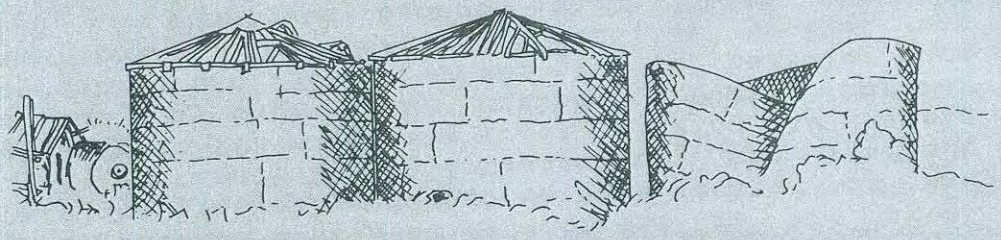
Norwegian Bay Whaling Station

An Archaeological Report



S. Dickhart

by

Myra Stanbury

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NORWEGIAN BAY WHALING STATION

AN ARCHAEOLOGICAL REPORT

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Front cover: Sketch of Oil Storage Tanks
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Acknowledgement is also given to the Battye Library of West Australian History for the use of photographs and archival materials. Finally, thanks are due to Sue Cox and Barbara Sellman for typing the manuscript.

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1. Australian Admiralty Chart Aus.72: Anchorages on the West Coast of Australia.
   Norwegian Bay (Frazer I Anchorage).

2. Australian Admiralty Chart Aus 330: Point Cloates to Quobba Point.

3. 1:100 000 1652 Point Cloates, Edition 1, 1974.

INTRODUCTION

In January 1982, the Department of Maritime Archaeology, Western Australian Museum, carried out an archaeological investigation and survey of the site of a former whaling station at Norwegian Bay, W.A. The work was undertaken conjointly with the Department's third and final excavation season of the wreck of the *Rapid*, an American-China trader lost off Point Cloates in 1811 (Henderson, 1980 & 1981).

Whilst the project was designed partly to give students of the Post-Graduate Diploma Course in Maritime Archaeology additional field survey experience, it was also aimed at preserving some knowledge of a modern maritime industry now extinct in Western Australia.

This report presents the results of the field investigations together with an historical account of the whaling industry at Norwegian Bay as gleaned from archival and other literary sources.

HISTORICAL BACKGROUND

Modern whaling made its appearance in Western Australia at the beginning of the twentieth century with the arrival of the Norwegian whalers. Bringing well-equipped factory ships and steam-driven whale chasers with improved harpoon guns, they established an efficient whaling industry that continued in the State until November 1978, when the last operating land-based station at Albany finally closed down.

For more than a century previously, American and French whalers had successfully demonstrated the potential for such an industry.

Resources were good, but lacking the necessary capital to set up processing works, the early colonists were unable to exploit this valuable economic commodity to full advantage. Their activities were largely confined to bay-whaling for right whales (*Balaena spp.*) and humpbacks (*Magaptera spp.*), rather than deep-sea whaling for larger species such as the sperm whale (*Physeter macrocephalus*).

Needless to say, the Colonial authorities resented the success which the foreign whalers enjoyed since their activities represented a drain on a much needed source of revenue. Colonial reaction was often hostile and, in an attempt to protect the local whale population for colonial whaling, they officially discouraged the presence of foreign whalers. However, such whalemen did participate in bay-whaling, often landing on isolated, unsettled stretches of the coast whilst the factory ships hunted for whales farther out to sea (Wace & Lovett, 1973:17).

Prior to the arrival of the Norwegians in 1911, whaling in West Australian waters had been at a virtual standstill for about forty years. Although the decline was partly due to the colonists' inability to establish a viable whaling industry, it was more the result of changes in market trends.

The growing use of mineral and vegetable oils for lubrication, lighting and other purposes had greatly reduced the demand for whale oil (Tønnessen & Johnsen, 1982:10). Thus, it was uneconomic for foreign vessels to sail long distances to take home full cargoes to poor markets (Puls, 1973).

It was during this mid-nineteenth century period of declining prices, however, that the Norwegians pioneered their modern method of whaling. As described by Tønnessen and Johnsen (1982:3-15) it was introduced in 1869 and differed boilogically, technically and economically from the old method. Primarily, it aimed to catch the larger, faster-swimming baleen whales or rorquals. Attaining short period speeds of 25-30 knots, these powerful animals, in contrast to the right whales, sink after they are killed. Thus, they can not be easily floated ashore or to a floating station. Changes in technology were, therefore, a necessary adjunct to the hunting, catching and recovery of these species.

Technological innovations involved the use of steam-driven whale chasers fitted with powerful winches and the grenade harpoon mounted on the bow of the boat (Tønnessen & Johnsen, 1982:6, 29 & 44). The name behind these developments was the Norwegian Svend Foyn (Tønnessen & Johnsen, 1982:25-32; 37-39). Although Foyn was not the first to suggest the use of steamships or the grenade and harpoon combined in one shot, he was responsible for perfecting the practical application of these devices. Commercially, the modern method focussed almost exclusively on the extraction of oil, which was carried out not by cooking the blubber in open pans but by cooking the blubber, bone and flesh in large pressure cookers (Tønnessen & Johnsen, 1982:7).

With low prices for whale oil on the international market, the Norwegians sought ways to make whaling a profitable business. By maximising their access to raw material through the discovery of new whaling grounds, they could ensure a higher percentage of top grade oil, and a better price. Thus, the beginning of the twentieth century saw a global expansion of Norwegian whaling, and a revival in demand for whale oil.(1)

Gradually, Norwegian interests extended to the West Australian coast and in 1911 several companies applied for exclusive licenses to operate from Esperance to Cape Lambert. After the resentment shown towards earlier foreign whalemen, the Government's attitude was now little more than 'apathetic' (Puls, 1973:101). Their interests lay more towards developing a social welfare platform rather than economic development.(2) Hence, they were not particularly concerned to preserve local assets. Only later, when whale stocks showed signs of becoming depleted and it was too late to ensure that the industry was properly regulated, did the Government begin to take an interest in whaling.

(1) The reasons for this revival are not properly understood but were in part due to the invention of the hydrogenation process which enabled whale fat to be used for the manufacture of margarine, artificial lard and soap. See Tønnessen & Johnsen, 1982:227.

(2) Under the Labour, Scadden Government, 1900-1914 was a period of social experimentation (Puls, 1973:101)

Through the Consul of Norway in Perth, whaling licences were granted to three Norwegian companies: the Spermacet Company, for the area Esperance to Leeuwin; the Fremantle Company, for the area Leeuwin to Steep Point; and the Western Australian Company, for the area Steep Point to Cape Lambert. Each company was formed individually with separate capital and directors but the same company of General Managers, Christian Nielsen and Co. of Larvik, handled their legal and accounting affairs. This tripartite arrangement was somewhat of an enigma to the Australian authorities who failed to see how one firm could "own" three companies, each with its own shareholders (Puls, 1970:10). The object of the arrangement, however, was to keep competition in abeyance: one large company would only receive one licence, whilst three small companies could obtain three of a limited number of licences (Tønnessen & Johnsen, 1982:222). The central management company was represented in Australia by the Norwegian Consul at Perth.(1)

The licence for the Western Australian Company was to run for 7 years from 1st January 1912 with a rental of 250 pounds p.a. Within 12 months from its commencement, the company was required to establish a factory and works for the treatment of whales, whale blubber, and other material derived from whales. They were to provide all necessary plant and machinery for that purpose, the amount of capital to be expended thereon during such a period being not less than 5000 pounds (Puls, 1973:19).

Although the companies had planned to erect shore stations for their own economic working, their acceptance of such licences bound them in this respect. Clearly, the West Australian Government saw the advantages to be gained both in terms of providing wheat farmers with a ready supply of manure, increased employment opportunities and additional revenue from the sale of supplies, taxes, licence fees etc. (Puls, 1973:18-19).

Choosing a suitable location for the erection of a shore station, however, was not an easy task. Not only did the station need to be close to the whaling grounds, but it needed an adequate supply of fresh water and suitable anchorages (Dakin, 1963:189-190).

Whilst sister companies examined the feasibility of Shark Bay and Maud's Landing as possible sites, the West Australian Company discovered Norwegian Bay(2), where the 'landscape was inhospitable and bleak, with sand dunes as white as snow' (Tønnessen & Johnsen, 1982:224). However, it was close to Point Cloates where whales in both the northern and southern "treks" were found to pass and congregate. Fresh water was in limited supply, the wells that were drilled tending to absorb salt water. A great many of the hands 'spent all their time digging wells, the water of which was practically always brackish', giving rise to salt deposits in the cookers (Tønnessen & Johnsen, 1982:224).

(1) Richard Haynes, K.C. was the first representative and was succeeded by August Stang.

(2) Norwegian Bay was so-named by Captain Seigwarth who led the exploratory expedition (Dakin, 1963:208).

The harbour was considered ' a pretty dangerous place to operate from' (V & P, 1914-1915, V.2, Cl.799). Large vessels could only enter in exceedingly calm water and on spring tides, whilst in bad weather it was practically a trap, there being little possibility of getting out (V & P, 1914-1915, V2, Cl.799). Nevertheless, the site was chosen as the most suitable in the area.

Although the machinery for the shore station was ordered in 1912, delivery was delayed until the harbour could be properly surveyed and charted. This, together with the erection of a self-attending light buoy, was undertaken by the company at their own expense. Construction of the shore station, therefore, did not commence until August 1915. In the meantime, whaling was carried out using a factory ship and four whale chasers. Often, they were joined by vessels of the sister companies and all worked in concert, catches exceeding all expectations.

Nine hundred whales were caught in 1913 yielding 24,000 casks of oil(1) and the following year, 2,000 whales yielded 54,000 casks of oil (Letter from Stang to Davis dated 28/9/1925).

Lack of shore facilities, however, meant that a considerable revenue was lost through the inability of factory ships to process the whole whale; oil could be extracted, but the offal could not be converted into fertiliser. The Government expressed some concern over this matter since they had envisaged a ready supply of manure for wheat farmers in the northwest. But, poor drafting of the licence gave them no legal recourse to enforce its production. Whenever possible, carcasses were towed to shore pending the erection of the station, but otherwise they were dumped at sea (V & P, 1914-1915, V.2).

As news of the whaling successes at Norwegian Bay spread, companies operating in less remunerative areas tried to obtain places on the Western Australian grounds. This ultimately gave rise to a political dispute and a special inquiry by a select committee of the Legislative Assembly into the whaling industry (Dakin, 1963:207).

The dispute arose when the Australian Company of Tonsberg, which had been operating on the east coast of Australia, (Dakin, 1963:204ff) was granted a licence to fish the previously protected waters north of Cape Lambert. This area had been declared a reserve on account of the belief that the humpback whales might breed in this vicinity. Hence, considerable concern was aroused as to the effects this might have on the future of whale stocks if breeding grounds were interfered with.

Furthermore, the viability of the Norwegian companies operating further to the south was put in jeopardy, since vast capital outlays could not be risked if whale catches were going to be markedly reduced.

(1) Catching during 1913 had to be suspended owing to lack of water and storage facilities for the oil, otherwise catches may have been doubled: see Tønnessen & Johnsen, 1982:224).

The results of the enquiry appeared in a detailed parliamentary report in March 1915 (V & P, 1914-15, V.2) and clearly indicated the ignorance of the inquiring politicians with regard to many aspects of whaling. Nevertheless, they concluded that there was 'a great future for this industry if carried on under proper conditions and with proper safeguards' (V & P, 1914-1915, V.2, Cl.6).

By the end of 1915, the construction of the shore station was well under way, the estimated costs of erecting the plant being between 20,000 pounds - 30,000 pounds. All the machinery was imported, as were the guano factory and its inventing engineer. Other materials, however, such as jarrah poles for the jetty, second hand rails and tramways, i.e. rolling stock, were obtained locally.

A 160ft. long jetty had to be built, along with tramways, factory units, and accommodation for the men. Provisions were made for water supplies: windmills were put up, motor pumps installed and piping laid down. But unfortunately, whale catches were lean. In 1915 only 1500 whales were caught yielding 30,000 casks of oil. The following year, an even smaller number yielded no more than 9,000 casks of oil. Loath to risk more, the Western Australian Company sold its ships and closed down its operations.

After the First World War, a group of West Australian formed the North West (Aust) Whaling Company and purchased the station from the Norwegians. Whaling was commenced in 1922, but despite the excellent shore facilities, the company was insufficiently capitalized with the result that catches were poor (Stewart-Dawkins, 1929). By 1925 they were forced into liquidation and agreed to lease the station and ships to a new company, the Norwegian Bay Whaling Corporation (Stewart-Dawkins, 1929).

The founder of this company was Captain Gustav Bull who had formerly controlled the whaling operations of the Norwegian companies. During this time he had closely observed the whale "treks" past Norwegian Bay and established that they were only moderate, becoming seriously diminished once whaling had started.

Bull's concern over the vulnerability of the whale population in the face of over-exploitation was expressed in 1925 in communication with Mr. Will Davies, Liquidator for the North West (Aust) Whaling Company (Letter dated 29/10/1925). Once again, the Government were considering issuing a second whaling licence for the North West coast which posed a threat to his company's operations (Letters dated 30/9/1925; 29/10/1925; 11/11/1925).

Government policy, however, did not condone the granting of monopolies. Hence, in order to afford some practical protection to other operators, yet allow others to participate in whaling, the conditions imposed on the new licences had restrictive clauses relating to shore stations, labour conditions, time limits etc. (Letter dated 12/11/1925).

Despite this attempt at regulation, it was far from satisfactory. But, as Davies remarked to Bull in a letter dated 12/11/1925:

> "Until the control of whaling under all conditions of time and place becomes an international matter, theoretical considerations about extermination of the animals however sane and logical they may be will almost certainly be overborne by the policy of "catch who catch can".'

Between 1925-1928 while leasing and working the station, the Norwegian Bay Whaling Corporation spent over 18,000 pounds on improvements and replacements. Catches were good, totalling 3443 whales in less than 16 months of actual whaling time in four seasons. Substantial royalty on their returns was paid to the North West (Aust) Whaling Company (Stewart-Dawkins, 1929).

During this period four steam whalers were in operation: the S.S. *Fynd*, S.S. *Ingeborg*, S.S. *Hauken* and S.S. *Havorn* (see Appendix 1). At ordinary tide, the smaller steamers were able to steam within half a mile or less of the main jetty and permanent moorings were provided for them in the harbour. Smaller, deep-sea motor launches with relatively shallow drafts were used for whale and cargo towage work. Slips and a cradle for docking these vessels were built near the jetty (Stewart-Dawkins, 1929).

Buoys were provided in the harbour for other sailing vessels and whale buoys were placed near the factory ships in deep water. During rush periods, whales could thus be safely moored until required.

