

SAM 21 2008

ISSN: 0804-6824
SEPTEMBER 2008

Discussion paper

The 19th Century Antarctic Sealing Industry. Sources, Data and Economic Significance

BY
BJØRN L. BASBERG AND ROBERT K. HEADLAND

This series consists of papers with limited circulation, intended to stimulate discussion.

The 19th Century Antarctic Sealing Industry. Sources, Data and Economic Significance¹.

Bjorn L. Basberg
Economic History Section, Department of Economics
Norwegian School of Economics and Business Administration
N-5045 Bergen
bjorn.basberg@nhh.no

Robert K. Headland
Scott Polar Research Institute, University of Cambridge
Cambridge CB2 1ER
rkh10@cam.ac.uk

September 2008

Abstract

Sealing was the first exploitative industry in the Antarctic region. Throughout the 19th century it was characterized by large fluctuations in harvests and shifts in hunting grounds as seals were almost exterminated in some locations. The paper reviews the historical literature on this industry. In particular it reviews sources and data that relate the economic importance. So far, no one has succeeded in indicating the aggregate economic value of the industry. The main aim, therefore, is to explore new data, especially on market prices and catches that will enable us to assess more accurately the significance of the industry.

Introduction

Since the progressive discoveries during the late 18th century, several exploitative industries have operated in the Antarctic regions, notably sealing, whaling and fisheries. In an attempt to analyse the economic history of this region, the economic significance of the various industries is obviously a crucial factor – to enable

¹ Paper presented at the *SCAR/IASC IPY Open Science Conference - Polar Research – Arctic and Antarctic Perspectives in the International Polar Year* (Session 2.4./5.2., Human Linkages: The history of Non-indigenous Peoples in Polar Regions – Impacts and Interactions), St. Petersburg, 8.-11. July 2008. The paper was written while Bjorn L. Basberg was a Visiting Scholar at Scott Polar Research Institute, University of Cambridge (2007/08). He is grateful for financial support from The Norwegian Research Council, Norwegian School of Economics and Business Administration and Røwdes Foundation (Legat).

comparisons of the Antarctic industries with similar industries in other regions, and to be able to compare the different industries within the Antarctic itself over time.²

Sealing was the earliest Antarctic industry. It was characterized by large fluctuations in catches and shifts in sealing grounds as seals were almost exterminated in particular locations – in an era completely lacking regulations. Already by the mid 19th century the industry dwindled.

The majority of the sealers were from Britain and United States (from New England). They took fur seals first (for the fur) and later elephant seals (for the oil). The most important markets were in Britain (London), the US (New York) and Canton (China) where the furs were remunerative for hats and other clothing. The markets for oil were mainly the first two.

There is an extensive literature on the history of this industry focussing specifically on Antarctic sealing and dealing with it as one aspect of the larger South Seas Trades (or Fisheries) or the larger Fur Trade. In the following this literature will be reviewed to give concert of the development of the Antarctic sealing industry. The literature provides valuable and detailed insights into many aspects of the economics of the industry. However, no one has yet succeeded in indicating its aggregate economic value or the aggregate development throughout the years of operation, combining data on market prices and catches. This is the aim of this paper, which will thus enable more accurate assessment of the significance of the industry compared with subsequent Antarctic exploitative industries especially whaling and fisheries. Sugden has provided one such comparison, but it is a rather general model of the assumed pattern of development and without factual data.³ Laws has made a comparison of output of catches of the main species of the exploitative industries (seals, whales, fish, krill) from 1784 to 1988.⁴ This is instructive in showing how immense the production of whaling was compared with that of the other industries. For a number of years,

² Such issues were raised in an introductory paper that outlined a larger project on research into the economic history of the Antarctic region; B.L. Basberg, "Perspectives on the Economic History of the Antarctic Region", *International Journal of Maritime History*, XVIII, No. 2, 2006.

³ D. Sugden, *Arctic and Antarctic. A Modern Geographical Synthesis*, Oxford 1982, p. 401.

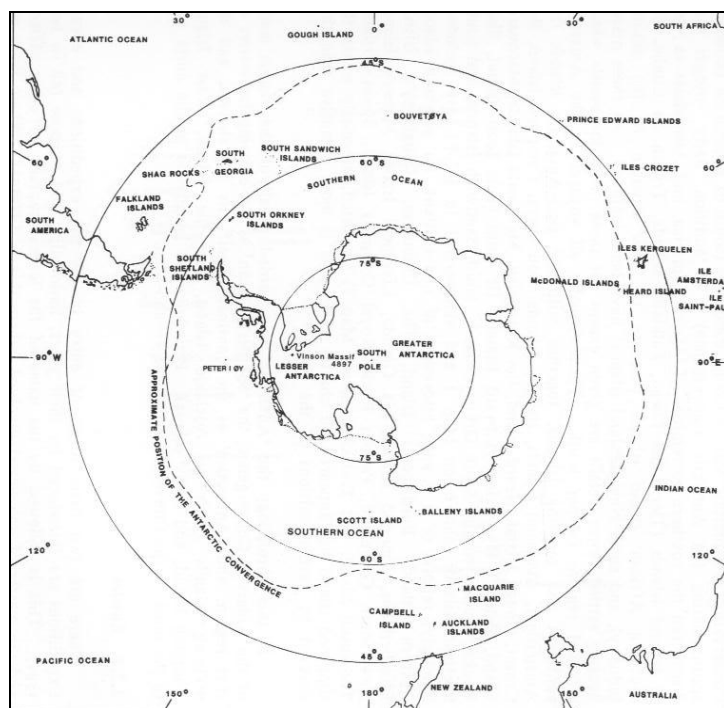
⁴ R. Laws, *Antarctica. The Last Frontier*, (Boxtree), London, 1989, p. 181. Laws does not refer to any sources, and it is consequently difficult to assess the reliability of his data and analyse them as other than estimates.

between one and three millions tons were caught annually. Fish and krill reached 0.5 million at their maximum, the sealing much less. However, a comparison of quantities gives only an incomplete concept of the economic significance of the industries. For such purposes, prices have to be taken into account.

The geographical area included in the following study will be somewhat wider than what is often understood as the Antarctic. In addition to the coast of Antarctica itself (which in this context affects the northern parts of the Antarctic Peninsula and its islands), also the main sub- or peri-Antarctic islands are included. Some of these are situated below the Antarctic Convergence (or Front), some are located slightly to the north of it (see Figure 1).⁵

Figure 1

The Antarctic Region



Source: R.K. Headland, *Chronological List of Antarctic Expeditions and Related Historical Events*, Cambridge 1989, p. 3.

