undine visited Bird Island for the Compañía Argentina de Pesca in December 1909 (Chapter 10) without seeing any (Jorgensen 1910a & b). Up to 30 were seen at sea in 1911 (Larsen 1920), and a juvenile male was mistakenly killed on the south-eastern end of South Georgia (Bonner 1968) by a crew member from Undine in 1915, the skin being sent to the British Museum (Natural History) (Colonial Secretary 1915).

The stock was to be increased by introducing animals from the Falkland or Lobos Islands [A. australis, but not then realized] on to beaches adjacent to whaling stations where they could be observed (Colonial Office 1920c). Sceptical of whalers' attitudes towards conservation, the Stipendiary Magistrate proposed that they be reintroduced on to Bird Island or the Dartmouth Point Seal Reserve (Barlas 1920). The plan was rejected on 19 September 1932 on the grounds of excessive cost, and concern that they might not adapt to the new environment (Discovery Committee 1932).

Further measures for controlling elephant sealing were introduced in the Seal Fishery (Consolidation) Ordinance 1921. This repealed the Seal Fishery Ordinance 1899 and the Seal Fishery (Dependencies) Ordinance 1909, and provided in part for the appointment of Seal Fishery Officers to accompany sealing vessels and enforce regulations. Although officers were appointed as rookery guards in the Falkland Islands (Chapter 9) no appointment was made at South Georgia until 1956 (Section 11.22) possibly because the Falkland Islands Government felt that the Compañia Argentina de Pesca was conducting sealing satisfactorily.

The Magistrate did however suggest that the company could use its sealing licence more efficiently, since they were concentrating on whaling and only making maximum sealing effort when whale catches were low. Low seal catches and oil yields (Appendix 9) caused Binnie (1921) to refuse issuing the 1921 licence unless greater sealing effort was made. Binnie (1922a) also suggested that industrial rejuvenation might occur if the licence was awarded to another company, preferably British. This lack of sealing effort was also influenced by the depressed economy of the whaling industry, which led to the company being almost liquidated in 1921 (Binnie 1922b). They agreed (Binnie 1922a) to improve their efficiency, although attempts were made to interest other companies in licences for two divisions (Binnie 1927a). Chr. Salvesen & Co. were asked to apply for licences on condition that their whaling and sealing operations were kept separate, and the sealing company registered in Stanley and employed Falkland Islands labour. Seven-year licences for 10 000 elephant seals per year were to be taken out (Binnie 1928).

Neither company wanted to share the licences, although both were interested in a four division licence monopoly. Consequently, the Falkland Islands Government continued its policy of awarding all division licences to the Compañía Argentina de Pesca. These attempts to develop a sealing industry independent of the whaling industry proved fruitless, and the economics and logistics of a separation would have made it unfeasible.

Sealing continued virtually unchanged throughout the 1930s and 1940s, except for periodic adjustments to the season closing date to compensate for poor weather, delayed haul out, and late arrival of sealing crews from Buenos Aires.

The 6 000 quota was reached for the first time in 1937 (Appendix 9), attributed to more seals being available (Barlas 1937).

Season extensions were granted during World War II as a war measure to increase oil production, although:

The disturbance of the herds late in the mating season may have had the effect of decreasing the chances of the females being fertilized, thus resulting in possible decreases in the herd in later years, and thus they should not be allowed when the war ceases (Fleuret 1943).

Pressure was not taken off the stocks after the war. The Compañía Argentina de Pesca (1948a) requested that the annual quota be increased to 9 000 because of increased post-war demand for edible oils. The increase was unwisely recommended by the Magistrate. More seals were thought to be present on the Dartmouth Point reserve, and rookeries in less accessible bays

were getting bigger. The company deserved an increased quota because they adhered to licence conditions (Fleuret 1948a).

A 7 500 quota was introduced in 1948 (Colonial Secretary 1948a) to be increased to 9 000 if stock reports were favourable after that year (Colonial Secretary 1948b). The quota was raised to 9 000 for 1949 and 1950, but reduced to 8 000 for the 1951 season (Colonial Secretary 1950a).

Stock decline therefore occurred because of the high catches of the 1930s and 1940s (Appendix 9), frequent season extensions, and increased quotas from 1948 to 1951.

11.2 Utilization on biological principles, 1951 to 1964

Laws' (1951) study of elephant seals at South Georgia described their biology and showed that overexploitation was occurring. Indirect indicators derived from commercial data may be more valuable in determining the size and change rate of large commercially utilized stocks because of difficulties in counting individual animals (Laws 1979). Laws (1951) therefore used five such indicators to show overexploitation.

11.21 Overexploitation indicators

Laws determined age by counting dentine cross-section paired annual rings produced by growth discontinuities during the breeding and moulting fast periods (Laws 1952, 1953b & c). Commercially killed bulls had a mean age of 6.6 years compared to a ten-years mean age in a sample from the unexploited South Orkney Islands stock. The longevity of South Orkney Island bulls was some 20 years, compared to 11 years in South Georgia stocks where old harem bulls were removed during sealing. Replacement

of these large bulls by less dominant smaller individuals was considered to decrease the sexual capability of the bull stock, causing reduced fertilization, birth rates and stock growth.

This may not have been the case. An opposite effect can be postulated. Some cows in large harems may not have been fertilized. Smaller harem bulls would be less effective at defending territory and controlling cows, hence harems might fragment into smaller ones wherein the fertilization would be more widespread.

Some Annual Sealing Reports from the 1920s to 1930s suggested that stocks were increasing more rapidly on small less accessible beaches, compared to larger more accessible ones. Increased South Orkney Islands stocks were also recorded, from approximately 1 700 in February 1937 to some 10 000 in 1948-49. The increased numbers of animals on large South Georgia breeding beaches was considered to be forcing some to move elsewhere (Barlas 1936). This was later interpreted as a response to increased hunting pressure at South Georgia (Laws 1951). Animals tagged at South Georgia (Dickinson 1967, Laws 1973) were recovered at the South Orkney Islands, showing that such movement did occur.

Comparison of the reproductive biology and behaviour of animals from exploited and unexploited stocks (Matthews 1929, Laws 1956) gave more evidence of overexploitation. The breeding season was some 50% longer and delayed by about one month at South Georgia, and the average harem size, maximum harem size and cow:bull ratio was greater.

Mean monthly oil production per seal fluctuates with the amount of blubber reserves used during breeding and moulting, and with decreased size of animals caught as the smaller males hauled out later in the season (Table 11.1).

Table 11.1: Mean monthly oil yield (barrels per seal) 1943-56
(Bonner 1956a, Laws 1960)

Month	January-February	March	April	September	October	November
Yield	1.2	1.77	1.69	2.28	1.99	1.75

Mean annual oil production declined from 2.01 barrels per seal in 1948 to 1.80 barrels per seal in 1952 (Appendix 9), fewer high yielding large bulls being available in the peak yield months of September and October.

A 27.8% decline in catching efficiency was shown, from 38.3 seals per CDW [catcher days work] in the 1930s to 27.6 seals per CDW from 1949 to 1952. October catch figures were used [October being the one month of constant catching duration since sealing began] combined into four-year periods to eliminate variation due to divisional rotation.

11.22 Licence revision

Licence changes were recommended by Laws, and introduced into the 1952 licence, the first major change since 1909.

Divisional quotas of 2 000 bulls were replaced by differential quotas because of different divisional surplus bull accession rates (Laws 1960). The 6 000 adult bull annual quota was restored, and divisional quotas were continually modified (Annual Sealing Reports, South Georgia 1910-65) using information gained from an annual stock census.

Sealers had to take one lower canine tooth from every 20th bull killed in each division by each vessel, providing

a random 5% sample for ageing. Decreased mean catch ages were considered to indicate overexploitation, requiring annual or divisional quota reduction. This assumption is not entirely valid. It could also indicate increased recruitment of juveniles from previous years of higher birth rate or decreased mortality. Sample examination was initially done at the Falkland Islands Dependencies Survey, Cambridge, the British Museum (Natural History), and later by sealing inspectors at South Georgia.

Only bulls over 3.5 metres long from the tip of the nose to the tip of the tail could be shot, corresponding to length at sexual maturity. This redefined the existing licence clause referring solely to 'mature adult bulls'. 10% of the bulls on each beach were to be left to ensure a satisfactory fertilization rate.

Sealing Inspectors [W.N. Bonner (1956-62), R.W. Vaughan (1961-65), A.B. Dickinson (1964-66)] were appointed to accompany vessels, monitoring stock changes and ensuring compliance with the regulations.

Reviews (Observer 1952, Statesman 1952) of Sea Elephant. The Life and Death of the Elephant Seal (Matthews 1952) led to questions in the House of Commons on possible cruelty during killing (Colonial Office 1952). Others however considered that the industry provided a good example of controlled utilization of a mammalian stock (Bertram 1952). Discussions with the Grytviken station manager (Administrative Officer 1953b) concluded that there may have been cruelty since the sealers were paid on a bonus system (Table 11.2). Seals were shot, then stabbed in the heart to reduce bleeding during flensing. Cases of bulls 'coming back to life' as described by Matthews were 'unlikely'.

Table 11.2: Sealer's bonus payments, 25 March 1955
(Compañia Argentina de Pesca 1955a)

Rank	Bonus (\$re per barrel)
Master	74
Chief engineer	51
2nd engineer	46
Shooter	33
Engineer's assistant	30
Cook	30
Sailors	29
Stokers	29
Labourers	29

The Colonial Secretary (1953) therefore requested that a clause prohibiting inhumane killing 'as far as possible' be inserted into the licence. The clause first introduced into the 1954 licence (Administrative Officer 1954) required that:

The licensee shall ensure that seals are killed in the most humane way that is practicable, i.e. they shall not be clubbed or lanced to death, but shall only be shot (Administrative Officer 1953c).

Cruelty occasionally occurred when driving and shooting bulls, and warding off cows, but standards were high and sealers humane (Bonner 1956a). Unsuccessful attempts were made to improve driving. Electrical cattle goads were tried, but many seals did not respond. Increasing the shock strength burned out the goads (Bonner 1957a).

Divisional and reserve limits were redefined after 20 animals were shot on the Dartmouth Point reserve. The vessel did not have charts showing the reserve limits (Bonner 1956b). The position of the Dartmouth Point reserve was loosely described in 1918,

and it had been 'agreed' in 1943:

That the east boundary of the Dartmouth Point reserve should be the Nordenskjold Glacier and the west boundary should be the de Geer Glacier [= Harker Glacier] at the top of Moraine Fjord (Colonial Secretary 1956).

This 'agreement' was omitted from the Falkland Islands Gazette, resulting in imprecise divisional limits being specified in the licence from 1944 to 1954. Existing limits (Table 11.3) were amended, Division II being respecified as:

"The North-East coast, between Cape North and Cape Saunders",

and included as such in the 1960-61 licence.

Table 11.3: Sealing Division limits, South Georgia 1959-60
(Falkland Islands 1960)

Division	Limits
I	Capes Nufies to Cape North, excluding Willis and Bird Islands,
II	Cape Buller to Cape Saunders, excluding Prince Olaf Harbour,
III	Larsen Point to Cape Disappointment, excluding the reserve at Dartmouth Point in East Cumberland Bay
IV	Cape Disappointment to Cape Nufies

Bird and Willis Islands were excluded from Division I in 1933 when fur seals were found there (Mathew 1957). Division III was split into two sub-divisions at Cape Harcourt in 1961-62, less than 60% of the catch to be taken from heavily sealed beaches in the north-west sub-division (Bonner 1961a).

Simultaneous use of four divisions was introduced in 1961-62 when it became apparent that there was no significant increase in the mean ages of bulls killed in a division immediately before and after it was rested, indicating that they migrated between divisions (Laws 1960).

Seasonal limits were changed. The season extended from 1 March to 31 October inclusively with a close season for the rest of the year, although extensions were often granted into the November breeding period. Sealing in March and April was stopped in 1954 because of the poor condition of the seals and low oil yield (Table 11.1) (Annual Sealing Reports, South Georgia 1910-65).

11.23 Results of revision

The licence revisions improved the stocks, as shown by three indicators.

Catch per unit effort increased (Table 11.4).

Table 11.4: Catch per unit effort (in catcher days work = CDW), 1949-64
(Laws 1960, Bonner & Vaughan 1962, Vaughan 1965)

Season	Seals/CDW
1949-52	27.6
1955-58	34.8
1960-61	36.7
1961	23.35
1963	46.26
1964	45.6

This may have been partly due to the introduction of the larger Petrel in 1958 to replace Carl which had a maximum capacity

of some 90 pelts. The temporary decline in 1961-62 was probably due to unskilled Norwegian labour being used when the Compañia Argentina de Pesca was reorganized to become Albion Star (South Georgia) Ltd (Bonner & Vaughan 1962). No sealing occurred in the 1962-63 season, which together with the higher work rate of the Japanese sealers (Vaughan 1964) and concentration of effort in October was probably responsible for the high catching efficiency in 1963 and 1964. These variations in the conduct of the industry are considered (Laws 1984, personal communication) to reduce the reliability of this indicator as a measure of stock improvement.

Mean annual oil yield rose from 1.88 barrels per seal in 1949-54 to 2.08 barrels per seal in 1955-60/61 (Appendix 9). This increase was probably due to the introduction of more efficient oil extraction plant. Although autumn sealing for low yield bulls ended after 1954, this had little effect on oil production. During 1949-56 autumn sealing produced an average of 1.77 barrels of oil per seal, reducing spring season average oil production of 1.89 barrels per seal to a seasonal average of 1.88 barrels per seal (Annual Sealing Reports, South Georgia 1910-65). Further increases in oil production could have occurred if there had been more catching in September, since blubber weight decreased by 30% during the breeding season (Bonner 1965). This may have required more catchers and been economically infeasible. Oil yield increases could also have occurred with whole carcass utilization (Chapter 12).

Tooth ring analysis showed an increased mean catch age, stabilizing at approximately 7.5 years (Laws 1979) as predicted by Laws (1960). Variation in tooth collection occurred. Some were returned without pulp cavities, two teeth were sometimes returned from the same animal, or were occasionally not collected

(Bonner 1961b). These irregularities did not obscure the overall trend of increased mean annual catch age. The stock improvement shown by these indicators thus confirmed that continued exploitation on a sustainable yield basis was possible.

11.3 Japanese sealing, 1963 and 1964

Albion Star (South Georgia) Ltd and Chr. Salvesen & Co., Ltd ceased operations at South Georgia after the 1961-62 and 1960-61 whaling seasons.

Both applied for a 1962-63 season sealing licence (Colonial Secretary 1962a) although the former had been told that they would keep the licence:

Irrespective of temporary suspensions of operations (Administrative Officer 1962a).

They probably did not intend to use the licence (Colonial Secretary 1962b) except to make any possible sale of their stations a more attractive proposition to potential buyers (Administrative Officer 1962b). Sealing licences were not awarded for the 1962 season.

Albion Star (South Georgia) Ltd leased Grytviken to the International Fishery Company Ltd [a consortium of Taiyo Gyogyo Kabushiki Kaisha, Hogeï Kabushiki Kaisha and Kokusai Gyogyo Kabushiki Kaisha] for three years from 1963. They operated in the 1963 and 1964 seasons, but did not return in 1965 for economic reasons.

Chr. Salvesen & Co., Ltd leased Leith Harbour to Nippon Suisan Kaisha [NSK] for 1963-65, followed by a £420 000 lease to the end of the 1966-67 whaling season (Administrative Officer 1965). They did not return for the 1966-67 season.

Both Japanese companies were interested in sealing, licence applications being made on their behalf by Albion Star and Salvesen's. The Colonial Office agreed that both should have an equal chance of getting the licence (Pettitt 1963a). Albion Star and Salvesen's were both informed of this (Pettitt 1963b), and that:

Sealing is a specialized business, and the Government would have to be satisfied that the Japanese can undertake it (Pettitt 1963c).

The Falkland Islands Government wanted the licence to be awarded to a company whose employees were experienced sealers (Falkland Islands 1963). Albion Star's application was therefore favoured, since their crews were to train Japanese sealers (Colonial Office 1963). The licence was consequently awarded to the International Fishery Company Ltd for the 1963 season. NSK did not tender for it.

The Japanese Government initially stopped the International Fishery Company Ltd from using the licence, the terms agreed with Albion Star (South Georgia) Ltd being considered unreasonable. The government eventually relented, or the terms were renegotiated, and the International Fishery Company Ltd took 3 939 seals for 7 042 barrels of oil. Norwegian masters, gunners and boatmen were used, with Japanese flensers, hookers and catcher crews (Vaughan 1964). 1796/5

Probably because of this success, NSK decided to get experience in sealing. They applied for (Hirabayashi 1963) and were granted (Administrative Officer 1964a) a free experimental licence to take up to 100 seals. The sealing inspector instructed the crews in sealing techniques. 57 seals were taken for 114.7 barrels

of oil in February 1964, the average of 2.01 barrels per seal being the highest recorded for autumn sealing (Vaughan 1964).

NSK and the International Fishery Company Ltd both wanted the 1964 licence. Salvesen's suggested to the Colonial Office that:

The method of offering the licence to tender year by year does preclude the building up an efficient sealing organisation, and the development over the years of methods which will give better utilisation of raw material. We feel that a preferable arrangement would be to allocate half the total permitted catch to each company. In this way each would develop its own catching and processing techniques, and learn from the other. Thus there would be a better chance in the course of time that the aim of the Government would be realised, i.e. that this carefully protected raw material would be harvested on the most economical basis (Elliot 1964a).

This suggestion was not acted upon, the 1964 licence being granted to the International Fishery Company Ltd on 25 April 1964. Little consideration appears to have been given to the application from Salvesen's and NSK.

Salvesen's protested to the Colonial Office that this award contravened earlier statements that both companies would have an equal opportunity to obtain the licence (Elliot 1964b). According to the Governor of the Falkland Islands, equal opportunity had been given. The NSK manager at Leith Harbour was informed on 24 February 1964 that the International Fishery Company Ltd had applied for the licence, and they they should quickly apply if they also wished to be considered. The manager was unable to do this, the company's plans for 1964-65 not being finalized. He agreed to inform his superiors in Japan on return there in March 1964, but since the Falkland Islands Government did not receive a reply from Japan the licence was awarded to the International Fishery Company Ltd.

Salvesen's objected (Elliot 1964b) to this, on the grounds that:

- (i) Important negotiations should not have been made during conversation between the Governor and the whaling station manager, whose command of English was poor.
- (ii) It was unnecessary to make the decision as early as 25 April, only three weeks after the end of the previous season.
- (iii) The application from the International Fishery Company Ltd should have been considered provisional until operating agreements had been made between lessors and lessees for the 1964-65 whaling season.

They requested that the Falkland Islands Government remedy the situation by offering the 1965 licence to NSK since (Elliot 1964b):

The issue goes further than the allocation of sealing licences. We are seeking to ensure that the principle of strict fairness of treatment is maintained between the companies. We see no reason why the Government should want to discriminate against us, as a British owned and managed company, and we accept that on this occasion the discrimination was unintentional. We have managed to launch a successful joint operation with the Japanese at South Georgia, to a great extent through close personal cooperation. If they started to feel, however wrongly, that the Falkland Islands Government was biased against us, it might well prejudice our position with them, and affect seriously the prospect of future operations from the island.

The Colonial Office therefore examined ways of allowing interested companies an equal chance of obtaining the licence. Quota division was thought too difficult to control without further government vessels, and although Japanese operating costs appeared lower than Norwegian and British (Administrative

Officer 1964a) quota division was considered uneconomical (Colonial Secretary 1964). Increasing the quota prior to division was a poor conservation measure (Administrative Officer 1964b).

The decision was made that future licences be issued after open tender. The licence would be awarded to the company most likely to make best use of it and carry out whole carcass utilization. The Governor's advice would not be referred to again! (Colonial Secretary 1964).

11.4 1965 to 1972

The International Fishery Company Ltd stopped whaling and sealing after the 1964 season. The sealing licence was awarded to Albion Star (South Georgia) Ltd for the 1965 and 1966 seasons (Colonial Secretary 1965, 1966a). It was not used, since whaling did not resume at Grytviken even though Albion Star (South Georgia) Ltd had stated its intention to do so if the International Fishery Company Ltd did not return (Administrative Officer 1964b). Nippon Suisan Kaisha was whaling at Leith Harbour in 1965-66, but did not apply for a licence, possibly because of a lack of skilled sealing crews and the new requirement to carry out whole carcass utilization.

The Falkland Islands Government attempted to reintroduce sealing by writing to possibly interested companies such as Chr. Salvesen & Co., Ltd (Colonial Secretary 1968a) and Wm. Brandt's Sons & Co., Ltd (Colonial Secretary 1968b). The availability of the licence was also advertised in the Falkland Islands Gazette (Falkland Islands 1965, 1966, 1967b, 1971a & b, 1972). Companies were required to pay the annual licence fee

of £200 and carry out whole carcass utilization. In a later attempt to develop interest, the licence fee became open to negotiation (Falkland Islands 1971a).

The only company interested was the Run Fishing Company Ltd, who applied for a licence on 1 September 1966 (Colonial Secretary 1966b). The company had Norwegian principals [Peter Simonsen and Lars Musaeus], a lawyer's address in Stockholm, and was registered with the Bahamas International Trust Company Ltd in Nassau. They were expected to begin operations in late September or early October 1967, the 1967-68 sealing licence to be issued to them on arrival at South Georgia (Colonial Secretary 1967a). Their ship was required to clear Customs prior to leaving South Georgia to report the number of seals killed (Colonial Secretary 1967b).

Their vessel was the 683-ton Run (Capt. Hansen), having a 30-ton daily freezing capability and a total capacity for 450 tons of frozen meat and 250 tons of oil (Colonial Secretary 1967c).

Due to apparent construction delays, Run was late arriving at the Falkland Islands, entering and clearing Stanley on 26 January 1968. Her master was given the licence there, rather than having to collect it at South Georgia, under the conditions that it would be invalid until the £200 fee had been paid into the Colonial Treasury at Stanley, either via the British Embassy in Oslo or the Crown Agents in London (Colonial Secretary 1967d) and that it be surrendered to the Colonial Secretary at Stanley when sealing was finished.

The licence allowed Run to take 6 000 seals from 1 July 1967 to 30 June 1968. Since she would arrive at South Georgia

in the close season, Capt. Hansen requested permission to kill five seals for experimental purposes. Run arrived at King Edward Point at 0600 hrs on 29 January 1968, and left at 1130 hrs on 30 January 1968 after taking five elephant seals. There is no information available to the author as to where the seals were taken from. It is also doubtful if the £200 licence fee was paid. This had not been done when the vessel arrived in Stanley (Colonial Secretary 1968c), although according to Capt. Hansen it had been paid in London (Administrative Officer 1968) presumably to the Crown Agents.

Run left South Georgia without clearing Customs or returning the sealing licence, and went to South Africa. The company was liquidated there, the vessel or proceeds from its sale being awarded to unnamed creditors. Capt. Hansen went to Angola where:

He was jailed for a number of years, returning to the Bahamas in the early 1980s, claiming that the vessel had wrongly and illegally been taken from him (Heap 1984).

It is unlikely that Run went to South Georgia to catch seals. Since she had also been pirate whaling (Bonner personal communication 1984) she may have gone to South Georgia to get abandoned whaling equipment or assess the feasibility of using the island as a base. Possession of a sealing licence gave her a legitimate reason to be there.

The Falkland Islands Government appears to have negotiated with a company of dubious merit. The licence was advertised until 1972, but not awarded again.

11.5 Summary and conclusions

In 1920, the Interdepartmental Committee on Research and Development in the Dependencies of the Falkland Islands recommended that the elephant seal stock at South Georgia be assessed to determine its size and the feasibility of continued exploitation. The consequent 1921 report by the Falkland Islands Government naturalist indicated that the stock was not declining, although comparative census information on which to base this assumption was unavailable. Stock stability was probably due to the conservation regulations under which the industry operated, and to low sealing effort, the Compañía Argentina de Pesca taking less than half its permitted annual quota. Elephant seal catches averaged 2 640 bulls annually from 1910-19, the oil produced accounting for up to 23.5% of the company's whale and seal oil production at South Georgia. The catches declined to 1 300 annually during 1919-21, contributing only some 17.5% of total oil production. The company experienced financial difficulties in the 1920s because of low oil prices, being almost liquidated in 1921. Low oil prices and markets probably meant that there was little incentive to produce seal oil, the company instead concentrating on keeping its whaling operation working.

The low elephant seal catches reduced the oil production duties paid into the Falkland Islands revenue. Consequently the Falkland Islands Government demanded that the company put more effort into sealing or lose its licence to Chr. Salvesen & Co. at Leith Harbour. The Stipendiary Magistrate also suggested that future sealing operations should be run separately from whaling, clearly an impractical proposition in view of the need to use whaling equipment to produce seal oil. Faced with the threat of loss of its licence, the company improved its sealing effort, taking 5 000 elephant seals

in 1927 from a stock estimated at 100 000 in a 1929 Discovery Committee report. Catches only declined below this level five times until the company, as Albion Star (South Georgia) Ltd, stopped whaling and sealing at South Georgia after 1962.

The industry continued throughout the 1930s with little variation other than occasional changes in season closing dates to compensate the company for reduced catches due to poor weather and delayed haul out. The catching season was extended during World War II to increase oil production. This increased hunting pressure continued after the war, the Compañia Argentina de Pesca asking the Falkland Islands Government to increase the quota so that more oil could be produced to meet increased post-war demand for edible oil. The Government unwisely established annual quotas of 7 500 in 1948, 9 000 in 1949 and 1950 and 8 000 in 1951. These changes were made without a stock census.

The first detailed study of elephant seal biology at South Georgia was done in 1951. Examination of indirect indicators of stock stability showed that overexploitation was occurring, attributable to the arbitrary post-war quota increases and annual catches approaching 6 000 since 1930.

The study recommended methods of reversing this decline. Appropriate modifications were made to the sealing licence from 1952, the first major regulatory changes since 1909. These included reduction of the annual quota to 6 000, introduction of variable divisional quotas, and tooth collection for sample age structure determination. Continuous monitoring of the industry and stock was ensured by the appointment of Sealing Inspectors from 1956, as allowed under the Seal Fishery (Amendment) Ordinance 1921. The Falkland Islands Government had appointed such officers

at the Falkland Islands (Chapter 9) to prevent illegal sealing but had not done so at South Georgia, considering that the industry was well regulated by the Stipendiary Magistrate, licence regulations and company attitudes.

The licence revisions halted the stock decline, catch per unit effort, mean oil yield and catch size increasing, the latter stabilizing at a previously predicted 7.5 years until the industry ended after 1964.

The Compañia Argentina de Pesca [as Albion Star (South Georgia) Ltd from 1960] stopped sealing and whaling at South Georgia in 1962, and leased their whaling and sealing licences to the Japanese International Fishery Co. for 1963 and 1964. The International Fishery Co. could not carry out a viable whaling operation on declining stocks, and left Grytviken after the 1964 season. Elephant sealing therefore ended. The licence continued to be advertised in the Falkland Islands Gazette until 1972, but was only awarded once. The dubious Run Company Ltd used it in 1968 to provide their vessel with a legitimate reason for being at South Georgia for other unknown reasons.

Elephant sealing at South Georgia in the 20th century was a well regulated industry. Its demise occurred because the whaling industry could not be similarly well regulated.

Chapter 12

Economics of the industry

The importance of sealing to the whaling companies and to the revenue of South Georgia can be estimated from annual oil production figures, catch values and export duties. Data are fragmentary, catch values were often recorded as 'whale and seal oil', since (Compañia Argentina de Pesca 1954):

The costs of whaling and sealing are not kept separately, and ... it is impractical to find the proportional distribution of whaling and sealing expenses.

Further, and contrary to King (1983), seal oil was sometimes mixed with lower grade whale oil to improve the quality of the latter (Dye 1965). According to Hamilton (1923b) however:

The herd is one of considerable value, since in a good year the output of oil approximates to 5 000 barrels, at an estimated value of £20-30 000.

12.1 Importance to the whaling companies

At least 3 004 834 barrels of oil were produced from 1909 to 1964 (Appendix 9), of which 16.5% (498 870 barrels) was seal oil.

97.8% of the seal oil produced was equivalent in quality to the most valuable No.1 grade whale oil, amounting to about 16.2% of combined whale and seal oil production (Table 12.1).

Table 12.1: Grades and barrels of seal oil produced at Grytviken, 1921-58 (Annual Sealing Reports, South Georgia 1910-65; Annual Whaling Reports, South Georgia 1910-65)

Oil type and grade	Barrels	% of total seal oil	% of total seal and whale oil
Seal - No.1	366 466	97.8	16.2
- No.2	7 954	2.1	0.3
- No.3/4	272	0.1	0.01
Total seal oil	374 692	-	-
Total seal and whale oil	2 264 988	-	16.5

Elephant seals produced some 38% more No.1 grade oil than whale carcasses. Only skin, blubber and adhering muscle was used, being processed up to three days after killing. Whole carcass utilization of whales, and delays in getting the animals back to the plant, meant that some 41% of their oil was No.2 grade or less (Table 12.2).