After these four good seasons, the Norwegians suddenly ceased operations(1) leaving over 8,000 pounds worth of machinery and materials at the station in order that its efficiency as a going concern would not be interfered with (Stewart-Dawkins, 1929). Lists of this equipment were included in the liquidator's inventory (see Appendix 2) and a detailed account of the buildings, plant and machinery as they existed at this time, is given in a report by Stewart-Dawkins (1929). A blue print showing the general arrangement of the plant was brought approximately up to date in 1929 by Dawkins, the late General Assistant at Head Office, and Catch Manager's Secretary, (North West (Aust) Whaling Co. Ltd. (Fig. 1).

An attempt to float a new Australian company at Norwegian Bay in the early 1930s was unsuccessful and shore-based whaling was discontinued until after World War II (Dakin, 1963).

(1) According to Tønnessen & Johnsen (1982:226) the reason for their departure was the realisation that there was no real future in the exclusive catching of humpbacks, in addition to low oil prices and preparation of a stringent Whaling Act.

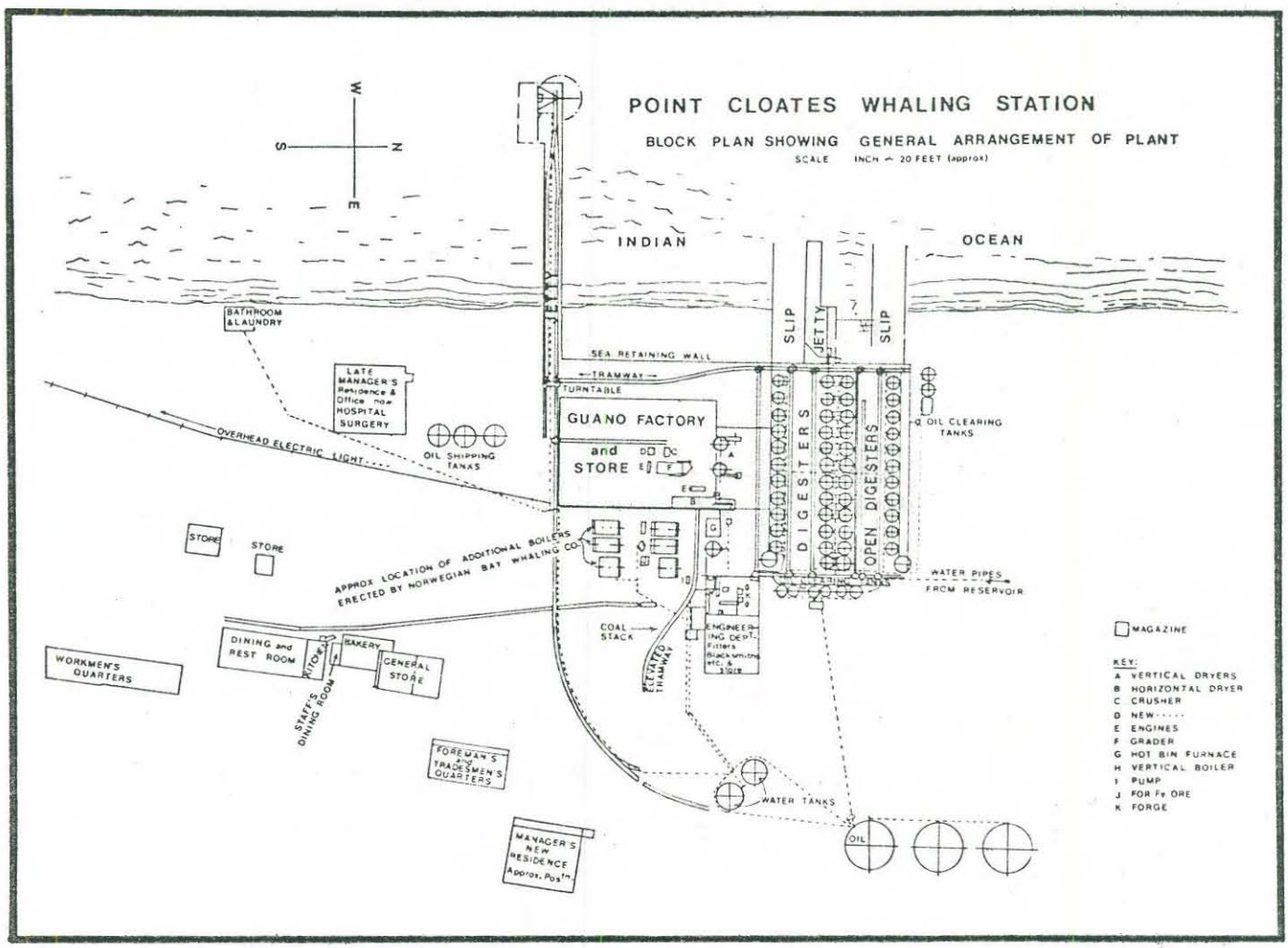


Fig. 1. Drawing taken from a photograph of a coloured tracing of an old Blue Print, brought up to date approximately by R. Stewart-Dawkins (late catch-manager's secretary) c/- Will Davies Esq., (Liquidator) Messrs. Ford Rhodes & Davies Perth W.A. 21/-/29.

Photograph: Battye Library

When Post-War whaling began in Australia, the Australian Government allotted separate quotas of humpback whales to each whaling station, sent inspectors to each to ensure that the regulations (similar to those of the International Whaling Commission) were obeyed, and initiated a programme of biological research upon this species.(1) These moves were aimed at making the most efficient use of this resource with the least possible damage to stocks of whales.

In 1944, the station at Norwegian Bay was devastated by a cyclone. After some preliminary investigations, it was resurrected in 1949 by the Nor'-West Whaling Company. The plant was modernized so 600 whales could be dealt with each season, making it one of Australia's most successful shore-based stations (Moore, n.d.)

Two ex-naval Fairmile launches were converted and used as catchers. The biggest problem was delivering whale oil to ships for overseas transport. Oil was put into drums which were loaded onto beached landing barges. These were then towed by whale chasers to overseas tankers anchored some distance offshore. Empty drums for filling had to be brought from as far south as Albany and as far north as Darwin.

During the early 1950s major additions were made to the plant including driers for the production of whalemeal, new Hartmann and Kvaerner whale cookers, and improvements to personnel quarters and electricity generating units. To facilitate the transport of heavy machinery to the station from overland centres such as Carnarvon, a roadway was laid through the sandhills in 1952.

In 1955, the first Cleaver-Brooks distiller unit in Australia was installed. This was used to distill salt or sea water into fresh water as a boiler feed. That same year, the whale quota was reduced to 500.

In 1956, the Nor' West Whaling Company took possession of the Federal Government's station at Babbage Island, near Carnarvon, and for a while maintained joint operations of both stations. However, the strain on employees and equipment proved too much and in 1957 the station at Norwegian Bay was closed for the last time. Ships, equipment, men and quotas were all concentrated at Carnarvon.

SITE LOCATION AND ACCESS

The remains of the whaling station lie in isolation on the northeast shore of Norwegian Bay in latitude $22^{o}35.7'S$, longitide $113°40.1'E$ (Fig. 2). Exposed to the Indian Ocean on its westward side, the shore settlement is located in an area of the Carnarvon Basin known as the Coastal Dunes (Beard, 1975:7). This region of the sedimentary basin is described by Beard (1975:100) as having a 'semi-desert bixeric' climate, with both summer and winter rainfall peaks. Annual precipitation is approximately 200mm.

(1) See Chittleborough, R.G. 1965

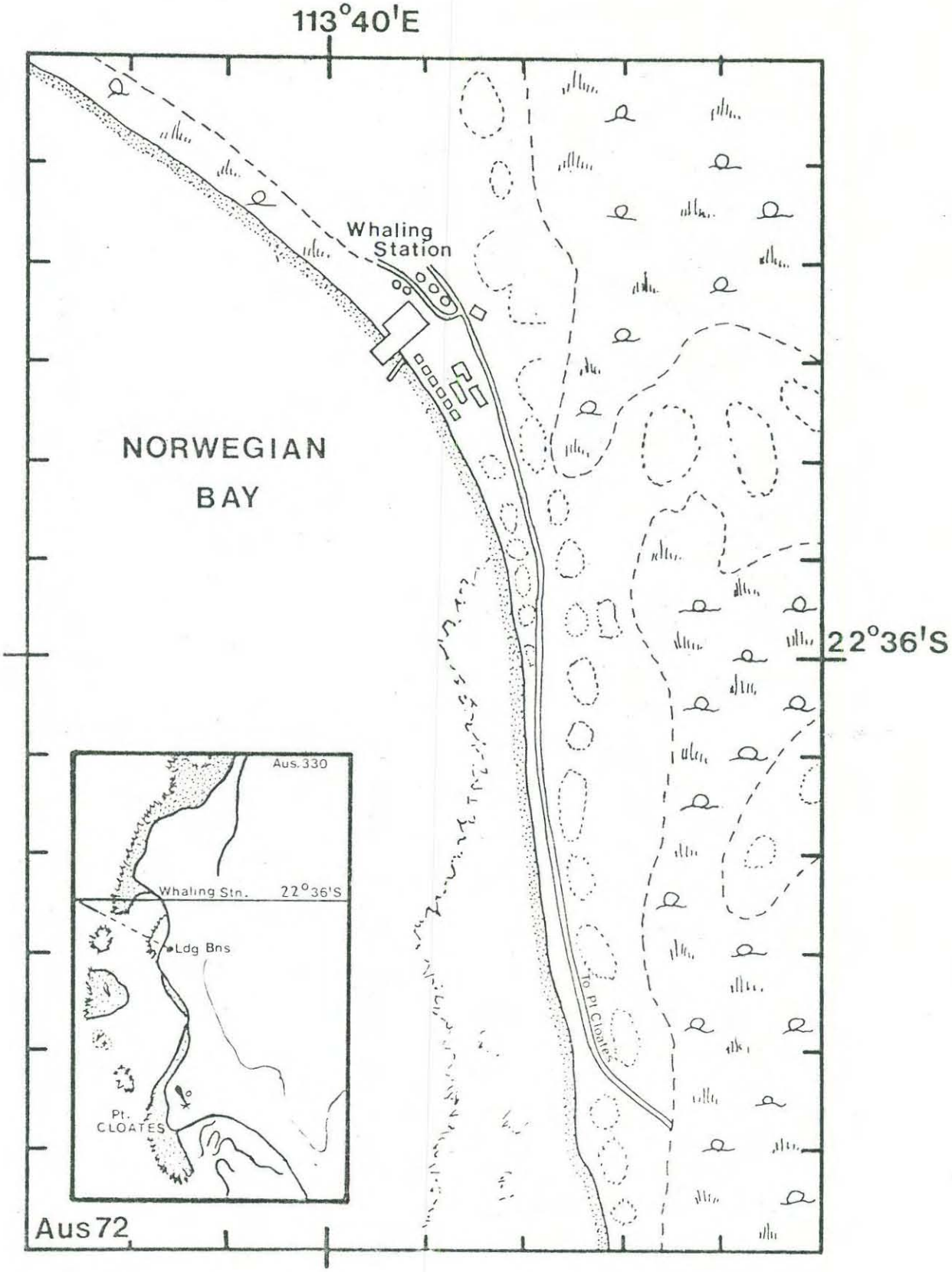


Fig. 2. Map of Norwegian Bay drawn from Australian Admiralty Charts Aus.72 and Aus.330.

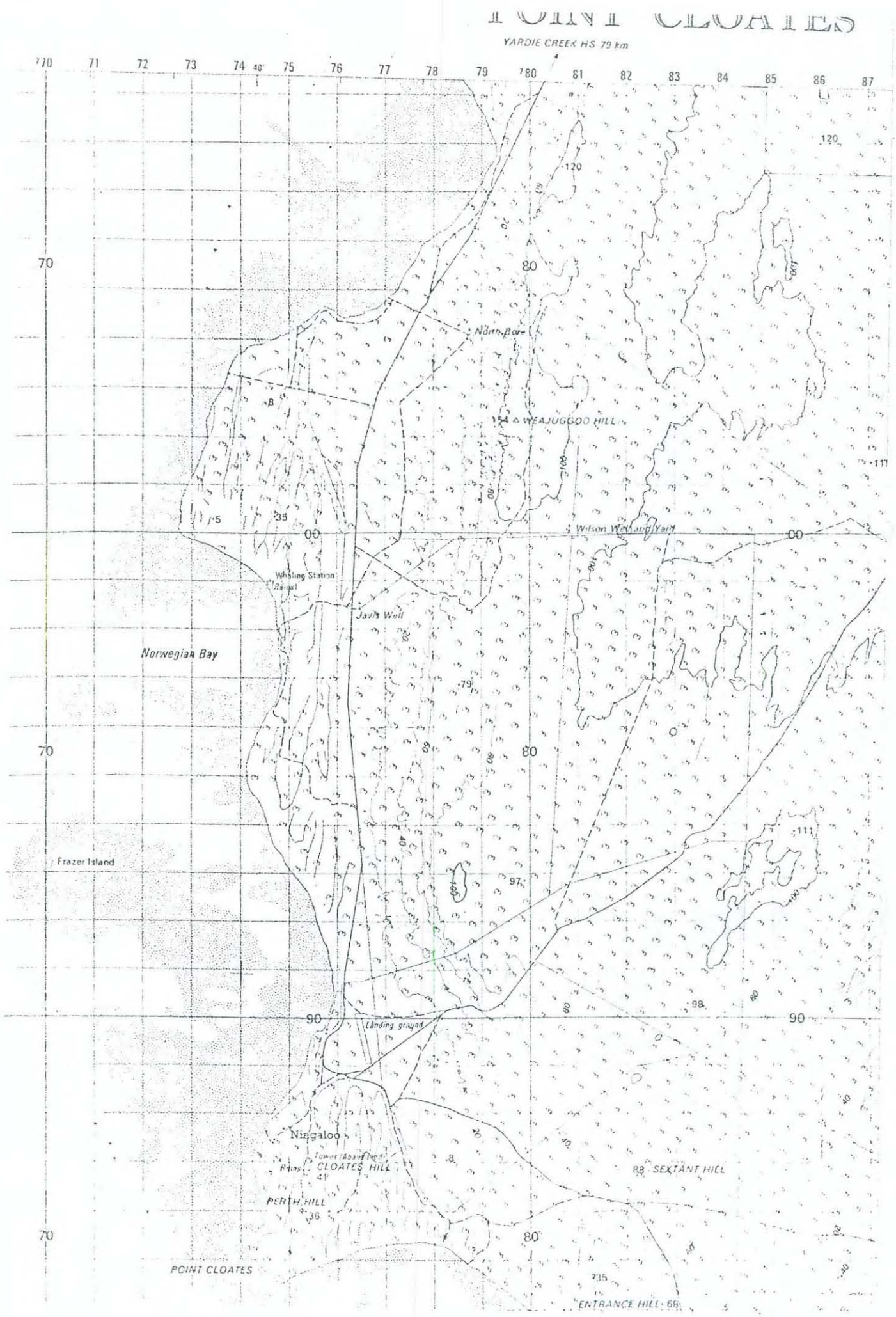


Fig. 3. 1:100 000 1652
Point Cloates

Apart from the remnants of jetties and slipways, the main settlement and processing works are located on a belt of low-lying, flat ground running between the high water beach berm and the dune foothills. A substantial width (up to 4 km) of unconsolidated recent dunes extends in a N-S direction from the southern to the northern end of the bay, reaching heights of 30 m or more. Further inland, older seif dunes(1) run in a NW-SE direction.