⁵ I full discussion of definitions; see Basberg (2006), *op.cit.*

Such a wider definition (in geographical terms) is necessary when the aim is to analyse the Antarctic as an economic region. The sealers operated throughout the Southern Ocean, and did not venture further south than what was necessary to find seals. A cargo might consist of catches from several islands (Antarctic and elsewhere), without distinguishing between them in the records. This fact also poses problems regarding islands further to the north such as the Falkland Islands, Tierra del Fuego, southern Australasian islands, and Tristan da Cunha that are obviously not located in the Antarctic, but at the same time the sealing there may be difficult to distinguish from the trade further south.

The main areas included are the following:

- The South Orkney Islands, South Shetland Islands and the Antarctic Peninsula (with islands)
- South Georgia, South Sandwich Islands and Bouvetøya – south of the Atlantic Ocean
- Prince Edward Island, Iles Crozet, Heard Island and Iles Kerguelen – south of the Indian Ocean
- Campbell, Auckland and Macquarie Islands – south of New Zealand.

There are in addition a number of other smaller islands (like Peter I Øy, Balleny Islands and Scott Island) that were rarely or never visited by sealers and which have never had more than very minor populations of seals.

The paper is organized in the following way: The first section reviews the historical development of Antarctic sealing from its beginning in the late 18th century, focussing on catching grounds, participants, markets and organization of the industry. A second section reviews sources and data relating the industry, with an emphasis on voyages and vessels, employment, production (catches), prices and economic importance.

Antarctic sealing – an overview

Sealers had exploited grounds in the Southern Hemisphere – along the coasts of Africa and South America, Australia and the Pacific islands throughout the latter part

of the 18th century.⁶ The Falkland Islands were visited by whalers and sealers at least as early as 1774. Both fur seals and elephant seals were caught from the beginning.

Grounds in the Southern Ocean were not really discovered before James Cook's circumnavigation between 1772 and 1775, leading to reports of abundance of seals and consequently the attention of the sealing communities. South Georgia had the first recorded visit by sealers in 1786. It developed into a substantial industry already before the turn of the century, and by around 1820 there were few seals left. More than one million fur seals may have been killed according to James Weddell's estimates.⁷ The next area to be explored was the South Shetlands, discovered in 1819. Already the following summer season more sealers were around and the next two seasons experienced an 'invasion', probably reaching close to one hundred vessels in 1821/22, again mainly British and United States (see later and Figure 2). The South Shetlands seals, which were principally fur seals, soon experienced the same fate as those on South Georgia. The beaches were emptied, and the sealers moved to other peri-Antarctic islands that experienced short peaks and collapses in the following decades; for example at Crozet and Prince Edward Islands (1840s) and in Kerguelen and Heard Islands (1850s). Sealing at the islands south of New Zealand started already in the 1790s. The trade peaked in the 1820s with the peri-Antarctic Macquarie Island as the most important sealing ground.⁸

The seal population recovered to some extent, and grounds like South Georgia, South Shetlands and Macquarie Island experienced renewed interest from the sealers in the late 19th century. However, the catches were far less than those of the early peak seasons.

⁶ For reviews of the development; see G. Deacon, *The Antarctic Circumpolar Ocean*, Cambridge 1984, B.C. Busch, *The War against Seals. A History of the North American Seal Fishery*, (McGill-Queen's UP), Kingston, ON 1985, R.K. Headland, *Chronological List of Antarctic Expeditions and Related Historical Events*, (Cambridge UP), Cambridge 1989, R. Laws, *Antarctica. The Last Frontier*, (Boxtree) London 1989, A.G.E. Jones, "Voyages to South Georgia, 1795-1820", "British Sealing on New South Shetland" (Part I and II) and "The British Southern Whale and Seal Fisheries", *Polar Portraits. Collected Papers*, (Caedmon) Whitby 1992, M. Stevens, *Trade, Tactics and Territory. Britain in the Pacific 1783-1823*, (Melbourne UP) Melbourne 1983, A.B. Dickinson, *Seal Fisheries of the Falkland Islands and Dependencies. An Historical Review*, Research in Maritime History No. 34, St. John's, Newfoundland 2007, R. Burton, "History of Sealing", *Encyclopedia of Antarctica*, (Routledge) New York 2006, p. 875.

⁷ Busch, *op.cit.*, p. 36.

⁸ I. Smith, *The New Zealand Sealing Industry*, Wellington (Dept. of Conservation), 2002.

The sealers have been called the “nomads of the sea”.⁹ In a single voyage, they often visited several islands, moving when the beaches in one place had been emptied. However, they also left gangs ashore for extended periods, staying in caves or erecting shelters or refuges of wood or stone, and brought their try-works for the processing of elephant seal oil.¹⁰ Some even wintered, but more typically stayed for the Austral summer only.

Most sealers came from the United States, and they were active throughout the entire century. In the early years and throughout the South Shetland bonanza of the 1820s British vessels were about equal in number, but after around 1840 Britain was very much out of this business. In addition to these two major bases the Cape Colony (South Africa), Australian (New South Wales and Tasmania), New Zealand and French vessels were active.

The sealing industry was part of larger industries and to some extent difficult to distinguish from them. The fur seal industry was part of the fur trades in the sense that the furs went to the same markets and to some extent represented substitutes for other furs. Elephant sealing or ‘elephanting’ was distinct. Vessels, equipment, skills and grounds were to some extent different.¹¹ It was, on the other hand, closely connected with the whaling trade. The oils were similar and could be processed aboard the vessels using the same equipment (the try works). Indeed, many vessels were taking both whales and elephant seals, and the two industries were very much integrated. Especially the United States 19th century whaling was a very significant industry, and the quantities of seal oil were just a small fraction of the quantities produced by the whaling trade of that country.

The sealing companies both in the United States and in Britain were predominantly located in some few areas. In the US, they were, as the whaling companies, in the north east – in New England. Although the sealing and whaling trades were closely

⁹ E. Stackpole, *The Sea-Hunters. The New England Whalesmen During Two Centuries, 1635-1835*, (J.B. Lippincott & Co.) New York, 1953, p. 181.

¹⁰ For examples of the early primitive accommodations; M. Pearson and R. Stehberg, “Nineteenth century sealing sites on Rugged Island, South Shetland Islands”, *Polar Record*, Vol. 42, No. 223, 2006.