Table 12.2: Comparison of No.1 grade seal and whale oil production. Grytviken 1921-58 [excluding sperm whale oil] (Annual Sealing Reports, South Georgia 1910-65; Annual Whaling Reports, South Georgia 1910-65)

Source	Oil yield (barrels)	No.1 grade oil	
		Barrels	%
Whale	1 823 522	1 080 712	59.3
Seal	374 692	366 466	97.8

Financial returns to the companies from the sale of seal oil are difficult to estimate accurately, since the quantity and prices obtained were generally recorded as whale oil.

If whale oil values (Annual Whaling Reports, South Georgia 1910-65) are applied to seal oil production (Appendix 9), seal oil accounted for some 19% of total oil value and 15.5% of all Grytviken products (Table 12.3).

Table 12.3: Comparison of seal and whale oil values (£), from company estimates of whale oil production value, Grytviken 1923-65

Product	Compañía Argentina de Pesca	International Fishery Co., Ltd	Total
Seal oil	3 203 982	220 379	3 424 361
Whale oil	13 951 751	490 550	14 442 301
Total oil	17 155 733	710 929	17 886 662
Other products	3 817 239	579 710	4 396 949
Total production	20 972 972	1 290 639	22 263 611

When annual seal oil production (Appendix 9) is related to the average annual market price of No.1 grade whale oil (Tønnessen and Johnsen 1982), 20% of the value of total oil production derives from seal oil.

Estimated seal oil values were occasionally given in the Annual Sealing Reports, South Georgia 1910-65. Seal oil again comprised about 19% of total oil value (Table 12.4).

Table 12.4: Comparison of some estimated annual seal and whale oil production values (£).

(Annual Sealing Reports, South Georgia 1910-65;
Annual Whaling Reports, South Georgia 1910-65)

Whaling Season	Estimated seal oil value	Whale oil value	Total oil value
1956-57	177 000	702 786	879 786
1957-58	135 000	1 222 463	1 357 463
1958-59	140 400	475 023	615 423
1959-60	151 600	458 969	610 569
1960-61	148 600	591 763	740 363
1964-65	121 275	217 150	338 425
Total	873 375	3 668 154	4 541 529

Seal oil accounted for about 31% of the value of oil produced by the International Fishery Co., Ltd, compared to 18-21% by the Compañía Argentina de Pesca (Table 12.3). The greater importance of seal oil to the International Fishery Co., Ltd may either be a reflection of only two seasons' catch data being available, decreased whale oil contribution (Appendix 9) from declining stocks, and increased emphasis on whale meat production.

12.2 Importance to the economy of South Georgia

From 1909 to 1964, 9 628 171 barrels of oil were produced in South Georgia (Headland 1984a), 5.2% (498 870 barrels) being seal oil.

The export duties paid on this oil contributed to the island's revenue. When the Compañía Argentina de Pesca began sealing in 1909, the Seal Fishery Ordinance 1899 required royalty payments of 2/- per hair seal to the Colonial Treasury, a catch revenue of £59. 10. Od. The royalty system was abandoned on

1 January 1910 (Falkland Islands 1909) when it was realized that more revenue could be obtained from an oil export duty. A 3d. per barrel duty was introduced, providing revenue to install navigation lights, build a Customs shed, telegraph station and other government buildings, and subsidize a regular mail service to Buenos Aires (Colonial Secretary 1912).

The duty upset the whaling companies, Larsen (1912b) stating in a letter to the manager of the South Georgia Co. Ltd that:

Money collected should be used for benefit of this island only, and it is unjust to force on us an export duty simply to benefit the inhabitants of the Falkland Islands, or rather Port Stanley. ... If duty should be forced on us, protest by all means against any attempt of extortion of that kind ... aversion to export duty is not due to the amount involved, but by the principle that the government of the Falkland Islands in this way are trying to exploit us beyond the limits fixed in the licence before expiration of the same. If we do not protest against the export duty now, we have no guarantee whatever that it will not be increased in the near future. If the protest against the export duty was headed by the British Whaling Companies the effect would most certainly be far stronger ... in this case the whaling companies are not protesting against the expenses common to any civilized sovereignty, as will be perhaps stated by certain persons in the reports to England. Thanks to the whaling companies the government of the Falkland Islands have got incomes of South Georgia and further have the whaling companies themselves provided everything which in other countries are rendered in exchange of taxes. It is therefore unnecessary and unwarranted to induce taxes to meet such expenses which in this case are altogether uncalled for.

In a letter to Herman H. Schlieper, President of the Compañía Argentina de Pesca, Larsen (1912c) requested that:

I trust you will not freely leave the authorities to tax us any further, to restrict their limits or in any way hinder us in exercising our privileges. I beg to draw your attention to a fact which I consider to be of vital importance in this matter viz: that we started our operations here in Grytviken

before the incorporation of South Georgia as a dependency of the Falkland Islands. ... My opinion therefore is that there now must be put an end to our compliance towards the claims put forth to cut down our privileges. The governor of the Falkland Islands may be endowed with autocracy but still we have never in a civilised country experienced the retroaction of any law.

Larsen felt that if a telegraph station was required it could be built more cheaply by the whaling companies. There was insufficient mail for a regular mail service, and customs facilities were considered unnecessary, their operational expenses surpassing revenue from oil export duties. Ultimately he recommended that:

It would be desirable if by diplomatic action the attention of the government of the Falkland Islands might be called to the fact that still some important British interests in the Argentine as well as in Norway may be hurt by the governor using his autocracy for imposing unnecessary duties

and that:

I should recommend an agreement to the taxation on the strictly expressed terms that this tax is not in the future open for any raise, and on condition that money thus collected are to be used for the benefit of South Georgia only.

The protests had no effect. The duty was raised to 3-1/2d. per barrel in 1915 (Falkland Islands 1915), 1/6d. per barrel in 1919, and 5/- per barrel in 1920 to pay for the Discovery investigations. It was decreased to 1/6d. per barrel in 1938. The Oil (Export Duties) Ordinance 1947 (Falkland Islands 1947) placed the duty on a sliding scale relative to the average market price of No.1 grade whale oil. If the price was below £20 per ton, 1/6d. per barrel was payable, increasing to 5/- per barrel above £50 per ton. The duty was standardised at 1/- per barrel in 1962:

As a sympathetic gesture to the two companies which had been the Dependency's main source of revenue for the past fifty years, and which are now facing difficult times (Coleman 1964).

In 1964, the Colonial Office proposed increasing the duty to 2/6d. per barrel, since the Japanese were not paying income tax into the island's economy. The International Fishery Co., Ltd opposed this, arguing that they were operating at minimum profit margins. Although probably true for their whaling operations, it would not have been true for the rest of the corporation (Coleman 1964). A greater increase to 5/- per barrel was thus proposed (Coleman 1965). However the 1/- duty remained in effect until whaling and sealing ended.

Seal oil exports are estimated at 5.4% to 6.8% of the value of total and domestic exports from the island (Table 12.5).

Table 12.5: Comparison of seal oil export values (£) with total and domestic export values (£) from South Georgia in selected years (Falkland Islands 1934-53)

Year	Total exports	Domestic exports	Seal oil exports	Seal oil % total exports	Seal oil % total domestic exports
1934	455 486	361 644	14 806	3.2	4.1
1935	325 483	265 468	4 230	1.2	1.5
1936	556 181	417 856	33 738	6.1	8.1
1937	406 646	223 882	32 496	7.4	14.5
1938	463 912	251 551	23 714	5.1	9.4
1946	993 969	786 340	171 470	17.3	21.8
1947	1 949 492	1 843 365	69 921	3.6	3.8
1948	3 900 203	2 872 442	212 002	5.4	7.4
1949	3 084 774	2 897 024	189 726	6.1	6.5
1951	3 101 440	2 875 879	186 915	6.0	6.5
1952	3 689 165	2 689 977	203 680	5.5	7.6
1953	2 814 487	1 973 990	37 100	1.3	1.9
Total	21 740 238	17 459 418	1 179 798	5.4	6.8

Note Total Exports includes re-exports from pelagic whaling vessels

Revenue entering the island's economy from seal oil exports appears to have been small. About 72% of Customs' revenue came from oil duties, Customs' revenue in turn providing about 10% of total revenue in 1953-62. Seal oil duty paid in the same period (Table 12.6) is estimated at 5.7% of total oil duties (£455 593), 4.0% of Customs' revenue (£636 115) and 0.4% of total revenue (6 016 770) (Falkland Islands Dependencies 1953-62, British Antarctic Territory, 1963-64).

Table 12.6: Estimated seal oil duty, South Georgia 1953-62

Year	Average price of No.1 whale oil (£ per ton) (i)	Seal oil production (barrels) (ii)	Estimated duty (£) (iii)
1953-54	77	11 475	2 868
1954-55	83	11 425	2 856
1955-56	89	12 068	3 017
1956-57	85	11 805	2 951
1957-58	73	11 020	2 755
1958-59	76	12 476	3 119
1959-60	73	12 562	3 140
1960-61	67	12 381	3 095
1961-62	46	9 666	2 174
Total	-	104 878	25 975

(i) Average market price in two successive years, from Tønnessen and Johnsen (1982)

(ii) From Appendix 9

(iii) Calculated at 5/- per barrel except for 4/6d. per barrel in 1961-62 as per the Oil (Export Duties) Ordinance 1947

Accounts paid to Crown Agents by Wm. Brandt's Sons & Co. (1951-55) the London agents for the Compañía Argentina de Pesca, indicate that in those years seal oil duty (£12 789) comprised some 8% (£161 496) of oil duties paid.

Therefore, although seal oil production was important to the licensee, the value of the industry to the South Georgia revenue was small. Most revenue was obtained from whale product duties, import duties on alcohol, and government grants-in-aid. However, the industry generated sufficient revenue to pay the annual salary of a Sealing Inspector, that of the author being £1,100 (excluding messing and accommodation allowances) in 1964-65.

12.3 Use of other elephant seal products

12.31 Skin tanning

The possibility of tanning elephant seal skins from South Georgia was examined several times. The Imperial Institute in London informed the Governor of the Falkland Islands that there was a demand for sealskin to convert into bookbinding leather, skins of four 'hair seals' from the Falkland Islands producing leather:

Similar to that obtained from the Arctic or Greenland Seal (Grant 1906a).

To promote exports, the Falkland Islands Government proposed rebating some of the 2/- skin royalty paid to the Colonial Treasury (Grant 1906b). The Compañía Argentina de Pesca exported three barrels of salted elephant seal skins in 1910 (Larsen 1910), but further information is unavailable to the author.

Robert Cushman Murphy advised the Ocean Leather Co. Ltd, of New York, to request examination samples, since:

If the price of these hides is low enough, and the tests will prove, as we hope, satisfactory, we may consider the purchase of the entire output of same (Herlinger [1918]).

The Compañia Argentina de Pesca was not interested in dealing with them, the prices obtained for the skins probably being less than labour costs. If tanning had been viable, the Compañia Argentina de Pesca would probably have done it themselves. A similar enquiry was made by the August Schmielau Söhne Import Co. of Germany (Schmielau 1925) for large salted seal skins. This request was also refused (Compañia Argentina de Pesca 1925).

Wm. Brandt's Sons & Co. (1928) suggested that the Compañia Argentina de Pesca export seal skins since:

The position re hair seal skins is changing owing to the Arctic supply not being quite equal to demand, and that there is now a chance of trade in this article from the Antarctic for leather manufacture ... various buyers request sample shipments of approximately 100 skins to include sea elephants (all ages, the larger the better) and sea leopards (particularly the young) ... careful attention should be given to skin preparation ... essential to deblubber carefully, remove all oil and grease and thoroughly wash ... value is difficult to determine, but should be approximately 6/- to 8/- for an elephant seal skin, and 10/- to 20/- for a baby sea leopard skin.

The Discovery Committee found that the skins of northern hair seals:

When only a few weeks old and with the puppy coats, are saleable at a good price as fur trimmings, and that slightly older pups, the coats of which have begun to moult, are marketable as fine grain leather.

The Compañia Argentina de Pesca were asked to send the Committee skins from two elephant seal pups, two from animals which had completed the first moult, and two from adults. These were shipped in December 1934, but no further information is available to the author.

Large elephant seal skins were considered a possible substitute for walrus hides if not damaged on the underside by flensing knives and salted properly (Colonial Secretary 1950b). The skins were worth approximately 6d. per lb salted weight. Some skins were exported, and an export duty of 2-1/2% of market value levied (Magistrate 1950), but again no further information is available to the author.

Tanning was still considered by the Falkland Islands Government in 1956, Bonner (1956c) writing a description of suggested treatment techniques based on methods used in the Pribilof Islands sealing industry. Again, nothing resulted from this.

Tanning was therefore never done commercially, probably because of hide curing and shipping costs, and greater profits from oil sales.

12.32 Whole carcass utilization

The seal carcass or 'skrott' was left on the beach to decay after flensing. Profits from blubber oil sales probably made the Compañia Argentina de Pesca consider it unnecessary to use the rest of the carcass. However Bonner (1957b) estimated that 225 000 elephant seals killed from 1910 to 1957 would have produced an additional 56 000 barrels of oil and 54 000 tons of meal, worth about £3.5 million at 1957 prices.

Whole carcass utilization began to be considered in the 1920s, when one adult male elephant seal was processed at Husvik. 2.405 barrels of oil were produced, compared to 1.685 barrels per seal from the commercial catch (Binnie 1925). 15 seals were also taken in September 1926. The blubber produced 30 barrels of No.1 grade oil, and the meat 7.83 barrels of No.3 grade

oil (Tröim 1926). Oil yield increased by 26%, from 2.0 barrels per seal to 2.522 barrels per seal. Binnie (1927b) therefore suggested using a floating factory, so that at least 2.5 barrels of oil per seal and some meal could be produced. Unsuccessful attempts were made to introduce whole carcass utilization into the licence, the depressed world economy reducing the demand for edible oils (Hodson 1928).

In September 1948, 147 seals gave 37 barrels of No.3 grade oil and 9 600 kilos of meal. Most of the carcasses were over three days old and partly decomposed when brought to the factory, hence the low yield of poor quality oil. Meal quality was good, with 61.7% protein content (Tröim 1948). Production cost £287. 18s. 4d., excluding crew wages and catcher expenses. The Compañia Argentina de Pesca considered these expenses could be reduced if more carcasses were processed. Their experiments indicated possible extra production of 1 500 barrels of oil and 1 500 000 kilogrammes of meal on a 6 000 seal quota (Bonner 1956d).

The Compañia Argentina de Pesca continued to consider whole carcass utilization (Pierce-Butler 1955a & b), experimentally processing one seal in 1955. 2.2 barrels of No.1 grade oil, 0.35 barrels of No.3 grade oil and 315 kilogrammes of meal were produced, equivalent to about 2 200 tons of No.1 grade oil, 350 tons of No.3 grade oil and 1 896 tons of meal from a 6 000 quota. The animal was taken in March, when the average blubber oil yield had been 1.79 barrels per seal in the previous three years.

Ten seals were processed in 1956, 2 100 kilogrammes of meal of 78.4% average protein content, and 15.2 barrels of oil being produced. Mincing the carcass and decreasing cooking time increased No.1 grade oil production to 2.08 barrels per seal (Bonner 1956a). Further calculations estimated a 54% increase in total product value for a 6 000 quota (Table 12.7).

Table 12.7: Comparison of products and values (£), blubber sealing and whole carcass utilization (Administrative Officer 1957)

Product	Blubber Sealing		Factory Whole Carcass Utilization	
	Tons	Value	Tons	Value
Oil	1 975	177 740	2 225	200 250
Meat meal	-	-	1 500	75 000
Grax	-	1 000	-	-
Total	1 975	178 750	3 725	275 250

Note (a) Seal oil value calculated at £90 per ton

(b) Meat meal value calculated at £50 per ton

The success of whole carcass utilization depended on the ability to transport carcasses from beach to factory in sufficient time to prevent decomposition and reduction in oil quality (Compañía Argentina de Pesca 1948b). The use of a 3 000 ton factory ship was suggested, two catchers working beaches in a 20-miles radius and returning carcasses to the parent vessel for rapid processing and production of No.1 grade oil. Operations could also be extended to the Dependencias (Compañía Argentina de Pesca 1955).

The International Fishery Co. Ltd made the final attempt

to use parts other than skin and blubber. Frozen meat was taken to Japan for market evaluation in 1963-64 (Vaughan 1964) and meat extract was produced in 1964-65. Preparation of both items was abandoned because of high production costs and poor product taste after the initial test samples had been produced (Vaughan 1965).

The requirement for whole carcass utilization was introduced into the licence for 1965-66 and subsequent years, but was never practised.

12.4 Reopening the industry

Sealing was prohibited at the Falkland Islands under the Nature Reserves Ordinance and Wild Animals and Birds Protection Ordinance of 1964 and at South Georgia under the Falkland Islands Dependencies Conservation Ordinance of 1975 (Chapter 2). The Economic Survey of the Falkland Islands (1976) arbitrarily estimated a South Georgia fur seal stock of 2 000 000 by 1985 [compared to a currently estimated 1 000 000 (McCann 1986 personal communication)] which could be exploited if markets were available. Elephant sealing was considered possible if the abandoned processing plant at Grytviken could be used. This would now be impossible because of dilapidation, vandalism, and the projected removal of the plant for scrap by a British company (Headland 1986 personal communication). The Economic Survey made three recommendations concerning decisions on the reopening of sealing. The size and rate of increase of Falkland Island stocks was to be assessed, their potential as a tourist attraction was to be taken into account, and management control advice was to be sought from the Natural Environmental Research Council. Exploitation of South Georgia stocks was to be subject to advice from British Antarctic Survey (Falkland Islands Economic Study 1982).

Experimental processing of whole elephant seal carcasses showed that an estimated 2 220 tons of No. 1 grade oil, 348 tons of lower grade oil,

and 1 896 tons of meal could be produced from a 6 000 annual quota (Compañía Argentina de Pesca 1955). The minimum gross value of an elephant sealing industry at South Georgia is thus estimated to currently exceed £1 000 000 (Table 12.8). Bull numbers have increased since sealing ended in 1964 (McCann 1980), and an increased quota and yield may be possible. The stocks of some 30 000 sea lions and 3 500 breeding elephant seals at the Falkland Islands (Chapter 2) are too small to be exploited.

Table 12.8: Estimated annual production value (£), whole carcass utilization of 6 000 adult male elephant seals

Production	Estimated value/ton	Estimated production value
2 220 tons No. 1 grade oil	250	555 000
1 896 tons meal	270	511 920
Total	-	1 066 920

Notes

- (i) The last available UK price for No. 1 grade whale oil was US \$460/ton in 1977. Whale oil was generally valued at approximately US \$25 above the cost per ton of fish oil, recently US \$350/ton, but highly variable. The whale oil price is estimated at US \$375/ton.
- (ii) The meat meal price/ton is derived from the fish meal price (US \$6.25/unit of protein) at 65 protein units/ton for whale meal - US \$406/ton.
- (iii) Conversion rate used is £1 = US \$1.5.
- (iv) Estimated values from D. Geddes & Sons Ltd (1984 personal communication).

The feasibility of reopening sealing depends on the availability of markets. These are currently very depressed. There is little demand for seal oil. 1 192 650 metric tons of aquatic animal oil was produced in 1979, 60 328 metric tons (5.0%) being from marine mammals. This declined

to 4 481 metric tons by 1983, 0.4% of world aquatic animal oil production of 1 093 901 metric tons. 13 128 metric tons of seal oil produced in Canada, Norway and South Africa during 1979-83 accounted for 12% of world marine mammal oil production of 106 866 metric tons, and only 0.09% of world aquatic animal oil production (5 822 643 metric tons) (F.A.O. 1983). Some 1 200 metric tons of seal oil were exported annually from Canada to Norway during 1979-84, for use in the margarine and pharmaceutical industries at a sale price of \$Can. 0.6 per litre (fl.20 per litre) (Canada 1986).

The European Economic Community has been the largest market for seal skins in recent years, importing 50-60% of world production and 70-75% of the skins entering international trade during 1979-83.

Some 150 000 raw seal skins were annually imported, particularly from Greenland, Canada, South Africa and Norway. An estimated 246 000 dressed skins were also annually imported, mainly from Norway and including skins sent there for processing from Canada, Denmark and Great Britain. Most of the skins were used in West Germany (81 743) and Denmark (78 815).

Some 48 000 skins of the Cape Fur Seal Arctoccephalus pusillus were annually exported to Europe from South Africa and Namibia during 1978-82, mainly to West Germany. These exports stopped in 1983, commercial sealing ending as the market collapsed. There is no seal skin processing facility or market in Southern Africa.

Importation of seal skins into the United States was prohibited under the Marine Mammal Protection Act of 1972. This market is supplied by some 20 000 Northern Fur Seal skins taken annually from the Pribilof Islands. There was no commercial sealing on the islands in 1985, and this industry and market probably has a limited future (Canada 1986).

The seal skin market collapsed in Europe after a successful campaign by extremist conservation groups to abolish the Canadian hunt for harp

seals Phoca groenlandica and hooded seals Cystophora cristata. The EEC Council of Ministers banned imports of harp and hooded seal pup skins and manufactured products for two years from 1 October 1983. The campaign and ban affected imports of other types of seal skins. The Government of the Netherlands prohibited the import and sale of all seal skins, and West German furriers voluntarily stopped purchasing seal skins out of concern that anti-sealing sentiments would reduce the market for other furs and garments.

Seal skin imports sharply decreased after the 1983 ban, some 55 000 raw skins and 49 000 dressed skins being annually imported in 1984 and 1985. The West German market absorbs some 25 000 skins annually, mainly for the production of leather goods and après-ski boots. Manufacture of the latter has declined by 90% since the late 1970's. Seal skin coat production has decreased from 70-80 000 in 1981 to some 10 000 in 1984, and the retail price has fallen by 40% in the same period. Most are now manufactured in Denmark from skins of the ringed seal Phoca hispida. Some 60% of these are exported, particularly to declining markets in West Germany, Norway and Austria. The Far East seal skin market is limited and has little potential, although the Canadian Sealers Association is assessing the Hong Kong market. Current Canadian demand is estimated at 20 000 skins, supplied from the remnants of the indigenous industry. European seal skin demand is currently satisfied by existing industries, particularly those of Greenland and Norway. It is unlikely that this market will be revitalized in the near future. The EEC ban was extended to 1989 after expiry in 1985, and may be extended again in the absence of a pro-sealing majority in the Community.

Decreased demand has reduced the number of seal skin processing companies. The last French seal skin tanner ceased operations in 1980,

and the world's largest processor, G.C. Reiber of Bergen, closed part of its factory in 1983. The Fouke Fur Co. of Greenville, North Carolina is considering stopping processing Northern Fur Seal skins (Canada 1986).

Reduced demand has lowered sale prices, often to below production cost. Northern Fur Seal skins were sold by the United States Government to the Fouke Fur Co. for U.S. \$67 each in 1983, compared to U.S. \$111 in 1980. Ringed seal skins sold at the Royal Greenland Trade Department auctions in 1984 for Dkr 48 each, compared to some Dkr 250 production cost.

There is little market for other seal products. Norwegian data shows that only 20% of seal meat is suitable for human consumption, the oil content causing deterioration and rancid taste if the meat is not frozen or canned within 24 hours. Japanese experiments have shown that there is no domestic market for frozen elephant seal meat (Section 12.3). Seal meat consumption in Atlantic Canada is satisfied by local harp seal catches (Canada 1986). Meal has also been produced, latest available figures showing 400 metric tons produced in South Africa in 1979, 2.8% of world marine mammal and 0.01% of world aquatic animal meal production (F.A.O. 1979). This is suitable for feeding to commercially farmed fur bearers such as mink, but unsuitable for farmed fish, imparting an undesirable taste to the flesh. Multinational pet food manufacturers are unwilling to use seal meat or meal in their products, fearing a decline in sales because of public opposition to sealing (Canada 1986).

A sealing revival in the Falkland Islands and Dependencies would face high operational costs because of the remoteness of the herds from the depressed markets, lack of equipment and vessels, and the expense of individually hunting young male fur seals scattered in broken ground behind the beaches (Bonner 1968). Costs would be further increased if British crews were used. An able seaman employed on a vessel belonging to

the General Council of British Shipowners receives some £212 per week gross pay [£92 per five day week of 68 hours, 28 hours per week overtime at £3.36 per hour and a leave entitlement of £28.11 per week (Seamen's Union 1986 personal communication)]. British companies outside the Council would probably have to pay above these rates to induce crews to work in this remote region under less than ideal conditions. Crew costs could be reduced by employing labour from the Falkland Islands or Far East, and registering vessels under flags of convenience. The former is unlikely because of labour shortages in the Colony, and the latter two options would be politically inadvisable. The cost of protecting the industry from extremist protest group actions would also be excessive. Lack of markets and high operational costs would probably therefore require the industry to be subsidized by the British Government. This is unlikely in the face of high domestic anti-sealing feelings, and as signatories to the 1983 EEC ban.

The position of British Antarctic Survey, potential advisors to the British Government on reopening of the industry, is also that sealing would not be possible because of poor markets and high operating costs (Bonner 1984 personal communication, McCann 1986 personal communication).

12.5 Summary and Conclusions.

Estimates of revenue obtained by the licensee and the Falkland Islands Government from elephant sealing at South Georgia are imprecise. Little specific information is available on catch values. Seal oil exports were often recorded as whale oil, and the two oils were occasionally mixed.

Some 2 000 tons of elephant seal oil was produced annually at Grytviken, using whaling crews and processing plant. 16.5% of all oil produced there during 1910-64 was obtained from elephant seals, 97.8% being equivalent in

quality to No. 1 grade whale oil. Elephant seal oil accounted for 20% of the value of oil produced at South Georgia by the *Compañía Argentina de Pesca/Albion Star (South Georgia). Ltd.*, and 31% of that produced by the *International Fishery Co.* The greater importance of seal oil to the latter company reflects a decreased emphasis on whale oil production in favour of whale meat processing.

Whaling companies produced large quantities of valuable high quality oil from elephant sealing, with little extra financial investment over their whaling operations. The quantity and quality of this oil was an important incentive for them to comply with conservation regulations, ensuring that they continued to be awarded the sealing licence.

The licensees were required to pay revenue to the Falkland Islands Government in the form of export duties per ton of oil produced. Elephant seal oil comprised an estimated 6.8% of the value of whale and seal products exported from South Georgia, some 4.0% of the island's Custom's revenue and 0.4% of total revenue. This revenue was produced at little cost to the Falkland Islands Government.

Blubber sealing was a wasteful process, carcasses being discarded after flensing. The Falkland Islands Government and licensees attempted to reduce this waste, and increase their revenue and profits. Sporadic experimental whole carcass utilization from the 1920s estimated a 54% increase in oil and meal production on a 6 000 annual catch compared to blubber sealing. Whole carcass sealing was never practiced commercially, companies making high profits from whaling until the 1950s. Thereafter, they were probably unwilling to invest in the floating factory vessels required to process elephant seal carcasses when their whaling future at South Georgia was precarious. Export of hides to Europe for tanning was impractical due to high shipping and preparation costs, and attempts to

sell seal meat and extract in Japan were unsuccessful due to poor product taste and high production cost.

Whaling stopped at Grytviken after the 1964-65 season, causing the end of elephant sealing. Whole carcass utilization was introduced as a sealing licence condition from 1965 in case the industry reopened. This did not occur, although a sealing licence was issued in 1968. An elephant sealing industry at South Georgia has a current potential gross product value in excess of f1 000 000 for whole carcass utilization of a 6 000 annual quota from a stock stabilized at some 350,000. Fur seal numbers have increased at South Georgia to an estimated 1 000 000 under protective legislation and increased krill availability as whale stocks declined. It is unlikely that either stock will be exploited because of high catching cost, lack of processing equipment, poor markets and anti sealing opinions of the general public.

Pinnipeds on the Falkland Islands could not be hunted because of their low numbers and value as a tourist attraction.

SUMMARY AND CONCLUSIONS

Sealing began in the Falkland Islands and Dependencies in the second half of the 18th century, and included hunters of four nationalities: French, Spanish, American and British. The latter two quickly became dominant, their whaling ships and crews being readily adaptable to the needs of this new industry. The industry passed through several phases between the 18th and mid 20th centuries, reflecting political events, local stock over-exploitation, exploration and discovery of new stocks, changing market demands and fluctuations in whaling and maritime trade. Market demand shifted from time to time between oil, skins and furs, with the main markets varying between Great Britain, China and the United States. This thesis identifies major changes in emphasis within the industry, ascribing causes where possible.

Pinnipeds of seven species were hunted, especially fur seals and elephant seals. Original stock sizes can only be estimated from incomplete and inaccurate voyage records. Some 8 000 000 fur seals and 5 000 000 elephant seals were taken from southern ocean colonies until the end of the 19th century. Numbers may therefore have been at least as high as the currently estimated 1 000 000 fur seals and 750 000 elephant seals. Hunting methods and seasons were determined by the species' reproductive biology, seals being particularly vulnerable to exploitation when ashore in large numbers during spring and summer for breeding and moulting. Limited pelagic fur sealing also occurred during the first decade of the 20th century. Raw products of the industry included oil and dried or salted skins. Oil was mainly produced from elephant seals, but also from southern sea lions, leopard seals and Weddell seals. It was sold along with whale oil and used in industry and for lighting. Fur seal and occasionally sea lion and elephant seal skins were tanned into leather. Fur seal skins were also used to make imitation beaver skin hats, garment trimmings and coats. Stripped fur and guard hairs were used in pelting.