Vegetation at the site is sparse, consisting primarily of spinifex and low open scrub. Predominent species are various types of *Acacia* and *Eucalyptus*, the shrubs rarely exceeding 1 m in height.

The most obvious anomoly to the natural vegetative cover is a large Zamia palm growing at the southern end of the site. This was presumably planted by the whalers, probably in an attempt to add some relief to the barren environment.

Although there is no direct riverine source of fresh water to the site a good supply is available at Yardie Creek some 90 km to the north. In addition, supplies may be obtained from underground sources, but the water is generally brackish. Since the area is subjected to periods of heavy cyclonic rain and the desiccated surfaces of the dunes are relatively imermeable to water, run-off is generally rapid, often causing flooding of the interdunal valleys and saline flats.

The most convenient land access point for vehicles is Javis Well, on the coastal road from Point Cloates to Yardie Creek (Fig. 3, 1:100 000, 1652 Point Cloates GQ 764 985). From here, the whaling station lies on a compass bearing of 287° at a distance of approximately 1.8 km. Although a track leading west from Javis Well is indicated on the 1:100 000 map, this is only traversable by vehicles for a distance of 0.8 km. The track ends abruptly at the base of a sandhill, and from thence is no longer passable, being obscured by encroaching dunes.

From this point, the site can be reached on foot. The terrain varies from high sand dunes to interdunal valleys of low lying flattish ground. The latter support a dense growth of spinifex with scattered clumps of low scrub, and small isolated patches of banksia (*Banksia ashbyi*). Average walking time to the site is 35 minutes.

A southern track leading to the whaling station is also indicated on the 1:100 000 map, but here again, lack of constant vehicluar use has resulted in the track becoming obstructed by moving dunes. Owing to the danger of becoming bogged in the soft sand, it is advisable for suitable four-wheel drive vehicles to attempt the route only when the sand has been consolidated following heavy rainfall. Even then it is likely that progress will be slow and difficult.

(1) Seif dunes are longitudinal, mobile dunes which develop where there is plenty of sand and bidirectional wind regime. The dunes are moulded by winds from two dominant directions. They attain great heights and extend continuously over long distances: see Twidale, 1976:220.

Access by sea is not without its hazards. For large deep draft vessels, the only entrance to the bay is via a passage in the encircling coral reef. Approach to the passage is on an E.S.E. course bearing 117° true to leading beacons situated on the sand dunes at the southern end of the bay (Lat. 22°37.4'S, Long. 113° 40'E). After westerly winds, the swell breaks heavily in the entrance making extreme caution necessary.

Within the bay, submerged coral reefs and rocks make navigation difficult and large ships must anchor at some distance from the shore. For small craft, conditions are easier although care must be taken to avoid the shallow reefs at the southern entrance to the bay.

With prevailing southerly and southwesterly swells, the utmost care must be taken to moor boats securely and at a safe distance south of the whaling station. If anchored too close to shore, boats are in danger of being washed up and grounded on the beach or driven northeastwards onto protruding piles and submerged iron machinery at the site of the old jetty and slipway.

Since there is generally a heavy surf breaking onshore, it is advisable to secure the boat at some distance offshore, allowing it to drift back on the anchor line to a suitable depth for unloading purposes. The anchor line may then be shortened and the vessel pulled back out to sea. Failure to carry out this procedure may result in grounding of the vessel, damage to outboard motors and difficulty in relaunching. As the beach gradient is fairly steep, giving good depths of water close to shore, landing equipment and personnel is frequently a wet and arduous task. Care should be taken, therefore, to ensure that items subject to damage by salt water are suitably protected.

The team operated from a base at the shearers' quarters of Ningaloo Station and travelled to and from Norwegian Bay in a 5 m Attwood aluminium dinghy with two 20 hp Evinrude outboard motors. From the base, travelling time was approximately 25-30 minutes depending on weather conditions.

Owing to it being the cyclone season, visits to the site were dependent on favourable weather. Strong winds and heavy southerly and southwesterly swells made sea-going difficult and frequently curtailed activities. Two-way radio communication between the base and the site proved unreliable due to the intervening high sand hills, thus enhancing an awareness of the need for safety precautions for boats and personnel.

Adverse weather conditions were probably the most limiting factor in the execution of this work, strong winds, in particular, hampering stadia survey procedures and dictating access to the site by sea.

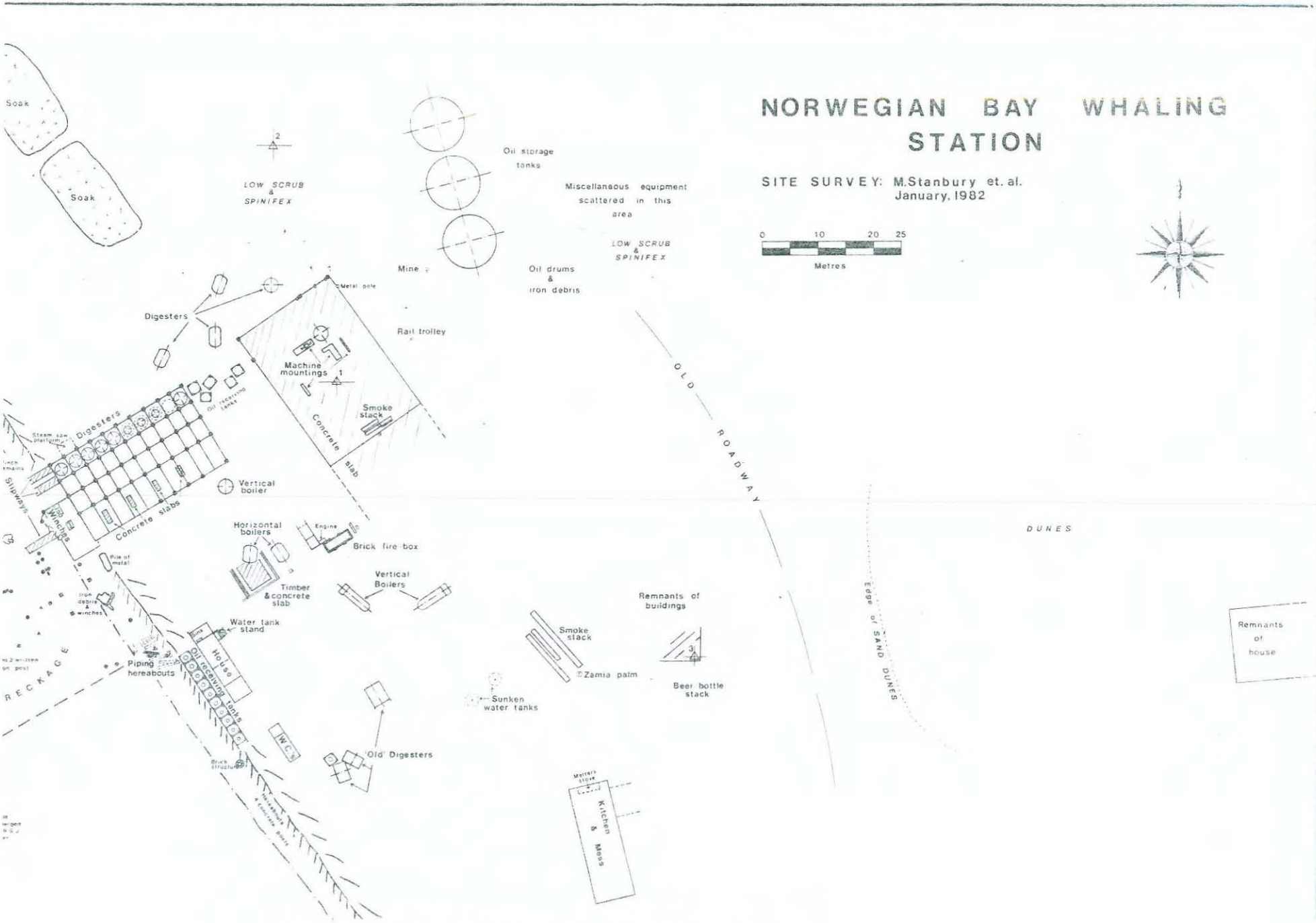


Fig. 4 Site plan of Norwegian Bay Whaling Station

SITE DESCRIPTION AND SURVEY

The site of the whaling station (as surveyed), occupied an area of approximately 0.04 sq.km[1] with the main layout running in a NW-SE direction, parallel to the shoreline. Few permanent structures remain standing, most having collapsed due to the effects of weathering, strong winds and human salvage.

In some instances, the only indications of former buildings are a few metal and/or wooden uprights with or without concrete foundations: in others, all that exists, is a pile of miscellaneous rubble. Remains of machinery, boilers, storage tanks, fittings, supplies, vehicles and so on, are found scattered throughout the site. Pottery sherds, broken glassware and other miscellaneous items are likewise found randomly distributed.

The aim of the survey was to map the position of the main structures and features of the site. For this purpose a radial stadia survey technique was used.

Since there were no permanent visible landmarks that could be used as fixed orienting stations, a datum point was chosen which lay on a NS axis through the site. A concrete slab situated centrally, provided an ideal position for the initial station and gave a good vantage of the major structures. The datum point was marked using a steel nail hammered into the concrete and the theodolite set at zero on a metal upright lying due north. Second and third stations were subsequently established to the north and southeast of the site, to enable the features in these areas to be mapped.

The results were plotted to a scale of 1:250 to produce a plan of the site (Fig. 4). Owing to lack of time and bad weather, the jetty remains were surveyed using a tape and compass only, reference being made to known points at the seaward end of the flensing deck framework. These positions, therefore, are not considered to be completely accurate. Minor discrepancies have also occurred with regard to the positioning of some structures (notably the house and ablution block) on the shore site. These errors are probably due to inaccurate readings of the staff caused by movement in heavy winds. Unfortunately time did not allow for the re-checking of doubtful measurements.

(1) The area as given by Stewart-Dawkins (1929) is 25 acres (0.1 sq. km). The represents the total area under lease, being Special Lease No. 1707/152 in the North West Division and Crown Lease 519/1926: Letter from Davies to Blanchard dated 1/5/1929.

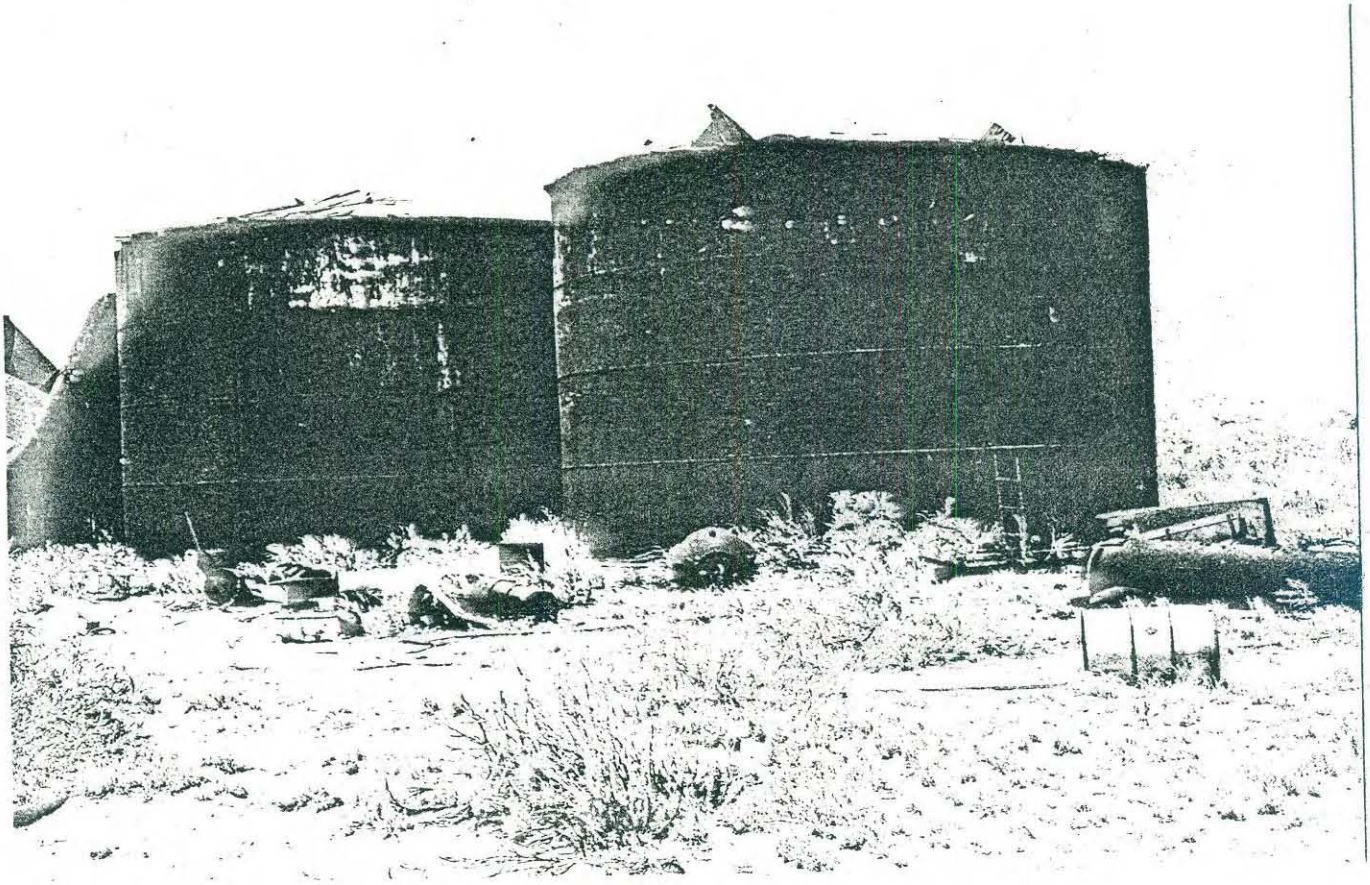


Fig. 5. Oil storage tanks.