¹¹ M. Downes and E. Downes, “Sealing at Heard Island in the nineteenth century”, in K. Green and E. Woehler (eds.), *Heard Island. Southern Ocean Sentinel*, (Surrey Beatty & Sons), Chipping Norton NSW, 2006, p. 186.

connected, the sealing industry had its centre in smaller communities in Connecticut (Stonington in particular) rather than in the whaling capital of New Bedford. In Britain, London was the business centre where the majority of the companies and vessels belonged. In much smaller numbers, occasional vessels went from other ports such as Liverpool, Cork, Bristol, Plymouth and Hull.¹² Especially in Britain, sealing was part of the much larger shipping or maritime communities. In Jones' words; 'the fur seal fishery was a drop in the ocean'.¹³

There were two main markets for fur seals; London and Canton (China). They both developed from the beginning of the industry in the 1780s and developed due to both supply and demand factors. On the supply side, the opening of the new southern catching grounds was important. The increased demand was related to development in processing techniques that made finer furs and could put the pelts to new uses. Such developments took place in China already from the mid 17th century and in Europe much later from the late 1790s.¹⁴

The London market was by far the most important during the 1780s – supplied mainly by British sealers. London then supplied the domestic market, but furs were also re-exported to Europe and China. The British Canton trade – in charge of the East India Company - lasted only until about the turn of the century. The European trade declined from the late 1820s.

United States sealers reached the Canton market in the 1790s and soon dominated that trade.¹⁵ Furs from seals also soon outnumbered the otter and beaver skin imports that previously also had been dominated by US traders. Already at the turn of the 18th century the market there was saturated with fur seals, thus prices and imports gradually declined.¹⁶ By the early 1830s the trade on Canton ceased.

¹² Jones, *op.cit.* (British Sealing on New South Shetland Part II, Table 1), p. 403.

¹³ Jones, *op.cit.* (British Sealing on New South Shetland), p. 294.

¹⁴ Steven, *op.cit.*, p. 86 and 95.

¹⁵ The market evidences are explicitly analysed by R. Richards, "New market evidence on the depletion of southern fur seals: 1788-1833", *New Zealand Journal of Zoology*, Vol. 30, 2003.

¹⁶ *Ibid.*, p. 3, and J.R. Gibson, *Otter Skins, Boston Ships, and China Goods. The Maritime Fur Trade of the Northwest Coast, 1785-1841*, (McGill-Queen's UP), Montreal 1992, p. 202.

Between the 1840s and the 1880s Antarctic fur sealing was completely dominated by US vessels now mainly supplying the domestic market there, but to some extent also Europe.

The elephant seal oil market was more stable. It yielded high grade oil that was used for lighting, lubrication and leather treating. However, as was the case with whale oil, the market for lighting was supplanted South Orkney Islands in the latter part of the century by the new mineral oil as well as gas.¹⁷

Sources and data on the sealing industry

The literature on 19th century Antarctic sealing, and more generally the South Seas trades and the Fur Trade, contains a vast amount of data relating the industry; vessels, catches and market information. However, most of it is fragmentary and sporadic, making it difficult to acquire a good concept of the long run economic development. A problem is also the incompleteness of the primary sources. Summing up her work on British records, Steven concluded:

“The dispersed nature of the trade, both at its collection and disposal points, helped to obscure activity and now makes regular estimates difficult to compile.... Even the comparatively formal regularity of the British Customs is interrupted by blank sections in records otherwise kept with some degree of faithfulness”.¹⁸

Her assessment may be followed by Jones, writing in the introduction to his study that “[t]he comprehensive history of the southern whale and seal fisheries from Britain, from the 1770s to the 1850s still has to be written. When it is done it will be unsatisfactory as the material is so scrappy and scattered.”¹⁹

The following section will review the available sources and data. Then we will discuss how to proceed to be able to compile more consistent data, especially co-relating the economic aspects.

¹⁷ S. Jones, *The Ice Hunters. A History of Newfoundland Sealing to 1914*, (Newfoundland History Series 8), St. John's, 1994. Chapter 1 contains a detailed analysis of the British seal oil market in the 19th century.

¹⁸ Steven, *op.cit.* p. 100.

¹⁹ Jones, *op.cit.*, (The British Southern Whale and Seal Fisheries), p. 393.

Vessels

The number of vessels employed in Antarctic sealing is one important indicator of the extent of the industry. Data are found in logbooks, but on a more aggregate level, such vessels are identified in sources like the *Lloyd's Register*, *Lloyd's List*, *Registers of Shipping* or various Customs Lists relating the British fleet.²⁰ A problem with these and other sources is the extent to which it is possible to identify specifically the Antarctic sealing. A sealing *and* whaling voyage may be listed as a whaling voyage. Quite often the only geographical identification is the "South Seas" which of course could be much more than the Antarctic waters.²¹

Several historians have compiled information on vessels from primary sources. An effort to obtain a complete list based on primary as well as secondary ones, is by Headland, who has recorded about 1200 sealing voyages, distributed across years, on grounds and countries of origin of the expeditions (Figure 2).²²

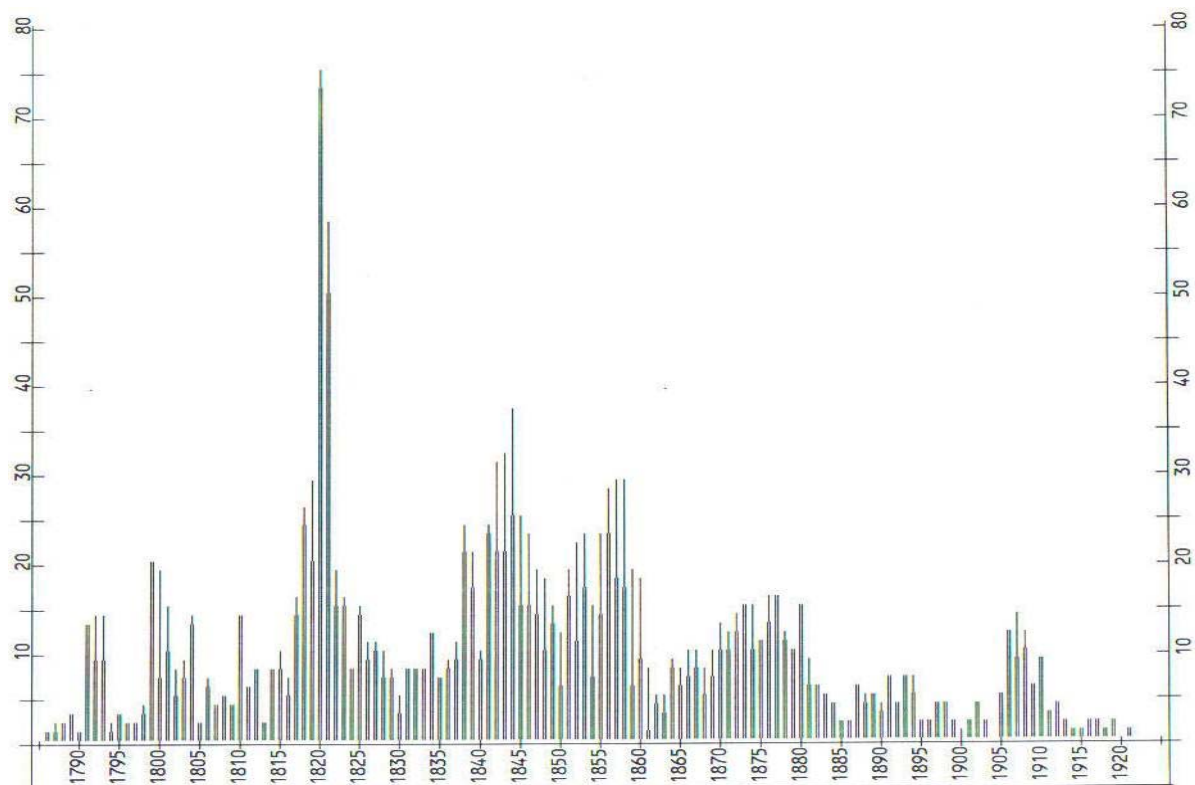
²⁰ *Ibid.*, p. 401.