The early and late stages of the industry are considered in two main centres, the Falkland Islands and the Dependencies, culminating in the final 20th century phase on South Georgia.

1. The Falkland Islands

Though a small shipment of oil and skins was exported from the Falkland Islands by French settlers in 1766, concerted exploitation did not begin until 1774 when American and British whalers arrived in search of new whaling grounds. The vessels were old, financial investment was small, and working conditions were generally poor. Some crew members had experience of northern hemisphere sealing, and used this knowledge to make large catches and profits from full utilization of the pinniped stocks. American sealing was interrupted by the War of Independence (1775-83) when a British blockade prevented vessels from leaving New England ports. The British Government allowed one sealing and whaling fleet to leave destitute Nantucket for the Falkland Islands in 1775, after Massachusetts merchants received reports of excellent seal oiling possibilities. Though required to return the oil to their home port, the vessel owners intended to circumvent the blockade by shipping it directly to London where they could profit from high British oil prices. This first attempt to sell Falkland Islands seal oil in London was unsuccessful, most of the fleet being destroyed by bad weather or enemy action.

The British southern hemisphere whale fishery continued throughout the war and afterwards. Seal and whale oil was sold on the London market to replace that supplied by American fleets in pre-war days. Fur seal skins were also imported for tanning, a method for removing guard hairs to provide fine clothing furs being at this time unknown to western furriers.

American sealers returned to the Falkland Islands in 1784, sending oil to London and fur seal skins to New York for shipment to a recently discovered Canton market. Severe post-war economic depression in the United States prevented their return in large numbers until 1792, when they concentrated on taking fur seal skins for this new and highly profitable market. Chinese furriers removed the guard hairs, and used the skins in garment manufacture as a cheap abundant alternative to sea otter skins, traditionally obtained from the northwest Pacific Ocean and now becoming scarce and expensive. British sealers were constrained in this market by the trade and price fixing monopoly of the East India Company, and could not compete with the Americans. Americans therefore dominated the Canton fur seal skin trade for the next 30 years. However, a domestic market was opened to British sealers from 1799 when a London furrier discovered a process for removing guard hairs for felt and using the fur to make imitation beaver skin hats. Uncontrolled hunting to supply these profitable markets destroyed Falkland Islands fur seal stocks by the end of the 18th century. Cargo records show that little oil was produced during this early phase of sealing. Oil was then provided for the British market from the Greenland and southern hemisphere whaling industries, and for America from whaling off Brazil and in the Pacific Ocean. Most of the seal oil was subsequently produced by American crews, demand declining in Britain from 1817 as gas became more commonly used for lighting.

When Daniel Jewitt claimed the Falkland Islands for the United Provinces de la Plata in 1820, his attempt to stop foreign sealing was largely ignored by American and British sealers. Louis Vernet formed a settlement for the United Provinces in 1826, and also prohibited foreign sealing in an attempt to preserve stocks for the development of an indigenous industry. American sealers were particularly active, supplying a market for imitation

beaver hats which had developed in the United States after furriers there successfully removed guard hairs in 1823. Vernet arrested American sealers to enforce his policy, the few British sealers who were still active were not molested. Vernet had been warned by the British Government representative in Buenos Aires that retaliation would follow if British vessels were seized. His settlement was destroyed by the United States Navy in retaliation, and Vernet himself was banished from the islands by Britain.

This unsuccessful conservation attempt may have convinced the British Government of the need to introduce a similar policy for the benefit of any future British settlement and sealing industry. Britain repossessed the islands in 1833, and established a naval administration in the following year. The Royal Navy failed to protect local sealers from continued foreign small-scale stock deprecations on the grounds of excessive cost. The administration however laid the foundation for future regulated exploitation, introducing a licensing system which made settlers responsible for fur seal exploitation and conservation in particular areas.

The indigenous industry did not flourish despite these regulations. American fur sealing continued, although on a reduced scale, and further depleted already low stocks. Settlers therefore only made small catches, supplying a British fur seal skin market depressed by a fashion change from the wearing of imitation beaver to silk hats. British southern whaling and sealing ended in the 1840s, crews being unable to compete profitably with the more numerous and efficient Americans.

From 1843, improved control by civil administrations and better Royal Navy protection of the low stocks made American sealing voyages unprofitable. Few were made by the 1850s. The market for animal oils declined further after the discovery of mineral oil and petroleum. Experienced sealing crews also became scarce as better paid and more acceptable employment

became available on shore. The few American merchants that continued sealing cut their costs by using low paid labour, mainly Azorean and Cape Verde Island native crews.

A mid century market for ladies sealskin coats developed in Britain, leading settlers to export fur seal skins to London. Sea lion and elephant seal oil was also shipped to Britain and France. However, this indigenous sealing industry exploited very low stocks, and produced only about 3% of the value of exports from the Colony during the second half of the century.

In 1881 and 1889 the Falkland Islands Government introduced conservation legislation aimed at improving depleted pinniped stocks and developing a more viable sealing industry. Sealing was prohibited during breeding seasons, sealers were required to pay royalties on catches, and districts and quotas were arbitrarily introduced. Fines were established for contraventions of regulations, and Royal Navy ships visited the Colony during the breeding season to enforce the legislation. Despite this, viable domestic sealing enterprises could not be developed. Competition between settlers and foreign sealers re-occurred when Canadian and Chilean vessels arrived in 1901. During the next decade they illegally took fur seals from rookeries and did pelagic sealing, further reducing the numbers available to settlers.

The first fur seal census in 1919-20 estimated some 5 000 animals, indicating that the Colony's stock had not recovered from over exploitation. Fur sealing was therefore prohibited from 1921, armed Seal Fishery Officers being appointed to enforce the ban. The stock consequently increased to an estimated 9 000 by 1925. Further expansion was thought unlikely unless breeding space was made available by reducing the numbers of sea lions, a stock hunted little since the late 19th century. A sea lion oil industry therefore began in 1925, and continued sporadically until 1940. Elephant

seals were also killed, their higher oil yield being vital to the potential success of the industry. A short lived seal oiling revival occurred from 1950-52, when the Falkland Islands Government unwisely set high catch quotas from outdated 1937 census data. Oil produced by these industries was exported to Great Britain. A few sea lion skins were also taken by settlers in 1962 and 1968.

It has not been possible to develop a viable sealing industry in the Colony during the present century. The elephant seal stock was small, catches and oil production were low, oil prices were low and fluctuating, and operational and shipping expenses were excessive. Pinnipeds in the Falkland Islands have been protected from exploitation since the introduction of the Nature Reserves and Wild Animals Protection Ordinances of 1964. Numbers remain low however. The breeding southern elephant seal stock was estimated at some 3 500 in 1985, whilst southern sea lion numbers have declined for unidentified reasons from 380 000 in 1937 to 30 000 in 1969. The ban on fur sealing has allowed the stock to increase to an estimated 16 000 in 1973. A sealing industry could not be revived on these low stocks, particularly valued as a tourist attraction.

2. The Dependencies

Sealing probably began on South Georgia in 1786-87 shortly after Cook made known his discovery of the fur seal rookeries. As the Falkland Islands stocks were destroyed, those on South Georgia were increasingly exploited. Americans hunted them for the developing Canton fur seal skin trade, whilst Britons continued to supply their own market demands. Catch records indicate that this stock was severely depleted by the early 19th century. Sealers thus turned their attentions to newly discovered stocks on the South Shetland Islands from 1819, the South Orkney Islands from 1821 and the South Sandwich Islands from 1823.

As on the Falkland Islands, the high profits obtained from fur seal skin sales dominated the industry in the Dependencies during this early phase of sealing. Elephant seal hunting became more extensive after fur sealing declined in the first quarter of the 19th century. Oil was mainly produced by American crews for the American market. Demand had decreased in Britain from about 1817 as the use of coal gas increased. Continued but small demand in America kept United States sealers active in the Dependencies until the turn of the 20th century, but very few operated beyond the mid 19th century.

Although a viable domestic sealing industry could not be developed on the Falkland Islands in the 20th century, sealing for oil was possible at South Georgia under Government supervision. The industry contributed revenue to the Falkland Islands Government from 1909. Whalers stationed at Grytviken by the Compañía Argentina de Pesca in 1904 began killing elephant seals in 1905. They processed blubber in the whaling factory, continuing the 18th and 19th century tradition of supplementing whale oil production with high quality seal oil. Barely exploited since the mid 19th century, elephant seals were plentiful, and the Falkland Islands Government awarded the Compañía Argentina de Pesca its first sealing licence in 1909. The industry subsequently operated under conservation legislation transferred from the Falkland Islands, and new legislation developed specifically for South Georgia. Stipendiary Magistrates were sent to the island from 1909 to administer the developing community, and enforce both whaling and sealing legislation. The Compañía Argentina de Pesca was itself conscious of the need to conserve elephant seals, so that some 2 000 tons of valuable oil could continue to be produced from an annual catch quota of 6 000. The sealing licence allowed limited fur sealing, but few animals were seen and only one was killed, accidentally.

Fur sealing was prohibited from 1915 to allow a small population on the north-west coast of the island to increase. Exploitation of Weddell seals from a small colony on the south-east end of the island was similarly prohibited in 1917. The sealing regulations were violated by Capt. B.D. Cleveland of Daisy, awarded a licence in 1913 to produce elephant seal oil using 19th century techniques.

Oil could be produced from the large number of elephant seals at South Georgia using whaling crews and equipment. Expenses specifically associated with sealing were probably small, although the *Compañia Argentina de Pesca* rarely separated the operational and transport costs of whaling and sealing. The company made little sealing effort immediately after World War I because of low oil prices and their own financial instability. From 1918-23 only about 2 100 elephant seals were taken annually, reducing oil export revenue to the Falkland Islands Government and making them consider awarding the sealing licence to Chr. Salvesen & Co., then whaling at Leith Harbour. Faced with this potential annual loss of some 2 000 tons of high grade oil, the *Compañia Argentina de Pesca* increased its sealing effort, taking almost the maximum permitted quota from 1930-48.

The first comprehensive biological examination of the species and industry was made in 1951, indirect stock stability indicators showing that elephant seal numbers were decreasing. This was attributed to high catches since 1930, and increased quotas established by the Falkland Islands Government from 1948-51 without the benefit of contemporary census data. The sealing regulations were revised from 1952 to reverse this decline, the first major changes in the industry since 1909. Sealing Inspectors were appointed from 1956 to monitor the industry and stock. Mean catch ages were determined from dentine rings in a 58 catch tooth sample, and divisional catch quotas were seasonally adjusted. Sustainable

yield exploitation was therefore possible until sealing ended after the 1964 season.

Whaling became less profitable at South Georgia from the 1950s, and the Compañía Argentina de Pesca, reorganized as Albion Star (South Georgia) Ltd., left Grytviken after the 1961 season. The whaling and elephant sealing licence was awarded to the International Fishery Co. of Japan for the 1963 and 1964 seasons. They did not return to South Georgia thereafter, and the availability of the licence continued to be advertised in the Falkland Islands Gazette until 1972. It was awarded only once, in 1968 to a company of dubious background who used it as an excuse to send a vessel to South Georgia for unknown reasons. Only five elephant seals were taken.

The value of elephant seal oil was a major incentive for licensees to comply with conservation regulations for their own long term benefit. 20%-30% of the oil produced at Grytviken came from elephant seals, 97.8% being equivalent in quality to No. 1 grade whale oil. The Falkland Islands Government also profited from the industry. 6.8% of exports from South Georgia are estimated as elephant seal oil, export taxes on this oil producing some 4.0% of the Customs' revenue generated on the island for the Falkland Islands Government. The value of the industry could have been increased by an estimated 54% if the licensee had been required to process the entire carcass. This was never done commercially. Companies were probably unwilling to invest in vessels when whaling profits were large, and when their operational future on the island was precarious.

Elephant sealing at South Georgia in the 20th century provided an excellent example of controlled wildlife exploitation. The industry was successful because of the presence of a large easily hunted stock, whaling personnel and oil production plant, and the existence of conservation legislation from the beginning of the industry.

Sealing is prohibited at South Georgia and the South Sandwich Islands by the 1975 Falkland Islands Dependencies Conservation Ordinance. Pinnipeds in the Dependencies south of 60°S are protected under the Antarctic Treaty and the 1972 Convention for the Conservation of Antarctic Seals. The Convention on the Conservation of Antarctic Marine Living Resources of 1980 also attempts to ensure that catches of other species, particularly krill, are set at levels which will not deplete other stocks, especially pinnipeds, south of the Antarctic Convergence.

Fur seal and elephant seal stocks have increased at South Georgia under conservation legislation, the ending of sealing, and increased krill availability as whale stocks declined. Fur seal numbers continue to grow, being currently estimated at 1 000 000. Elephant seal numbers have stabilized at some 350 000.

The various pieces of legislation provide for a possible resumption of sealing, and stocks at South Georgia are at exploitable levels. However, it is unlikely that the legislation will be tested by a sealing revival. Exploitation costs are high, public opinion is against marine mammal exploitation, and current and foreseeable oil and fur markets are poor.

The sealing industry continued in the Falkland Islands and Dependencies for two centuries with intermittent success. Its final demise ended an important era in the history of wildlife exploitation.

APPENDICES

Appendix 1: Seal skin imports into London from the British southern whale fishery, 1788 to 1820 (after Steven 1983)

Year	Number of seal skins imported	Value (£)	Total fishery value (£)	Seal skin value as % of total fishery value
1788	64 256	2 677	45 191	5.9
1789	72 010	3 050	47 394	6.3
1790	73 798	3 075	52 485	5.8
1791	36 694	1 529	83 197	1.8
1792	150 718	6 279	105 648	5.9
1793	361 903	15 079	151 189	9.9
1794	77 492	3 229	96 589	3.4
1795	21 159	882	82 992	1.1
1796	25 563	1 065	119 001	0.9
1797	6 614	275	139 605	0.1
1798	10 277	428	95 843	0.5
1799	67 909	2 829	83 985	1.2
1800	100 327	4 180	89 164	1.1
1801	80 379	3 349	148 876	1.4
1802	18 842	785	104 153	1.1
1803	6 590	274	117 882	0.6
1804	104 599	4 358	111 162	4.1
1805	59 459	2 477	98 989	2.5
1806	1 522	63	113 846	0.1
1807	66 557	2 773	64 854	4.3
1808	125 158	5 214	74 082	7.1
1809	-	-	-	-
1810	-	-	-	-
1811	-	-	-	-
1812	41 186	1 716	-	-
1813	-	-	-	-
1814	29	2	92 204	-
1815	1 721	71	55 708	0.1
1816	21 396	891	46 045	1.9
1817	10 547	439	88 906	0.5
1818	4 820	200	131 955	0.2
1819	13 285	553	150 855	0.4
1820	18 103	754	138 107	0.6
Total	1 601 698	66 728	2 637 703	2.5

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Appendix 2



A.D. 1799 N° 2317.

Separating the Wool or Fur from Skins.

CHAPMAN'S SPECIFICATION. . .

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, THOMAS CHAPMAN, of the Parish of Saint Mary Magdalen, Bermondsey, in the County of Surry, Skinner and Seal Wool Manufacturer, send greeting.

WHEREAS His present Majesty King George the Third, in and by His
5 Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Sixth day of June now last past, for Himself, His heirs and successors, did give and grant unto me, the said Thomas Chapman, His especial licence, full power, sole privilege and authority, that I, the said Thomas Chapman, my executors, administrators, or assigns, and every of them, by myself
10 and themselves, and by my and their deputy or deputies, servants or agents, or such others as I, the said Thomas Chapman, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the
15 Town of Berwick-upon-Tweed, and also in all His said Majesty's Colonies and Plantations abroad, my Invention of "A NEW IMPROVED METHOD OF TAKING OR GETTING OFF THE WOOL OR FUR FROM SEAL AND OTHER SKINS IN A MORE PERFECT STATE THAN HAS HITHERTO BEEN DONE, FOR THE PURPOSE OF MANUFACTURING THE SAME INTO HATS OR ANY OTHER ARTICLE OF CLOATHING, WHEREBY
20 THE SKINS OR PELTS ARE LESS DAMAGED THAN BY ANY OTHER PROCESS YET ADOPTED, AND ARE KEPT AND PRESERVED IN A PERFECT STATE FOR THE PURPOSE OF TANNING



Chapman's Method of Separating the Wool or Fur from Skins.

INTO ANY KIND OF LEATHER;" in which said Letters Patent there is contained a proviso obliging me, the said Thomas Chapman, by an instrument in writing under my hand and seal, particularly to describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, and to cause the same to be inrolled in His said Majesty's High Court 5 of Chancery within one calendar month next and immediately after the date of the said recited Letters Patent, as in and by the same, reference being thereto had, will more fully appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Thomas Chapman, do hereby describe and ascertain the nature of my said 10 Invention, and the manner in which the same is to be performed, as follows, that is to say:—

"When the seal or other furr skin is in the raw or natural state lay it in clean cold fresh water for twelve hours, or thereabouts; afterwards take the skin to a beam usually worked on, and with a proper fleshing or beaming 15 knife scrape or take off the blubber or oily substance that adheres to the skin or pelt, then wash the skin or pelt very clean in heated or scalding water, made as warm as the hand can bear it, in which water the following ingredients must have been before mixed and dissolved (that is to say):— To every fourteen pails of the water, each pail containing two gallons or 20 thereabouts, put three pounds and an half of soft or other soap, and two pounds of pearl ash, and so in proportion for a smaller or larger quantity; then put the seal or other furr skin in hoops to dry in the sun, or a stove room, and make them as dry as possible. After the skins are so dried take them out of the hoops, and carefully wash them again in the aforesaid composition, made 25 afresh and as hot as before. The skins are then to be taken to the beam, and again scraped with the beaming knife, and the beaming knife will draw at every stroke of the workman the course hair from the skin or pelt, and leave the skin or pelt with the furr or wool adhering thereto cleared from all the course hair. Then lay or immerse the skin in warm water for twelve 30 hours, in which water the following ingredients must have been before mixed and dissolved, that is to say:—To every fourteen pails, each pail containing two gallons or thereabouts in quantity, three pounds of soft or other soap, one pound and a half of pearl ash, and one or two pounds of banilla more or less, according to the temper, curing, and pliability of the 35 skin. After the skin has laid in the water for the above time, take the skins out and lay them on the beam, and scrape them with a proper beaming knife, and the workman will at every stroke draw, extract, or discharge from the skin or pelt some of the wool or furr, until all the wool or furr be extracted

Chapman's Method of Separating the Wool or Fur from Skins.

or discharged, and will extricate and eradicate the roots that are by nature in the skin, and from which the wool or furr issues, and thereby the skin or pelt will be left free from every particle of hair, furr, or wool, and will be in nowise injured or damaged in its surface or inward substance. After
 5 the wool or furr is thus separated from the skin or pelt, put it into a hair-bottomed sieve, or any other utensill or thing that will let a liquid pass through it, but at the same time keep the wool or furr therein; then take two vessells, copper kettles, iron pans, or boilers, of sufficient size to hold fourteen pails of water, each pail containing two gallons or thereabouts:
 10 After having filled one of the vessels with water, put therein three pounds and an half of soft or other soap, two pounds and an half of pearl ash, and heat the water sufficiently to dissolve the above ingredients, the wool or furr being still kept in the hair-bottomed sieve or other utensill above described. Immerse the same in the water, stir it about frequently, and pressing it with
 15 the hand or otherwise about five minuets, you will perceive the roots of the wool or furr separate, expand, and divide freely. After the above operation has been practised with effect, take the other vessell, fill it with warm water, and therein immerse the wool or furr, and thoroughly wash, cleanse, purify, and press from and out of the wool or furr every filth or dirt that then
 20 adhers or appears to adhere thereto. After it is so cleansed let it be dried by a slow fire stove, or by heat of the sun, if the season will permit. After it is compleatly dried pull or part it by hand or otherwise, as it will freely part. After it is so parted, bow it with the bow string, or other like instrument, and the wool or furr so prepared, dried and finished will be found to be fit for the
 25 purpose of being used in the manufacture of hats and other articles of cloathing, and to be nearly equal to every purpose for which the wool or furr called beaver is used, and is also a wool or furr of so fine a texture and so good a staple as to be convertable to any other article of cloathing.

In witness whereof, I, the said Thomas Chapman, have hereunto set
 30 my hand and seal, this Fifth day of July, in the year of our Lord One thousand seven hundred and ninety-nine.

THOMAS CHAPMAN. (L.S.)

Scaled and delivered, being first duly
 stamped, in the presence of

35

JN. COKAYNE,
 Lyons Hill.
 THO^s THEO^r TAYLOR,
 same Place.

A.D. 1799.—N^o 2317.

Chapman's Method of Separating the Wool or Fur from Skins.

AND BE IT REMEMBERED, that on the same Fifth day of July, in the year above mentioned, the aforesaid Thomas Chapman came before our Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute 5 in that case made and provided.

Inrolled the same Fifth day of July, in the year above written.

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1856.

8 NO 56

Appendix 3: Auction prices obtained by L.M. Hoffman & Co., New York for 'Southern' salted fur seal skins, 1824-46 [except see below]
(Shipping and Commercial List and New York Price Current, 1824-46)

Year	Skin type												Reference			
	Wigs			Bulls			Clapmatches			Yearlings				Pups		
	f	low	high	f	low	high	f	low	high	f	low	high		f	low	high
1824	2 000	4.50	4.87	350	4.00	4.25	5 000	3.50	3.62	3 077	2.00	2.50	850	0.30	0.63	10(32) 21 Apr-11 1824 ⁽¹⁾ 10(104) 29 Dec. 1824 ⁽¹¹⁾
Annual range	468	4.77	4.86	769	4.25		1 791	3.25	4.23	4 152	0.64	1.82	55			
1825		4.50	4.87	4.00	4.25		3.25	4.23	0.64	2.50		0.30	0.63			11(21) 12 Mar. 1825 ⁽¹¹¹⁾ 11(101) 17 Dec. 1825 ^(iv)
Annual range		3.40	4.25	3.75			2.20	2.27	1.32	1.75						
1826	334		3.2	3.75			2.20	3.25	1.32	1.75						
1827		3.10	3.25	3.75			3 123	2.50	2.81	450	1.77					12(39) 17 May 1826
1828	337	2.12	2.95				4 800	1.91	2.40	220	0.85					13(37) 9 May 1827
							1 291	2.15	2.35	375	1.07		334	0.25		14(74) 17 Sept. 1828

Year	Skin type												Reference			
	Wigs			Bulls			Clapmatches			Yearlings				Pups		
	f	low	high	f	low	high	f	low	high	f	low	high		f	low	high
1829	543	6.00	6.15	281	5.50		1 773	2.70	5.60	134	1.15		456	0.20	0.25	15(53) 4 July 1829 ^(v)
	356	1.81	2.00				4 398	1.82	2.00	806	1.13	1.62	30	0.20		15(65) 15 Aug. 1829 ^(vi)
	620		6.50	500	6.00		8 940	2.62	4.25	140	2.00		200	0.30		15(98) 21 Nov. 1829

	Reference															
	Wigs			Bulls			Clapmatches			Yearlings			Pups			
	f	low	high	f	low	high	f	low	high	f	low	high	f	low	high	
1829	543	6.00	6.15	281	5.50		1 773	2.70	5.60	134	1.15		456	0.20	0.25	15(53) 4 July 1829 ^(v)
	356	1.81	2.00				4 398	1.82	2.00	806	1.13	1.62	30	0.20		15(65) 15 Aug. 1829 ^(vi)
	620	6.50	6.50	500	6.00		8 940	2.62	4.25	140	2.00		200	0.30		15(93) 21 Nov. 1829
							48	4.50		75	2.50		124	0.47		15(98) 9 Dec. 1829 ^(vii)
Annual range		1.81	6.50		5.50	6.00	1 122	1.75	2.15	65	1.80		746	0.30		15(101) 19 Dec. 1829 ^(viii)
							1 775	4.50			1.13	2.50		0.20	0.47	
1830	558	4.75	6.50				1 250	4.75		122	2.75	3.00	1500	0.28		16(47) 12 June 1830 ^(ix)
	1 501	4.85	5.82				3 582	3.05	5.50	390	1.60	2.25	310	0.17	0.23	16(48) 16 June 1830 ^(x)
	472	3.12	6.25	198	3.50	7.62	1 390	1.56	10.37	684	0.62		970	0.20	1.65	16(75) 18 Sept. 1830 ^(xi)
Annual range		3.25	4.25													
		3.12	6.25		3.50	7.62		1.56	10.37		0.62	3.00		0.17	1.65	16(81) 9 Oct. 1830 ^(xii)
1831	90	3.00					1 242	4.50	5.00	40	2.87		468	0.32		17(37) 7 May 1831 ^(xiii)
	23	9.50					184	9.50		345	1.30	2.40	200	0.37		17(40) 18 May 1831 ^(xiv)
	398	9.00	9.10				731	7.62	9.12	40	4.50		300	0.44	0.47	17(42) 25 May 1831 ^(xv)
Annual range		3.00	9.50					4.50	9.50		1.30	4.50		0.32	1.82	17(56) 13 July 1831 ^(xvi)
													108	0.48		17(60) 27 July 1831 ^(xvii)

Year	Skin type												Reference			
	Wigs			Bulls			Clapmatches			Yearlings				Pups		
	f	low	high	f	low	high	f	low	high	f	low	high		f	low	high

Year	Skin type												Reference			
	Wigs			Bulls			Clapmatches			Yearlings				Pups		
	f	low high		f	low high		f	low high		f	low high			f	low high	
1832	243	8.25	8.50	1800	7.50	8.00	5112	4.30	4.80	93	2.75	115	0.25	18(20) 10 Mar 1832		
	203	7.75					1839	2.50	8.00	162	0.63	1028	0.14	18(21) 14 Mar 1832(xv111)		
	375	3.62	3.75				144	3.62		93	2.05	344	0.26	18(25) 28 Mar 1832		
	26	8.25					91	6.00	6.25			560	0.17	18(78) 13 Oct. 1832(x1x)		
	206	7.75	8.00	83	7.00		653	6.62								
	231	8.12	9.37	1520	6.75		2606	3.62	6.87	371	0.62	193	0.25	18(82) 27 Oct 1832		
Annual range		3.62	9.37		6.75	8.00		2.50	8.00		0.62	2.75	0.14	0.72		
1833	100	2.52		200	4.62		200	2.65		400	1.75	2.00		19(2) 5 Jan. 1833 (xx)		
	288	10.62	11.25	1206	9.37	9.55	2600	4.62	5.50	27	4.00			19(24) 23 Mar 1833		
	203	11.12		689	9.62		1230	5.12	5.37	47	3.12			19(27) 3 Apr 11 1833		
	100	11.00					873	3.00	7.62	202	1.75			19(47) 12 June 1833 (xx1)		
	60	6.25	6.50	300	9.12	9.62	200	4.37	4.55			184	0.20	19(51) 26 June 1833 (xx11)		
	116	11.12					187	3.50	5.00	382	1.75	185	.7	0.12		
							109	5.80						19(53) 3 July 1833 (xx111)		
							50	7.62						19(57) 17 July 1833		
	102	5.00	6.75				394	4.25	8.50	88	2.12			19(64) 10 August 1833		
	77	12.75		358	10	10.05	632	6.37	7.12	75	3.37			19(68) 24 August 1833		
	52	15.50					93	9.87		5	5.25			19(84) 19 October 1833		
Annual range		2.52	15.50		4.62	10.05		2.65	9.87		1.75	5.25	0.12	0.75		

Year	Skin type												Reference			
	Wigs			Bulls			Clapmatches			Yearlings				Pups		
	f	low	high	f	low	high	f	low	high	f	low	high		f	low	high
1886	79	9.75		200	8.50	8.75	629	4.62	7.62	70	4.12	4.37	649	0.30	0.80	22(38) 11 May 1886
	292	8.12	11.50	631	6.87	9.37	619	5.00	8.00	1 177	4.12	5.37	1 124	0.29	0.37	22(39) 14 May 1886
	170	11.75	13.25				356	9.00	10.50				231	1.55	1.75	22(75) 17 Sept. 1886
Annual range		8.12	13.25					4.62	10.50		4.12	5.37		0.29	1.75	
1887	123	14.00		1 244	12	13.12	7 523	5.75	8.37							23(15) 22 Feb. 1887
1888	400	9.25	11.62				1 400	4.50	6.75							24(22) 26 May 1888 ^(xxiv)
	64	5.00	6.75	228	5.25	5.50	33	5.87		760	1.40	1.50	27	0.55		24(42) 26 May 1888 ^(xxv)
	63	4.12	9.00				51	5.62		68	3.62					24(50) 23 June 1888
	131	3.62	4.70				38	2.05								24(54) 2 July 1888
Annual range		3.62	11.62		3.20	5.50		2.05	6.75		1.40	3.62		0.55		
1889	341	9.75	10.75	400	8.50	8.62	2 366	4.75	6.75	131	2.12					25(27) 6 Apr 11 1889 ^(xxvi)
							250	5.25								25(77) 28 Sept. 1889
Annual Range		9.75	10.75		8.50	8.62		4.75	6.75		2.12					