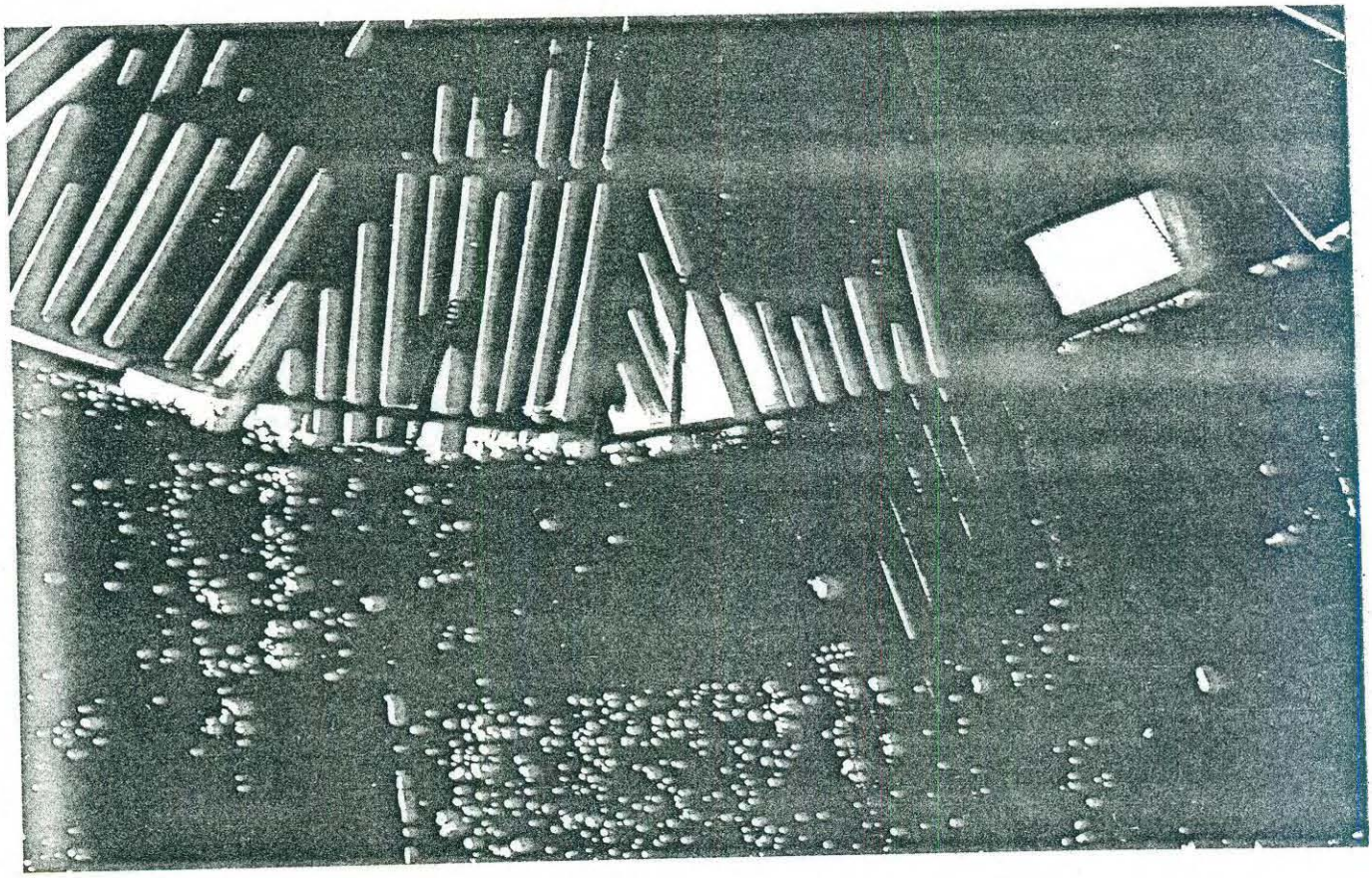


Fig. 6. Internal view of roof of oil storage tank.

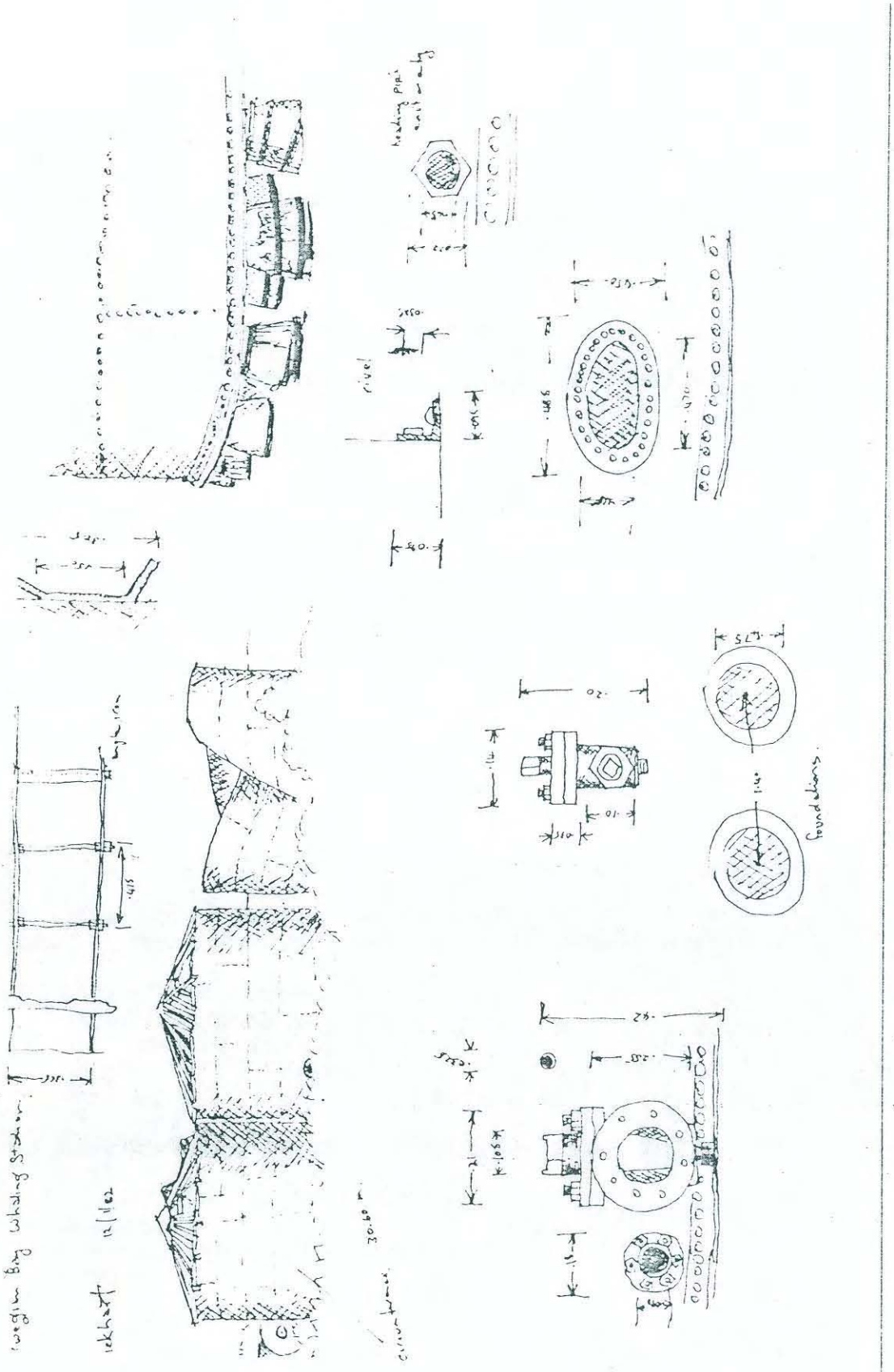


Fig. 7. Field sketches of Oil Storage Tanks
By: S.J. Dickhart.

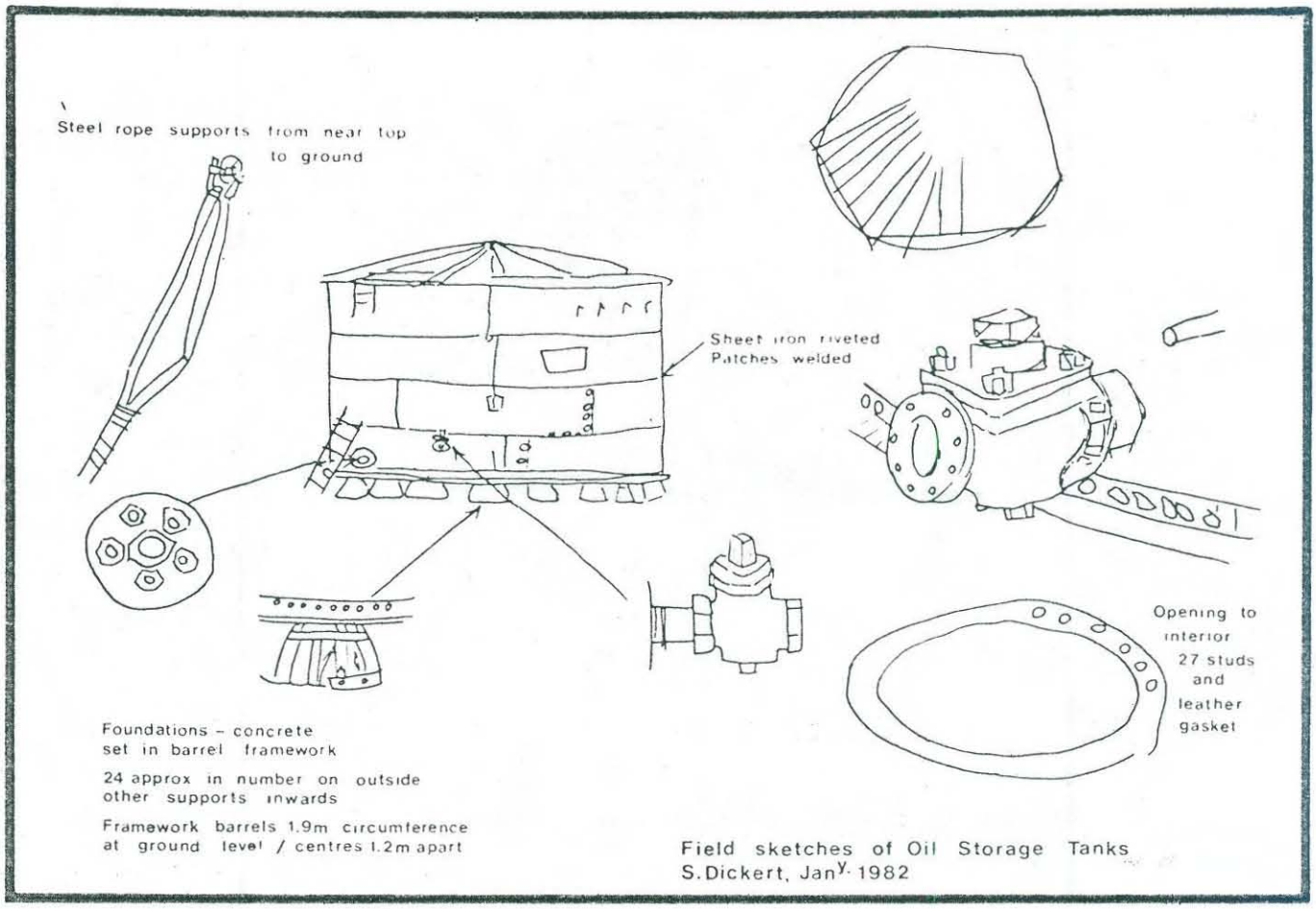


Fig. 8. Field sketches of Oil Storage Tanks
By: S.J. Dickhart.

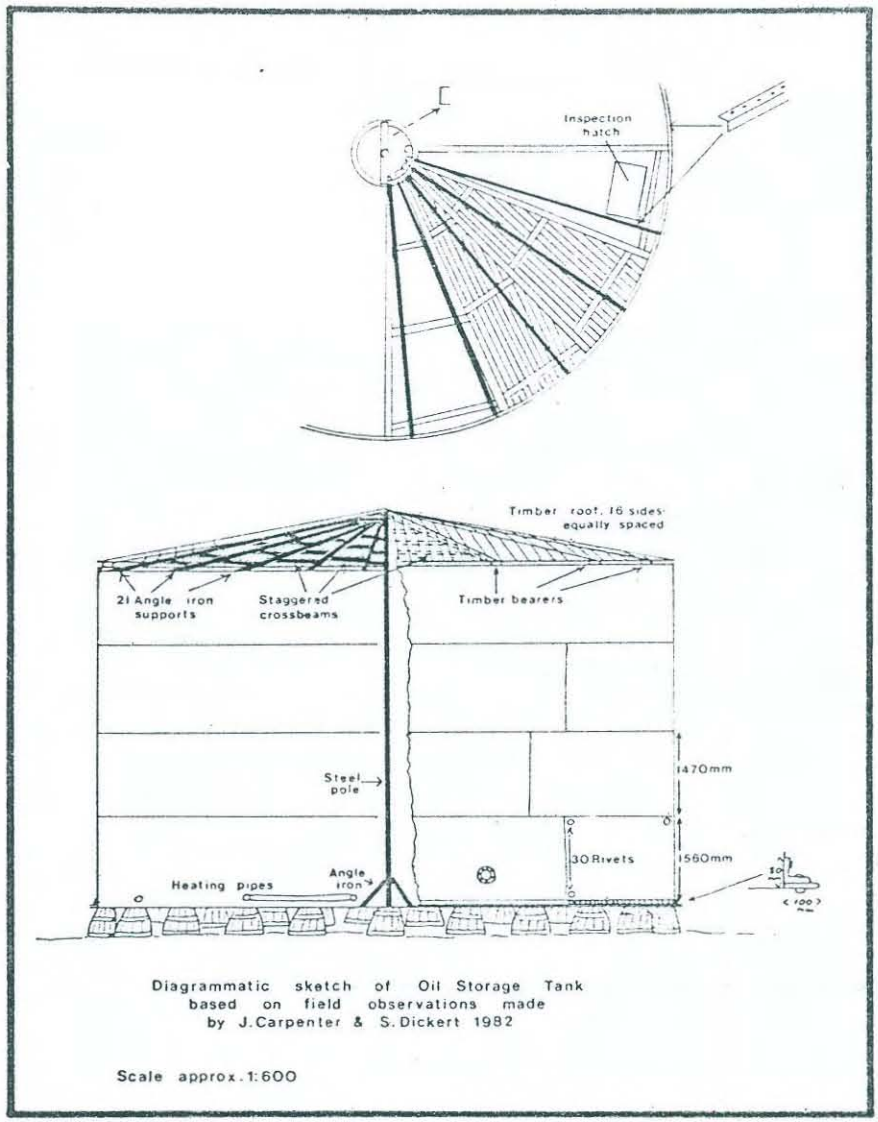


Fig. 9. Diagrammatic sketch of Oil Storage Tank based on field observations made by J. Carpenter & S.J. Dickhart.

FINDINGS

(a) Oil Storage Tanks and environs

To the northeast of station 1, were three circular steel oil storage tanks mounted on a foundation of cement-filled wooden barrels (Fig. 5). With diameters of 9.7 m and heights of over 6 m these form one of the most prominent features of the site.

The walls of the tanks are constructed from overlapping plates of steel arranged in brickwork fashion and rivetted together with 30 mm diameter steel rivets. Each plate is roughly 1.5 m wide, four widths giving a side wall height of 6 m. (Figs. 7 & 8).