²¹ Jones, *op.cit.*, (Voyages to South Georgia), p. 360.

²² The 1989 version of Headland's *Chronological List* recorded 930 voyages, but many more have been added. Revised figures will appear in R.K. Headland, *A Chronology of Antarctic Exploration*, forth. 2008. In addition to the aggregate numbers displayed here, the data may be distinguished on the nationality of the vessels (British, United States, Australian, New Zealand, Cape Colony and South African, French, and others (Brasil, Canada, Chile, Germany, Norway and Portugal)) and catching grounds (Illes Kerguelen and Heard Island, South Georgia and South Sandwich Islands, Prince Edward Islands and Illes Crozet, Auckland, Campbell and Macquarie Islands, South Shetland and South Orkney Islands, Gough Island and Illes Saint-Paul et Amsterdam).

Figure 2

Vessels employed in Southern Ocean Sealing, 1790 – 1920.



Source: R.K. Headland, *A Chronology of Antarctic Exploration*, forth. 2008.

Sealing vessels varied substantially in size, making it difficult to talk of a “standardized” type. Sizes have been recorded from more than 600 tons to as little as 27 tons.²³ An average size of United States sealing vessels before 1900 has been estimated to about 240 tons. There also seems to have been a declining trend throughout the 19th century towards vessels below 200 tons.²⁴ This was smaller than the average whaling vessels that typically were 300 - 350 tons.²⁵ There were both practical and economic reasons for using smaller vessels. A large vessel would require a longer voyage to fill the hold. A large vessel was also difficult to navigate in the shallow and narrow waters where the sealers had to operate. Some elephant sealers, in fact, employed smaller tenders (fore-and-aft schooners of 70-100 tons) that

²³ Jones, *op.cit.*, (The British Southern Whale and Seal Fisheries), p. 398.

²⁴ Dickinson, *op.cit.*, p. 11. For the entire period 1816-1905 average New Bedford ships were 357 tons, while barks were 302 tons.

²⁵ L. Davis, R. Gallman and K. Gleiter, *In Pursuit of the Leviathan: Technology, Institutions, Productivity, and Profits in American Whaling, 1816-1906*, (University of Chicago Press), Chicago 1997, p. 220ff.

accompanied the main vessels for navigation close to shore.²⁶ The whalers, in contrast, operated further out from the coast.

Based on his studies primarily of the *Lloyd's Register*, Jones has also compiled systematic information about several other characteristics of the vessels involved in the trade, including age and the number of sealing voyages a vessel made. It appeared, not surprisingly, that vessels tended to be fairly new in the early phases of the industry (late 18th century) and much older ones were used in the later – and declining – stages of the industry. Jones also revealed that a vast majority of the vessels were employed in only one or two voyages before they entered other trades. This obviously demonstrates the cyclical nature of this business as well as the general “mobility in shipping”.²⁷

Employment

The crew obviously varied according to vessel size. The average 240 ton vessel had a estimated average crew of seventeen – again much less than the average whaling vessel where the crew on a typical New Bedford ship was 29 – or 26 for a typical bark.²⁸

Not much is known about the sealers life and working conditions aboard and ashore, but they were no doubt among the most unpleasant in the maritime industries. Jones put it this way: ‘Socially, the South Sea trade was near the bottom of the hierarchy, and the seal fishery was lower still’.²⁹

As was the case in whaling, sealing was not an attractive employment. Especially in the United States, hiring became increasingly difficult and both sealing and whaling expeditions had to rely on crew recruited from Azores and Cape Verde Islands. Another similarity between the two industries was the way payment to the crew was organized, by the so-called lay system.

²⁶ Downes and Downes, *op.cit.*, p. 190.

²⁷ Jones, *op.cit.*, (The British Southern Whale and Seal Fisheries), p. 396 ff.

²⁸ Davis et.al., *op.cit.*, p. 154.

²⁹ Jones, *op.cit.*, (The British Southern Whale and Seal Fisheries), p. 400.

The total employment in the industry in a single year, or for a longer period, is not known, but it is possible to estimate based on information on vessels and crew size. Using the average calculated crew size of 17 men (on a 240 ton vessel), the all time high year of 1821 where up to 100 vessels may have participated, would indicate a total employment of 1400.³⁰ A typical season throughout the century did not have more than about 10 vessels, indicating between 150 and 200 men. So, in a comparative perspective (to industries elsewhere, other maritime industries or later Antarctic industries) we are dealing with a very minor industry.

Production (catches)

Based on earlier studies and contemporary sources, Bush estimated the total number of fur seals killed in the southern trade to a total of 5.2 million in the period from the beginning to 1812. About 1.7 million were killed within what we have defined as the Antarctic region. He realized the vast uncertainties of the estimates, stressing that “[a]ny figure is but a guess”.³¹ Detailed studies of primary sources may, however, reduce such uncertainties. Since output will appear at various stages in the value chain (seals killed, imports, sales, final products...), it may be located in different sources ranging from the logbooks, via customs papers (for example the London Custom Ledgers, New London Customs Records, Abstracts of Imports, London, the China Trade Ledger) to market information relating sales and manufacturing (for example Canton Factory Records and London Price Currants). Several studies have been based on such sources, and Richards has most recently compiled new figures for the fur seal markets in London and Canton based on such and secondary sources for the period 1788 to 1833.³² He has also critically reviewed some of the previous published figures of the total extent of the fur sealing on the various southern grounds, indicating the imprecise nature of some of those estimates, and also emphasizing the severe difficulties in obtaining accurate numbers from an industry that at the time was not much concerned with exact reporting. According to Richard’s estimates, a minimum of seven million fur seals were killed and sent to the London and Canton markets

³⁰ Jones (*ibid.*, p. 317) suggests that about 1000 men were employed in the South Shetlands, but not referring to a specific year.