Year	Skin type												Reference			
	Wigs			Bulls			Clipsatches			Yearlings				Pups		
	f	low	high	f	low	high	f	low	high	f	low	high		f	low	high
1840	248	5.62	6.00	250	5.25	5.75	211	4.25	4.50							26(28) 4 Apr 11 1840
	299	6.00	6.50	489	6.12	6.50	4 400	3.50	5.50							26(22) 14 Mar. 1840 (xxv11)
Annual range		5.62	6.50		5.25	6.50		3.50	5.50							
1841	483	5	5.12	1 100	5.25	5.50	4 463	2.37	3.50							27(33) 28 Apr 11 184 (xxv111)
	201	8.50	11.87	127	10.75	11.87	957	8.25	9.37	12	4.00		103	0.75	0.87	27(33) 28 Apr 11 1841 (xxx1x)
	95	5.37	5.75	143	5.50		395	4.25	5.25	125	2.37					27(33) 28 Apr 11 1841 (xxx)
Annual range		5.00	11.87		4.00	11.87	1 162	1.87	2.87							27(60) 31 July 1841
1842		No Sales Recorded														
1843	206	5.75	5.87													29(78) 30 Sept. 1843
1844							1 069	2.75	3.25							30(39) 15 May 1844 (xxx1)
Annual range							200	2.30	3.40							30(26) 30 March 1844 (xxx11)
1845		No Sales Recorded						2.30	3.40							
1846	101	6.75	7.25	688	4.25	5.12	1 835	2.75	3.62							32(42) 27 May 1846

			200	2.30	3.40			30(26) 30 March 1844 ^{xxx117}
Annual Range				2.30	3.40			
1845	No Sales Recorded							
1846		101	6.75	7.25	688	4.25	5.12	32(42) 27 May 1846

- | | | | |
|---------|---|---------|--|
| (i) | Franklin & Minturn Auctioneers, New York. | (ii) | Auction at Stonington, Conn. |
| (iii) | Cargo from Pacific Ocean. | (iv) | Auction at Boston. |
| (v) | Auction at Stonington, Cargo of <u>Pangolin</u> from South Seas. | (vi) | Part cargo of <u>Antarctic</u> from South Seas. |
| (vii) | R. R. Minturn, Auctioneer, New York. | (viii) | R. R. Minturn, Auctioneer, New York |
| (ix) | P. C. Dummer, Auctioneer, Jersey City. | (ix) | Auction at Stonington, Cargoes of <u>Free Gift</u> and <u>Alonso</u> . |
| (xi) | P. C. Dummer, Auctioneer, Jersey City. | (x) | Cargo of <u>Sea Nymph</u> from Pacific Ocean. |
| (xii) | Cargoes of <u>Boots</u> and <u>American</u> from Pacific Ocean. | (xi) | |
| (xiii) | Auction by R. R. Minturn, New York. | (xii) | Auction at Stonington; cargoes of <u>Alonso</u> and <u>Harris</u> from South Seas. |
| (xiv) | Cargo of <u>General Putnam</u> . | (xiii) | Auction at Stonington, cargo of <u>Pangolin</u> from South Seas. |
| (xv) | M. F. Pell & Co.; Auctioneers, New York. | (xiv) | Auction from M. F. Pell & Co.; New York, cargo of <u>Elizabeth Jane</u> from South Seas. |
| (xvi) | Auction by M. F. Pell & Co.; New York, part cargo of <u>Isar</u> from South Seas. | (xv) | R. R. Minturn, Auctioneers, New York. |
| (xvii) | Auction by C. Mills & Co.; New York. | (xvi) | R. R. Minturn, Auctioneers, New York. |
| (xviii) | Cargo of <u>Pangolin</u> from Cape Horn. | (xvii) | Cargo of <u>Colonel Howard</u> from Buenos Aires. |
| (xix) | Cargo of <u>Alonso</u> . | (xviii) | Lobos Islands. |
| (xx) | Cargo of <u>Tampico</u> . | (xix) | Lobos Islands. |
| (xxi) | Lobos Islands. | (xx) | Cargo of <u>Pangolin</u> from Cape Horn. |
| (xxii) | Cargo of <u>Putnarch</u> from South Shetland Islands. | (xxi) | Lobos Islands. |

Appendix 4: Vessel arrivals and departures, Puerto Soledad, June 1826 to March 1831
(Parish 1831a)

<u>Date arrive</u>	<u>Date leave</u>	<u>Vessel</u>	<u>Nationality</u>	<u>From</u>	<u>To</u>	<u>Nature of voyage</u>
- Jun 26	23 Aug 26	Star	England	Liverpool	Cape Horn	Sealing
- Jun 26	10 Sep 26	Sprightly	"	London	"	"
9 Jun 26	9 Sep 26	Alert	"	Buenos Aires	Rio Negro	Freight to settlements
9 Sep 26	9 Sep 26	Yankey	American	New York	Cape Horn	Sealing
23 Sep 26	31 Oct 26	Science	"	"	"	Tender to <u>Port Captain</u>
22 Oct 26	"	Port Captain	"	"	"	Sealing
11 Dec 26	19 Dec 26	John Palmer	England	London	"	Whaling
28 Dec 26	4 Jan 27	Mary Ellen	"	Lima	Gibraltar	Merchantman
4 Jan 27	6 Jan 27	Uxbridge	"	Pacific	Round the islands	Sealing
14 Jan 27	24 Feb 27	Sprightly	"	"	"	"
18 Jan 27	28 Jan 27	Triton	France	Nantes	Pacific	Whaling
21 Jan 27	30 Jan 27	Partridge	England	London	"	"
27 Jan 27	31 Jan 27	Uxbridge	"	These islands	Home	Sealing
11 Feb 27	21 Feb 27	Star	"	"	"	"
"	19 Feb 27	Science	American	"	"	"
21 Mar 27	25 Mar 27	Penguin	"	Patagonia	"	"
2 Apr 27	16 Apr 27	Sprightly	England	These islands	London	"
4 Apr 27	16 Apr 27	Lively	"	Pacific	"	"
22 May 27	25 May	Hugh Crawford	"	Van Dieman's Land	"	Freight
-	19 Jun 27	Doria	"	Patagonia	Buenos Aires	Merchantman
11 Jun 27	14 Jun 27	Eliza Ann	America	These islands	Home	Sealer
28 Jul 27	2 Aug 27	Sarah Atkins	"	Portsmouth, USA	These islands	"
4 Sep 27	4 Oct 27	Vulture	England	Liverpool	Chile & Peru	Merchantman
1 Oct 27	4 Oct 27	Uxbridge	"	London	These islands	Sealer
1 Oct 27	4 Oct 27	Sarah Atkins	America	These islands	"	"
11 Oct 27	29 Oct 27	Decatur	"	United States	"	Whaler
14 Oct 27	17 Oct 27	Salmon	"	Boston	Valparaiso	Merchantman
25 Oct 27	6 Nov 27	Mercury	England	London	These islands	Sealer
31 Oct 27	11 Nov 27	Adeona	"	"	"	"
2 Dec 27	20 Dec 27	Sarah Atkins	America	These islands	"	"
9 Jun 28	3 Feb 27	Ocean	France	Nantes	Pacific	Whaler
15 Jan 28	21 Jan 28	Rolla	England	Sydney	London	Merchantman
15 Feb 28	20 Feb 28	Sarah Atkins	America	These islands	Portsmouth	Sealer
25 Mar 28	28 Mar 28	Uxor	"	N. America	Chile	"
30 Mar 28	17 Apr 28	Triton	France	California	Nantes	Whaler
3 Apr 28	9 Apr 28	Nautilus	England	Hamburg	Valparaiso	Merchantman
22 Apr 28	7 May 28	Elizabeth	"	Pacific	London	Whaler
14 Aug 28	17 Aug 28	Mercury	"	Cape Horn	Cape Horn	Sealer
28 Aug 28	15 Sep 28	Combine	America	Rio Negro	Rio Negro	Freight to settlements
2 Sep 28	16 Nov 28	Luisa	Buenos Aires	"	"	"
13 Dec 28	14 Dec 28	Post Captain	American	Chile & Peru	New York	Merchantman
13 Jan 31	8 Feb 31	Adeona	England	Cape Horn	London	Sealer
16 Jan 31	8 Feb 31	Mercury	"	"	Greenock	"
20 Jan 31	21 Jan 31	Sarah Atkins	American	These islands	Staten Land	"

Appendix 5: Annual summary of the Falkland Islands domestic sealing industry, 1846-1940
(Falkland Islands 1846-1940)

Year	Exports	Value (£)	Comments
1846	Hair seal skins	2/2d. each	Boats occasionally get seals, number uncertain Fur seals reserved by government, £2. 10.0d each
1847	"	"	Number variable, uncertain
1848	Seals		Value according to quality
1849	1 046 hair seal skins 37 fur seal skins 140 galls. seal oil	£ 262 total	
1850	Hair, fur seal skins	£ 500	
1851	"	"	Volunteer Rocks lease, £8 annum
1852	"	"	Fishery destroyed by American vessels
1853			Rookeries destroyed, valueless
1854			Rookeries need several years rest to attain earlier numbers
1855			As above
1856	5 000 skins 420 barrels oil	£2 000 total	
1857	Seal and sea elephants	£3 500	
1858	Seal, seal lion and sea elephants	£5 000	
1859	7 217 skins 17 000 galls. oil	£1 732 £2 550	Sea lion skins 750 @ 10/- each Fur seal skins 70 @ 22/- each Inferior skins 6 397 @ 4/-each Seal oil @ 3/- gall.
1860	Seal, whale oil Seal skins	£ 144 £ 527	
1861	Seal, whale oil Fur seal skins Hair, sea lion skins	£2 050 £3 650 £2 006	From Falkland Islands, Patagonia and Tierra del Fuego
1862	Seal, whale oil	£2 666	
1863	Seal, whale, penguin oil	£6 719	
1864	Seal, whale, penguin oil	£2 400	
1865	Seal, whale, penguin oil	£5 720	
1866	Seal, whale, penguin oil Skins	£3 600 £1 050	
1867	Skins Seal, whale, penguin oil	£ 320 £3 840	

1862	Seal, whale oil	£2 666	
1863	Seal, whale, penguin oil	£6 719	
1864	Seal, whale, penguin oil	£2 400	
1865	Seal, whale, penguin oil	£5 720	
1866	Seal, whale, penguin oil Skins	£3 600 £1 050	
1867	Skins Seal, whale, penguin oil	£ 320 £3 860	No records
1868			
1869	Skins	£ 742	
1870	Seal, whale, penguin oil Hair seal skins Fur seal skins Seal, whale, penguin oil	£3 300 £1 338 £ 377 £3 650	
1871	Hair seal skins Fur seal skins Sea lion skins Seal, whale oil	£ 747 £ 498 £ 562 £1 692	Seals scarce fur seal skins, 4/6d-13/6d. Seal oil, 1/9d-2/6d gall. Skins and oil to England and Belgium
1872			No records
1873	Fur, hair, sea lion skins Seal, whale, penguin oil	£ 949 £1 241	From Patagonia. Fur seal skins almost unobtainable, value £1 each. Hair seal skins, 3/9d. each
1874	Seal skins Seal, whale, penguin oil	£ 700 £ 950	Sealing collapsed. Fur seal skins valued at £4 each but unavailable
1875	Seal skins Seal, whale, penguin oil	£ 2 £1 800	Trade collapsed due to no seals and lighter trade taking supplies to West Falkland farms. Oil to France, use unknown
1876	Seal, whale, penguin oil	£ 160	Two schooners at Patagonia for seal oil at 1/9d.-2/6d. gall. Hope trade revived so 'a man can make £40-£70 in six months'.
1877	Seal skins Seal, whale, penguin oil	£ 308 £1 200	
1878	Seal skins Seal, whale, penguin oil	£1 213 £1 312	£258 not colonial produce
1879	Fur, hair seal skins Seal, whale, penguin oil	£1 400 £1 200	£120 not colonial produce
1880	Fur, hair seal skins Seal, penguin oil	£2 100 £1 100	
1881	Sealskins	£ 968	
1882			No records
1883			No records

1880	Fur, hair seal skins	£2 100	
	Seal, penguin oil	£1 100	
1881	Sealskins	£ 968	No records
1882			No records
1883			
1884	Sealskins	£ 191	
	Seal oil	£ 125	
1885	-	-	No records
1886	-	-	No records
1887	Sealskins	£ 12	
1888	Sealskins	£ 388	
1889	Sealskins	£ 254	
1890	Sealskins, 658	£ 730	
	Seal oil, 800 galls	£ 51	
1891	Sealskins, 838	-	
1892	Sealskins, 512	£ 788	
1893	Sealskins, 343	£ 482	
1894	Sealskins, 651	£ 720	
	Seal, penguin oil, 30 casks	£ 30	
1895	Sealskins, 672	£1 000	
	Seal oil, 12 casks	£ 60	
1896	Sealskins, 727	£1 090	
1897	Sealskins, 1 609	£2 413	
	Seal oil, 7 casks	£ 14	
1898	Sealskins, 571	£ 787	
1899	Sealskins, 580	£ 800	
1900	Sealskins, 707	£1 500	
1901	Sealskins, 100	£ 100	
1902	Sealskins, 93	£ 186	
1903	Sealskins, 310	[£ 465]	Plus 22 484 fur seal skins valued at £44 968 from Canadian vessels
1904	Sealskins, 103	£ 151	
1905	Sealskins, 151	£ 227	
1906	Sealskins, 325	£ 258	
1907	Sealskins, 3 472	£6 944	Includes cargo of Canadian sealing vessels
	Seal oil, 7 barrels	£ 30	
1908	Hair seal skins, 334	£ 84	Hair and fur seal skins to England,
	Fur seal skins, 547	£1 649	oil to Chile
	Seal oil, 28 barrels	£ 42	

Plus 22 484 fur seal skins valued at £44 968
from Canadian vessels

[£ 465]

1903 Sealskins, 310
1904 Sealskins, 103
1905 Sealskins, 151
1906 Sealskins, 325
1907 Sealskins, 3 472
Seal oil, 7 barrels
1908 Hair seal skins, 334
Fur seal skins, 547
Seal oil, 28 barrels

£ 151
£ 227
£ 258
£6 944
£ 30
£ 84
£1 649
£ 42

Includes cargo of Canadian sealing vessels

Hair and fur seal skins to England,
oil to Chile

1909 Hair seal skins, 327
Fur seal skins, 280
Seal oil, 7 casks
1910 Skins, 170
1911 Skins, 960
1912 Hair seal skins, 250
Fur seal skins, 2 859
Seal oil, 21 casks
1913 Skins, 266
1914 Skins, 10
1915
1916
1917
1918
1919 Seal oil, a barrel
1920
1921 Seal oil, 1 barrel
1922 Skins, 96
1923 Skins, 127
1924 Skins, 17
1925
1926
1927 Skins, 9

£ 75
£ 81
£ 170
£3 732
£ 75
£7 907
£ 20
£ 598
£ 26

(Figures not kept
(separately for
(Colonies and
(Dependencies

£ 50
£ 60
£ 288
£ 500
£ 35

£ 40

(Figures not kept
separately for
Colonies and
Dependencies)

1915			
1916			
1917			
1918			
1919	Seal oil, a barrel	£	50
1920			
1921	Seal oil, 1 barrel	£	60
1922	Skins, 96	£	288
1923	Skins, 127	£	500
1924	Skins, 17	£	35
1925			
1926			
1927	Skins, 9	£	40
1928			
1929	Skins, 337	£	577
	Seal oil, 2 657 barrels	£16	423
1930	Seal oil, 2 424 barrels	£5	920
1931			
1932	Seal oil, 1 701 barrels	£5	000
1933	Seal oil, 1 806 barrels	£4	660
1934	Seal oil, 8 barrels	£	16
1935	Seal oil, 2 006 barrels	£4	135
1936	Seal oil, 2 732 barrels	£4	135
1937	Seal oil, 1 654 barrels	£4	200
1938			
1939	Seal oil, 635 barrels	£1	800
1940	Seal oil, 93 barrels	£	400

Appendix 6: The value of seal products exported from the Falkland Islands compared to the value of total exports, 1849-1940
(Falkland Islands 1849-1940, Appendix 5)

Year	Value (£) of seal products exported	Total export value (£) of domestic produce	Seal product export values (£) as % of total export values (£)	Year
1849	262	2 660	9.9	1909
1850	500	1 560	32.0	1910
1851	500	4 500	11.1	1911
1852	500	5 880	8.6	1912
1853		7 428		1913
1854		6 500		1914
1855				1915
1856	2 000	11 800	16.9	1916
1857	3 000			1917
1858	5 000			1918
1859	4 381	6 892	63.5	1919
1860	671	5 910	11.3	1920
1861	7 706	15 986	48.2	1921
1862	2 666	15 556	17.1	1922
1863	6 719	18 415	36.4	1923
1864	2 400	10 114	23.7	1924
1865	5 720	17 325	33.0	1925
1866	4 650	21 780	21.3	1926
1867	4 180	18 230	22.9	1927
1868		12 695		1928
1869	4 042	19 184	21.0	1929
1870	5 365	19894	26.9	1930
1871	3 499	24 692	14.1	1931
1872		31 435		1932
1873	2 190	40 586	5.3	1933
1874	1 650	41 720	3.9	1934
1875	1 802	38 989	4.6	1935
1876	160	37 121	0.4	1936
1877	1 508	59 878	2.5	1937
1878	2 525	51 055	4.9	1938
1879	2 600	71 340	3.6	1939
1880	3 200	88 564	3.6	1940
1881	968	87 919	1.1	
1882		76 931		
1883		84 593		
1884	316	107 338	0.3	
1885		97 846		
1886		108 946		
1887	12	107 995	0.01	
1888	388	88 743	0.4	
1889	254	116 102	0.2	
1890	781	115 865	0.7	
1891		130 752		
1892	768	126 312	0.6	
1893	482	134 872	0.4	
1894	750	131 801	0.6	
1895	1 060	122 988	0.9	
1896	1 090	132 194	0.8	
1897	2 427	125 123	1.9	
1898	787	106 984	0.7	
1899	800	132 203	0.6	
1900	1 500	111 539	1.3	
1901	100	111 024	0.1	
1902	186	90 838	0.2	
1903	[465]	160 883	0.3	
1904	151	126 935	0.1	
1905	227	167 450	0.1	
1906	258	185 227	0.1	
1907		246 435		
1908	1 775	137 767	1.2	

mpared

Year	Value (£) of seal products exported	Total export value (£) of domestic produce	Seal product export values (£) as % of total export values (£)
1909	156	216 514	0.07/
1910	170	308 930	0.05
1911	3 732	471 156	0.8
1912	8 002	623 875	1.3
1913	598		
1914	56		
1915			
1916			
1917			
1918		340 893	
1919	50	404 512	0.01
1920		363 998	
1921	60	130 006	0.05
1922	288	103 622	0.3
1923	500	167 440	0.3
1924	35	267 312	0.01
1925		330 454	
1926		239 958	
1927	40	247 933	0.01
1928		296 311	
1929	1 700	268 870	0.6
1930	5 920	213 941	2.8
1931		146 943	
1932	5 000	121 947	4.1
1933	4 660	116 972	4.0
1934	16	142 714	0.01
1935	4 135	124 301	3.3
1936	6 581	116 656	5.6
1937	4 200	204 020	2.1
1938		200 706	
1939	1 800	198 918	0.9
1940	400	199 405	0.2

Appendix 7: Canadian pelagic sealing vessel entries and cargoes, Stanley 1901-12
 (Lawson 1985d [1901-08], Miller 1985 [1911-12], except as shown)

Date entered	Vessel	Master	From	Number of skins	Departed for	Date
23 12 01	Beatrice L. Corkum	Reuben Balcom	Halifax	-	Cape Horn/South Shetland Is. (i)	14 1 04
28 1 02	Edward Roy	F.W. Gilbert	Halifax	- [Roy total 3 700, Corkum total 4 000; Colonist 1903]	Sealing	1 2 02
10 3 02	Beatrice L. Corkum	Reuben Balcom	South Georgia	900	"	22 3 02
12 3 02	Edward Roy	F.W. Gilbert	South Atlantic	484	"	31 3 02
12 5 02	Beatrice L. Corkum	Reuben Balcom	Sealing	1 120	"	21 5 02
26 1 03	Edward Roy	E.F. Robbins	Halifax/sealing	1 478	Sealing in Pacific	4 2 03
26 1 03	Beatrice L. Corkum	W.E. Baker	"	1 731	"	"
26 1 03	Ola M. Balcom	Reuben Balcom	"	2 080	"	6 2 03
7 2 03	E.B. Marvin	J. Anderson	Victoria/sealing	2 474 (ii)	Sealing	17 2 03
7 2 03	F.H. Smith	Mathew Ryan	"	2 529 [3 321 (iii)]	"	24 2 03
11 2 03	F.M. Munsie	Chester Beaver	Sealing	1 861	"	25 2 03
11 5 03	Beatrice L. Corkum	W.E. Baker	"	2 237	"	-
11 5 03	Ola M. Balcom	Reuben Balcom	"	1 514	"	-
18 5 03	F.M. Smith	Mathew Ryan	"	1 002	"	26 5 03
21 5 03	E.B. Marvin	J. Anderson	"	1 379 [1 000 (iv)]	"	30 3 03
21 5 03	Leslie L.	F.W. Gilbert	"	1 706	"	-
25 5 03	Edward Roy	E.F. Robbins	"	2 020	"	-
25 5 03	F.M. Munsie	C. LeBlanc	-	-	-	-
30 5 03	St. Clair	S.H. Balcom	-	-	-	-
22 1 04	Edith R. Balcom	Reuben Balcom	Cape Irio Bay	326	Halifax N.S.	28 2 04
23 1 04	Edward Roy	E.F. Robbins	"	715	"	20 2 04
23 1 04	Ola M. Balcom	Reuben Balcom	"	1 169	"	"
24 1 04	St. Clair	S.H. Balcom	"	1 550	"	"
24 1 04	Leslie L.	F.W. Gilbert	"	711	"	"
25 1 04	E.B. Marvin	J. Anderson	"	913	"	"
25 1 04	Agnes G. Donahoe	Mathew Ryan	"	1 721	"	"
27 1 04	Beatrice L. Corkum	W.E. Baker	"	1 024	"	"
11 2 04	Annie E. Larder	John Collier	"	1 050	"	1904
14 4 04	F.M. Munsie	C. LeBlanc	Montevideo	2 671	-	25 4 04
21 4 04	Ola M. Balcom	Reuben Balcom	Sealing	1 267	-	27 4 04
21 4 04	Agnes G. Donahoe	Mathew Ryan	"	1 860	-	-
21 4 04	Leslie L.	F.W. Gilbert	"	425	-	27 4 04
26 4 04	Edith R. Balcom	S.H. Balcom	"	675	-	"

16 1 06	Markland	C. LeBlanc	-	1 000 (ix)	Sealing/Punta Arenas	30 1 06
26 1 06	Beatrice L. Corkum	E.F. Robbins	Sealing	1 500 (v)	"	"
12 2 06	Beden-Powell	J. Anderson	South Shetland	-	"	"

16 1 06	Merkland	C. LeBlanc	-	1 000 (ix)	-	Sealing/Punta Arenas	30 1 06
26 1 06	Beatrice L. Corkum	E.F. Robbins	Sealing	1 500 (v)	"	"	7 2 06
12 2 06	Beden-Powell	J. Anderson	South Shetland	-	"	"	24 2 06
19 2 06	Edith R. Balcom	Reuben Balcom	South Orkneys	936 (vi)			
			South Shetlands	538 (vii)			
			total	3 004 (viii)			
- - 06	E.B. Marvin (x)	W.E. Baker	-	2 612	-	-	-
7 1 07	Alice Gertrude	Mathew Ryan	Halifax/Sealing	556 (xi)	Punta Arenas		6 2 07
19 1 07	E.B. Marvin	A. Hilty	Sealing	640	Montevideo		9 2 07
26 1 07	Baden-Powell	E.F. Robbins	Sealing	844	"		5 2 07
3 2 07	Agnes Donahoe	S.H. Balcom	"	1 382	"		14 3 07
- - 07	Latooka (xii)	? Wentzel	-	-	-		-
- - 07	Edith R. Balcom (xiii)	W.E. Baker	-	2 000	-		-
21 1 08	Alice Gertrude	Mathew Ryan	Halifax	539	Sealing		4 2 08
26 1 08	Beatrice L. Corkum	F.W. Gilbert	"	136	"		"
9 2 08	E.B. Marvin	A. Hilty	"	385	"		- - 08
- - 08	Village Belle (xiv)	C. LeBlanc	-	-	-		-
- - 09	Beatrice L. Corkum (xv)	W.E. Baker	-	-	-		-
30 1 11	Isabel May	W.E. Baker	-	-	-		-
5 2 11	Village Belle	E.F. Robbins or C. LeBlanc (xvi)	-	1 600 (xvi)	-		-
16 2 11	Ida M. Clark	W. Gilbert	-	none (xvii)	-		-
21 2 11	Hilda R.	Mathew Ryan	-	'good catch' (xvii)	-		-
- - 11	? (xviii)	E.F. Robbins	-	600	-		-
- - 11	? (xvii)	C. LeBlanc	-	1 235 [80 from South Sandwich Islands]	-		-
31 1 12	Ida M. Clark	E.F. Robbins	-	in ballast	-		-
8 2 12	Hilda R.	Mathew Ryan	-	"	-		-

Notes

- (i) Harding 1907b. (ii) Lawson 1905a. (iii) Lawson 1905a. (iv) Harding 1903a. (v) Yarmouth Herald 1906.
(vi) Kellogg 1942. (vii) Pacific Fishermen 1906a. (viii) Pacific Fishermen 1906b. (ix) Strange 1972. (x) Yarmouth Herald 1906.
(xi) Allardyce 1907. (xii) Yarmouth Herald 1907a. (xiii) Yarmouth Herald 1907b. (xiv) Yarmouth Herald 1909a.
(xv) Yarmouth Herald 1909b. (xvi) Yarmouth Herald 1911a. (xvii) Yarmouth Herald 1911b. (xviii) Yarmouth Herald 1911c.
(xvii) Yarmouth Herald 1911a.

Appendix B: Canadian sealing schooners operating in the Falkland Islands and Dependencies, 1901-1911
(Yarmouth Herald 1903-11; Mercantile Navy List and Maritime Directory, 1906 and 1911)

<u>Vessel Name</u>	<u>Official Req. No.</u>	<u>Port Registered</u>	<u>Port built/Year built</u>	<u>Tons</u>	<u>Owner</u>
Agnes G. Donahoe	115482	Lunenburg, N.S.	Lunenburg, N.S. 1903	99	Sprott Balcom (Pacific Whaling Co., Victoria, B.C.)
Alice Gertrude	111738	LeHave, N.S.	Lunenburg, N.S. 1902	81	John B. Young (Lunenburg)
Annie E. Larder	90837	St. John's, Nfld.	Port Medway, N.S. 1900	93	Robert Moulton. (Burgoe, Nfld.)
Baden Powell	111412	Lunenburg, N.S.	Lunenburg, N.S. 1900	94	Baden-Powell Sealing Co. (Halifax)
Beatrice L. Corkum	107130	Halifax, N.S.	Lunenburg, N.S. 1899	81	John A. Bechtel (Victoria, B.C.)
E.B. Marvin	94810	Victoria, B.C.	Kennebunk, Mass. 1884	96	Victoria Sealing Co., Ltd. (Victoria, B.C.)
Edith R. Balcom	116491	Lunenburg, N.S.	Lunenburg, N.S. 1903	100	Sprott Balcom (Pacific Whaling Co., Victoria, B.C.)
Edward Roy	107962	Lunenburg, N.S.	LeHave, N.S. 1900	75	Sprott Balcom (Pacific Whaling Co., Victoria, B.C.)
Florence M. Munsie	112094	Lunenburg, N.S.	Mahone Bay, N.S. 1902	97	William Munsie (Victoria, B.C.)
Florence M. Smith	94771	Victoria, B.C.	Lunenburg, N.S. 1888	99	Victoria Sealing Co., Ltd. (Victoria, B.C.)
Hattie L.M.	107641	Halifax, N.S.	Mahone Bay, N.S. 1899	88	The Pioneer Exploration Co. (Halifax)
Hilda R.	126904	Halifax, N.S.	LeHave, N.S. 1910	100	Canada Sealing Co. (Halifax)
Ida M. Clark	111687	Halifax, N.S.	Sable River, N.S. 1902	99	William McFatridge (Halifax)
Isabel May	126901	Halifax, N.S.	Lunenburg, N.S. 1910	123	John A. Bechtel (Victoria, B.C.)
Latooka	111635	Lunenburg, N.S.	LeHave, N.S. 1901	99	Rufus Conrad (LeHave)
Leslie L.	111439	St. John's, Nfld.	Shelburne, N.S. 1902	100	William Snow (Twillingate)
Markland	112110	Lunenburg, N.S.	Mahone Bay, N.S. 1903	99	Victoria Sealing Co., Ltd. (Victoria, B.C.)
Ola M. Balcom	112093	Lunenburg, N.S.	Lunenburg, N.S. 1902	99	Sprott Balcom (Pacific Whaling Co., Victoria, B.C.)
St. Claire	107117	Lunenburg, N.S.	Lunenburg, N.S. 1898	98	Sprott Balcom (Pacific Whaling Co., Victoria, B.C.)
Village Belle	116556	Maitland, N.S.	Maitland, N.S. 1907	99	John Clark (Maitland)
Volando	116908	Parrsboro, N.S.	Parrsboro, N.S. 1907	77	David A. Huntley (Parrsboro)

Appendix 9: Seal catch, seal and whale oil production, Grytviken 1909-10 to 1964-65
(Annual Sealing Reports, South Georgia 1910-65; Annual Whaling Reports, South Georgia 1910-65; Headland 1984a).