Internally, an umbrella-type steel structure supports a conical-shaped timber roof. The steel support consists of a central pole anchored at its base with four legs of angle iron, with approximately 21 arms of angle iron radiating from a ring fixed to its upper end. The arms are welded to an internal lip of angle iron around the top of the tank.

The timber roof is made up of 16 triangular sections. Each section is formed of wooden bearers with staggered crossbeams, supporting a series of wooden planking (approximately 12 in number). The arrangement of the planking is illustrated in figures 6 & 9. A small inspection hatch approximately 60 cm square is cut into one of the sections. Leading up to the hatch on the outside of the tank is a steel ladder.

Around the lower part of the tanks on the outside are numerous fittings and attachments. Some appear to be exit or entry points for heating pipes which are coiled over the floor of the tank. Others, however, are obviously associated with the delivery of oil to and from the tanks. Affording additional support to the tanks are steel cables running from the top of the tanks to the ground.

According to the inventory lists compiled during the liquidation of the North West (Australia) Whaling Company Ltd., the specifications of the tanks are: diameter 32' (9.76 m); height 19'6" (5.9 m); capacity - about 100,000 gallons each (Appendix 2(ii)).

Bill Stephens (1982: Pers.comm.) who worked at Norwegian Bay in the 1950's, reports that the oil storage tanks were rebuilt during that period and two extra tanks erected. The oil in the tanks was heated to keep it in a liquid form and prevent the fat solidifying on the bottom of the tank. It was pumped out via the valves at the side to lighters for transhipment. When Moore & Co. moved to Carnarvon the two new tanks were taken with them, leaving the original Norwegian tanks in situ (Sledge, 1974, pers.comm. with Lefroy).

To the east of the oil storage tanks, a variety of machinery and equipment was located, much of which was overgrown with scrub. Finds included the following:

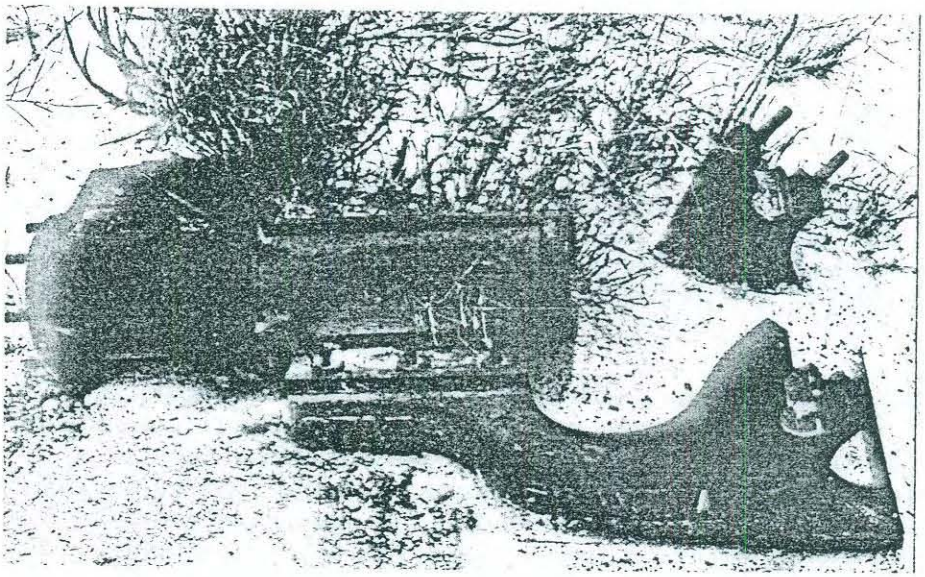


Fig. 10

i. Part of a steam winch marked 'STAFSJO MEK WEKST'

Fig. 10

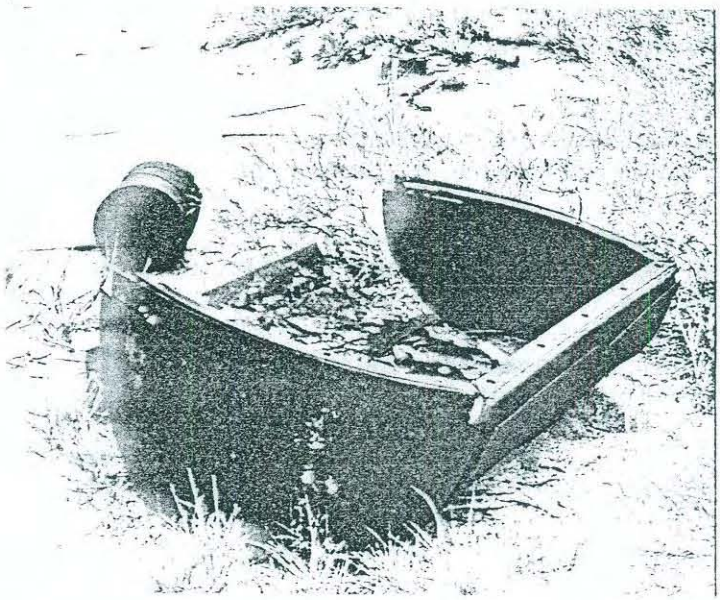


Fig. 11

ii. Semi-circular steel bin (Fig. 11) containing a clay brick marked 'BONNYTON'.

vi. Steel pulley block marked 'SELF OILING LOVERIDGE LTD., CARDIFF' (Figs. 14 & 15) These were arrached to winches and used for pulling the whale up onto the flensing deck. (Stephens, 1982, pers. comm.) (see also Fig. 35).

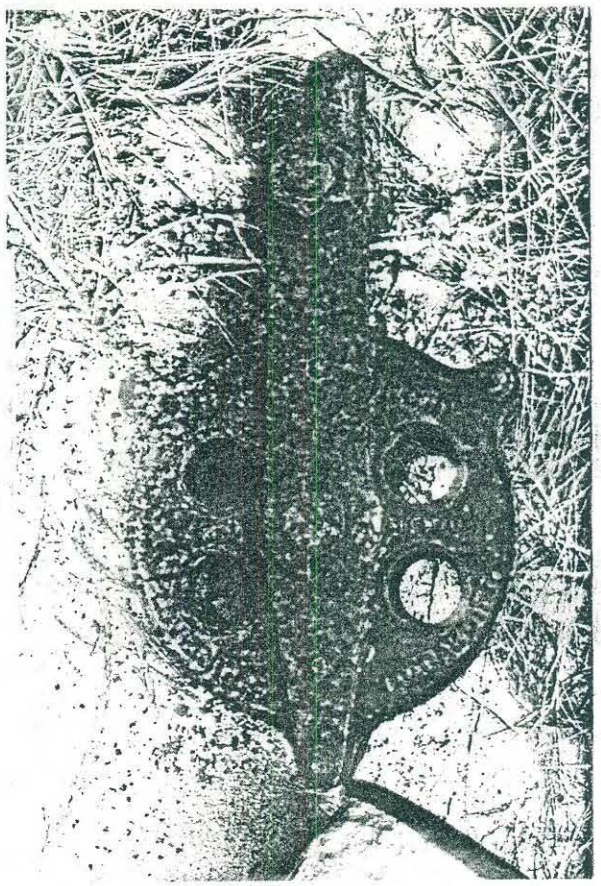


Fig. 14.

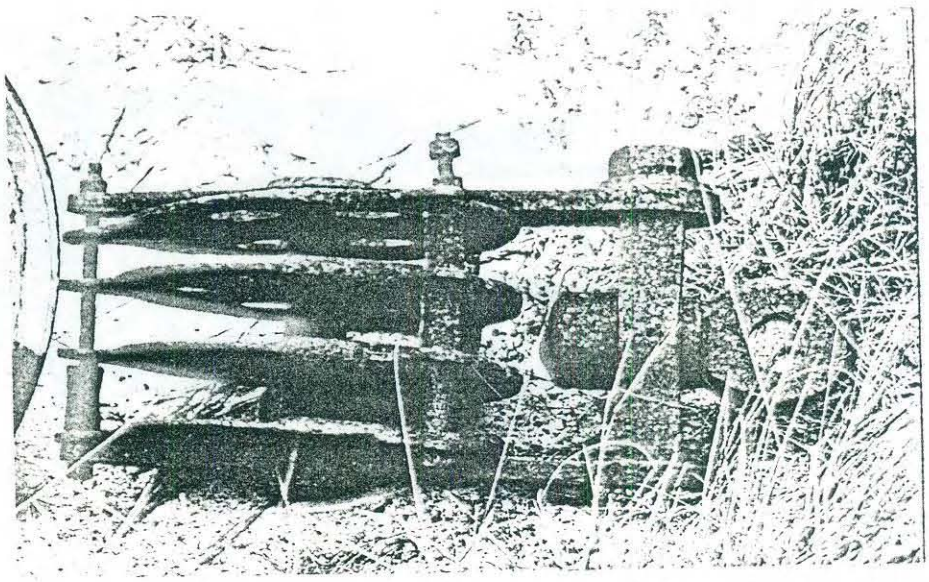


Fig. 15.

vii An old army truck.

vi. Steel pulley block named 'SELF OILING LOVEDEE LTD., CARDIFF (Figs. 14 & 15). These were attached to winches and used for pulling the whale up onto the flensing deck. (Stephens, 1982, pers. comm.) (see also Fig. 13).

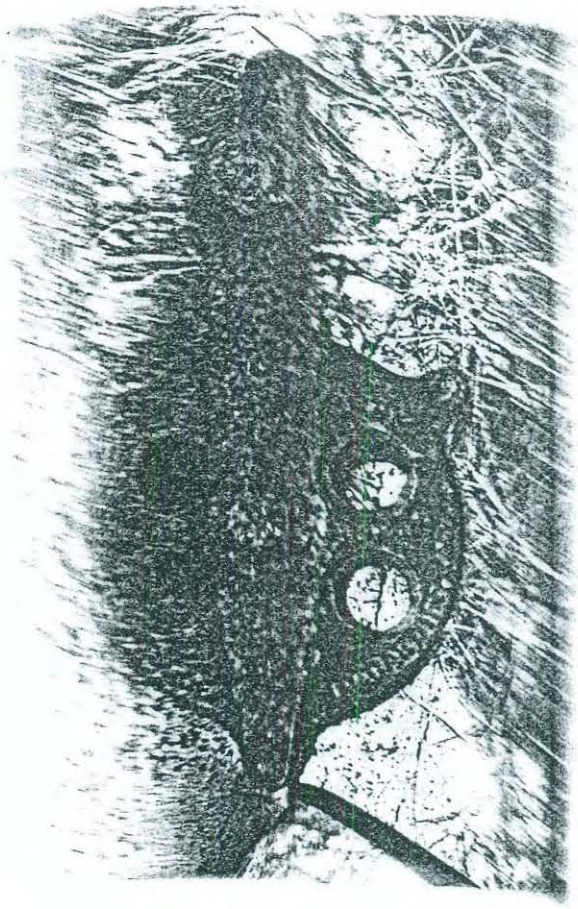


Fig. 14.

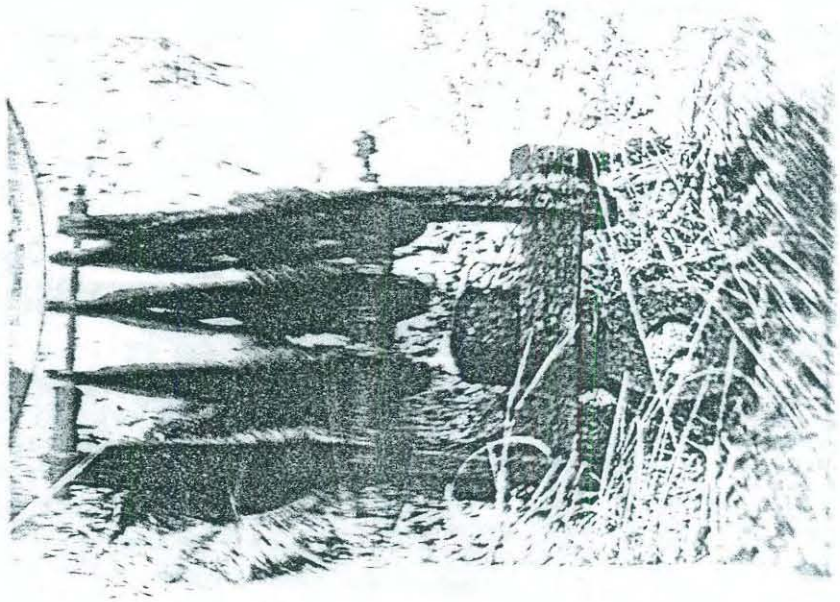


Fig. 15.

vii An old army drum.

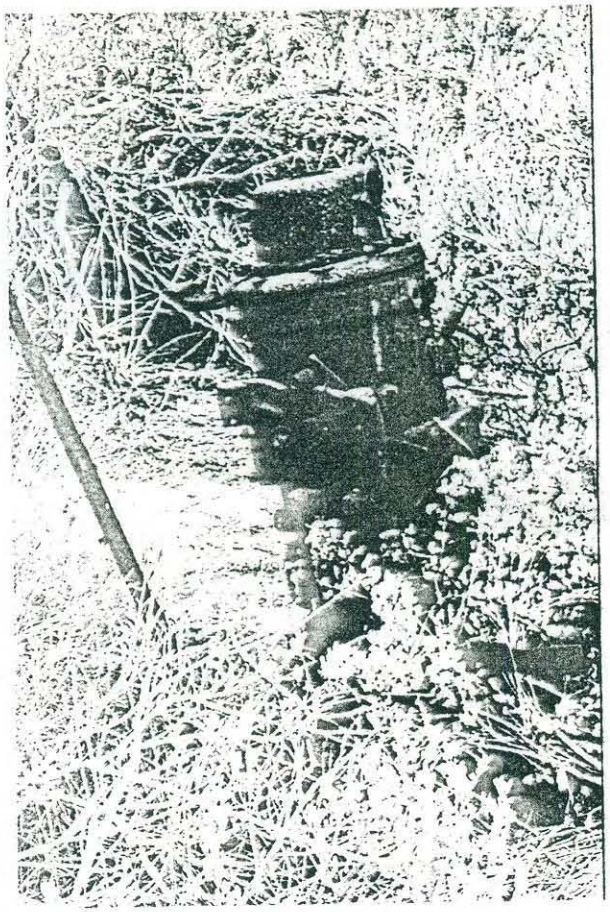


Fig. 16. Steam Engine.

Fig. 17. Steam Engine.

viii. A steam engine marked '9301' (Figs. 16 & 17).

Many of these items are listed in the liquidation inventory (Appendix 2). Heavy pulley blocks, winches and tackle were needed for lifting whales; steam engines for operating pumps and processing machinery; and rail trollies for the conveyance of supplies, whale blubber, guano etc. to and from the jetties and between various parts of the plant.

To the south and southwest of the oil storage tanks were the following:

i. A rail trolley with wooden platform (Fig. 18).