³¹ Busch, *op.cit.*, p. 36.

³² Richards, *op.cit.*, Table 1 and Appendix 1, pp. 3 and 9.

before 1833 – 20% more than previous estimates. This includes the entire southern fur sealing, and he is not making estimates for the Antarctic region as such.³³

The number of elephant seals killed and the production of oil throughout the late 18th and 19th century are also rather obscure and involve estimates. The main reasons are, as we have mentioned already, that figures often were ‘hidden’ as they were included in whale oil production or in the larger South Seas Trade. Busch has also studied elephant sealing, and again emphasizing that his figures are estimates, calculated a catch of about 800000 elephant seals during the nineteenth century at the main catching grounds of South Georgia, Kerguelen, Heard and Macquarie.³⁴ As a comparison, the number of elephant seals reported killed during the licensed sealing there between 1904 and 1964 was about 260000.³⁵

Prices

To be able to analyse the economic significance of industries, production only tells part of the story. It is necessary to compare values, and therefore also take the prices into account.

There are several relevant price-series, corresponding to the different main products and main markets:

- Fur seal prices in the UK (London) per skin (£)
- Fur seal prices in the US (New York) per skin (\$)
- Fur seal prices in Canton per skin (\$)
- Elephant seal oil prices in the UK (London) per ton (or barrel) (£)
- Elephant seal oil prices in the US (New York) per ton (or barrel) (\$)

When it comes to such series, the sources and data situation is also difficult and complex, as was the case about the more physical aspects of the trade (vessels, catches). There are primary sources both relating the London, New York and Canton markets. The main problem is related to the difficulties in identifying prices that

³³ The comparison Richard is making between his and Busch’ data may be taken only as a very rough indication. The areas included are not identical. More importantly, while Richard’s data covers 1788 to 1833, Busch’ data seems to extend only into the first and second decades of the nineteenth century.

³⁴ Busch, *op.cit.*, p. 181 ff.

³⁵ Dickinson, *op.cit.*, Appendix 5, p. 179.

indicate a price for a specific product for a specific period. A measure such as a ‘unit fur seal price’ in one year did not exist and will have to be calculated. There are multiple reasons for this problem: One is that prices differed according to sex and age of the fur seals because such factors influenced decisively on the size and quality of the furs (wigs, bulls, clapmatches, yearlings, pups). Another reason was that the quality of the furs when they reached the market varied substantially according to how they had been prepared and especially how, and for what period, they had been stored in the vessel. There are examples of cargoes that were not saleable. Typically, the furs were auctioned, and prices varied significantly. Dickinson has compiled auction prices in New York for Southern fur seals between 1824 and 1846, divided on the various categories of skins. They show annual variations from typically \$ 5 to 10 maximum to \$ 0.50 to 0.25 minimum.³⁶ Gibson found that fur seals fetched from \$ 3 or 4 to 0.35 at Canton, generally about \$ 1.³⁷ This is not far from Busch’ estimates who wrote that the fur seals yielded an average price of about 90c each.³⁸ It is, however, not obvious how such an average price should be calculated.

A further illustration may be found in the *New York Price Current* (published bi-weekly in *New York Shipping & Commercial List*) that lists fur seal prices between 1821 and 1854. Lowest and highest quotes are listed for Salted Fur Seal Skins (in most years Clapmatches).³⁹ In Figure 3 three high and low quotes per year (about 15 January, 15 June, and 15 December) are plotted for the entire period.

³⁶ A. Dickinson, *A History of Sealing in the Falkland Islands and Dependencies, 1764-1972*, D.Ph. Thesis, University of Cambridge, Cambridge 1987, Appendix 3, p. 264 ff.

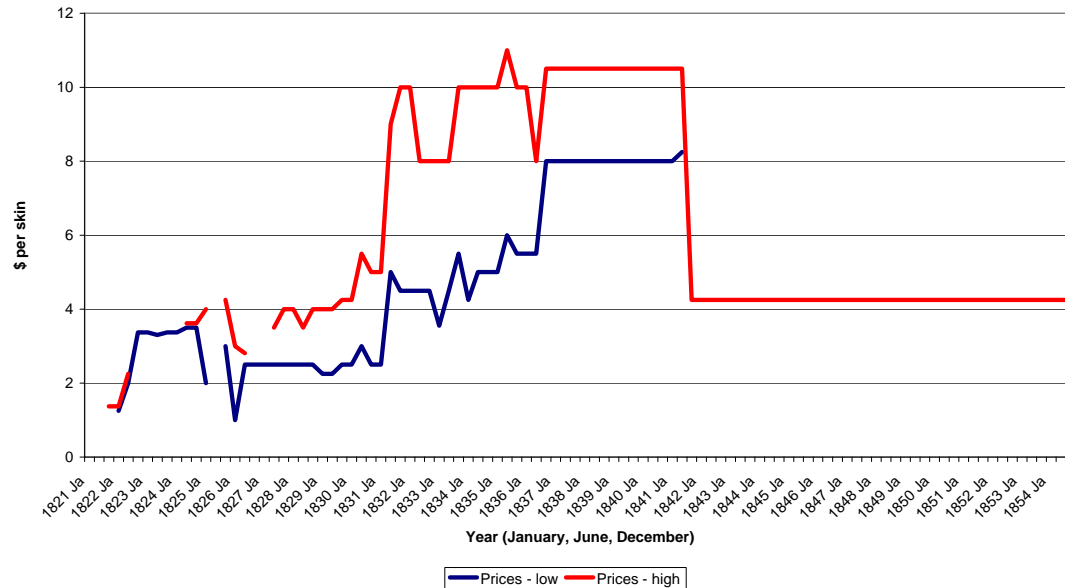
³⁷ Gibson, *op.cit.*, p. 253.

³⁸ Busch, *op.cit.*, s. 36.

³⁹ “Dry” Fur Seal Skins are listed between 1821 and 1825. The prices are typically slightly higher than for salted skins.

Figure 3

Prices for Salted Fur Seal Skins in New York, 1821-1854.



Sources: New York Price Curreant, New York Shipping & Commercial List

Note: The New York Shipping & Commercial List was published twice a week. The data plotted here are from 15 January, 15 June, and 15 December every year or from publication dates as close as possible to these dates (typically 13 to 17).