Season	Catch	Seal oil production (barrels)	Average per seal	Whale oil production	Total oil production	Seal oil production as % of total products
1909-10	595	1 082	1.81	31 428	32 510	3.3
1910-11	3 005	3 467	1.15	52 129	55 596	6.2
1911-12	2 059	4 031	1.95	44 682	48 713	8.3
1912-13	2 794	5 712	2.04	32 048	37 760	17.8
1913-14	4 540	7 840	1.74	27 070	34 910	22.4
1914-15	3 113	4 641	1.49	37 478	42 128	11.0
1915-16	2 016	2 537	1.25	48 308	50 845	5.0
1916-17	2 906	5 337	1.83	34 577	39 914	13.4
1917-18	3 018	5 297	1.75	25 475	30 772	17.2
1918-19	2 954	6 137	2.07	19 985	26 122	23.5
1919-20	1 230	1 650	1.34	19 902	21 552	7.6
1920-21	1 545	2 269	1.46	33 511	35 780	6.3
1921-22	1 114	1 660	1.49	34 878	39 819	41.1
1922-23	2 713	5 035	1.86	51 075	56 110	8.9
1923-24	2 994	6 375	2.12	34 765	61 590	10.4
1924-25	3 902	7 486	1.91	49 013	56 449	13.2
1925-26	3 801	6 891	1.81	54 476	61 367	11.3
1926-27	4 782	8 094	1.69	59 681	67 775	11.9
1927-28	5 515	10 033	1.81	54 839	68 872	14.5
1928-29	4 883	8 768	1.79	53 362	62 430	14.0
1929-30	5 102	9 224	1.81	44 112	53 336	17.3
1930-31	5 814	10 616	1.83	39 537	50 153	21.1
1931-32	5 929	11 580	1.95	48 717	60 297	19.2
1932-33	5 172	9 867	1.91	54 583	64 450	15.3
1933-34	5 987	12 252	2.05	65 790	78 042	15.6
1934-35	4 438	8 896	2.00	53 281	62 177	14.3
1935-36	5 838	11 892	2.04	75 192	87 084	13.6
1936-37	5 604	11 366	2.03	47 377	58 743	19.3
1937-38	6 000	12 295	2.05	51 766	64 061	19.2
1938-39	5 833	11 515	1.97	66 826	78 341	14.6
1939-40	6 000	12 154	2.03	39 482	51 586	23.5
1940-41	6 000	12 168	2.03	44 498	56 666	21.4
1941-42	5 831	11 786	2.02	60 087	72 593	16.2
1942-43	3 989	6 572	1.65	50 960	57 532	11.4
1943-44	5 927	11 167	1.88	25 001	36 168	30.8
1944-45	6 000	11 940	1.99	75 540	87 480	13.6
1945-46	5 382	10 382	1.93	45 028	55 410	18.7
1946-47	4 449	8 075	1.82	47 830	55 905	14.5
1947-48	6 000	11 994	2.00	44 965	56 959	22.3
1948-49	7 500	15 093	2.01	52 518	67 611	24.4
1949-50	6 876	13 358	1.94	41 348	54 706	24.3
1950-51	6 901	13 035	1.89	40 593	53 628	24.3
1951-52	7 877	14 608	1.85	41 825	56 433	25.8
1952-53	6 000	10 807	1.80	32 187	42 994	25.2
1953-54	6 000	11 475	1.91	53 478	64 953	17.6
1954-55	6 000	11 425	1.90	50 568	61 993	18.5
1955-56	6 000	12 068	2.01	43 576	55 644	21.6
1956-57	6 000	11 805	1.97	51 330	63 135	18.6
1957-58	5 408	11 020	2.04	94 055	105 075	10.5
1958-59	5 864	12 476	2.14	39 430	51 906	24.0
1959-60	5 787	12 562	2.18	40 500	53 062	23.6
1960-61	5 632	12 381	2.20	58 016	70 397	17.5
1961-62	4 765	9 666	2.03	49 815	59 581	16.3
1962-63			No sealing or whaling			
1963-64	3 996	7 156	1.78	21 173	28 215	24.9
1964-65	5 147	9 702	1.89	16 493	26 195	37.0
Total	260 950	498 870	1.9	2 506 159	3 004 834	16.5

Note Includes 752 leopard seals, 1910 to 1927 (Table 10.3);
97 Weddell seals 1910 to 1916 (Table 10.4) and 1 fur seal, 1915

BIBLIOGRAPHY

- Note: 1. SPRI MS refers to unpublished manuscripts in the library of Scott Polar Research Institute, Cambridge.
2. PRO CO refers to unpublished manuscripts in Colonial Office papers at the Public Record Office, Kew.

- Abbott, C.C. & Selster, P.L. 1868. On the seals of the Falkland Islands. Proceedings of the Zoological Society of London. 1868: 189-192.
- Adams, J.T. 1926. New England in the Republic, 1776-1850. Little, Brown & Co., New York.
- Administrative Officer. 1953a. Telegram to the Colonial Secretary (n.d.). SPRI MS 1228/8/46.
- Administrative Officer. 1953b. Telegram 20/53 to the Colonial Secretary. 3 February 1953. SPRI MS 1228/9/8.
- Administrative Officer. 1953c. Telegram 79 to the Colonial Secretary, 19 May 1953. SPRI MS 1228/8/45.
- Administrative Officer. 1954. Letter S.G. 20/54 to the Manager, Compañía Argentina de Pesca. SPRI MS 1228/8/46.
- Administrative Officer. 1957. Memorandum: Revision of Sealing licence, 6 April 1957. SPRI MS 1228/9/1.
- Administrative Officer. 1962a. Telegram 184 to the Colonial Secretary, 13 July 1962. SPRI MS 1228/8/54.
- Administrative Officer. 1962b. Telegram 190 to the Colonial Secretary, 20 July 1962. SPRI MS 1228/8/54.
- Administrative Officer. 1964a. Telegram to the Colonial Secretary, 4 May 1964. SPRI MS 1228/6/51.
- Administrative Officer. 1964b. Telegram 189 to the Colonial Secretary, 4 June 1964. SPRI MS 1228/6/51.
- Administrative Officer. 1965. Despatch S.G. 614 to the Colonial Secretary, 5 February 1965. SPRI MS 1228/6/51.
- Administrative Officer. 1968. Telegram 30 to the Colonial Secretary, 30 January 1968. SPRI MS 1228/8/60.
- Admiralty. 1928. Despatch to the Under Secretary of State for the Colonies, 12 May 1928. PRO CO 78/180:3.
- Aguayo, A. 1978. The present status of the Antarctic fur seal Arctocephalus gazelle at South Shetland Islands. Polar Record 19(199): 167- 76.
- Allardyce, W.L. 1905a. Despatch to the Secretary of State for the Colonies, 5 September 1905. PRO CO 78/106.
- Allardyce, W.L. 1905b. Lease: South Georgia Exploration Company. 27 July 1905. PRO CO 78/105.
- Allardyce, W.L. 1906a. Despatch 44 to the Secretary of State for the Colonies, 14 May 1906. PRO CO 78/108.
- Allardyce, W.L. 1906b. Despatch 28 to the Secretary of State for the Colonies, 28 March 1906. PRO CO 78/108.
- Allardyce, W.L. 1906c. Despatch 12 to the Secretary of State for the Colonies, 17 January 1906. PRO CO 78/108.
- Allardyce, W.L. 1906d. Despatch 17 to the Secretary of State for the Colonies, 29 January 1906. PRO CO 78/108.
- Allardyce, W.L. 1906e. Despatch F10331/1906 to the Colonial Office, 7 October 1905. SPRI MS [unnumbered].
- Allardyce, W.L. 1906f. Despatch to the Secretary of State for the Colonies, 20 December 1906. PRO CO 78/108.
- Allardyce, W.L. 1907. Despatch 15 to the Secretary of State for the Colonies, 22 February 1907. PRO CO 78/110.
- Allardyce, W.L. 1908a. Despatch to the Secretary of State for the Colonies, 24 January 1908. PRO CO 78/112.
- Allardyce, W.L. 1908b. Despatch to the Secretary of State for the Colonies, 7 February 1908. SPRI MS 240/1.

- Allardyce, W.L. 1908c. Despatch to the Secretary of State for the Colonies, 6 February 1908. PRO CO 78/112.
- Allardyce, W.L. 1908d. Despatch to the Secretary of State for the Colonies, 4 February 1908. SPRI MS 240/1.
- Allardyce, W.L. 1908e. Despatch to the Secretary of State for the Colonies, 1 November 1908. SPRI MS 240/1.
- Allardyce, W.L. 1908f. Despatch to Robert J. Kennedy, British Minister in Montevideo, 10 February 1908. SPRI MS 240/1.
- Allardyce, W.L. 1908g. Despatch 38 to the Secretary of State for the Colonies, 12 May 1908. SPRI MS 240/1.
- Allardyce, W.L. 1908h. Despatch to the Secretary of State for the Colonies, 1 October 1908. SPRI MS 240/1.
- Allardyce, W.L. 1908j. Despatch to the Secretary of State for the Colonies, 11 July 1908. SPRI MS 240/1.
- Allardyce, W.L. 1909a. Despatch to the Secretary of State for the Colonies, 19 January 1909. SPRI MS 240/1.
- Allardyce, W.L. 1909b. Despatch to the Secretary of State for the Colonies, 17 February 1909. SPRI MS 240/1.
- Allardyce, W.L. 1909c. Letter to the Secretary of State for the Colonies, 17 February 1909. SPRI MS 240/1.
- Allardyce, W.L. 1909d. Despatch 33 to the Secretary of State for the Colonies, 13 May 1909. PRO CO 78/113.
- Allardyce, W.L. 1909e. Despatch to the Secretary of State for the Colonies, 12 May 1909. SPRI MS 240/1.
- Allardyce, W.L. 1910a. Despatch 21/1910 to J.I. Wilson, 17 January 1910. SPRI MS 1228/30/2.
- Allardyce, W.L. 1910b. Despatch to J.I. Wilson, 30 June 1910. SPRI MS 1228/30/2.
- Allardyce, W.L. 1910c. Despatch to the Secretary of State for the Colonies, 26 December 1910. SPRI MS 240/1.
- Allardyce, W.L. 1911a. Despatch 40 to the Secretary of State for the Colonies, 18 March 1911. SPRI MS 240/1.
- Allardyce, W.L. 1911b. Despatch to the Secretary of State for the Colonies, 3 August 1911. SPRI MS 240/1.
- Allardyce, W.L. 1911c. Despatch to the Colonial Secretary, 8 July 1911. SPRI MS 240/1.
- Allardyce, W.L. 1912a. Despatch to the Secretary of State for the Colonies, 6 July 1912. PRO CO 78/123.
- Allardyce, W.L. 1912b. Despatch 71 to the Secretary of State for the Colonies, 4 June 1912. PRO CO 78/123.
- Allardyce, W.L. 1913a. Despatch to the Secretary of State for the Colonies, 14 January 1913. PRO CO 78/126.
- Allardyce, W.L. 1913b. Despatch to the Secretary of State for the Colonies, 13 April 1913. PRO CO 78/126.
- Allardyce, W.L. 1914. Despatch to the Under Secretary of State for the Colonies, 9 March 1914. PRO CO 78/133.
- Allen, J.A. 1892a. A synopsis of the Pinnipeds, or seals and walrus, in relation to their commercial history and products. In: Fur Seal Arbitration. Appendix to the case of the United States. I: 367-391. Government Printing Office, Washington DC.
- Allen, J.A. 1892b. Fur seal hunting in the southern hemisphere. In: Fur Seal Arbitration. Appendix to the case of the United States. I: 393-410. Government Printing Office, Washington DC.
- Annual Sealing Reports, South Georgia. 1909-65. SPRI MS 1228/7/1-62.
- Annual Whaling Reports, South Georgia. 1909-65. SPRI MS 1228/1/1-63.
- Anson, G. 1748. A voyage round the world in three years, 1740-44. John and Paul Knapton, London.
- Antarctic Treaty Consultative Committee. 1979. 10th Antarctic Treaty Consultative Meeting, 17 September to 5 October 1979, Washington.
- Arrow, HMS. 1839. Log of the ketch Arrow. PRO Admiralty 51/3052.

- Auburn, F.M. 1981. The Antarctic environment. In: The Year book of World Affairs 1981: 248-265. Stevens & Sons, London.
- Auburn, F.M. 1982. Antarctic law and politics. Hurst & Co., London.
- Azpiri, J.L.M. 1966. Historia Completa de las Malvinas. 3 vols. Buenos Aires.
- Baillon, A.E. 1893a. Letter to the Colonial Secretary, 24 June 1893. PRO CO 78/85.
- Baillon, A.E. 1893b. Letter to the Colonial Secretary, 18 August 1893. PRO CO 78/86.
- Balch, E.S. 1904. Antarctic addenda. Journal of the Franklin Institute 157 (938): 81-88.
- Balch, E.S. 1909. Stonington Antarctic explorers. Bulletin of the American Geographic Society 41: 473-492.
- Berles, W. 1920. Despatch 108/20 to the Colonial Secretary, 30 September 1920. SPRI MS 1228 S.G. 630.
- Berles, W. 1936. Report on the 1936 Sealing Season. SPRI MS 1228/7/26.
- Berles, W. 1937. Report on the 1937 Sealing Season. SPRI MS 1228/7/27.
- Bernard, C.H. 1829. A narrative of the sufferings and adventures of Capt. Charles H. Bernard in a voyage round the world during the years 1812, 1813, 1814, 1815 and 1816. J. Lindon, New York.
- Berrat, A. & Mougou, J.L. 1978. L'Elephant de mer Mirounga leonina de l'île de la Possession, archipel Crozet (46°25'S., 51°45'E). Mammalia 42: 143-174.
- Barrow, John (Sir). 1835. Letter F.I.1076 to R. Gray. PRO CO 78/2.
- Baylies, F. 1832. Letter from the American Chargé d'Affaires to the Buenos Aires Minister, 20 June 1832. British and Foreign State Papers 20 [1836]: 330-338.
- Beale, T. 1835. A few observations on the natural history of the sperm whale, with an account of the rise and progress of the fishery. Effingham Wilson, London.
- Beattie, A.E. 1927. Despatch 73 to the Secretary of State for the Colonies, 12 April 1927. PRO CO 78/176: 10.
- Bendt, W. 1892. Deposition. In: Fur Seal Arbitration. Case of the United States, Appendix II: 405. Government Printing Office, Washington DC.
- Bennett, A.G. 1923. Report on an inspection of the Jason Islands fur seal rookery, 20 December 1923. PRO CO 78/166.
- Bennet, A.G. 1926. Observations on the fur seal stocks of the Falkland Islands, 27 August 1926. PRO CO 78/173.
- Bennett, A.G. 1929. Fur seal inspection report, 14 August 1929. PRO CO 78/185: 11.
- Bertram, G.C.L. 1952. Letter to the Secretary of State for the Colonies, 14 November 1952. SPRI MS 1228/9/8.
- Bertrand, K.J. 1971. Americans in Antarctica 1775-1948. Special Publication No.39. American Geographical Society, New York.
- Best, T.A.V. 1911. Letter to Capt. B.D. Cleveland, 30 September 1911. SPRI MS 1228/30/6.
- Best, T.A.V. 1912a. Despatch 251/1911 to the Magistrate, South Georgia, 10 June 1912. SPRI MS 1228/30/8.
- Best, T.A.V. 1912b. Despatch 544/11 to the Magistrate, South Georgia, 20 September 1912. SPRI MS 1228/8/4.
- Best, T.A.F. 1913. Despatch 544/11 to the Magistrate, South Georgia, 4 August 1913. SPRI MS 1228/8/5.
- Betteridge, T.C. 1920. Despatch from the British Vice-Consul in Punta Arenas to H.M. Consul-General, Valparaiso, 28 December 1920. PRO CO 78/160.
- Bigelow, B.M. 1931. Aaron Lopez; Colonial merchant of Newport. New England Quarterly IV(4): 757-767.
- Binnie, E.B. 1912. Despatch 80/1912 to the Colonial Secretary, 8 August 1912. SPRI MS 1228/30/8.
- Binnie, E.B. 1916. Despatch to the Colonial Secretary, 18 June 1916. PRO CO 78/139.
- Binnie, E.B. 1917. Sealing Report, 1917. SPRI MS 1228/7/7.
- Binnie, E.B. 1918. Despatch 24/18 to the Colonial Secretary, 19 March 1918. SPRI MS 8/10.
- Binnie, E.B. 1919. Despatch 150/19 to the Colonial Secretary, 20 October 1919. SPRI MS 1228/7/4.

- Binnie, E.B. 1920. Despatch 107/20 to the Colonial Secretary, 30 September 1920. SPRI MS 1228/7/18.
- Binnie, E.B. 1921. Letter to the Compañía Argentina de Pesca, 2 January 1921. SPRI MS 1213/4/5.
- Binnie, E.B. 1922a. Despatch to the Colonial Secretary, 2 January 1922. SPRI MS 1228/8/14.
- Binnie, E.B. 1922b. Despatch SG3/22 to the Colonial Secretary, 5 January 1922. SPRI MS 1228/8/14.
- Binnie, E.B. 1925. Annual Sealing Report, 14 December. SPRI MS 1228/7/15.
- Binnie, E.B. 1927a. Despatch SG 76/27 to the Colonial Secretary, 21 March 1927. SPRI MS 1228/9/1.
- Binnie, E.B. 1927b. Despatch SG 248c/27 to the Colonial Secretary, 7 November 1927. SPRI MS 1228/8/19.
- Binnie, E.B. 1928. Despatch S.G. 3/1928 to the Colonial Secretary, 2 January 1928. SPRI MS 1228/9/1.
- Bird, C.W. 1916. Letter from the Ministry of Munitions of War, Explosives Dept. (Propellants Branch) to the Colonial Office, 30 May 1916. PRO CO 78/138.
- Biscoe, J. 1830-32. Journal of a voyage towards the South Pole on board the brig Lula under the command of John Biscoe with the cutter Lively in company.
In: Murray, G. (ed.). 1901. The Antarctic manual for the use of the Expedition of 1901: 305-359. Royal Geographical Society, London.
- Bockstoce, J.R. 1986. Whales, ice, and men. The history of whaling in the Western Arctic. University of Washington Press, Seattle and London, in association with the New Bedford Whaling Museum, Massachusetts.
- Boissière, R.E. et Cie. 1908. Letter to John Swan & Sons. New York Times, 23 May 1908: 3, col.1.
- Bonner, W.N. 1956a. Report on the sealing industry at South Georgia. Season 1956. SPRI MS 1228/7/48.
- Bonner, W.N. 1956b. Letter to the Administrative Officer, South Georgia, 12 October 1956. SPRI MS 1228/9/1.
- Bonner, W.N. 1956c. Suggested treatment for the preparation of elephant seal pelts for export, 24 October 1956. SPRI MS 1228/9/3.
- Bonner, W.N. 1956d. Complete utilization of seal carcasses in South Georgia. SPRI MS 1228/9/5.
- Bonner, W.N. 1957a. Report on the sealing industry at South Georgia, 1957 season, 17 March 1958. SPRI MS 1228/7/50.
- Bonner, W.N. 1957b. Note on the Sealing Divisions and reserves, 1 April 1957. SPRI MS 1228/9/1.
- Bonner, W.N. 1958. Exploitation and conservation of seals in South Georgia. Oryx 4(6): 373-380.
- Bonner, W.N. 1959. Report on the sealing industry at South Georgia, Season 1959. SPRI MS 1228/7/54.
- Bonner, W.N. 1961a. Report on the sealing industry at South Georgia, Season 1960-61. SPRI MS 1228/7/56.
- Bonner, W.N. 1961b. Memorandum: 'Collection of seal teeth', 17 March 1961. SPRI MS 1228/9/1.
- Bonner, W.N. 1964. Arctophelus tropicalis gazelle et South Georgia.
In: Carrick, R., Holdgate, M. & Prévost, J. (eds.). 1964. Biologie Antarctique: 433-443. Hermann, Paris.
- Bonner, W.N. 1965. The utilization of elephant seals in South Georgia.
In: Smith, E.A. (ed.). A seals symposium: 27-31. Proceedings of Meeting on 29 September 1964. Department of Zoology, University of Cambridge.
- Bonner, W.N. 1968. The fur seal of South Georgia. British Antarctic Survey Scientific Reports 56.
- Bonner, W.N. 1979. Antarctic (Kerguelen) fur seal. In: Mammals in the sea. FAO Fisheries Series 5(II). FAO, Rome.
- Bonner, W.N. 1981. Southern fur seals. In: Ridgeway, S.H. & Harrison, R.J. (eds.). Handbook of marine mammals I: 161-208. Academic Press, London.
- Bonner, W.N. 1982. Seals and men. A study of interactions. University of Washington Press.

- Bonner, W.N. 1984. Conservation. In: Laws, R.N. (ed.). Antarctic Ecology II: 821-850. Academic Press, London.
- Bonner, W.N. 1985. Antarctic seals. In: Bonner, W.N. & Watton, D.W.H. (eds.). Antarctica (Key Environments): 202-222. Pergamon Press, London.
- Bonner, W.N. & Laws, R.M. 1964. Seals and sealing. In: Priestley, R., Adie, R.J. & Robin, G. de Q. (eds.). Antarctic Research Chapter 10: 163-189. Butterworths, London.
- Bonner, W.N. & Lewis Smith, R.I. (eds.). 1985. Conservation areas in the Antarctic: a review. Scientific Committee on Antarctic Research, Scott Polar Research Institute, Cambridge.
- Bonner, W.N. & Vaughan, R.W. 1961. Report on the sealing industry at South Georgia, Season 1960-61. SPRI MS 1228/7/56.
- Bonner, W.N. & Vaughan, R.W. 1962. Report on the sealing industry at South Georgia, Season 1961-62. SPRI MS 1228/7/57.
- Bougainville, L. de 1772. A voyage round the world in the years 1766, 1767, 1768 and 1769. Bibliotheca Australiana #12. 1967. N. Israel/Amsterdam. De Capo Press/New York.
- Boyson, V.F. 1924. The Falkland Islands: with notes on the natural history by Rupert Vallentin. Clarendon Press, Oxford.
- Brandt's, Wm. Sons & Co., Ltd. 1928. Letter to the Compania Argentina de Pesca, 14 February 1928. SPRI MS 1213/5/2.
- Brandt's, Wm. Sons & Co., Ltd. 1951-55. Payments to the Crown Agents. SPRI MS 1213/5/5-7.
- British and Foreign State Papers. 1836. Correspondence relative to the misunderstanding with the United States, with respect to the fishery etc: on the coasts of the Malvinas, or Falkland Islands, 18 September 1832. 20: 311-441.
- British Antarctic Territory. 1962. Order-in-Council 1962 No.400. British Antarctic Territory Gazette 1: 2-5.
- British Antarctic Territory. 1963-64. Estimates. 22p.
- Bruce, W.S. 1893a. On the Antarctic seal. Knowledge 16: 221.
- Bruce, W.S. 1893b. Proposed expedition to South Georgia. Scottish Geographical Magazine 9(10): 542-543.
- Bryce, J. 1909. Despatch 170 to the Foreign Office, 14 July 1909. PRO CO 78/115.
- Bryden, M.M. 1968. Lactation and suckling in relation to early growth of the southern elephant seal, Mirounga leonina L. Australian Journal of Zoology 16: 739-748.
- Bryden, M.M. 1972. Body size and composition of elephant seals (Mirounga leonina): absolute measurements and estimates from bone dimensions. Journal of Zoology 167: 256-276.
- Budington, J.W. 1892. Antarctic sealing and rookeries. In: Fur Seal Arbitration. Appendix to the case of the United States. II: 593-598. Government Printing Office, Washington, DC.
- Bullard, John M. 1947. The Rotches. New Bedford, Massachusetts.
- Busch, B.C. 1980a. Master of Desolation. The American Maritime Library, IX. Mystic Seaport Museum Inc. Mystic, Connecticut.
- Busch, B.C. 1980b. Elephants and whales: New London and Desolation, 1840-1900. American Neptune 40: 117-126.
- Busch, B.C. 1985a. Cape Verdeans in the American whaling and sealing industry 1850-1900. American Neptune XLV(2): 104-116.
- Busch, B.C. 1985b. The war against the seals: a history of the North American seal fishery. McGill University Press, Montreal.
- Caillet-Bois, R.R. 1948. Una tierra Argentina - Las Islas Malvinas. Ediciones Peuser. Buenos Aires.
- Callender, J. 1766. Terra Australis Cognita: or, voyages to the Terra Australis, or Southern Hemisphere during the sixteenth, seventeenth and eighteenth centuries. 3 vols. 1766-68. A. Donaldson, Edinburgh.
- Canada. 1920. Telegram from the Governor-General to the Secretary of State for the Colonies, 9 December 1920. PRO CO 78/157.
- Carrick, R. & Ingham, S.E. 1962. Studies on the Southern elephant seal Mirounga leonina (L.) V. Population dynamics and utilization. CSIRO Wildlife Research 7(2): 198-206.
- Carrick R. et al. 1962. Studies on the southern elephant seal Mirounga leonina (L.). III. The annual cycle in relation to age and sex. CSIRO Wildlife Research 7(2): 119-160.

- Cawkell, M.B.R., Maling, D.H. & Cawkell, E.M. 1960. The Falkland Islands. Macmillan, London.
- Chadwick-Brooks, J. 1930. Letter to L.B. Freeston, Colonial Office, 8 February 1930.
PRO CO 78/186:12.
- Chapman, T. 1799. Separating the wool or fur from skins. Patent No.2317. Patent Office, London.
- Chernock, J. 1797. Biographie Navelis. Vols.I-VI. R. Faulder, London.
- Chippendale, H.A. 1953. Seals and Whales, Andrew Melrose Ltd, London.
- Christie, E.W.M. 1951. The Antarctic problem. An historical and political study. George Allen & Unwin Ltd, London.
- Chyet, S.F. 1970. Lopez of Newport. Wayne State University Press, Detroit.
- Clark, A.H. 1887a. The Antarctic fur seal and sea elephant industries.
In: Goode, G.B. The fisheries and fishery industries of the United States. United States Bureau of Fish and Fisheries. 77th Congress. 1st session. Senate Miscellaneous Documents 124 Section V (2) 400-467. Government Printing Office, Washington, DC.
- Clayton, S.W. 1776. An account of Falkland Islands. Philosophical Transactions of the Royal Society of London 66 Pt.I: 99-108.
- Cleveland, B.D. 1911. Letter to W.L. Allardyce, 2 August 1911. PRO CO 78/122.
- Cleveland, B.D. 1913. Letter to J.I. Wilson, 13 March 1913. SPRI MS 1228/8/5.
- Cleveland, B.D. 1909. Sea elephant hunting in the wilds of the Antarctic. Hampton's Magazine May 1909: 628-633.
- Cleveland, E.J. & Cleveland, H.P. 1899. The genealogy of the Cleveland and Cleaveland families. 3 vols. Case, Lockwood & Brainard Company, Hartford, Connecticut.
- Clifford, M. 1954. Letter to the Administrative Officer, South Georgia. 7 January 1954.
SPRI MS 1228/8/46.
- Cobb, F.E. 1893. Letter to the Colonial Office, 17 May 1893. PRO CO 78/87.
- Coleman, D.J. 1964. 1963-64 Whaling report. SPRI MS 1228/1/62.
- Coleman, D.J. 1965. Extracts from the 1964/65 Whaling Report, 24 February 1965. SPRI MS 1228/6/51.
- Colnett, J. 1798. A voyage to the South Atlantic and round Cape Horn into the Pacific Ocean Bibliotheca Australiana #36. N. Israel/Amsterdam. De Capo Press/New York. 1968.
- Colonial Office. 1891. Despatch No.25 to Foreign Office. Enclosure #3 from Collector of Customs, British Columbia. In: Further Correspondence respecting the Behring Sea seal fishery. United States. No.1 (1891) HMSO London. [c.6253]. 1892.
- Colonial Office. 1893. Minutes. Falkland Islands 14268, 21 August 1893. PRO CO 78/85.
- Colonial Office. 1898. Despatch F.I.52 to Governor Grey-Wilson, 23 November 1898. PRO CO 78/96.
- Colonial Office. 1908. Minutes. Falkland Islands No.6867. PRO CO 78/112.
- Colonial Office. 1912. Despatch from the Secretary of State for the Colonies to Governor W.L. Allardyce, 15 November 1912. PRO CO 78/123.
- Colonial Office. 1913a. Despatch from the Secretary of State for the Colonies to Governor W.L. Allardyce, 29 March 1913. PRO CO 78/126.
- Colonial Office. 1913b. Letter from the Under-Secretary of State for the Colonies to Chr. Selvesen & Co., 12 August 1913. PRO CO 78/129.
- Colonial Office. 1916. Telegram to the Governor of the Falkland Islands, 2 June 1916.
PRO CO 78/138.
- Colonial Office. 1917. Despatch from the Secretary of State for the Colonies to Governor W.D. Young. PRO CO 78/135.
- Colonial Office. 1920a. Minutes. Falkland Islands 20464. PRO CO 78/154.
- Colonial Office. 1920a. Despatch 57 to the Officer Administering the Government of the Falkland Islands, 25 May 1920. SPRI MS 1228 S.G. 630.
- Colonial Office. 1920b. Report of the Interdepartment Committee on Research and Development in the Dependencies of the Falkland Islands. HMSO, London [Command Paper 657].
- Colonial Office. 1923. Minutes. Falkland Islands 27893. PRO CO 78/164.
- Colonial Office. 1924. Minutes. Falkland Islands 19721. PRO CO 78/166.
- Colonial Office. 1927. Telegram from the Secretary of State for the Colonies to the Governor of the Falkland Islands, 11 June 1927. PRO CO 78/176:10.
- Colonial Office. 1928. Minutes. FI 56804/28, 11 May 1928. PRO CO 78/180:3.