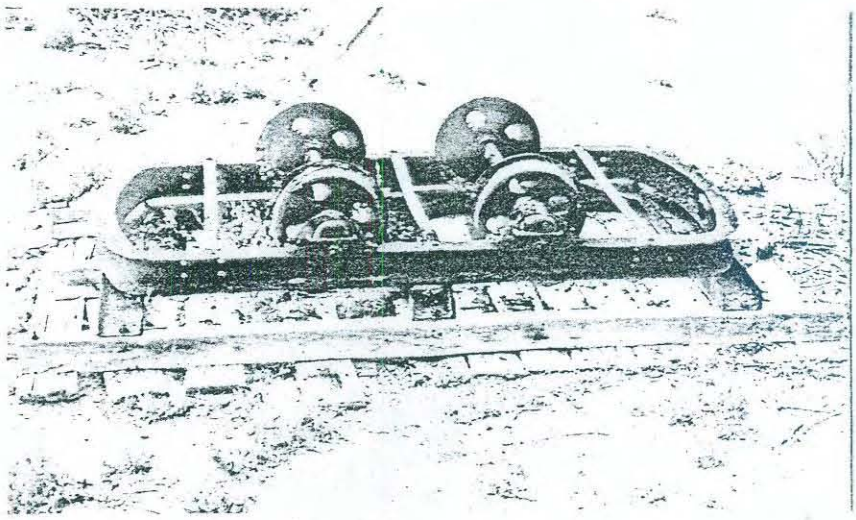


Fig. 18. Rail Trolley

ii. A wartime mine. These were used as mooring bouys (Stephens, 1982, pers. comm.).

iii. Remains of a smoke stack.

iv. Empty 44 gallon oil drums

v. Miscellaneous debris.

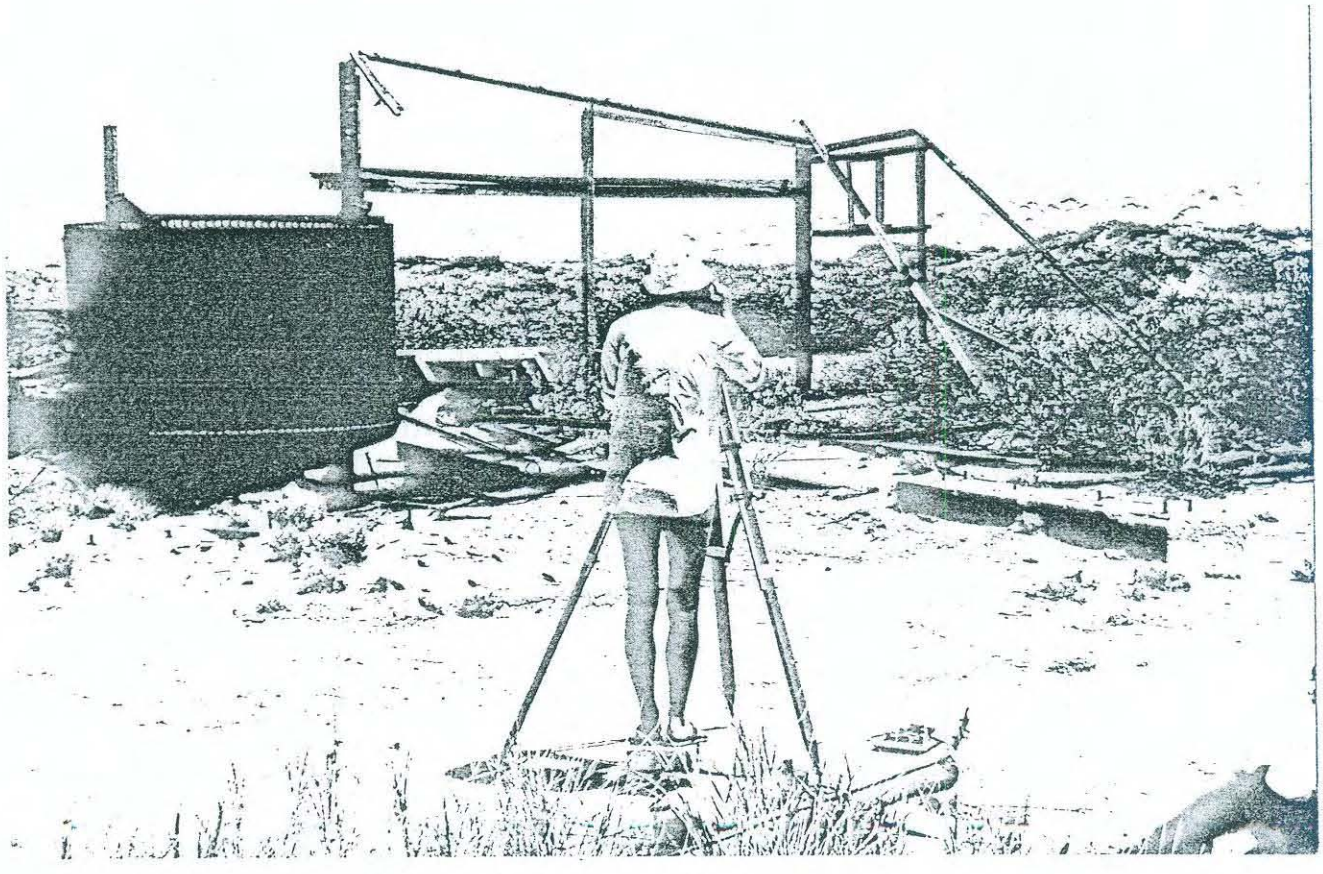


Fig. 19. Looking North from Station No. 1.

(b) Central area: workshops

A large concrete foundation slab demarcates the site of a former building 19.5 m x 28 m[1]. At the northern end, some of the framework was still standing (Fig. 19). Rolled steel joists (R.S.J.'s) formed the main supports with additional wooden uprights in between. Lying on the ground nearby was the wood and iron supporting framework for the roof.

Set into the concrete slab at the north end were raised concrete mountings for machinery. One piece of machinery remains in situ, adjacent to part of a circular steel drum (possibly part of a digester). At the south end of the slab lay segments of circular steel smoke stacks.

According to the original blueprint (Fig. 1) this area was the site of the engineering department - fitters and blacksmiths etc. - guano factory and store. This would explain the presence of the solid foundation and machine mounting blocks. It was confirmed by Bill Stephens (1982: pers. comm.) that this area corresponded to the site of the power house during the 1950's.

Specifications of buildings in this area are given by Stewart-Dawkins (1929) as follows:

> 'Guano Factory - Approximately 66'6" x 100' x 30' high, constructed of iron staunchions stays and beams, covered with Galv. corr. iron and Cement Plaster sheets and containing all necessary machinery for manufacturing guano. Has storage space for thousands of bags of guano etc. also equipped with a complete system of overhead belt driven transmission gear for all purposes. It is built almost adjoining the Boiling down factory to facilitate handling of material while the tramway runs through it to the jetty.
>
> Workshops, Blacksmiths, Engineers and Carpenters Shops - Approximately 64' x 34' x 20' constructed similarly to guano factory, comprises in addition a large store room for materials generally needed for the upkeep of the plant. The workships are fitted out with necessary appliances etc. for efficiently carrying out all repairs to and maintenance of the station ashore and afloat including maintenance of Harpoons.
>
> Electric Light Set Engine and Dynamo House and Set - Adjoins Engineers workshop and is described elsewhere.' (1929:5)

(1) The slab extended more than 28 m in a SE direction but was overgrown with ground cover and littered with iron debris. Without a good deal of clearance it was difficult to determine the southern limits.

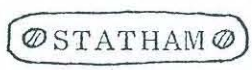
Stewart-Dawkins' report (and the Blueprint) indicates that an overhead lighting system ran on poles from the station to Pt. Hunter(1), $2\frac{1}{2}$ miles distant (south) to provide lighted beacons to guide and enable ships to enter harbour during darkness (1929:11).

On the west side of the southern end of the concrete slab was a rectangular brick structure measuring 6.48 m x 1.8 m (Figs. 20-22). It was built of two types of bricks. Forming the foundation levels were three rows of pressed red clay bricks 225 mm x 110 mm x 80 mm. Marked in the frog is the name 'CARDUP'. The Cardup Brick Company was a West Australian brick manufacturer having their works at Beenup (W.A.P.O.Dir. 1917:562), and later at Byford (W.A.P.O. Dir. 1938:711).

Remaining levels are constructed from flat-sided fire bricks 725 mm x 110 mm x 75 mm. Amongst the loose bricks the following samples were obtained:

(i) white clay brick marked 'BRISTILE' on the end. The Bristile comapny was started c.a. 1930, and this brick was probably manufactured in the Brown Street factory in East Perth, (Calhoun 1982: Pers. comm.);

(ii) pinkish clay brick with quartzite and dark coloured inclusions marked



Thomas Statham was the proprietor of the Darling Range Quarries, Fire Brick and Gravel Co. Ltd., Glen Forrest (W.A.P.O. Dir. 1917:505). The clay, with its heavy content of quartzite, is typical of this area (Calhoun 1982: Pers. comm.).

(iii) pale yellow clay brick, marked

This has not yet been identified, but possibly originates from Hoganas on the west coast of Sweden.

(iv) pale yellow-cream clay brick, marked

SKRONBERGA
M(?)

Not yet identified.

(1) Point Hunter is not marked on modern charts, but presumably referred to the southern most promontory of Norwegian Bay: see AUS 330.

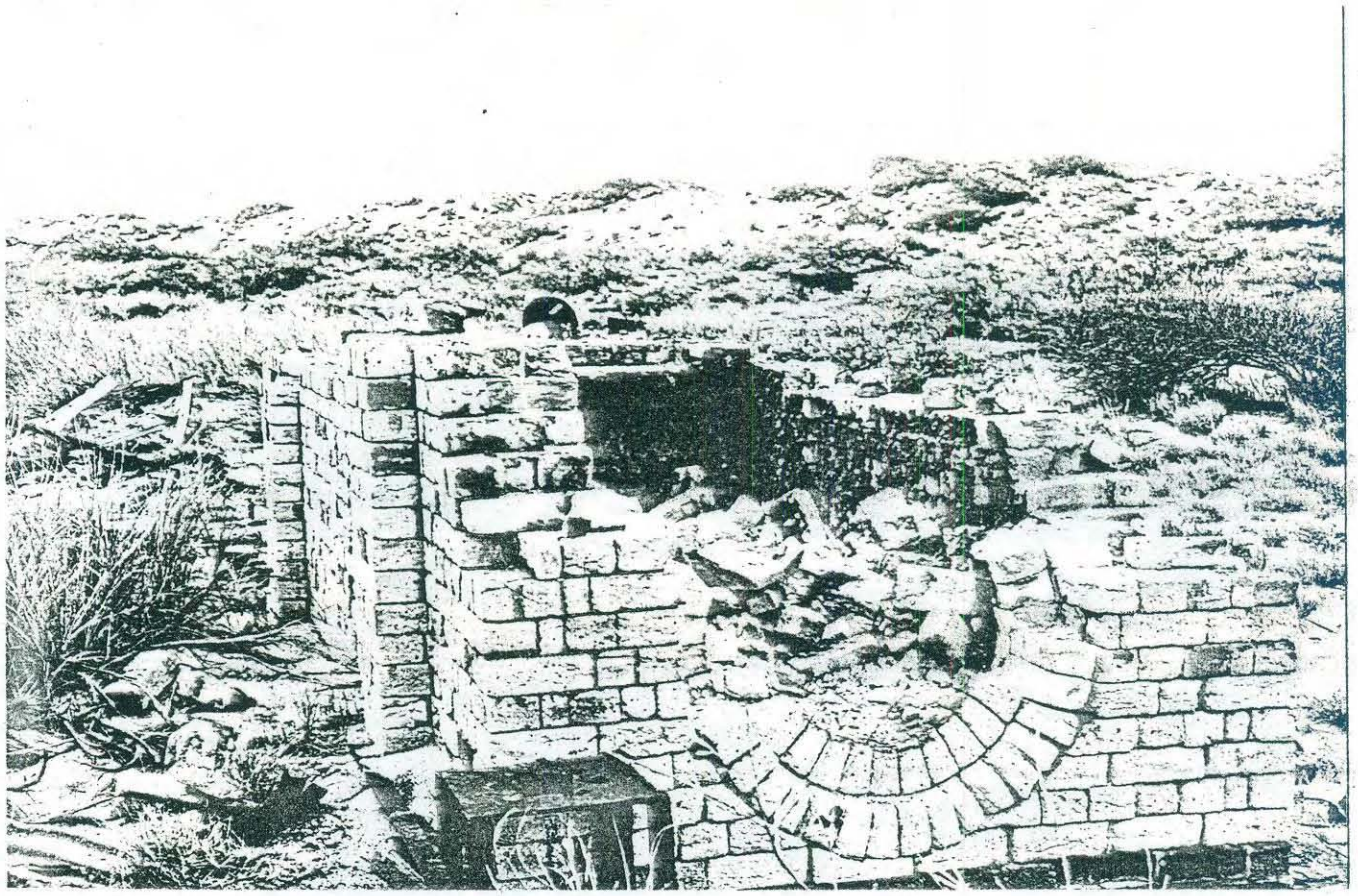


Fig. 20 Brick firebox.

Fig. 21. Brick firebox from the south.