The overall trend indicates an increase in prices from 1821 and throughout the 1830s, although most of this increase is associated with a sharp increase in prices during 1831. In 1841 the prices dropped dramatically (from \$ 10.50 to 4.25 as the maximum). At the same time the low quotes were not longer reported and the high quotes remained at \$ 4.25 until the reports ended in 1854. The sharp decline from the early 1840s may indicate a declining demand and worsened market conditions for fur seals.⁴⁰ However, it is also reasons to believe that the quotes in the *New York Price Curreant* for the period from 1842 until the quotes ended in 1854 are not entirely reliable.

Another feature displayed in the figure is the difference between maximum and minimum price quotes. They obviously varied from one year to the other, but were as much as \$ 5.50 at its greatest.

⁴⁰ Dickinson, *op.cit* (1987), p. 77ff.

Prices for Southern fur seal skins in London reveal the same pattern of large variations from high to low quotes. It has, so far, not been possible to compile consistent series of prices for a long period. Scattered observations between 1800 and 1821 show variations from £ 0-2s-6d (£ 0.125) to the exceptionally high £ 6-8s-0d (£ 6.4).⁴¹ Between 1822 and 1827 we have been able to compile consistent price data from the London Price Current that quotes prices twice a week. Table 1 shows such quotes for three selected dates every year (again about 15 January, 15 June and 15 December). As can be seen, the prices appeared fairly stable until late 1825 when they increased sharply.

Table 1
Prices for Fur Seal Skins (“South Seas Skins”) in London (£-s-d and £), 1822-1827

<i>Year</i>	<i>Month</i>	<i>From</i>	<i>To</i>
1822	15. January	0-1-6 (0.07)	0-8-6 (0.42)
	18. June	0-2-6 (0.12)	0-8-6 (0.42)
	17. December	0-2-6 (0.12)	0-8-6 (0.42)
1823	14. January	0-2-6 (0.12)	0-8-6 (0.42)
	18. June	0-2-6 (0.12)	0-8-6 (0.42)
	17. December	0-2-6 (0.12)	0-8-6 (0.42)
1824	13. January	0-2-6 (0.12)	0-8-6 (0.42)
	15. June	0-2-6 (0.12)	0-8-6 (0.42)
	14. December	0-2-6 (0.12)	0-8-6 (0.42)
1825	18. January	0-2-6 (0.12)	0-8-6 (0.42)
	14. June	0-2-6 (0.12)	0-8-6 (0.42)
	13. December	0-15-0 (0.75)	0-18-0 (0.9)
1826	17. January	1-00-0 (1.0)	1-05-0 (1.25)
	13. June	0-10-0 (0.5)	0-18-0 (0.9)
	12. December	0-10-0 (0.5)	0-18-0 (0.9)
1827	16. January	0-10-0 (0.5)	0-18-0 (0.9)
	12. June	0-10-0 (0.5)	0-18-0 (0.9)
	18. December	0-10-0 (0.5)	0-18-0 (0.9)

Source: Prince’s London Price Current.

Note: The London Price Current was published twice a week. We have extracted data for three dates per year, as close as possible to 15 January, 15 June and 15 December.

The twice weekly price data for fur seal skins in London may be compared with similar data for New York. Using annual exchange rates, it is possible to compare the

⁴¹ 11. April 1800; From £ 0-2s-6d to £ 0-8d-0d, 8 January 1813; From £ 0-2s-6d to £ 0-15s-0d (*Prince’s London Price Current*). Jones (1985) quotes prices in 1816 (£ 6-8s-0d), 1819 (£ 3-17s-0d) and 1821 (From £0-10s-0d to £ 1-10s-0d).

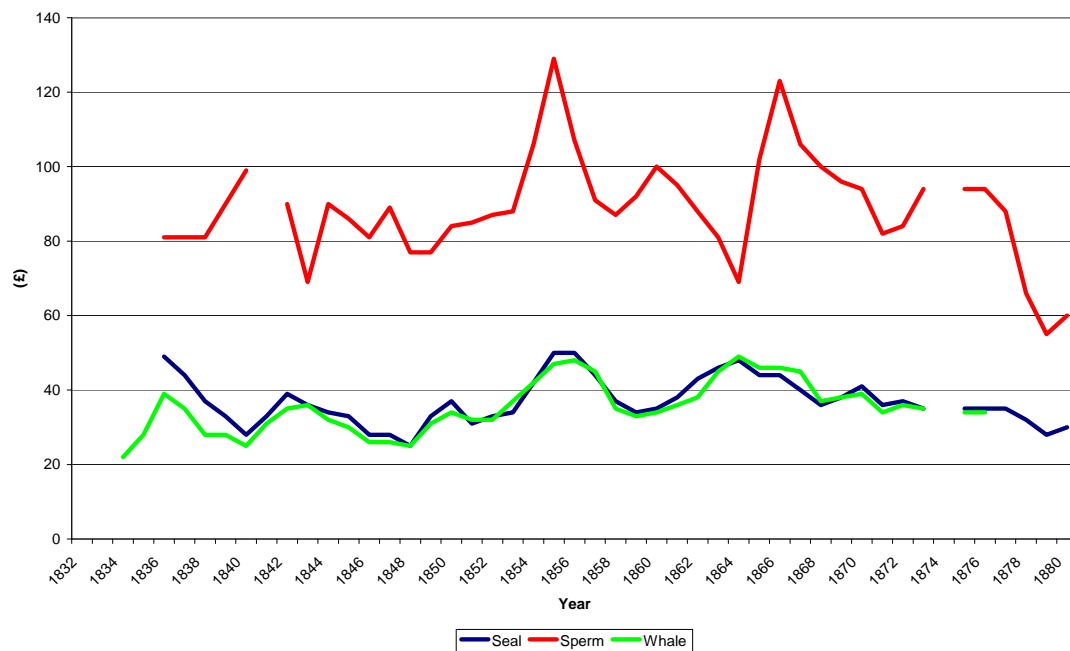
differences between prices of the two markets.⁴² In a few instances the prices were identical, but in general there seems to be no clear pattern other than that both price series fluctuated lower than £ 1 per skin. In the first three to four years New York prices were systematically higher than London prices by as much as £ 0.6 (comparing low quotes). During late 1825 and early 1826 London prices increased dramatically (from £ 0.1 to 0.9 for low quotes), and in the remaining 1826 and 1827 London prices equalled or were even slightly higher than those of New York. At least from these few observations, it is not possible to identify an integrated market across the Atlantic.

The market price for elephant seal oil was very different from that of the fur seal market. It represented a much more clearly defined product, and the quality did not vary much (although there were, indeed, different qualities). As has been mentioned, it was a close substitute for whale oil, and consequently it conformed with, to a large extent, the whale oil prices. In fact, they were almost identical. Ryan has extracted prices for seal oil, whale oil as well as sperm oil quoted on the London markets for an almost 50 year period (1832-1880). As can be seen from those data, which are shown in Figure 4, whale and seal oil prices both fluctuated the same way and at the same level.