- Colonial Office. 1929a. Despatch to the Governor of the Falkland Islands, 7 December 1929. PRO CO 78/185:1.
- Colonial Office. 1929b. Letter from E.R. Darnley to J.E. Hamilton, 9 October 1929. PRO CO 78/185:11.
- Colonial Office. 1930. Memorandum by the West Indies Department of the Colonial Office on the Falkland Island hair sealing scheme, 3 June 1930. PRO CO 78/187:6.
- Colonial Office. 1931. Letter to B.F. O'Shaughnessy, 6 August 1931. PRO CO 78/189:6.
- Colonial Office. 1932. Despatch 86765/1 to the Governor of the Falkland Islands, 8 January 1932. PRO CO 78/188:5.
- Colonial Office. 1934a. Telegram 7 to the Governor of the Falkland Islands, 20 February 1934. PRO CO 78/193:14.
- Colonial Office. 1934b. Minutes 39249. PRO CO 78/196:16.
- Colonial Office. 1935. Telegram 69 to the Governor of the Falkland Islands, 26 August 1935. PRO CO 89/199:11.
- Colonial Office. 1952. Memorandum MED 123/124/03 to the Colonial Secretary, 26 November 1952. SPRI MS 1228/9/8.
- Colonial Office. 1963. Telegram S.G.14 to the Governor of the Falkland Islands, 12 July 1963. SPRI MS 1228/6/50.
- Colonial Secretary. 1912. Despatch 57/1912 to the Magistrate, South Georgia, 29 January 1912. SPRI MS 1213/4/2.
- Colonial Secretary. 1915. Despatch 292/15 to the Magistrate, South Georgia, 9 June 1915. SPRI MS 1228 S.G. 630.
- Colonial Secretary. 1919. Despatch 279/191 to the Magistrate, South Georgia. SPRI MS 1228/8/11.
- Colonial Secretary. 1920. Despatch to E.B. Binnie, 12 January 1920. SPRI MS 1228/8/11.
- Colonial Secretary. 1948a. Telegram 172/1947 to the Magistrate, South Georgia, 20 February 1948. SPRI MS 1228/8/40.
- Colonial Secretary. 1948b. Telegram 71 to the Magistrate, South Georgia, 21 June 1948. SPRI MS 1228/8/40.
- Colonial Secretary. 1950a. Telegram 37 to the Administrative Officer, South Georgia, 16 March 1950. SPRI MS 1228/8/42.
- Colonial Secretary. 1950b. Letter 0795: Processing of Seal Elephant Hides, 16 March 1950. SPRI MS 1213/4/36.
- Colonial Secretary. 1953. Telegram 72 to the Administrative Officer, South Georgia, 15 May 1953. SPRI MS 1228/8/45.
- Colonial Secretary. 1945. Letter 1607 to S.L. Bjelland, 26 January 1954. SPRI MS 1228/8/46.
- Colonial Secretary. 1956. Telegram 168 to the Administrative Officer, South Georgia, 23 October 1956. SPRI MS 1228/9/1.
- Colonial Secretary. 1962a. Telegram 147 to the Administrative Officer, South Georgia, 19 July 1962. SPRI MS 1228/8/54.
- Colonial Secretary. 1962b. Telegram 164 to the Administrative Officer, South Georgia, 2 August 1962. SPRI MS 1228/8/54.
- Colonial Secretary. 1964. Telegram 191 to the Administrative Officer, South Georgia, 13 July 1964. SPRI MS 1228/6/51.
- Colonial Secretary. 1965. Letter D/2/64 to Albion Star (South Georgia) Ltd, 24 June 1965. SPRI MS 1228/6/52.
- Colonial Secretary. 1966a. Telegram 127 to the Administrative Officer, South Georgia, 21 June 1966. SPRI MS 1228/6/52.
- Colonial Secretary. 1966b. Letter D/2/64 to Peter Simonsen and Lars Muesaeus, 23 November 1966. SPRI MS 1228/8/58.
- Colonial Secretary. 1967a. Telegram 135 to the Administrative Officer, South Georgia. SPRI MS 1228/8/59.
- Colonial Secretary. 1967b. Telegram 135 to the Administrative Officer, South Georgia. SPRI MS 1228/8/59.
- Colonial Secretary. 1967c. Telegram 147 to the Administrative Officer, South Georgia. SPRI MS 1228/8/59.

- Colonial Secretary. 1967d. Letter to Mr Asmund Simonsen, 7 September 1967. SPRI MS 1228/8/59.
- Colonial Secretary. 1968a. Letter (Sealing Licence) to Chr. Salvesen & Co. Ltd, 23 November 1968. SPRI MS 1228/8/60.
- Colonial Secretary. 1968b. Letter D/2/64 to William Brandt's Sons & Co. Ltd, 23 November 1966. SPRI MS 1228/8/58.
- Colonial Secretary. 1968c. Telegram 18 to the Administrative Officer, South Georgia, 26 January 1968. SPRI MS 1228/8/60.
- Colonist. 1903. Capt. Balcom on Southern Sealers. 20 November 1903: 3.
- Comer, G. 1892. Antarctic sealing. In: Fur Seal Arbitration, Appendix to the case of the United States. II: 596-598. Government Printing Office, Washington, DC.
- Commission for the Conservation of Antarctic Marine Living Resources. 1985. Newsletter 4 October 1985.
- Committee for the Privy Council for Trade. 1845. Letter to G.W. Hope, Colonial Office, 12 September 1845. PRO CO 78/13.
- Compañía Argentina de Pesca. 1925. Letter to August Schmielau Söhne, 9 May 1925. SPRI MS 1213/12/3.
- Compañía Argentina de Pesca. 1948a. Letter to the Magistrate, South Georgia, 12 February 1948. SPRI MS 1228/8/46.
- Compañía Argentina de Pesca. 1948b. Report on Utilization of seal carcasses, 3 October 1948. SPRI MS 1213/2/35.
- Compañía Argentina de Pesca. 1954. Letter to the Magistrate, South Georgia, 26 January 1954. SPRI MS 1213/2/47.
- Compañía Argentina de Pesca. 1955a. Memorandum to the Magistrate, South Georgia, 25 March 1955. SPRI MS 1213/2/49.
- Compañía Argentina de Pesca. 1955b. Letter to the Administrative Officer, South Georgia, 22 March 1955. SPRI MS 1228/9/5.
- Condy, P.R. 1978a. Distribution, abundance and annual cycle of fur seals (*Arctocophalus* spp.) on the Prince Edward Islands. South African Journal of Wildlife Research 8: 159-168.
- Condy, P. 1978b. The distribution and abundance of southern elephant seals *Mirounga leonina* (Linn.) on the Prince Edward Islands. South African Journal of Antarctic Research 8: 42-48.
- Condy, P.R. 1979. Annual cycle of the southern elephant seal *Mirounga leonina* (Linn.) at Marion Island. South African Journal of Zoology 14: 95-102.
- Cook, J. 1777. A voyage towards the South Pole and round the world, performed in His Majesty's Ship Resolution and Adventure, in the years 1772, 1773, 1774 and 1775. London, W. Strahan and T. Cadell.
- Cook, J. 1784. A Voyage to the Pacific Ocean in the years 1776, 1777, 1778, 1779 and 1780. 3 vols. John Douglas, London.
- Corning, H. 1942. List of ships arriving at the Port of Canton and other Pacific Ports, 1799-1803. Essex Institute Historical Society Collections 78: 329-347.
- Corning, H. 1944. The letters of Sullivan Dorr. Proceedings of the Massachusetts Historical Society 67: 178-364.
- Craigie-Malkett, M. 1933a. Despatch to the Secretary of State for the Colonies, 25 August 1933. PRO CO 78/193:14.
- Craigie-Malkett, M. 1933b. Despatch 149 to the Secretary of State for the Colonies. PRO CO 78/193:14.
- Cram, G. 1848. Letter to Earl Grey, Secretary of State for the Colonies, 7 December 1848. PRO CO 78/20.
- Crèvecoeur, J.H. St. John de. 1787. Lettres d'un Cultivateur Americain. Paris, 2 vols.
- Crichton, A.C. 1920. Letter to the Governor of the Falkland Islands, 1 January 1920. PRO CO 78/154.
- Crown Agents. 1915. Letter to the Under Secretary of State for the Colonies, 20 May 1915. PRO CO 78/136.
- Crown Agents. 1921. Memorandum to the Under Secretary of State for the Colonies, 13 October 1921. PRO CO 78/160.

- Culverwell Brooks & Co. 1935. Letter to the Crown Agents, 25 March 1935. PRO CO 78/199:14.
- Cumpston, J.S. 1963. Shipping arrivals and departures, Sydney 1788-1825. Canberra.
- Davies, J.L. 1958. The Pinnipedia: an essay in zoogeography. Geographical Review 48: 474-493.
- Debenham, F. 1945. The voyage of Captain Bellingshausen to the Antarctic seas 1819-1820. 2 vols. The Hakluyt Society, Second Series No. XCI, Cambridge University Press.
- Decker, R.O. 1976. The Whaling City. A history of New London. Pequot Press, Chester, Connecticut.
- Delano, A. 1817. Narrative of voyages and travels in the northern and southern hemispheres. E.G. House, Boston.
- Dickinson, A.B. 1967. Tagging elephant seals for life-history studies. Polar Record 13 (85): 443-446.
- Dickinson, A.B. 1986. The first South Georgia population census. Polar Record 23 (144) [in press].
- Discovery Committee. 1932. Minutes of a special meeting of the Scientific Sub-Committee, 19 September 1932. SPRI MS 1228/9/6.
- Distant, W.L. 1899. The 'Sea-Elephant' (Macrorhinus elephantinus). Zoologist 4th Series, 3: 385-387.
- Dixon, E.V. 1933. Report on the sealing operations of the Falkland Islands and Dependencies Sealing Company, July-September 1933 4 October 1933. PRO CO 78/193:14.
- Dulles, F.R. 1930. The Old China trade. Houghton Mifflin Company, Boston and New York.
- Duncan, S. 1831. Letter to Geo. W. Slacum, American Consul at Buenos Aires, 1 December 1831. British and Foreign State Papers 20 [1836]: 317.
- Dye, J. 1965. An assessment of the relative merits of the whaling companies operating at South Georgia in the 1963-64 and 1964-65 seasons. SPRI MS 1228/6/51.
- Economic Survey of the Falkland Islands. 1976. 2 vols. The Economist Intelligence Unit Ltd, London.
- Elliot, G.H. 1964a. Letter to the Colonial Office, 7 April 1964. SPRI MS 1228/6/51.
- Elliot, G.H. 1964b. Memorandum: South Georgia Sealing Licence. 20 August 1964. SPRI MS 1228/6/51.
- Ellis, J.M. 1934. Telegram 27 to the Secretary of State for the Colonies, 30 May 1934. PRO CO 78/196:16.
- Falkland Islands. 1846-1953. Annual Reports. PRO CO 81/1-95.
- Falkland Islands. 1880. Extract from the Minutes of the Executive Council of the Falkland Islands, 17 December 1880. PRO CO 78/71.
- Falkland Islands. 1881. Seal Fishery Ordinance 1881. Ordinance No.4, 1881.
- Falkland Islands. 1891. Notice: Applications for licences to take seals. Falkland Islands Gazette 1(8): 1.
- Falkland Islands. 1893. Sealing licences. Falkland Islands Gazette 3(8): 2.
- Falkland Islands. 1894. Notice. Falkland Islands Gazette 4(14): 286.
- Falkland Islands. 1895. Notices: Applications for the right to take seals. Falkland Islands Gazette 5(15): 1.
- Falkland Islands. 1899. Seal Fishery Ordinance 1899. Ordinance No.1, 1899.
- Falkland Islands. 1900. South Georgia: Conditions of lease. Falkland Islands Gazette 10(11): 51.
- Falkland Islands. 1903. Tariff Amendment Ordinance, 1903. Falkland Islands Gazette 13(10): 22.
- Falkland Islands. 1904a. The Seal Fishery Amendment Ordinance, 1904. Falkland Islands Gazette 14(9): 22.
- Falkland Islands. 1904b. Duty on Seal Skins. Order in Council, No.54. Falkland Islands Gazette 14(7): 16.
- Falkland Islands. 1906a. Order in Council. Falkland Islands Gazette 16(9): 111-112.
- Falkland Islands. 1906b. Lease at South Georgia to the Sociedad Anonima Compania Argentina de Pesca. SPRI MS 1228/5/13.

- Falkland Islands. 1907. Order in Council No.90 - Abolishment of duty on Seal Skins imported into the Colony for the purposes of transhipment or exportation. Falkland Islands Gazette 17 (8): 100.
- Falkland Islands. 1908a. Letters Patent, 1908. Falkland Islands Gazette 18 (9): 106-108.
- Falkland Islands. 1908b. Dependencies Ordinance, 1908. Falkland Islands Gazette 19 (1): 6-8.
- Falkland Islands. 1909. Seal Fishery (Dependencies) Ordinance, 1909. Falkland Islands Gazette 19 (11):161-163.
- Falkland Islands. 1911. Notice 61: Sealing Districts at South Georgia. Falkland Islands Gazette 21 (4): 74-75.
- Falkland Islands. 1912. Notice 127: Declaring King Edward Cove, South Georgia, to be a Port of Entry. Falkland Islands Gazette 22 (8): 143.
- Falkland Islands. 1913. Notice No.4. Crown Reserve. Falkland Islands Gazette 22 (1): 4.
- Falkland Islands. 1914a. Agreement with Sir Ernest Shackleton CVO for a lease of fur seal rookeries. PRO CO 78/132.
- Falkland Islands. 1914b. Notice 127A. Sealing Regulations, 29 June 1914. Falkland Islands Gazette 23 (7): 145.
- Falkland Islands. 1915. Tariff (War) Amendment Ordinance, 1915. Falkland Islands Gazette 24 (7): [n.p.].
- Falkland Islands. 1916a. Sealing (Emergency) Regulations. Falkland Islands Gazette 25 (10): 114.
- Falkland Islands. 1916b. Telegram to the South Georgia Magistrate, 4 June 1916. PRO CO 78/138.
- Falkland Islands. 1917a. Letters Patent for the further Definition and Administration of certain Islands and Territories as Dependencies of the Colony of the Falkland Islands. Falkland Islands Gazette 26 (2): 69-70.
- Falkland Islands. 1917b. Sealing (Emergency) Regulations, 1917. Falkland Islands Gazette 26 (6): 63.
- Falkland Islands. 1917c. The Whale and Seal Oil Export Ordinance, 1917. Falkland Islands Gazette 26 (6): 65-66.
- Falkland Islands. 1918a. Tariff (Export Duty) Amendment Ordinance 1900. Falkland Islands Gazette 31 October 1918.
- Falkland Islands. 1918b. Sealing (Emergency) Regulations, 1918. Falkland Islands Gazette 27 (8): 81.
- Falkland Islands. 1918c. Seal Reserve, South Georgia. Falkland Islands Gazette 27 (6): 57.
- Falkland Islands. 1921a. Proclamation No.1. 23 March 1921: Suspension of the issue of licences to kill or capture the fur seal. Falkland Islands Gazette 30 (5): 21.
- Falkland Islands. 1921b. Notice No.33. Falkland Islands Gazette 30 (7): 32.
- Falkland Islands. 1921c. Seal Fishery (Consolidation) Ordinance 1921. Falkland Islands Gazette 31 (1): 14-17.
- Falkland Islands. 1922a. Notice No.13. Seal Reserves. Falkland Islands Gazette 31 (3): 28.
- Falkland Islands. 1922b. The Seal Fishery (Consolidation) Ordinance, 1921. Falkland Islands Gazette 31 (1): 14-17.
- Falkland Islands. 1924. Notice No.75: Report on seal oil from the Falkland Islands. Falkland Islands Gazette 33 (1): 2-3.
- Falkland Islands. 1927. Notice No.101. Prices current in England of Wool, Tallow and Whale Oil. Falkland Islands Gazette 36 (1): 2.
- Falkland Islands. 1928. Notice 147: Retirement of Sir W.L. Allardyce. Falkland Islands Gazette 37 (11): 104.
- Falkland Islands. 1934. Tariff (Export Duties) Amendment Ordinance 1934. Ordinance No.7.
- Falkland Islands. 1947. Tariff (Oil Export Duties) Amendment Ordinance, 1947. Falkland Islands Gazette 61 (7): 71.
- Falkland Islands. 1953. Draft - Colony of the Falkland Islands - Sealing Licence. SPRI MS 1228/8/46.
- Falkland Islands. 1953-62. Dependencies Estimates.
- Falkland Islands. 1956a. Telegram 129 to the Administrative Officer, South Georgia, 21 July 1956. SPRI MS 1228/8/48.

- Falkland Islands. 1956b. Telegram 203 to the Administrative Officer, South Georgia, 19 October 1956. SPRI MS 1228/8/48.
- Falkland Islands. [1957]. Sealing Licence, Albion Star Comapny Ltd. SPRI MS 1228/9/1.
- Falkland Islands. 1960. Notice No.33. Sealing Divisoinis in South Georgia. Falkland Islands Gazette 69 (11): 150.
- Falkland Islands. 1963. Telegram S.G.14 to the Secretary of State for the Colonies, 13 July 1963. SPRI MS 1228/6/50.
- Falkland Islands. 1964a. Nature Reserves Ordinance, 1964. Falkland Islands Gazette 73 (10): 108-109.
- Falkland Islands. 1964b. Wild Animals and Birds Protection Ordinance 1964. Falkland Islands Gazette 73 (16): 193-197.
- Falkland Islands. 1965. Sealing Licence. Notice 20. Falkland Islands Gazette 74 (4): 21.
- Falkland Islands. 1966. Sealing Licence. Notice 3. Falkland Islands Gazette 75 (1): 1.
- Falkland Islands. 1967a. Sealing licence. Falkland Islands Gazette 76 (6): 80.
- Falkland Islands. 1967b. Sealing licence. Notice 1. Falkland Islands Gazette 76 (1): 1.
- Falkland Islands. 1971a. Sealing Licence. Notice 12. Falkland Islands Gazette 80 (3): 16.
- Falkland Islands. 1971b. Sealing Licence. Notice 15. Falkland Islands Gazette 80 (5): 39.
- Falkland Islands. 1972. Sealing Licence. Notice 7. Falkland Islands Gazette 81 (6): 33.
- Falkland Islands. 1975a. Falkland Islands Dependencies Conservation Ordinance. Falkland Islands Gazette 84: 17-21.
- Falkland Islands. 1975b. South Atlantic Sealing Company. Falkland Islands Gazette 84 (4): 24.
- Falkland Islands. 1982. Falkland Islands and Dependencies (Interim Administration) Order. Falkland Islands Gazette 91 (7): 45-46.
- Falkland Islands Economic Study. 1982. HMSO London. [Cmnd.8653].
- Falkland Islands Magazine. 1902a. XIV (2) June 1902.
- Falkland Islands Magazine. 1902b. XIV (6) October 1902.
- Falkland Islands Magazine. 1902c. XIV (8) December 1902.
- Falkland Islands Magazine. 1903a. XIV (11) March 1903.
- Falkland Islands Magazine. 1903b. XV (2) June 1903.
- Falkland Islands Magazine. 1903c. XV (8) December 1903.
- Falkland Islands Magazine. 1906. XVII (10): 5.
- Falkland Islands Magazine and Church Paper. 1908a. Wreck of the Baden-Powell. XX (2): 4.
- Falkland Islands Magazine and Church Paper. 1908b. XX (8): 6.
- Falkland Islands Magazine and Church Paper. 1908c. Loss of the Edith R. Balcom. XX (1) New Issue No.12: 7.
- Falkland Islands Magazine and Church Paper. 1908d. XX (6): 6.
- Falkland Islands Magazine and Church Paper. 1908e. XX (4): 2.
- Falkland Islands Company. 1908. Despatch 332 from Stanley to London Office, 28 January 1908. Falkland Islands Company Archives, Stanley.
- Falkland Islands Company. [1951]. The Falkland Islands Company Ltd. 1851-1951. Herley Publishing Co. Ltd., London.
- Falkner, Thomas. 1774. A description of Patagonia and the adjoining parts of South America - particulars relating to Falkland's Islands. C. Pugh, London.
- Fanning, W. 1822. Letter to Edmund Fanning. 27 February 1822. In: Jones, R.M. 1977. Sealing and Stonington. The Log of Mystic Seaport 28: 119-126.
- Fanning, E. 1838. Voyages to the South Seas with an account of the new discoveries made in the Southern Hemisphere between the years 1830-1837. William H. Vermilye, New York.
- F.A.O. 1979. Year Book of Fishery Statistics. Fisheries Series 48. Food and Agriculture Organization of the United Nations, Rome.
- F.A.O. 1983. Year Book of Fishery Statistics. Fisheries Series 56. Food and Agriculture Organization of the United Nations, Rome.

- Faustini, A. 1906. Di una carta nautica inedita della Georgia Australe. Revista Geografica Italiana 13 (6): 343-351.
- Fildes, R. 1820. Journal of a voyage kept on board brig Cora of Liverpool bound to New South Shetlands. SPRI MS 101/1.
- Fisher, E.M. 1941. Prices of sea-otter pelts. California Fish and Game 27 (4): 261-265.
- Fishing News. 1952. The South Atlantic Sealing Company. 2057: 1. 20 September 1952.
- Fitzroy, R.N. [Capt.]. 1839. Narrative of the Surveying Voyages of His Majesty's Ships Adventure and Beagle, Between the Years 1826 and 1836. 3 vols. Henry Colburn, London.
- Fleuret, A.I. 1943. Report on the 1943 Sealing Season. SPRI MS 1228/7/33.
- Fleuret, A.I. 1948a. Despatch S.G. D/17/46 to the Colonial Secretary, 14 February 1948. SPRI MS 1228/8/40.
- Foreign Office. 1883. Letter from G. Hertelet to the Colonial Office, 7 August 1883. PRO CO 78/73.
- Foreign Office. 1894. Letter to the Undersecretary of State, Colonial Office, 22 June 1894. PRO CO 78/89.
- Foreign Office. 1909. Despatch to the British Ambassador in Washington, 1 July 1909. PRO CO 78/115.
- Foreign Office. 1928. Minutes, 56804/28. 6 June 1928. PRO CO 78/180:3.
- Forster, G. 1777. A voyage round the world in His Britannic Majesty's sloop Resolution. 2 vols. White, Robson, Elmely and Robinson, London.
- Fox, H.J. 1832. Despatch from H.J. Fox to Lord Palmerston, 15 October 1832. PRO CO 78/1.
- Gallagher, R.E. (ed.) 1964. Byron's Journal of his circumnavigation, 1764-1766. The Hakluyt Society, Cambridge University Press.
- Goebel, J. 1927. The struggles for the Falkland Islands, a study in legal and diplomatic history. 1st ed. Yale University Press, New Haven and London.
- Goldsworthy, R.T. 1891. Despatch 167 to the Secretary of State for the Colonies, 17 November 1891. PRO CO 78/82.
- Goldsworthy, R.T. 1892. Despatch 43 to the Under Secretary of State for the Colonies, 5 April 1892. PRO CO 78/83.
- Goldsworthy, R.T. 1893a. Despatch 135 to the Secretary of State for the Colonies, 10 November 1893. PRO CO 78/86.
- Goldsworthy, R.T. 1893b. Despatch 22 to the Secretary of State for the Colonies, 20 February 1893. PRO CO 78/85.
- Goldsworthy, R.T. 1894. Lease of the Carcass, Jason and other islands. In: Allardyce, W.L. Despatch 10 to the Secretary of State for the Colonies, 24 January 1908. PRO CO 78/112.
- Gould, R.T. 1925. The first sighting of the Antarctic continent. Geographical Journal 65 (3):220-225.
- Grant, H.E.W. 1906a. Notice 100. Falkland Islands Gazette 16 (10): 113.
- Grant, H.E.W. 1906b. Notice 123. Hair Seal Skins. Falkland Islands Gazette 16 (12): 133.
- Grant, H.E.W. 1908a. Despatch 106, to the Secretary of State for the Colonies, 29 December 1908. SPRI MS 240/1.
- Grant, H.E.W. 1908b. Letter to the President of the Argentine Fishery Company, 29 October 1908. SPRI MS 240/1.
- Great Britain. 1965. The Antarctic Treaty and the recommendations of subsequent Consultative Meetings held at Canberra, 1961, Buenos Aires, 1962, Brussels, 1964, including the Agreed Measures on the Conservation of Antarctic fauna and flora. HMSO, London, [Cmd. 2822].
- Great Britain. 1973. Convention for the Conservation of Antarctic Seals. London, 1 June - 31 December 1972. HMSO, London. Misc.(11) 1973. [Cmd. 5302].
- Grey (Earl). 1848. Letter to George Cram, 14 December-1848. PRO CO 78/20.
- Grey (Earl). 1849. Despatch to Sir D. Le Marchant, Board of Trade, 10 July 1849. PRO CO 78/22.
- Grey-Wilson, W. 1898. Despatch 58 to the Secretary of State for the Colonies, 23 November 1898. PRO CO 78/96.
- Grey-Wilson, W. 1900. Despatch 28 to Joseph Chamberlain, Colonial Office, 21 March 1900. PRO CO 78/99.