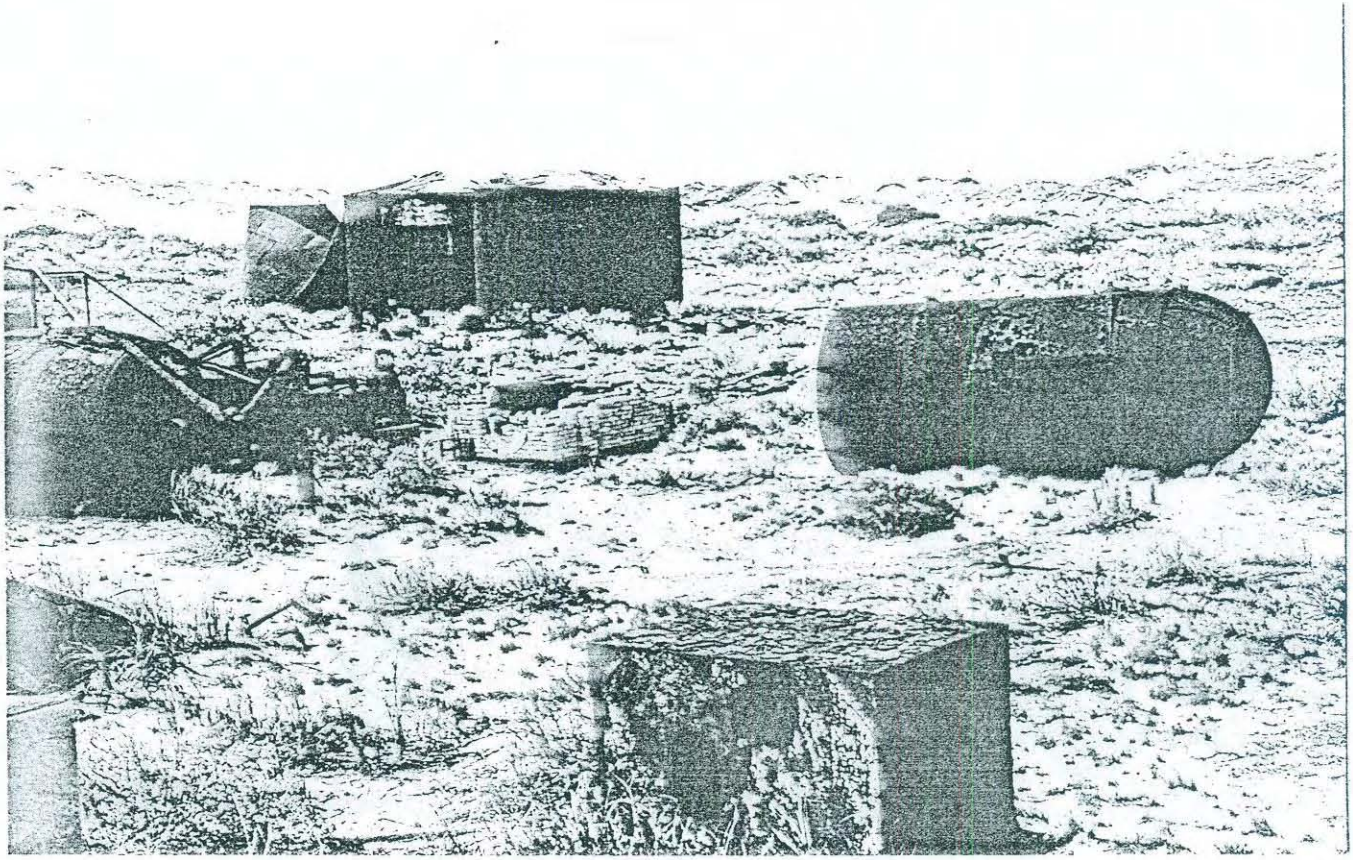


Fig. 22. General view of oil storage tanks, brick firebox and boilers from the southwest.

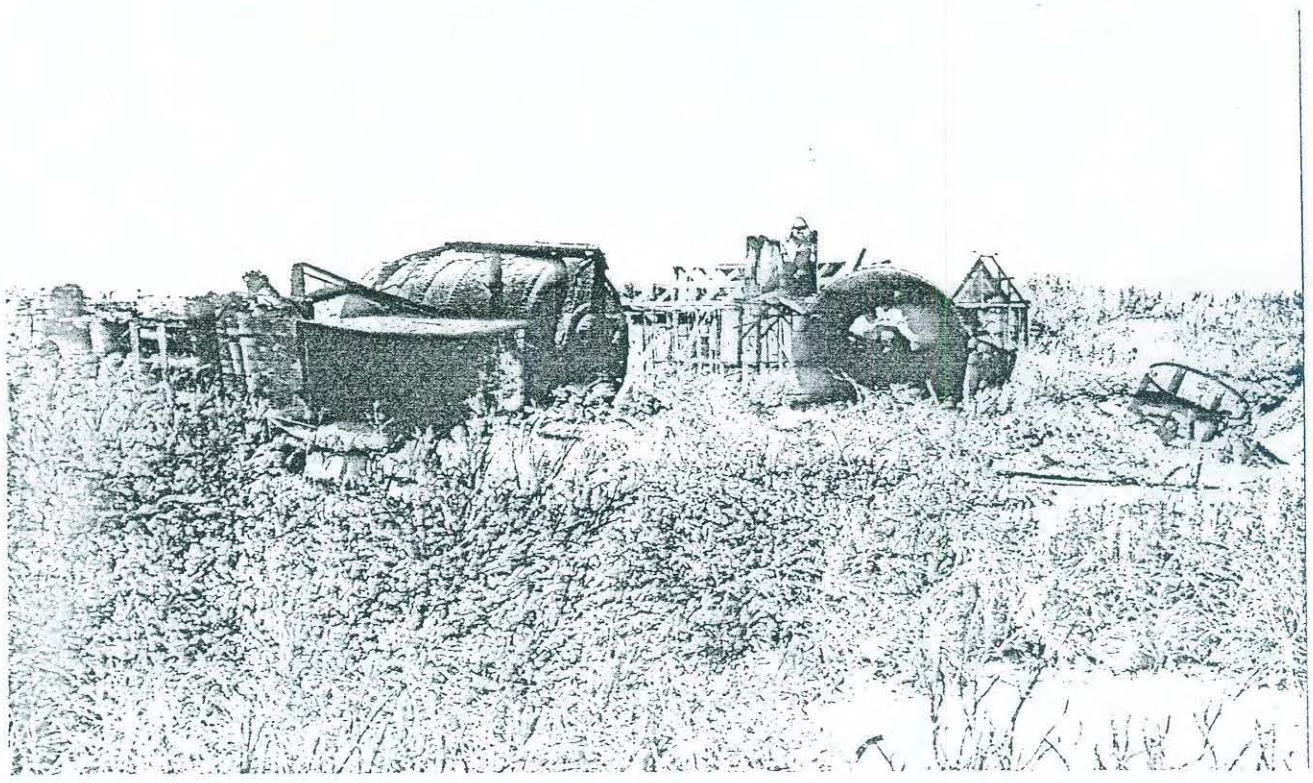


Fig. 23. Horizontal medium pressure boilers.

The surfaces of the bricks on the inside of the structure were coated with a dark brown ferruginous - looking glaze. Marked on the Blueprint in this area are the works 'FOR FE ORE', suggesting the structure was used as a furnace for casting iron, for example, harpoon heads. Beside the circular opening was a small iron "stool" with a star-type pattern cut-out of the upper surface.

The variety of fire bricks used to build the brick structure cast doubt as to its date of origin. Based on the 'BRISTILE' marked brick, it could not have been built prior to 1930, since this company was not operative until then (Calhoun, 1982: Pers. comm.).

Communication with Bill Stephens (1982) identified this structure as the fire-box (combustion chamber) on which the boiler from the old *Garrett* engine was mounted(1). The boiler was oil fired, hence the dark slag on the firebricks. It was used to provide additional steam and when the Nor' West Whaling Company moved to Babbage Island, the boiler was re-located there.

Two horizontal, medium pressure boilers mounted on wooden bearers are situated to the northwest of the brick fire-box together with a steam engine mounted on a concrete block. (Fig. 8). Both boilers were 2.4 m in diameter and had an average length of 3.4 m. A framework of R.S.J.'s around one boiler indicated some form of shelter, whilst the other was lagged with corrugated iron. From the liquidator's list, it would appear that a corrugated iron shelter for the boilers was provided by the Norwegian Bay Whaling Co. (see Appendix 2) suggesting these were part of the original equipment.

(c) Southern area: residential

South of the brick fire-box lie two very large boilers. These were identified by Bill Stephens (1982: Pers. comm.) as being vertical marine Cochrane boilers built in Scotland(2) (see Figs. 24 & 25). Two new Cochrane boilers of 750 square feet and 1,000 square feet, are recorded as belonging to the Norwegian Bay Whaling Co. and must have been amongst the new equipment introduced by them during 1925-28. One also belonged to the North West (Aust.) Whaling Co. Ltd., making a total of three. Early photographs of the station show these in situ in the vicinity of the engineering workshop (Fig. 27).

(1) The *Garrett* was an old locomotive whose engine was bought by R. Moore and Sons c.a. 1953 (Stephens: 1982: Pers. comm.)

(2) Cochrane vertical boilers were manufactured by Messrs. Cochrane of Birkenhead. For details of early Cochrane boilers see: Jamieson, A. 1899:307-311.

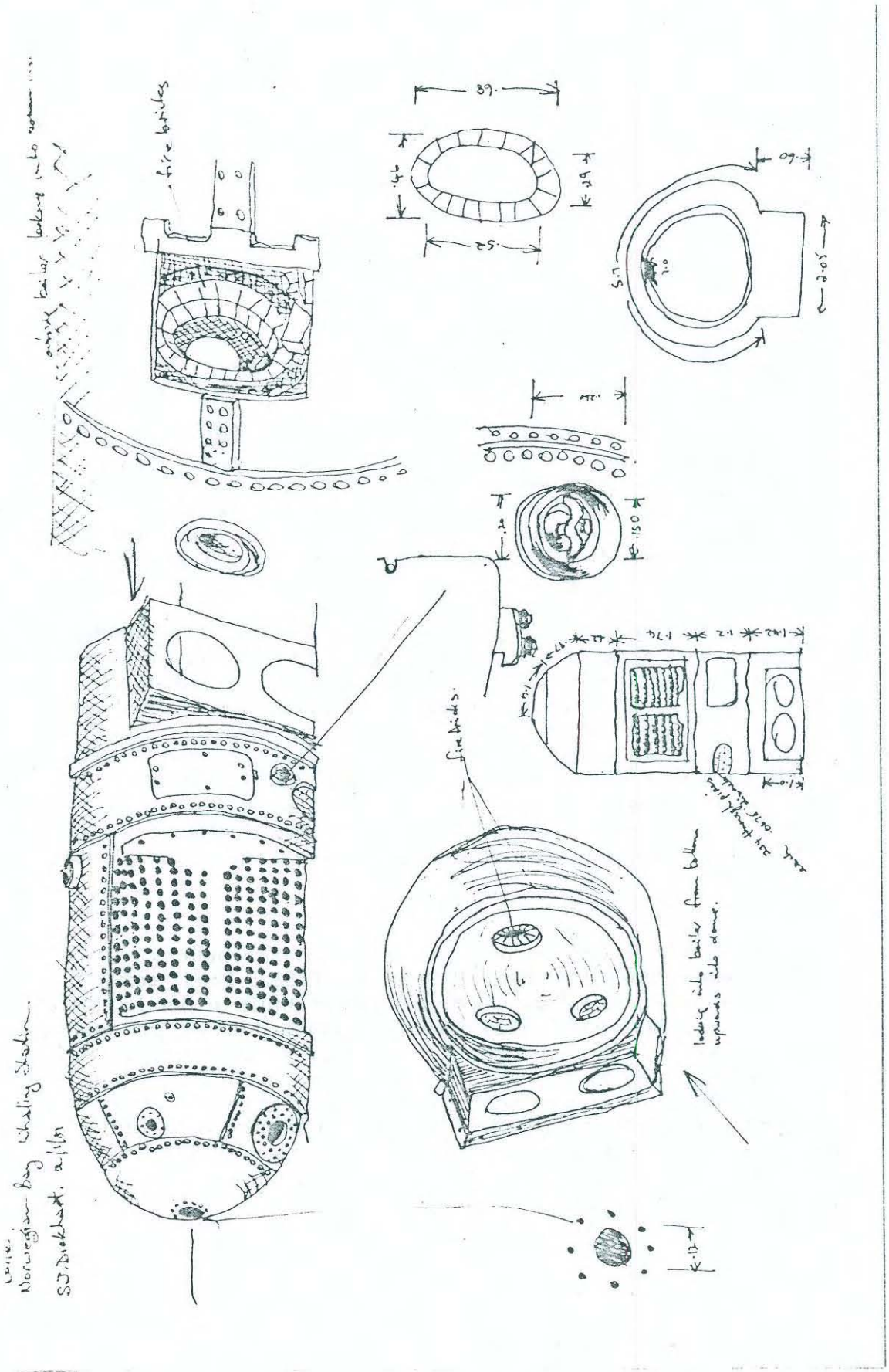


Fig. 24. Field sketches of vertical marine boiler by S.J. Dickhart

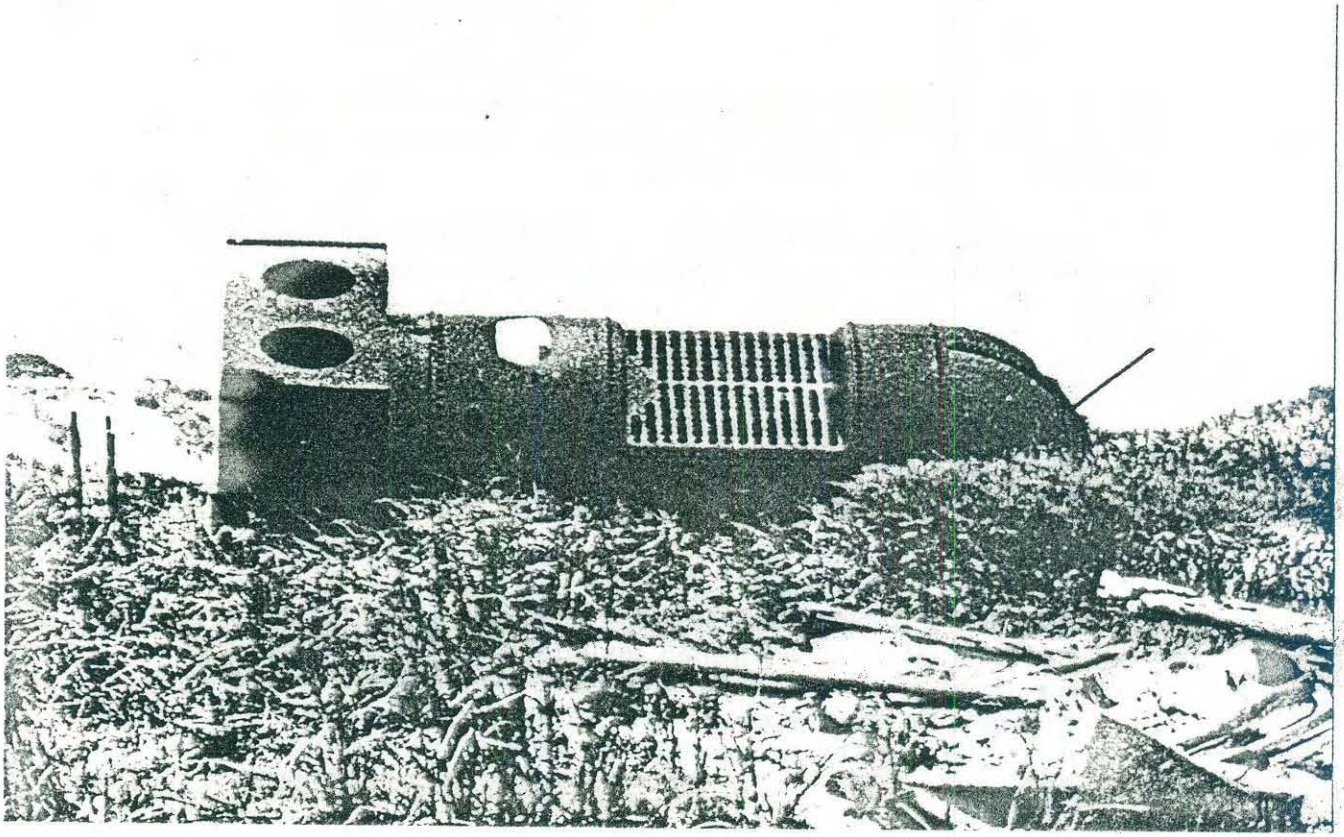


Fig. 25. Vertical Marine Boiler.