⁴² Annual exchange rates between British £ and US \$ from 1791 is published by MearuringWorth, see www.measuringworth.org/exchangepond.

Figure 4

Prices for seal oil, sperm oil and whale oil, London, 1832-1880.



Source: S. Ryan, *The Ice Hunters. A History of Newfoundland Sealing to 1914*, Newfoundland History Series 8, (Breakwater), St. John's 1994. Compiled from Table 1.8.

The data also show a very high degree of stability over this relatively long period – a very different development from fur seal prices that tended to fluctuate much more. It also shows that the price of sperm oil was an entirely different matter. It fluctuated much more and was also much higher – typically almost twice as high and even three times as high in some years.⁴³

Economic importance (Values)

Calculations of the economic importance of the Antarctic sealing industry are quite scarce and involve estimates and mere guesses. The reason is, as we have seen, the difficulties involved in obtaining reliable data both for the actual production (the catches) and prices.

⁴³ Some few annual observations on US prices from the early 1820s indicate approximately the same development. Elephant seal oil was priced slightly higher than whale oil (around 40 cents a gallon versus 30 cents). Sperm oil was typically almost twice the price of whale oil. *New York Price Current*, 1821-1825. Data from *Prince's London Price Current*, 1800, 1813 and 1822-1827 confirm this impression of conformity between seal oil and whale oil prices.

Busch, for example, calculated values of the US Canton fur seal sales between 1792 and 1812 based on various estimates of total production (about 3 million skins) multiplied by a calculated average price (about \$ 1) adding up to about \$ 3 million.⁴⁴ The sales figures are about the same as those used by Richards (about 2.8 million skins for the same period). However, Richards' data cover the period 1788 to 1833, and he estimates the American sales in Canton to 3.6 million skins.⁴⁵ Using the same average price, this gives a value of about \$ 3.5 million. The value of the British Canton trade, based on Richards' data (257824 skins between 1788 and 1804) would value about \$ 250000 or £ 50000 (based on an exchange rate of 1/5).

Steven has estimated values of fur seals brought into the London market from the southern fisheries.⁴⁶ She relies on data from British Customs Ledgers between 1788 and 1820. However, the annual values indicated for the Southern seal fisheries have been estimated using the same price per skin for every year; £ 0.04 (about 10 pence or a little less than 1 shilling). From what we know about sealskin prices, this estimated price is highly unlikely during a period of about thirty years.⁴⁷ The exact prices annually in the period she is considering are unknown, but from the data available it is known that also in that period prices varied and there were large differences between high and low quotes. Prices were quoted in 1800 and 1813 from about 2 shillings (£0.10) to 15 shillings (£ 0.75) per piece. Furthermore prices as high as 128 shillings a piece in 1816 and 15 to 30 shillings a piece in 1821 are recorded.⁴⁸ Prices between 1822 and 1827 were never as low as £ 0.04. Even with a low estimate average price, Steven's calculated total value of the London fur trade for the period 1788 to 1820 of about £ 66000 should probably at least be doubled. This again exemplifies the difficulties in relying on some of the primary sources.

Richard has estimated the number of fur seals sold in the London market between 1788 and 1833 (partly relying on Steven's data) to about 2.2 million skins.⁴⁹ Based on

⁴⁴ Busch, *op.cit.*, p. 36.

⁴⁵ Richards, *op.cit.*, p. 3.

⁴⁶ Steven, *op.cit.*, Appendix III, p. 131.

⁴⁷ Steven seems to be aware of this problem, noting that the Customs estimates "derived from arbitrary official values were unchanged during the century" (p. 130).

⁴⁸ Jones (1985), *op.cit.*, p. 298ff.

⁴⁹ Richards, *op.cit.*

the same estimated average price as before converted to British currency, gives £ 0.2 (\$ 1.0 at exchange rate 1/5), generate about £ 440.000 in gross value (or about \$ 2.2 million).

As indicated earlier Bush has estimated, based on various sources, the total number of elephant seals killed throughout the entire century to 800000. The seal oil prices were fairly stable. A calculated annual average based on the data published by Ryan between 1832 and 1880 is £ 36,35 per ton (see Figure 3). If we assume that one elephant seal yielded an average of one barrel of oil, the total estimated catch was about 800000 barrels which is about 133000 tons (based on 6 barrels per ton). This gives a total estimated value of a century of elephant sealing of £ 4835000 or about \$ 25 million. How this was distributed among different markets is not known, but the main one was probably the British.

Busch refers to Stevenson's calculations for South Georgia, where he estimated a production of 242000 barrels worth \$ 5420000 for the entire century. That would equal roughly £ 1 Million (with an exchange rate of 1 to 5), indicating that South Georgia elephant sealing produced about 1/5 of the total economic output.

If these figures are reliable, the economic value of elephant sealing was altogether much higher than fur sealing. We do not have fur seal data for the latter part of the century, but the figures were low because the population of the animals was severely depleted. Even a continuous income at the same size as before 1833 (when the data series end) does leave the number far below the income from oil.

Sealing in context: Whale oil and fur trades

Antarctic sealing was, as we have mentioned, yielding products that had substitutes and were thus part of much larger markets where it had to compete. The fur seal skins were just one of a wide variety of furs on the world market.⁵⁰ Oil from the elephant

⁵⁰ An illustrative indication of the great variety of furs the extent of this trade worldwide, see M. Bachrach, *Fur. A Practical Treatise*, (Pitman & Sons), London 1936.

seals competed with whale oil. How important were the seal products in these larger markets?

Gibson has compiled data for the aggregate fur imports to Canton between 1804 and 1837.⁵¹ In most years, fur seals were the single most important category, responsible for more than 50% of the total fur import. The other important categories were beaver, fox, land otter and sea otter - land otter and beaver being the most important. From around 1830 they were more important than fur seals.

How did fur seal prices compare with other furs and skins? Prices obviously varied a lot according to availability and size. It also varied a lot over the years and between different markets. In the early 19th century, sea otter was by far the highest priced fur in Canton, followed by beaver. Fur seals were never really high priced there, and from the 1830s they sold for higher prices in the US than in Canton.⁵²

Taking New York prices in the 1820s as an example, we can see from Table 2 that the market for furs and skins (or peltries as they were called) was quite varied at the time.