- Grey-Wilson, W. 1904a. Despatch 77 to the Secretary of State for the Colonies, 4 October 1904. PRO CO 78/104.
- Grey-Wilson, W. 1904b. Official report of the Colony for 1903. Falkland Islands Magazine 16 (5): 8.
- Grey-Wilson, W. 1904c. Despatch 9 to the Colonial Office, 22 January 1904. PRO CO 78/104.
- Hamilton, J.E. 1920. Report on a visit to the fur seal rookeries on the Jason Islands, Beauchêne and Volunteer Point. 2 February 1920. PRO CO 78/154.
- Hamilton, J.E. 1922. Report on sealing investigations, December 1921 to March 1922, 7 September 1922. PRO CO 78/162.
- Hamilton, J.E. 1923a. Report on sealing operations at the Falkland Islands 1922-23, 20 April 1923. PRO CO 78/164.
- Hamilton, J.E. 1923b. Observations on the report of the Magistrate at South Georgia on the Sealing Season 1922. SPRI MS 1228/7/13.
- Hamilton, J.E. 1931. Reports 1-4 on sealing investigations in the Falkland Islands. PRO CO 78/192:2.
- Hamilton, J.E. 1934. The Southern Sea Lion, Otaria byronia (De Blainville). Discovery Reports 8: 269-318.
- Hamilton, J.E. 1936. Enclosure to Falkland Islands Despatch 106, 17 July 1936. PRO CO 78/202:5.
- Hamilton, J.E. 1938. Seals and sealing in the Falkland Islands and their Dependencies. Journal of the Society for the Preservation of the Fauna of the Empire 34: 68-75.
- Hamilton, J.E. 1939. A second report on the Southern Sea Lion, Otaria byronia (de Blainville). Discovery Reports 19: 121-164.
- Hamilton, J.E. & Binnie, E.B. 1921. Despatch 521/21 to the Colonial Secretary. SPRI MS 1228/8/13.
- Hammond (Rear Admiral). 1835. Despatch FI 269 Enc.2 to Capt. Elliot (Admiralty), 10 February 1835. PRO CO 78/2.
- Hansen, C. 1881. Letter to Governor Kerr, 14 June 1881. PRO CO 78/71.
- Harding, W. 1902a. Despatch 201 to F.E. Cobb, Falkland Islands Company, London, 21 March 1902. Falkland Islands Company Archives, Stanley.
- Harding, W. 1902b. Despatch to F.E. Cobb, Falkland Islands Company, London, 7 January 1902. Falkland Islands Company Archives, Stanley.
- Harding, W. 1903a. Despatch 223 to F.E. Cobb, Falkland Islands Company, London, 3 March 1903. Falkland Islands Company Archives, Stanley.
- Harding, W. 1903b. Despatch 224 to F.E. Cobb, Falkland Islands Company, London, 31 March 1903. Falkland Islands Company Archives, Stanley.
- Harding, W.L. 1903c. Despatch 230 to F.E. Cobb, Falkland Islands Company, London, 24 June 1903. Falkland Islands Company Archives, Stanley.
- Harding, W. 1903d. Despatch to F.E. Cobb, Falkland Islands Company, London, 16 September 1903. Falkland Islands Company Archives, Stanley.
- Harding, W. 1903e. Despatch 232 to F.E. Cobb, Falkland Islands Company, London, 18 August 1903. Falkland Islands Company Archives, Stanley.
- Harding, W. 1904a. Despatch 245 to F.E. Cobb, Falkland Islands Company, London, 2 March 1904. Falkland Islands Company Archives, Stanley.
- Harding, W. 1904b. Despatch 242 to F.E. Cobb, Falkland Islands Company, London, 3 February 1904. Falkland Islands Company Archives, Stanley.
- Harding, W. 1907. Despatch 311 to F.E. Cobb, Falkland Islands Company, London, 26 March 1907. Falkland Islands Company Archives, Stanley.
- Harmer, S.F. 1922. Letter B.M.(N.H.)146/2294/22 to the Under Secretary of State, Colonial Office, 5 July 1922. SPRI MS 1228/9/1.
- Harmer, S.F. 1923. Report of the Trustees of the British Museum on Southern sealing and whaling, 24 July 1923. PRO CO 78/165.
- Hattersley-Smith, G. 1980. The history of place names in the Falkland Islands Dependencies (South Georgia) and the South Sandwich Islands. British Antarctic Survey Scientific Reports 101.
- Headland, R.K. [in press]. Chronological list of Antarctic expeditions and related historical events.

- Headland, R.K. 1984a. The island of South Georgia. Cambridge University Press.
- Headland, R.K. 1984b. Wrecks, hulks and other vessel remains at South Georgia, Falkland Islands Dependencies. British Antarctic Survey Bulletin 65: 109-126.
- Heap, P.W. 1984. Letter to A.B. Dickinson from Her Majesty's High Commissioner to the Bahamas, 12 April 1984.
- Hegarty, R.B. 1959. Returns of whaling vessels sailing from American ports, 1876-1928. Old Dartmouth Historical Society and Whaling Museum, New Bedford, Massachusetts.
- Henniker-Heaton, H. 1924. Despatch 37 to the Secretary of State for the Colonies, 21 March 1924. PRO CO 78/166.
- Henniker-Heaton, H. 1935. Telegram 25 to the Secretary of State for the Colonies. PRO CO 78/199:11.
- Henniker-Heaton, H. 1936. Despatch 106 to the Secretary of State for the Colonies, 17 July 1936. PRO CO 78/202:5.
- Henry, A.J. 1892. Report of Special Agent Henry. In: Fur Seal Arbitration. Proceedings of the Tribunal of Arbitration. Counter Case of the United States. VII: 245-249. Government Printing Office, Washington, DC.
- Herlinger, S. [1918]. Letter to 'British Subsidiary Magistrate, Falkland Islands'. SPRI MS 1228/9/3.
- Hill, H.A. 1894. Trade, Commerce and Navigation. In: Professional and industrial history of Suffolk County, Massachusetts. II: 9-165. The Boston History Company.
- Hill, L.W. 1970. Private wildlife sanctuary in the Falkland Islands. Polar Record 15 (96): 357.
- Hirabayashi, S. 1963. Letter 'Application for Sealing License' to Administrative Officer, South Georgia, 10 October 1963. SPRI MS 1228/8/55.
- HMS Dwarf. 1882. Cruise of HMS Dwarf amongst the Falkland Islands, January 1882. Falkland Islands Journal 1970 [134-40].
- Hobbs, W.H. 1939. The discoveries of Antarctica within the American sector. Transactions of the American Philosophical Society New Series, XXXI, Part 1, January 1939.
- Hockly, C.E. 1921. Report on suggested methods for the protection of the fur seals in the Falkland Islands, 21 April 1921. PRO CO 78/159.
- Hodges, M.H. 1906. Report on visit to South Georgia Island by HMS Sappho. PRO CO 78/109.
- Hodson, A. 1927. Telegram to the Secretary of State for the Colonies, 26 October 1927. PRO CO 78/176:10.
- Hodson, A. 1928. Letter F.I.93 to the Secretary of State for the Colonies, 1 March 1928. SPRI MS 1228/9/1.
- Hodson, A. 1929a. Despatch 195 to the Secretary of State for the Colonies, 18 September 1929. PRO CO 78/185:1.
- Hodson, A. 1929b. Despatch 188 to the Secretary of State for the Colonies, 28 August 1929. PRO CO 185/11.
- Hodson, A. 1930. Despatch 96 to the Secretary of State for the Colonies, 5 May 1930. PRO CO 78/186:12.
- Hodson, A. 1931. Despatch 40 to the Secretary of State for the Colonies, 3 March 1931. PRO CO 78/188:5.
- Holdgate, M. 1963. Observations on the South Sandwich Islands, 1962. Polar Record 11 (73): 394-405.
- Holdgate, M.W. 1970. Conservation in the Antarctic. In: Holdgate, M.W. (ed.). Antarctic Ecology 2: 924-945. Academic Press, London.
- Home, E. 1822. On the difference in the appearance of the teeth and the shape of the skull in different species of seals. Philosophical Transactions of the Royal Society of London 113: 239-240.
- Hope, A.F.J. 1983. Sovereignty and decolonization of the Malvinas (Falkland) Islands. Boston College International and Comparative Law Review 6 (2): 391-446.
- Howay, F.W. 1925. Capt. Simon Metcalfe and the brig Eleanora. Hawaiian Historical Society: 34th Annual Report: 33-39.
- Huntford, R. 1985. Shackleton. Hodder & Stoughton, London.
- Hunt's Merchant's Magazine. 1845. No.12: 50.

- Ichihara, T. & Nishiwaki, M. 1966. External measurements and weight of a Southern Elephant Seal. The Scientific Reports of the Whales Research Institute, Tokyo 20: 211-212.
- Imperial Magazine. 1820. Important Discovery. 2 (18): 674-675.
- Imperial Magazine. 1821. Extract of a letter from New South Shetland. 3 (27): 453-455.
- International Court of Justice. 1955. Application instituting proceedings filed in the Registry of the Court on May 4th 1955: Antarctica Case (United Kingdom v Argentina). General List No.26. 1955.
- Jackson, H.H.T. 1938. Concession for elephant seal taking. Journal of Mammalogy 19: 502-503.
- Jarvis, L. 1775. Letter to Aaron Lopez from Leonard Jarvis, 5 April 1775. In: Commerce of Rhode Island 1726-1800. II. 1775-1800. Collections of the Massachusetts Historical Society. 1915, 7th Series, X: 15.
- Jenkins, J.T. 1921. A History of the Whale Fisheries. H.F. & G. Witherby, London.
- Johnson, S. 1777. Papers relative to the late negotiation with Spain, and the taking of Falkland's Island from the English. Parts 1 and 2. J. Almon, London.
- Jones, A.G.E. 1966. Edward Bransfield, Master RN. Mariner's Mirror 52 (4): 379-388.
- Jones, A.G.E. 1969. Whale fishing around the Falklands. The Southern whale fishery. Falkland Islands Journal 1969: [69-71].
- Jones, A.G.E. 1971. New voyage to the South Shetland Islands 1819-20. Antarctic 6 (20): 63-66.
- Jones, A.G.E. 1973. Voyages to South Georgia 1795-1820. British Antarctic Survey Bulletin 32: 15-22.
- Jones, A.G.E. 1975. Captain Mathew Brisbane. Falkland Islands Journal 1975: 1-4.
- Jones, A.G.E. 1977. John Biscoe in the Falkland Islands, 1830-1832. Falkland Islands Journal 1977: 1-5.
- Jones, A.G.E. 1981. The British Southern whale and seal fisheries. Great Circle (Sydney) 3 (1): 20-29; 3 (2) 90-102.
- Jones, A.G.E. 1982. Antarctica observed. Caedmon, Whitby.
- Jones, A.G.E. 1985a. British sealing on New South Shetland 1819-1826. I. Great Circle (Sydney) 7 (1): 9-20.
- Jones, A.G.E. 1985b. British sealing on New South Shetland 1819-1826. II. Great Circle (Sydney) 7 (2): 74-85.
- Jordan, D.S. 1898. The fur seals and fur seal islands of the North Pacific Ocean. United States Treasury Department. Document 2017. Parts I-IV.
- Jorgensen, A. 1910a. Letter to C.A. Larsen, 1 January 1910. SPRI MS 1228/8/2.
- Jorgensen, A. 1910b. Letter to C.A. Larsen, 9 January 1910. SPRI MS 1228 S.G. 630.
- Kean, J. 1892. Pelagic sealing. In: Fur Seal Arbitration. Appendix to the case of the United States. II: 448. Government Printing Office, Washington, DC.
- Kellogg, R. 1942. Past and present status of the marine mammals of South America and the West Indies. Annual Report of the Smithsonian Institution 3705: 299-316.
- Kemp, S. 1929. Letter to E.R. Darnley, 7 October 1929. PRO CO 78/185:11.
- Kemp, S. & Nelson, A.L. 1931. The South Sandwich Islands. Discovery Reports 3: 133-198.
- Kerr, T. 1881a. Despatch 52 to the Secretary of State for the Colonies, 17 June 1881. PRO CO 78/71.
- Kerr, T. 1881b. Despatch 101 to the Secretary of State for the Colonies, 23 September 1881. PRO CO 78/72.
- Kerr, T. 1882. Despatch 33 to the Secretary of State for the Colonies. PRO CO 78/12.
- Kerr, T. 1888a. Despatch 111 to the Secretary of State for the Colonies, 22 October 1888. PRO CO 78/78.
- Kerr, T. 1888b. Despatch 57 to the Secretary of State for the Colonies, 26 May 1888. PRO CO 78/78.
- Kerr, T. 1890. Seal fishery licence. PRO CO 78/86.
- Kerr, T. 1890. Seal fishery licence. PRO CO 78/86.

- Kiernan, J. 1892. Deposition. In: Fur Seal Arbitration. Proceeding of the Tribunal of Arbitration. Case of the United States. Appendix II: 448-450. Government Printing Office, Washington, DC.
- King, J.E. 1983. Seals of the world. 2nd ed. Oxford University Press.
- Kirker, J. 1970. Adventures to China. Americans in the Southern Oceans 1792-1812. Oxford University Press, New York.
- Klutschak, H.W. 1881. Ein Besuch auf Sud Georgia. Deutsche Rundschau für Geographie und Statistica 3 (11): 522-534.
- Kooyman, G.L. 1981a. Weddell seal *Leptonychotes weddelli* (Lesson 1826). In: Ridgway, S.H. & Harrison, R.J. (eds.). Handbook of marine mammals. 2: 275-596. Academic Press, London.
- Kooyman, G.L. 1981b. Leopard seal *Hydrurga leptonyx* (Blainville 1820). In: Ridgway, S.H. & Harrison, R.J. (eds.). Handbook of marine mammals. 2: 261-274. Academic Press, London.
- Lacroix, L. 1938. Les derniers baleiniers francais. Imprimerie de Bretagne, Nantes.
- Lampson, C.M. 1903. Letter to the Under Secretary of State for the Colonies, 20 October 1903. PRO CO 78/103.
- Langenheim, A.G. 1939. Elementos para la historia de nuestras Islas Malvinas. Tomo 1. El Aleneo, Buenos Aires.
- Larsen, C.A. 1909a. Letter to J.I. Wilson, 14 December 1909. SPRI MS 1228/8/1.
- Larsen, C.A. 1909b. Letter to J.I. Wilson, 24 December 1909. SPRI MS 1228/8/1.
- Larsen, C.A. 1909c. Letter to H.H. Schlieper, 22 December 1909. SPRI MS 1213/1/1.
- Larsen, C.A. 1910. Letter to H.H. Schlieper, 2 April 1909. SPRI MS 1213/1/1.
- Larsen, C.A. 1912a. Letter to J.I. Wilson, 25 November 1912. SPRI MS 1228/8/4.
- Larsen, C.A. 1912b. Letter to the Manager, South Georgia Co. Ltd, 23 March 1912. SPRI MS 1213/1/3.
- Larsen, C.A. 1912c. Letter to H.H. Schlieper, 19 April 1912. SPRI MS 1213/1/3.
- Larsen, C.A. 1913. Letter to J.I. Wilson, 5 December 1913. SPRI MS 1213/1/4.
- Larsen, C.A. 1920. Statement on fur seals. In: Report of the Interdepartmental Committee on Research and Development in the Dependencies of the Falkland Islands. Appendix 11: 92. HMSO London [Cmd. 657].
- Larsen, J.M. 1908. Letter to H.H. Schlieper, 12 December 1908. SPRI MS 240/1.
- Latourette, K.S. 1927. Voyages of American ships to China, 1784-1844. Transactions of the Connecticut Academy of Arts and Sciences 28. New Haven.
- Laws, R.M. 1951. Report on the Sealing Industry at South Georgia. SPRI MS 1228/7/42.
- Laws, R.M. 1952. A new method of age determination for mammals. Nature 169 (4310): 972.
- Laws, R.M. 1953a. The seals of the Falkland Islands and Dependencies. Oryx 2 (2): 87-97.
- Laws, R.M. 1953b. The elephant seal (*Mirounga leonina* Linn.). I. Growth and Age. Falkland Islands Dependencies Survey Scientific Reports 8.
- Laws, R.M. 1953c. A new method of age determination in mammals with special reference to the elephant seal (*Mirounga leonina* Linn.). Falkland Islands Dependencies Survey Scientific Reports 2.
- Laws, R.M. 1956. The elephant seal (*Mirounga leonina* Linn.). II. General, social and reproductive behaviour. Falkland Islands Dependencies Survey Scientific Reports 13.
- Laws, R.M. 1960. The southern elephant seal (*Mirounga leonina* Linn.) at South Georgia. Norsk Hvalfæst-Tidende 10 & 11: 466-476, 520-542.
- Laws, R.M. 1973. The current status of seals in the Southern Hemisphere. In: Seals. Proceedings of a working meeting of seal specialists on threatened and depleted seals of the world, held under the auspices of the Survival Service Commission of I.U.C.N. 18-19 August 1973, University of Guelph. I.U.C.N. Publications New Series, Supplementary Paper 39: 144-161.
- Laws, R.M. 1979. Monitoring whale and seal populations. In: Nichols, D. (ed.). Monitoring the marine environment. Symposia of the Institute of Biology, 24: 115-140.
- Laws, R.M. 1981. Biology of Antarctic seals. Science Progress, Oxford 67: 377-397.
- Laws, R.M. 1984. In: Laws, R.M. (ed.). Antarctic Ecology. II: 621-715. Academic Press, London.

- Lawson, E. 1985a. Sealing Reports. Add.Mss.1001. Provincial Archives of British Columbia. Personal communication, letter 5 February 1985.
- Lawson, E. 1985b. Transcript of conversation in January 1984 with W. Hirtle, Stanley. Personal communication, letter 5 February 1985.
- Lawson, E. 1985c. Abstract of Victoria Sealing Co. Ltd records. Finding aid No.3-1. Provincial Archives of British Columbia. Personal communication, letter 5 February 1985.
- Lawson, E. 1985d. Extracts taken January 1984 from the Shipping Register, 1901 to 1908, Stanley. Personal communication, letter 5 February 1985.
- Leard, J. 1788. Observations on the Seal Fishery. PRO BT 6/95: 175-182.
- Ledyard, J. 1783. A journal of Captain Cook's last voyage to the Pacific Ocean and in quest of a North West passage. Nathaniel Patten. Hartford.
- Letters Patent. 1843. Letters Patent (Charter) of June 23 1843. Charter for the Government of the Falkland Islands. Patent Roll 7 Vict. Part I. C.66/4690.
- Lewis Smith, R.I.L. 1984. Beauchêne Island: A historical account. Polar Record 22 (137) :159-168
- Liebes, I. 1892. Deposition. In: Fur Seal Arbitration. Proceedings of the Tribunal of Arbitration. Case of the United States. Appendix II:452. Government Printing Office, Washington, DC.
- Lindahl, C. 1892. Arctic and Antarctic sealing. In: Fur Seal Arbitration. Case of the United States. Appendix II: 456. Government Printing Office, Washington, DC.
- Ling, J.K. & Bryden, M.M. 1981. Southern elephant seal - Mirounga leonina Linnaeus 1758. In: Ridgway, S.H. & Harrison, A.J. (eds.). Handbook of marine mammals 2: 297-327. Academic Press, London.
- Literary Gazette. 1820. Important Discovery. 4 (185) : 505-506.
- Literary Gazette. 1821. New Shetland (second paper). 5 (251): 712-713.
- Literary Gazette. 1821b. New Shetland (third and last paper). 5 (253): 746-747.
- Lonnberg, E. 1908. The protection of sea elephants. Field 111: 541.
- Lonnberg, E. [1909]. Letter to Mr Meade-Waldo [26 February 1909]. PRO CO 78/115.
- Lowcay, R. (Lieut.) 1838. Letter from Lieutenant Robert Lowcay to Vice-Admiral Sir Graham Hammond respecting a naval voyage around the Falkland Islands in December 1837. Falkland Islands Journal 1977: 9-20.
- Lyster, S. 1984. The Falkland Islands Foundation. Oryx 18: 22-23.
- Lyttleton, A. 1905. Despatch W.O. 10331/1906 to W.L. Allardyce, 15 November 1905. SPRI MS [unnumbered].
- Macy, O. 1835. The History of Nantucket. Hillard, Gray and Co., Boston.
- Magistrate. 1947. Telegram 176 to the Governor of the Falkland Islands, 18 November 1947. SPRI MS 1228/4/29.
- Magistrate. 1950. Memorandum D/11/1950 to the Compañia Argentina de Pesca. SPRI MS 1213/4/37.
- Malcolm, D. 1908. Letter to Capt. Poole. In: Allardyce, W.C. Despatch to the Secretary of State for the Colonies, 15 February 1908. SPRI MS 140/1.
- Mallett, L. 1911. Despatch to the Governor of the Falkland Islands, 17 March 1911. SPRI MS 1228/30/5.
- Manning, W.R. 1932. Diplomatic correspondence of the United States. Inter American Affairs 1831-1860. I - Argentina. Docs 1-387. Carnegie Endowment for International Peace, Washington.
- Marcus, J.R. 1961. Early American Jewry. 2 vols. The Jewish Publication Society of America, Philadelphia.
- Marr, J.W.S. 1935. The South Orkney Islands. Discovery Reports 10: 283-382.
- Marr, J.W. 1936. Second report on the fur seals of Bird Island, 23 October 1936. SPRI MS 1228/9/6.
- Mareh, J.W. & Stirling, W.H. 1867. The story of Commander A. Gardner R.N. with sketches of missionary work in South America. J. Nisbet, London.
- Martin, W.M. 1920. Despatch 124 to the Secretary of State for the Colonies, 16 December 1920. PRO CO 78/155.
- Mason, W. 1892. Deposition. In: Fur Seal Arbitration. Proceedings of the Tribunal of Arbitration. Case of the United States. Appendix II: 447. Government Printing Office, Washington, DC.

- Massachusetts Historical Society. 1915. Commerce of Rhode Island 1726-1800. II. 1775-1800. Boston.
- Massachusetts Historical Society. 1982. Journals of the House of Representatives of Massachusetts. 51. Part I. 1775.
- Mathew, J.W. 1957. Note on sealing legislation as applied to South Georgia, 26 August 1957. SPRI MS 1228/9/1.
- Matthews, L.H. 1929. The natural history of the elephant seal, with notes on the other seals found at South Georgia. Discovery Reports 1: 233-256.
- Matthews, L.H. 1931. South Georgia: The British Empire's Subantarctic outpost. John Wright & Sons, Ltd, London.
- Matthews, L.H. 1952. Sea elephant: the life and death of the elephant seal. MacGibbon & Kee, London.
- Mattsson, A.A. 1942. Fur seal hunting in the South Atlantic. American Neptune 2 (2): 154-166.
- Mattsson, A.A. 1943. Sealing boats. American Neptune 3 (4): 327-332.
- Melville, C. 1840. Letter to Lieut. Tyssen, 3 February 1840. PRO CO 78/4.
- Melville, W. 1893. Despatch 114 to the Secretary of State for the Colonies, 26 September 1893. PRO CO 78/86.
- Mercantile List and Maritime Directory. 1906-1911. London.
- Middleton, J. 1921. Despatch 109 to the Secretary of State for the Colonies, 25 November 1921. PRO CO 78/159.
- Middleton, J. 1922a. Despatch to the Secretary of State for the Colonies, 22 June 1922. PRO CO 78/162.
- Middleton, J. 1922b. Order by His Excellency the Governor prescribing under Section 14 of the Seal Fishery (Consolidation) Ordinance 1921 the manner in which the armed guard stationed at Elephant Jason Island shall perform their duties, 20 February 1922. PRO CO 78/162.
- Middleton, J. 1925. Despatch 74 to the Secretary of State for the Colonies, 1 July 1925. PRO CO 78/167.
- Miers, J. 1820a. Account of the discovery of New South Shetland, with observations on its importance in a geographical, commercial and political point of view. Edinburgh Philosophical Journal III Article XXI: 367-380.
- Miers, J. 1820b. Account of the discovery of New South Shetland with observations on its importance. Edinburgh Magazine and Literary Miscellany 7. August 1820: 110-112.
- Mill, H.R. 1905. The siege of the South Pole. Alton Rivers Ltd, London.
- Miller, S. 1979. The beginnings of the Falkland Islands Company. Falkland Islands Journal 1979: 8-21.
- Miller, S. 1980. The American sealers in the mid-nineteenth century. Falkland Islands Journal 1980: 29-34.
- Miller, S. 1985. Canadian sealing vessels arriving at Stanley, 1908-1912. Personal communication, letter July 1985.
- Milward, C.A. 1905. Copy of the South Georgia Exploration Co. Ltd Charter Party. 22 July 1905. F.O. 83/2092. SPRI MS [unnumbered].
- Mitterling, P.L. 1959. Americans in the Antarctic to 1840. University of Illinois Press, Urbana.
- Molano, E.D. & Homet, E. 1948. Tierras Australes Argentinas. Sociedad Geografica Americana, Buenos Aires.
- Moody, R.C. 1842a. Despatch to Lord Stanley, 5 March 1842. PRO CO 78/5.
- Moody, R.C. 1842b. Despatch to Lord Stanley, 14 April 1842. PRO CO 78/5.
- Moody, R.C. 1842c. Despatch to Lord Stanley, 12 October 1842. PRO CO 78/5.
- Moody, R.C. 1843. Statistical table showing the number of vessels at the Falkland Islands from 15 January 1842-29 July 1843. PRO CO 78/6.
- Moody, R.C. 1845. Despatch to Wm. Gore Ouseley, British Representative in Buenos Aires, 20 October 1845. PRO CO 78/12.

- Moore, W.H. 1840. Letter to W.E. Gladstone, 10 July 1840. PRO CO 78/15.
- Morrell, B. 1832. A narrative of four voyages to the South Sea, North and South Pacific Ocean, Chinese Sea, Ethiopic and Southern Atlantic Ocean, Indian and Antarctic Ocean from the year 1822-1831. J. & J. Harper, New York.
- Moulton, W. 1804. A concise extract from the sea journal of William Moulton. Utica, NY.
- Murphy, R.C. 1914a. Report on the South Georgia Expedition. Science Bulletin, Museum of the Brooklyn Institute of Arts and Sciences 2 (4): 41-102.
- Murphy, R.C. 1914b. Cruising in the South Atlantic. Brooklyn Museum Quarterly 1 (2): 83-110.
- Murphy, R.C. 1918. The status of sealing in the sub-Antarctic Atlantic. Scientific Monthly, New York 7: 112-119.
- Murphy, R.C. 1947. Logbook for Grace, Whaling Brig Daisy 1912-1913. The Macmillan Company, New York.
- Myer, L.W. 1892. Canadian pelagic sealing industry. In: Fur Seal Arbitration, Proceedings of the Tribunal of Arbitration, Case of the United States. Appendix I: 507-511. Government Printing Office, Washington, DC.
- McCann, T.S. 1980. Population structure and social organization of Southern elephant seals, Mirounga leonina (L.). Biological Journal of the Linnean Society 14: 133-150.
- McCann, T.S. 1985. Size, status and demography of Southern elephant seal (Mirounga leonina) populations. In: Ling, J.K. & Bryden, M.M. 1985 (eds.). Studies of sea mammals in south latitudes. Proceedings of a Symposium of the 52nd ANZAAS Congress in Sydney, May 1982: 1-17. South Australian Museum.
- McDonald, C.A. 1892. Deposition. In: Fur Seal Arbitration, Proceedings of the Tribunal of Arbitration, Case of the United States. Appendix I: 513. Government Printing Office, Washington, DC.
- MacGregor, W. 1844. Memorandum on the seal rookeries or resorts of seals at the Falkland Islands. Board of Trade, 5 September 1844. PRO CO 78/10.
- Mackinnon, L.B. 1840. Some account of the Falkland Islands, from a six months' residence in 1838 and 1839. A.H. Bailly & Co., London.
- Macpherson, D. 1805. Annals of commerce, manufactures, fisheries and navigation. 4 vols. Mundell & Son, Edinburgh. Reprinted 1972. Johnson Reprint Corporation, New York and London.
- Nautical Magazine. 1834a. Letter [copy] from Henry Rea R.N. to Rear Admiral Sir M. Seymour, C-in-C. South America. III. June 1834: 376-377.
- Nautical Magazine. 1834b. Massacre at the Falkland Islands. III. March 1834: 181.
- New London Gazette. 1821. 9 May 1821.
- New York Times. 1878. Seal skin dressing. 14 November 1878: 4.
- New York Times. 1908. French may tackle Yankee sea-captain. 23 May 1908: 3, col.1.
- New York Times. 1912. 28 June 1912.
- Nordenskjöld, O. 1905. Antarctica. Hurst and Blackett, London.
- Norgren, C.L. 1911. Letter to the 'Minister for the Colonies', 4 March 1911. SPRI MS 1228/30/5.
- Observer. 1952. 12 October 1952.
- Official Shipping Registers. [n.d.]. Public Archives of Canada, Ottawa.
- Ogden, A. 1941. The California sea otter trade 1784-1848. University of California Press, Berkeley.
- O'Gorman, F. 1961. Fur seals breeding in the Falkland Islands Dependencies. Nature 192 (4806): 914-915.
- Øritaland, T. 1960. Fur seals breeding in the South Orkney Islands. Norsk Hvalfangst-tidende 5: 220-225.
- Øritaland, T. 1970. Sealing and seal research in the south-west Atlantic pack ice, Sept.-Oct. 1964. In: Holdgate, M.W. (ed.). Antarctic Ecology 1: 367-376. Academic Press, London.
- Osgood, W.H. et al. 1915. The fur seals and other life on the Pribilof Islands, Alaska, in 1914. Senate Document 980, 63rd Congress, 2nd Session. In: Bulletin of the United States Bureau of Fisheries XXXIV: 1-72. 1914-1916. Department of Commerce, Washington.
- O'Shaughnessy, B.F. 1931. Letter to the Under Secretary of State for the Colonies, 17 June 1931. PRO CO 78/189:6.