Table 2
Prices for Furs and Skins, New York, 1823 (\$)

FURS	<i>Low</i>	<i>High</i>
Beaver, North	3.25	4.50
Beaver, S.& W.	1	3.25
Raccon, N.& S.	0.10	0.40
Muskrat, N.& S.	0.30	0.40
Martin, Can.	0.15	0.25
Martin, N.W.	0.95	1.50
Bear, N.& S.	0.75	2.50
Red Fox	0.75	1
Mink, North	0.25	
Mink, South	0.12	0.25
Otter, North	3	4
Otter, South	2	3.50
Nutria Skins	0.12	0.17

⁵¹ Gibson, *op.cit.*, Table 7, p. 315.

⁵² *Ibid.*, p. 318 (note 2), quoting prices from Morse and other sources. While sea otters in 1801-02 fetched \$22, fur seals fetched \$0.80.

SKINS

Deer, in hair	0.18	0.25
Deer, shaved	0.3	0.35
Goat, Mogade	0.25	0.40
Goat, Curracoa	0.25	0.37
Salted Fur Seal	3.35	
Dry Fur Seal	3.50	3.62
Seal, salted hair	0.95	1.12

Source: New York Price Curreant, 17. June 1823.

This example gives a somewhat different impression than the Canton prices from about the same period; fur seals being among the more expensive ones together with beaver and otter, again indicating that there was no integrated market.

How important was the sealing industry compared to the whaling industry - the other main Southern industry at the time? Again, this is a difficult question to answer because data are unreliable and whaling and sealing data to some extent may be mixed up. Steven has also calculated the total value of the import to London (basically the British industry) in the period 1788 to 1820, again based on Customs Ledgers data.⁵³ This was the period before the huge expansion after the discoveries of the South Shetlands, but the period when the industry was established and expanded for example at South Georgia. While the value of the whale oil import according to this source was typically between £ 50000 and £120000 annually, the value of the seal skins were calculated in a range between less than £ 1000 and £4000. In the most successful year for both industries in this period, 1793, whale oil generated £ 136110 and seal skins £ 15079. Thus the sealing generated 11 % of the value of whale oil that year. Taken the entire period together, sealskin values were, according to these data about 2.5 % of the whale oil value.⁵⁴ Even the value of whalebone (baleen) imports, itself a fraction of the whale oil value, for most years were many times higher than the value of sealskin imports. However, these figures have to be re-examined. As Steven emphasized the prices used in the Custom Ledgers data are estimated. This applies both to the seal prices as well as the whale oil prices.

⁵³ Steven, *op.cit.*, Appendix III, p. 131.

⁵⁴ The calculations are based on Steven's data. Steven (in Appendix II) has made a calculations based on detailed data for the season 1802 where sealskins amount to 2,3 % of the total (including whale oil, spermaceti oil and whale bone) – what should then be an average season. See also Dickinson, *op.cit.*, Appendix 1, p. 262.

Data for the British Southern whale fisheries between 1800 and 1834 has been estimated by Jenkins to a value of about £ 10.9 million, based on the quantities of sperm oil and whale oil imported and average annual prices per ton. This is a much higher estimate than Steven's.⁵⁵ Based on Richard's data about 1.2 million fur seal skins were brought into the London market in this period (1800-1834). Based again on a unit price of £ 0.2 this adds up to £ 240000. This is about 2.2 % of the estimated value of the whale oil import, so it corresponds quite well with Stevens' results.

Jenkins' data on the British Southern whale fisheries are based on data from McCulloch's *Dictionary of Commerce* (1832 and 1835) where it is explicitly stated that these fisheries – and the data – include Sperm whale, “common black whale” (Southern Right Whale) and elephant seals.⁵⁶ Sperm oil and prices are reported separately, being a distinct product with much higher prices. Whale oil and seal oil were not separated, because – as we have noticed – of the similarity between the two. The only aggregate data we have so far is Bush' very crude estimate of about 800000 killed elephant seals throughout the entire century which we estimated would gain about £ 4.8 million. Even if we divided by two for comparison with the whaling data for only the first half of the century, it indicates a much larger branch of the sealing industry than fur sealing.

The value of the US whaling products (including whale oil, sperm oil and whale bone) for the period 1804 to 1905 is estimated to \$ 372374000.⁵⁷ It includes whaling world wide, and the grounds were primarily outside what we would define as the Southern Ocean and the Antarctic. However, the figure reflects the supreme dominance of this industry in the 19th century. Converted to British currency, the value would roughly be £ 75 million (based on an exchange rate of 1/5).

⁵⁵ J.T. Jenkins, *A History of the Whale Fisheries*, (H.F. & G. Witherby), London 1921, Appendix III, p. 307. Jenkins' and Steven's data on quantities (tons) corresponds quite well. The prices and consequently the values are very different. While Steven's calculations (i.e. the Customs Ledgers) are based on an average annual price per ton of about £ 17.2, Jenkins' calculations are based on about £ 52.1.

⁵⁶ *Ibid.*, p. 208.

⁵⁷ K. Brandt, *Whale Oil. An Economic Analysis* (Fats and Oil Studies, No. 7), Stanford 1940, Table VII, p. 212. Brandt's figures rely on data from the contemporary secondary sources Starbuck (1878) and Tower (1907).

Conclusions

The aim of this paper has been to clarify sources and data available about 19th century Antarctic sealing to be able to analyse its economic significance. The historical literature on this industry has been reviewed and, more specifically, sources and data on number of vessels employed, employment, production (catches) and prices have been investigated. Such data enable estimations of the economic value or output of the industry.

The Southern sealing industry consisted of different trades, different participating nations and different markets. The main nations were the US and Britain. There were two main trades, fur sealing and elephant sealing, with two distinct products; fur / pelts and oil. The markets were in Britain and Europe, the US and in Canton (China) - especially in the early 19th century.

The data for all these aspects of the industry have been reviewed and analysed. So far only a few consistent long-run time series have been obtained. Thus the analysis has a preliminary character and more studies are needed. Some observations should be emphasized at this point:

- A substantial part of the data on most aspects of the industry reported in the existing historical literature is based on incomplete sources of very varying quality. This is also realized by most authors. Consequently, great cautiousness should be taken in interpretations and analyses based on them.
- The preliminary investigations in this paper indicate that especially the calculations of values of the trade (economic importance) need re-examination based on more adequate data. Some of the existing data are contradictory.
- There does not seem to have been an integrated or “global” market for fur seal skins during the 19th century, although the industry as such had a global character.
- The preliminary analysis reveals that seal oil from elephant seals seems to have been more important economically relatively to furs and whale oil than what has so far been anticipated.



NHH

**Norges
Handelshøyskole**

Norwegian School of Economics
and Business Administration

NHH
Helleveien 30
NO-5045 Bergen
Norway

Tlf/Tel: +47 55 95 90 00
Faks/Fax: +47 55 95 91 00
nhh.postmottak@nhh.no
www.nhh.no