- Pacific Fisherman. 1906a. 4 (5): 19.
Pacific Fisherman. 1906b. 4 (7): 20.
- Paget, A.W. (Commodore). 1906. Report of HMS Sappho, voyage to South Georgia, 13 February 1906. PRO CO 78/106.
- Palmerston (Lord). 1837. Despatch to Mr Mandeville, Buenos Aires, 4 January 1837. PRO CO 78/3.
- Parish, W. 1831a. Arrivals at Port Soledad in the Falkland Islands from June 1826 to March 1831, 14 December 1831. PRO CO 78/1.
- Parish, W. 1831b. Despatch from Woodbine Parish to Viscount Palmerston, 31 December 1831. PRO CO 71/1.
- Parish, W. 1831c. Despatch from Woodbine Parish to Lord Palmerston, 14 December 1831. PRO CO 78/1.
- Parliamentary Papers. 1893. United States No.2. Bering Sea Arbitration. Report of the Bering Sea Commission and Report of the British Commissioners 21 June 1892. HMSO, London.
- Paterson, D.G. 1977. The North Pacific seal hunt, 1886-1910. Rights and regulations. Explorations in Economic History 14: 97-119.
- Payne, M.R. 1977. Growth of a fur seal population. Philosophical Transactions of the Royal Society of London B. 279: 67-79.
- Payne, M.R. 1979. Growth in the Antarctic fur seal Arctoccephalus gazella. Journal of Zoology (London) 187: 1-20.
- Pernety, A.J. 1773. The history of a voyage to the Malouine (or Falkland Islands) made in 1763 and 1764, under the command of M. de Bougainville in order to form a settlement there. 2nd ed. William Goldsmith and David Steel, London. [Translation of French edition published 1769].
- Péron, F. 1816. Voyage of discovery to the southern lands ... during the years 1800 to 1804. [Translation of Vol. II Chapters XXII and XXIII]. In: Micco, H.M. 1971. King Island and the sealing trade, 1802. Roebuck Society Publication No.3, Canberra.
- Petersen, M. 1914. The fur traders and fur bearing animals. Hammond Press, Buffalo, NY.
- 'Petition'. 1906. Petition to the Secretary of State for the Colonies, 6 March 1906. PRO CO 78/108.
- Pettitt, R.G. 1963a. Letter to Chr. Salvesen & Co. Ltd, 13 June 1963. SPRI MS 1228/6/50.
- Pettitt, R.G. 1963b. Letter to Albion Star (Southampton) Ltd, 11 July 1963. SPRI MS 1228/6/50.
- Pettitt, R.G. 1963c. Letter to Chr. Salvesen & Co. Ltd, 11 July 1963. SPRI MS 1228/6/50.
- Phillips, W. 1911a. Letter to Sir Edward Grey, Secretary of State for Foreign Affairs, 9 January 1911. SPRI MS 1228/30/5.
- Phillips, W. 1911b. Letter to Sir Edward Grey, Secretary of State for Foreign Affairs, 14 February 1911. SPRI MS 1228/30/5.
- Pierce-Butler, K. 1955a. Letter to the Administrative Officer, South Georgia, 22 March 1955. SPRI MS 1228/8/47.
- Pierce-Butler, K.S. 1955b. Letter to the Magistrate, South Georgia, 5 March 1955. SPRI MS 1228/9/5.
- Pilleri, G. & Gahr, M. 1977. Radical extermination of the South American sea lion Otaria byronia (Pinnipedia, Otariidae) from Isla Verde, Uruguay. Verlag des Hirnanatomischen Institutes, Determinationen (Bern).
- Pitkin, T. 1835. A statistical view of the commerce of the United States of America: including also an account of banks, manufactures and internal trade and improvements. Currie & Peck, New Haven, Connecticut.
- Poland, H. 1892. Fur bearing animals in nature and in commerce. Gurney & Jackson, London.
- Porter, K.W. 1966. John Jacob Astor: Business Man. 2 vols. Russell & Russell, New York.
- Portlock, N. 1789. A voyage round the world; but more particularly to the Northwest Coast of America. J. Stockdale & G. Goulding, London.
- Powell, G. 1822. Notes on South Shetland. R.H. Laurie. London.
- Public Record Office. 1835. Memorial to Rt. Hon. Lord Glenelg from the owners and master of the cutter Susannah Ann complaining against Lieutenant Smith R.N., Governor of the Falkland Islands. PRO CO 78/2:104.
- Queyle Dickson, J. 1914. Report on the Sealing Industry in South Georgia, 2 June 1914. SPRI MS 1228/9/2.

- Raymond, E.H. 1936. The fur seal fishery and Salem. Essex Institute Historical Collections. LXXII (3): 181-207.
- Rayner, G. 1933. Report on a search made for fur seals in the neighborhood of Willis Island, South Georgia, February 1933. SPRI MS 1228/9/6.
- Redden, A.W. 1907. Letter to Governor W.L. Allardyce, 23 July 1907. PRO CO 78/111.
- Reynolds, J.N. 1828. Letter to Hon. Michael Hoffman, Chairman, Committee on Naval Affairs of the House of Representatives, 26 February 1828. United States Senate Report 24th Congress 1st Session [262]: 25-33 21 March 1836.
- Richards, R. 1981. The journal of Erasmus Darwin Rogers, the first man on Heard Island. American Neptune 41: 280-305.
- Robbins, E.F. 1906. Letter to Governor W.L. Allardyce, 29 January 1906. PRO CO 78/108.
- Roberts, B.B. 1958. Chronological List of Antarctic expeditions. Polar Record 9 (59): 97-134; 9 (60): 191-239.
- Roberts, B.B. 1966. Wildlife conservation in the Antarctic. Oryx 8(4): 237-243.
- Roberts, B.B. 1977. Conservation in the Antarctic. Philosophical Transactions of the Royal Society of London 279: 97-104.
- Robinson, W. 1839. Despatch from Lieut. Commander W. Robinson to Commodore Sullivan, South Atlantic Station, 23 December 1839. PRO CO 78/4.
- Robotti, F.B. 1950. Whaling and Old Salem. A chronicle of the sea. Newcombe & Gauss Co. Ltd, Salem, Massachusetts.
- Ross, F.E. 1937. American adventures in the early maritime fur trade with China. Chinese Social and Political Review (Peking) 31: 221-267.
- Rotch, F. 1794. Letter-book, W. Rotch Jr. Old Dartmouth Historical Society MS 2-3A1.
- Routledge, R.M. 1893. Letter to the Colonial Secretary, 15 February 1893. PRO CO 78/87.
- Royal Falkland Land, Cattle, Seal and Whale Fishery Company. 1850. A Notice issued in London in the year 1850. Falkland Islands Journal 1970 [5-13].
- Russell, John (Lord). 1841. Despatch from Lord John Russell to Lieutenant Governor Moody, 23 August 1841. In: Correspondence relative to the Falkland Islands. Falkland Islands Journal 1968 [7-15].
- Sage, B. 1985. Conservation and exploitation. In: Bonner, W.N. & Walton, D.W.H. (eds.). Antarctica (Key Environments): 351-369. Pergamon Press, London.
- Salcedo, S. 1900. Letter to Governor Grey-Wilson, 28 February 1900. PRO CO 78/99.
- Salem Gazette. 1821. Circular: possession of the Falkland Islands. 8 November 1821.
- SCAR. 1986. Bulletin No.83. Polar Record 23 (143): 221-252.
- Scheffer, V.B. 1958. Seals, sea lions and walrus. Stanford University Press, California.
- Schlieper, H.H. 1908. Letter to the Governor of the Falkland Islands, 16 October 1908. SPRI MS 240/1.
- Schmielau, A. 1925. Letter to the Compañía Argentina de Pesca, 6 March 1925. SPRI MS 1213/12/3.
- Schück, A. 1882. Die Entwicklung unserer Kenntnisse der Länder im Süden von Amerika. Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg 5 (8): 128, 5 (9): 130-136.
- Scientific Committee of the Convention for the Conservation of Antarctic Marine Living Resources. 1984. Report of the third meeting of the Scientific committee. Hobart, Australia, 3-13 September 1984.
- Seabright, f. 1912. Letter to Sarah Hansen, 24 December 1912. PRO CO 78/126.
- Seymour, Michael (Rear-Admiral Sir). [1834]. Report to the Admiralty on the Port Louis massacre. PRO CO 78/1.
- Shackleton, E.H. (Sir). 1914a. Letter to Governor Allardyce, 6 March 1914. PRO CO 78/133.
- Shackleton, E.H. (Sir). 1914b. Letter to the Under Secretary of State for the Colonies, 19 March 1914. PRO CO 78/133.
- Shackleton, E.H. (Sir). 1914c. Letter to the Under Secretary of State for the Colonies, 28 March 1914. PRO CO 78/133.
- Shackleton, E.H. (Sir). 1919. South. Wm. Heinemann, London.
- Sherratt, R. 1821. Observations on South Shetland. Imperial Magazine (London) 1821. Col. 1214-1218.

- Shipping and Commercial List and New York Price Current. 1815-54. New York.
- Shirreff, W.H. 1819. Sailing instructions to Edward Bransfield. In: Lee, I. 1913. The voyages of Captain William Smith and others to the South Shetlands. Geographical Journal XLII (4): 365-370.
- Sitwell, N. 1972. Sealing in the Antarctic. Animals 14: 156-157.
- Smith, E.A. & Burton, R.W. 1970. Weddell seals of Signy Island. In: Holdgate, M.W. (ed.). Antarctic Ecology I: 415-428. Academic Press, London.
- Smith, E.D. 1930a. Letter to the Under Secretary of State for the Colonies, 12 May 1930. PRO CO 78/187:6.
- Smith, E.C. 1930b. Letter to R. Darnley, Colonial Office, 12 May 1930. PRO CO 78/187:6.
- Smith, E.C. 1930c. Letter to L.B. Freeston, Colonial Development Advisory Committee, 12 May 1930. PRO CO 78/187:6.
- Smith, H. (Lieut.) 1834. Notice [Prohibition of Sealing]. Morning News & Public Ledger 12 November 1834. PRO CO 78/1.
- Smith, H. (Lieut.) 1835. Despatch to Sir George Grey, 5 August 1835. PRO CO 78/2.
- Smith, H.M. 1927. The Uruguyan fur seal islands. Zoologica 9: 271-294.
- Smith, J.G. 1903. The romance of sealing. Canadian Magazine 21 (5): 393-401.
- Smith, T.W. 1844. A narrative of the life, travels and sufferings of Thomas W. Smith. Wm. C. Hill, Boston.
- Snow, W.P. 1857. A two years' cruise off Tierra del Fuego, the Falkland Islands, Patagonia and the River Plate. 2 vols. Longman, Brown, Green, Longman & Roberts, London.
- Spears, J.R. 1910. The story of the American merchant mariner. The Macmillan Company, New York.
- Stackpole, E.A. 1952. The first recognition of Antarctica. Boston Public Library Quarterly 4: 3-19.
- Stackpole, E.A. 1953. The Sea-Hunters. J.B. Lippincott Company, Philadelphia, NY.
- Stackpole, E.A. 1955. The voyage of the Huron and the Huntress. Marine Historical Association. November 1955 No.29, Mystic, Connecticut.
- Stackpole, E.A. 1972. Whales and destiny. University of Massachusetts Press, Boston.
- Stanley Shipping Register. 1901-1912. Extracts provided by Lawson (1985d) and Miller (1985).
- Starbuck, A. 1878. History of the American whale fishery from its earliest inception to the year 1876. In: United States Commission of Fish and Fisheries. Part IV. Report of the Commissioner for 1875-76 ... II Appendix A - the sea fisheries. Misc.Doc. No.107 44th Congress 1st Session, Government Printing Office, Washington, DC.
- Statesman. 1952. 31 October 1952.
- Stephen, J. 1840. Despatch to Sir John Barrow, 26 May 1840. PRO CO 78/4.
- Steven, M. 1983. Trade, tactics and territory. Melbourne University Press.
- Stevens, T.A. 1977. The discovery of Antarctica. The Log of Mystic Seaport 28: 106-114.
- Stevenson, C.H. 1904a. Utilization of skins of aquatic animals. In: Report of Commissioner of Fish and Fisheries for year ending 30 June 1902. 28 (1904): 283-352. United States Commission of Fish and Fisheries, Washington.
- Stevenson, C.H. 1904b. Aquatic products in arts and industries: fish oils, fats and waxes. In: Report of Commissioner of Fish and Fisheries for year ending 30 June 1902. 28 (1904): 177-279. United States Commission of Fish and Fisheries, Washington.
- St. Johnston, T.R. 1920. Despatch 21 to the Secretary of State for the Colonies, 20 February 1920. PRO CO 78/154.
- Stonington Yankee. 1826. 27 December 1826.
- Strange, I.J. 1965. Beauchêne Island. Polar Record 12 (18): 725-730.
- Strange, I.J. 1969. Marine mammals of the Falkland Islands. Pacific Discovery 221: 16-23.
- Strange, I.J. 1972a. Wildlife in the Falklands. Oryx 11 (4): 240-257.
- Strange, I.J. 1972b. Sealing industries of the Falkland Islands. Falkland Islands Journal 1972.
- Strange, I.J. 1973. The silent ordeal of a South Atlantic archipelago. Natural History. 82 (2): 30-39.

- Strange, I.J. 1983. The Falkland Islands. 3rd edn. David & Charles, Newton Abbot.
- Strange, I.J. 1984. Fortress Falklands - but is its wildlife secure. Oryx 8 January 1984: 14-21.
- Strange, I.J. 1985. Nature Reserves and the law - time for a change. Falkland Islands Foundation Newsletter 3: 2-3.
- Swinhoe, E. 1905a. Rules and regulations of the South Georgia Exploration Company Ltd, 22 July 1905. F.O. 83/2092. SPRI MS [unnumbered].
- Swinhoe, E. 1905b. Letter to the Colonial Secretary, 14 November 1905. PRO CO 78/106.
- Taylor, N.W. 1858. Life on a whaler. Occasional Publications. The New London County Historical Society. New London, Connecticut, 1929.
- Thompson, W.A. 1908. Enclosure to Allardyce, W.L., Despatch to the Secretary of State for the Colonies, 24 January 1908. PRO CO 78/112.
- Thompson, W.A. 1911. Despatch to the Magistrate, South Georgia, 21 January 1911. SPRI MS 1228/30/4.
- Tønnessen, J.N. 1967. Verdensfangsten, 1883-1924. Del I 1883-1914. Utgitt av Norges Hvalfangstforbund, Sandefjord.
- Tønnessen, J.N. & Johnsen, A.O. 1982. The history of modern whaling. C. Hurst, London. Australian National University Press, Canberra.
- Townsend, E. 1888. The diary of Mr Ebenezer Townsend Jr., the supercargo of the sealing ship 'Neptune' on her voyage to the South Pacific and Canton. New Haven Colony Historical Society Papers 4: 3.
- Tröim, T. 1926. Analysis of press-boiled seal-meal oil. 14 December 1926. SPRI MS 1228/9/5.
- Tröim, T. 1948. Report No.4 (1948): Analyses of seal oil and guano from seal carcasses. 3 October 1948. SPRI MS 1213/2/35.
- Tyson, -. (Lieut). 1841. Despatch to the Secretary of State for the Admiralty, 6 April 1841. PRO CO 78/4.
- United States. 1900. 32nd Annual List of Merchant Vessels of the United States for the year ending June 10 1900. Government Printing Office, Washington, DC.
- Vallentin, R. 1900. Notes by a naturalist on his voyage to the Falklands and back, with remarks on the fauna and flora of those islands. Journal of the Royal Institution of Cornwall 14: 339-364.
- Vamplew, W. 1975. Salvesen of Leith. Scottish Academic Press, Edinburgh and London.
- Van Aarde, R.J. 1980. Fluctuations in the population of Southern elephant seals Mirounga leonina at Kerguelen Island. South African Journal of Zoology 15: 99-106.
- Vaughan, R.W. 1964. Report on the sealing industry at South Georgia, 1963-64 season. SPRI MS 1228/7/59.
- Vaughan, R.W. 1965. Report on the sealing industry at South Georgia, 1964-65 season. SPRI MS 1228/7/60.
- Vaughan, R.W. 1968. The status of the Weddell seal (Leptonychotes weddelli) at South Georgia. British Antarctic Survey Bulletin 15: 71-74.
- Vaz Ferreira, R. 1979. South American fur seal. In: Mammals in the seas. FAO Fisheries Series 5 (2): 34-36.
- Vaz Ferreira, R. 1981. South American sea-lion. In: Ridgway, S.H. & Harrison, R.J. (eds.). Handbook of marine mammals 1: 39-65. Academic Press, London.
- Vernet, L. 1829. Circular to foreign fishing vessels, 1 August 1829. In: Caillet-Bois, R.R. Una tierra Argentina. Las Islas Malvinas. Ediciones Peuser, Buenos Aires.
- Vernet, L. 1832. Report of the Political and Military Commandant of the Malvinas (translation). British and Foreign State Papers 20 [1836]: 369-436.
- Vernet, L. 1836. Memorial from Louis Vernet to the Government of Great Britain, 6 September 1836. PRO CO 78/3.
- Verrill, G.E. 1895. On some birds and eggs collected by Mr Geo. Comer at Gough Islands, Kerguelen Island and the island of South Georgia. Transactions of the Connecticut Academy of Arts and Sciences 9: 430-478.
- Vietor, A.O. 1956. New light on the activities of American sealing vessels in the South Shetland Islands and Antarctica, 1819-22. Geography and Map Division, Special Libraries Association. Bulletin No.26: 5-9.

- Walton, D.W.H. 1982. The first South Georgia leases: Compania Argentina de Pesca and the South Georgia Exploring Company Ltd. Polar Record 21 (132): 231-240.
- Watson, D.R. 1929. Report of the first season of the Falkland Islands and Dependencies Sealing Company, 14 January 1929. PRO CO 78/185:1.
- Watson, D.R. 1931a. Report of the Falkland Islands and Dependencies Sealing Company, 1929-30. 19 February 1931. PRO CO 78/188:5.
- Watson, D.R. 1931b. Falkland Islands and Dependencies Sealing Company Ltd; Summary of seasons 1928, 1929 and 1930. 13 February 1931. PRO CO 78/188:5.
- Watson, D.R. 1931c. Falkland Islands and Dependencies Sealing Company Ltd; Balance Sheet 1930. 19 February 1931. PRO CO 78/185:5.
- Webster, W.H.B. 1834. Narrative of a voyage to the South Atlantic Ocean in the years 1828, 29, 30, performed in H.M. sloop Chanticleer. 2 vols. Richard Bentley, London.
- Weddell, J. 1825. A voyage towards the South Pole performed in the years 1822-24. 2nd edn. Longman, Rees Orme Brown and Green, London.
- Weiss, H.B. 1974. Whaling in New Jersey. New Jersey Agricultural Society, Trenton, NJ.
- Whalemen's Shipping List and Merchants' Transcript. 1844. 26 November 1844. New Bedford.
- Whidden, J.D. 1908. Old sailing ship days. From forecandle to quarter-deck. Charles E. Lauriat Co., Boston, 1925.
- Whittington, G.T. 1834. Letter to Mr R.W. Hay, 13 June 1834. PRO CO 78/1.
- Whittington, G.T. 1840. The Falkland Islands, compiled from ten years' investigation of the subject. Smith, Elder & Co., London.
- Whittington, G.T. 1841. Letter to the Lords Commissioners of the Admiralty, 22 March 1841. PRO CO 78/4.
- Williams, T.W. 1892. Pelagic sealing. In: Fur Seal Arbitration. Proceedings of the Tribunal of Arbitration. Case of the United States. Appendix I: 491-505. Government Printing Office, Washington, DC, 1895.
- Williams, C.A. 1892. Pelagic sealing. In: Fur Seal Arbitration. Appendix to the Case of the United States. II: 535-548. Government Printing Office, Washington, DC.
- Williams, C.A. 1888. Statement and statistics relative to the fur seal fishery, submitted to committee of Congress on merchant marine and fisheries. In: Fur Seal Arbitration. Appendix to the Case of the United States. II: 540-547. Government Printing Office, Washington, DC.
- Wilson, B.H. 1833. Despatch from Bedford Hinton Wilson to Viscount Palmerston, 26 January 1833. PRO CO 78/1.
- Wilson, J.I. 1909. Despatch to the Colonial Secretary, 22 December 1909. SPRI MS 1228/8/2.
- Wilson, J.I. 1910a. Letter to Capt. C.A. Larsen, 7 January 1910. SPRI MS 1228/8/2.
- Wilson, J.I. 1910b. Despatch 19/1910 to the Colonial Secretary, 21 May 1910. SPRI MS 1228/30/2.
- Wilson, J.I. 1910c. Letter to Capt. C.A. Larsen, 14 January 1910. SPRI MS 1228/8/2.
- Wilson, J.I. 1910d. Despatch to the Colonial Secretary, 15 August 1910. SPRI MS 1228/8/2.
- Wilson, J.I. 1910e. Despatch to the Colonial Secretary, 3 February 1910. SPRI MS 1228/8/2.
- Wilson, J.I. 1910f. Sealing report on the 1910 season, S.G. 37/1910, 17 October 1910. SPRI MS 1228/7/1.
- Wilson, J.I. 1910g. Despatch to the Colonial Secretary, 3 September 1910. SPRI MS 1228/30/3.
- Wilson, J.I. 1911a. Despatch to the Colonial Secretary, 22 February 1911. SPRI MS 1228/30/4.
- Wilson, J.I. 1911b. Despatch 50/1911 to the Colonial Secretary, 18 July 1911. SPRI MS 1228/30/5.
- Wilson, J.I. 1911c. Despatch to the Colonial Secretary, 22 February 1911. SPRI MS 1228/30/4.
- Wilson, J.I. 1912. Despatch 81/1912 to the Colonial Secretary, 8 August 1912. SPRI MS 1228/8/4.
- Wilson, J.I. 1912b. Letter 544/1911 to Capt. C.A. Larsen, 8 September 1912. SPRI MS 1213/4/2.
- Wilson, J.I. 1913a. Despatch to the Colonial Secretary, 14 May 1913. SPRI MS 1228/8/5.
- Wilson, J.I. 1913b. Despatch 43/13 to the Colonial Secretary, 13 December 1913. SPRI MS 1228/8/5.

- Wilson, J.I. 1914a. Despatch 544/14 to the Colonial Secretary, 14 September 1914. SPRI MS 1228/9/2.
- Wilson, J.I. 1914b. Sealing tour of inspection in the s.s. Rosita, 24 September 1914. SPRI MS 1228/7/1.
- Wilson, J.I. 1914c. The sea elephants of South Georgia. In: Report of the Interdepartmental Committee on Research and Development in the Dependencies of the Falkland Islands. Appendix XV, April 1920: 113-114. HMSO, London [Cmd.657].
- Worsley, F.A. 1928a. Letter to E.R. Darnley, Colonial Office, 11 February 1928. PRO CO 78/180:3.
- Worsley, F.A. 1928b. Letter to the Under Secretary of State for the Colonies, 11 May 1928. PRO CO 78/180:3.
- Worsley, F.A. 1928c. Letter to the Under Secretary of State for the Colonies, 17 May 1928. PRO CO 78/180:3.
- Wright, E.W. 1897. Lewis and Dryden's marine history of the Pacific Northwest. Superior Publishing Co., Seattle [Reprint 1967].
- Yarmouth Herald. 1906. 10 July 1906.
- Yarmouth Herald. 1907a. 18 June 1901.
- Yarmouth Herald. 1907b. 19 March 1901.
- Yarmouth Herald. 1908a. 17 November 1908.
- Yarmouth Herald. 1908b. 24 March 1908.
- Yarmouth Herald. 1909a. 22 June 1909.
- Yarmouth Herald. 1909b. 30 November 1909.
- Yarmouth Herald. 1911a. 27 June 1911.
- Yarmouth Herald. 1911b. 4 April 1911.
- Yarmouth Herald. 1911c. 20 June 1911.
- Young, A. 1821. Notice of the voyage of Edward Bransfield, Master of His Majesty's ship Andromache to New South Shetland. Edinburgh Philosophical Journal 4 (8) Article 17: 345-348.
- Young, W.D. 1915. Despatch to the Secretary of State for the Colonies, 8 November 1915. PRO CO 78/135.
- Young, W.D. 1916. Despatch to the Magistrate, South Georgia, 3 June 1916. SPRI MS 1228/8/8.

BIBLIOGRAPHY (ADDENDUM)

- Albion, R.G., Baker, W.A., & Labaree, B.W. 1972. New England and the sea. Marine Historical Association, Mystic.
- Allen, J.A. 1880. The history of North American pinnipeds. United States Geological and Geographic Survey of the Territories. Misc.Pub.12, Department of the Interior, Washington, D.C.
- Amphlett, H. 1974. Hats: A history of fashion in headwear. Richard Sadler, London.
- Bertlett, R.J. 1929. Commerce and industry (1782-1820). In: Commonwealth history of Massachusetts Vol.III. Reissued, Russell & Russell, New York 1966.
- Bennet, A.G. 1931. Whaling in the Antarctic. Wm.Blackwood & Sons Ltd, London.
- Best, P.B. & Shaughnessy, P.D. 1979. An independent account of Captain Benjamin Morrell's sealing voyage to the southwest coast in the Antarctic 1828/29. South African Fisheries Bulletin 12: 1-19.
- Brooks, C.E.P. 1919. The climate and weather of the Falkland Islands. London Meteorological Office. Geophysical Memoir 15.
- Bryden, M.M. 1970. Utilisation of the meat of elephant seals. Proceedings of the Australian Society of Animal Production 8: 106-108.
- Caulkins, F.M. 1895. History of New London. H.D. Utley, New London.
- Clark, A.M. 1887b. Connecticut and its fisheries. In: Goode, G.B. The fisheries and fishery industries of the United States. Section II. A geographical review of the fisheries industries and fishing communities for the year 1880. Part V. United States Commission of Fish and Fisheries, Washington, DC. 10: 311-340.

- Clark, W.H. 1938. Ships and sailors. The story of our merchant marine. L.C. Page & Co., Boston.
- Davey, R. [1880]. Furs and fur garments. Roxburghe Press, London.
- Dorsett, E.L. 1951. Around the world for seals. American Neptune 11 (2): 115-133.
- Ewing, E. 1981. Fur in dress. B.T. Batsford Ltd, London.
- Gill, J.C.H. 1967. Notes on the sealing industry of early Australia. Journal of the Royal Historical Society of Queensland. 8 (2): 218-245.
- Goode, G.B. 1887. The fisheries and fishery industries of the United States. Section II. A zoogeographical review of the fisheries industries and fishing communities for the year 1880. United States Commission of Fish and Fisheries, Washington, D.C.
- Hainsworth, D.R. 1967. Exploiting the Pacific frontier: The New South Wales sealing industry 1800-1821. Journal of Pacific History 2: 59-75.
- Hohman, E.P. 1928. The American whaler. Longmans, Green & Co., New York.
- Jackson, G. 1978. The British whaling trade. Adam and Charles Black, London.
- Lawson, C. 1879. Hunting the sea-elephant. Forest and Stream, Rod and Gun. 11 (22) 2 January [New York].
- Laut, A.C. 1921. Concerning fur seals. American Fur Trader [1921]: 125-133.
- Lie, J. 1956. 70 years. Lars Christensen and his times. Norsk Hvalfangstidende 45 (2): 80-86.
- Linka, J.G. 1956. The book of fur. James Barrie, London.
- Martin, K.R. 1974. Delaware open whaling 1833-1845. The Hagley Museum. Greenville Delaware Eleutherian Mills-Hagley Foundation Inc.
- McLaughlin, W.R.D. 1962. Call to the south. George Harrap, London.
- Morison, S.E. 1921. The maritime history of Massachusetts 1783-1860. Houghton Mifflin, Boston.
- Partridge, J.H. 1873. Furs and their wearers. Popular Science Monthly 4: 143-156.
- Pasquière, T. du. 1982. Les Baleinières Françaises au XIXième siècle. Terre et Mer, Grenoble.
- Pope, C. (ed.). 1838. The yearly journal of trade, 1837-38. 17th edition. Thorp & Graham, London.
- Pope, C. (ed.). 1844. The yearly journal of trade. Charles Albrecht, London.
- Rand, R.W. 1973. Management of the South African fur seal. Journal of the South African Wildlife Management Association 3 (2): 85-87.
- Rydell, R.A. 1952. Cape Horn to the Pacific: The rise and decline of an ocean highway. University of California Press, Los Angeles.
- Saturday Magazine. 1835. 10 January 1835: 10-13.
- Scoreby, W. 1820. An account of the Arctic regions with a history and description of the northern whale fishery. 2 vols. Archibald Constable, London.
- Seaburg, C. & Paterson, S. 1971. Merchant prince of Boston: Colonel I.H. Perkins, 1764-1854. [n.pub.], Cambridge, Massachusetts.
- Sexé, M. 1923. Two centuries of fur trading. Draeger Frères, Paris.
- Smith, T.W. 1844. A narrative of the travels and sufferings of Thomas W. Smith. Wm. C. Hill, Boston.
- Starbuck, A. 1914. The Nantucket Whale Fishery. In: Douglas-Lithgow, R.A. Nantucket, a history. G.P. Putnam's Sons, New York and London.
- United States. 1889. Fur seal fisheries of Alaska. House of Representatives. 50th Congress. 2nd Session. Report 3883. Washington, DC.
- Vallentin, R. 1904. Notes on the Falkland Islands. Memoirs and Proceedings of the Manchester Literary and Philosophical Society 48. Part 3. (23): 1-48.
- Weeden, W.B. 1890. The economic and social history of New England, 1620-1789. Houghton Mifflin Co., New York.
- Wilcox, R.T. 1951. The mode in furs. Charles Scribner's Sons, New York.
- Williams, C.A. 1895. Early whaling industry of New London. Reports and Proceedings of the New London County Historical Society. II (1): 3-22.
- * Canada. 1986. Royal Commission on Seals and the Sealing Industry in Canada: Seals and Sealing in Canada. 3 vols. Canadian Government Publishing Centre. Ottawa.