Further south are three large circular tanks, one of which has a cog-wheel type handle (Fig. 26.). Their diameters range from 3.61 m to 3.83 m and the heights from 2.35 m to 3.1 m. None of my informants were clear as to the function of these tanks but tended to think they were old type digesters used by the Norwegians.

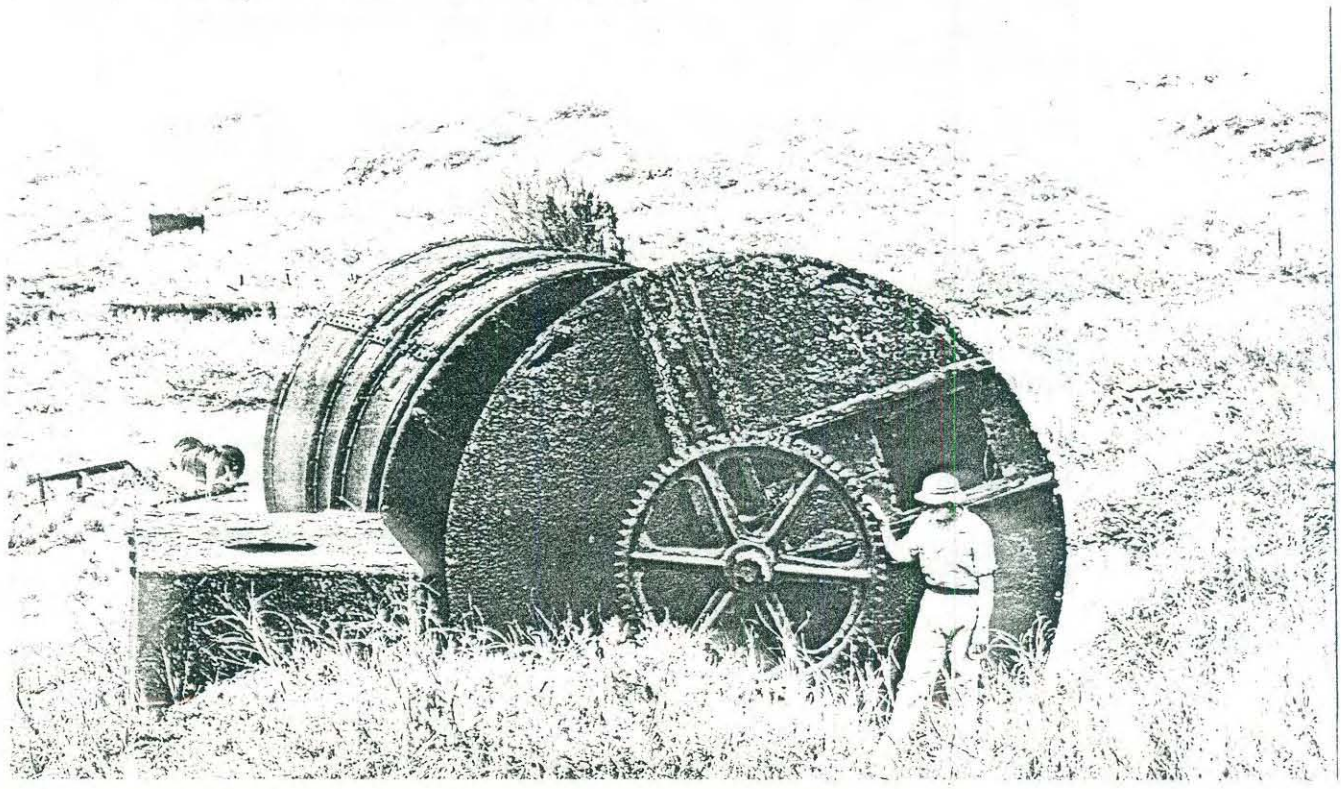


Fig. 26. Early Norwegian Digester

Also in this southern region were the remains of several timber framed buildings. A Metters No. 6 cooking range indicated one to be a mess block.

The following specifications of the various accessory buildings present on the site in 1929 are given by Stewart-Dawkins (1929:6-7):

> 'Hospital and Surgery etc. 6 rooms. This building was formerly used by Managers and staff as a residence. Size 40' x 25' with 8' wide verandahs back and front. Construction iron frame, galv. corrugated iron roof, walls reinforced laths & plaster.
>
> Kitchen and Mens Mess Room: This building also contains 2 partitioned off Bedrooms for Cook etc. Size 68' x 25'6. Iron frame. Covered with Corrugated Iron. Kitchen replete with large range for wood or coal and all necessary conveniences. Long comfortable dining room with 5 doors, 9 windows designed for the accommodation of a large number of men.
>
> Bakery: Size 24' x 20' complete with Oven, Tables, Troughs etc.
>
> Provisions and Mens Store: Size 40' x 35' Different sections partitioned off. Construction similar to other buildings. All suitably fitted up.
>
> Foremans' Experts' Quarters: Size 50' x 28' Well constructed & sub-divided into comfortable bedrooms, bathroom etc.
>
> Mens Quarters: Size 117' x 20' strongly built. Iron frame. Sub-divided and fitted out to accommodate a large number of men.
>
> Men's main bathroom and sanitary arrangements: Special provision has been made for the above with an ample supply of water laid on.
>
> Oil Shed: Size 24' x 16' oil, grease etc. for land Station and ships.
>
> Powder House: Size 8' x 8' safely situated for all kinds of explosives etc.
>
> Butchery - Killing House etc.: Provision for the above has been made near the beach, north of the factory.
>
> Manager's House: Built by and left by Norwegian Bay Co.' (1929:6).

Remains of a house corresponding to the position of the "new" Manager's residence on the Blueprint (Fig. 1), were located on the top of a sand dune on the eastern side of the site. The house is shown in the 1950's photographs (Fig. 27) but whether this was the original building erected by the Norwegian Bay Whaling Co. is not known. During the 1950's the house was occupied by Harold Martin (Stephens, 1982, pers. comm.).

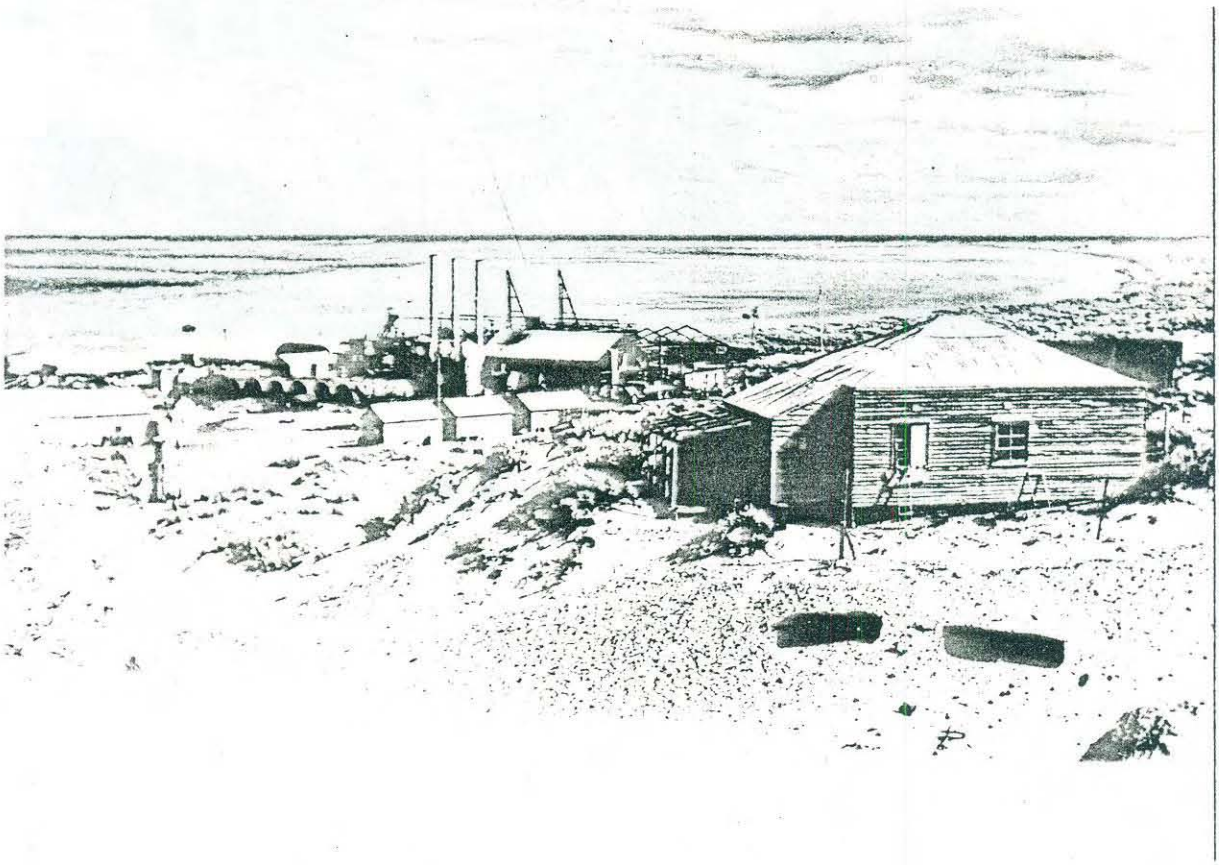


Fig. 27. View of the whaling station as it existed in the 1950's.

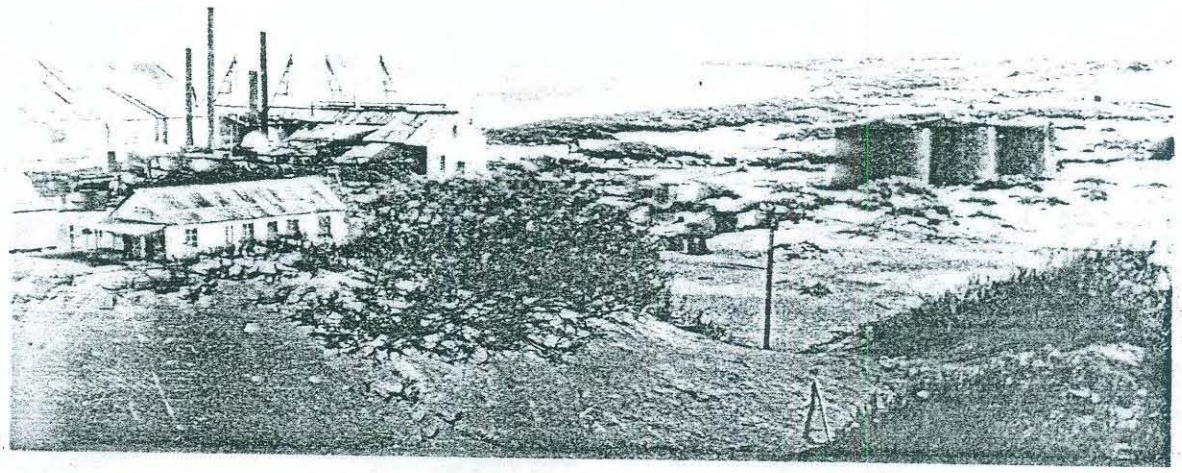


Fig. 28. View of the whaling station as it stood in 1924.

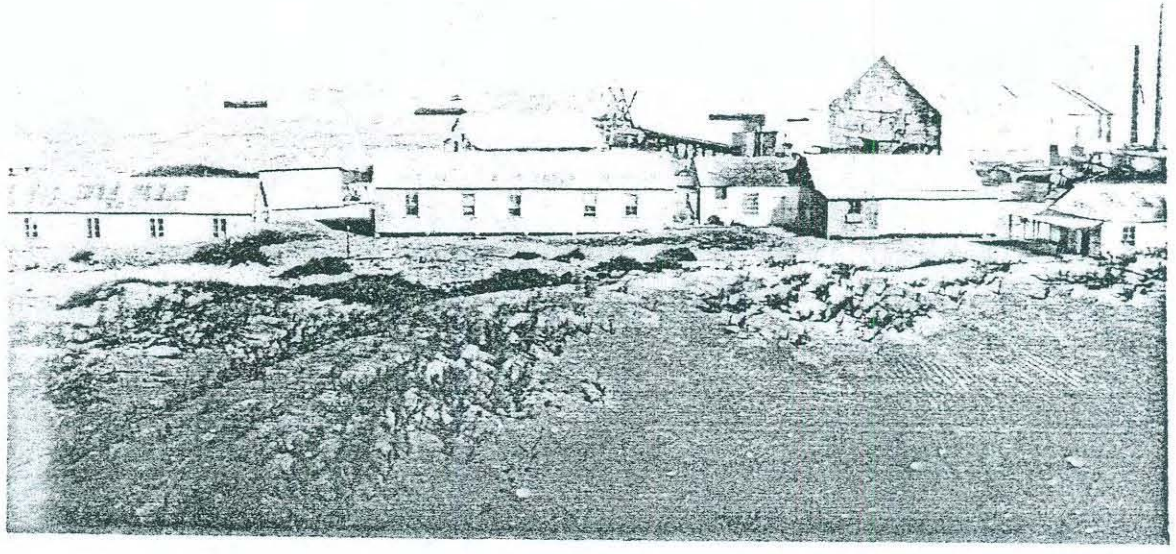


Fig. 29. View of the whaling station as it stood in 1924.

Comparisons of photographs taken in 1924 (Morrissy collection Figs. 28-29) and 1950's (Stephens collection) clearly indicate changes in the positions of many of the accessory buildings. The bathroom and laundry however, still appear to occupy the same position. Of all the remaining buildings this is the most complete (Fig. 30). Most of the timber framework is standing and in places, the asbestos walls and corrugated iron roof remain in situ. Part of the ablution block is built of red clay bricks with some light yellow ones. The latter were marked 'BORGESTAD' and possibly, originate from the town of Borge in western Norway.

Fig. 30. House and ablution block with flensing deck and digesters in the background.

(d) Western Area: jetties, slipways, flensing deck etc.

Along the western margin of the site are the remains of jetties, slipways, flensing deck, meat and blubber processing works (Fig. 31). A number of concrete piles on the seaward side of the raised beach berm would appear to be associated with a former jetty, or possibly the "slips" and a "cradle" referred to by Stewart-Dawkins (1929) and used for docking small craft and launches.

Moving northwards, numerous submerged and semi-submerged metal and wooden piles extend from the beach out to sea. Rusting remains of winches and lengths of piping lie scattered on the beach. A few metres from the shore, further remains lie submerged in about 2 m of water.

Fig. 31. Remains of jetty piles, piping and iron debris.

At low tide on a relatively calm morning, a snorkel dive was carried out in the area south of the slipways in an attempt to identify the underwater remains. There was a considerable amount of iron wreckage, but moderate visibility made it difficult to accurately determine what the structures were. An iron barge is reported to have sunk in the region of the jetties (Paxman, 1982 pers.comm.), whose hull was divided into tanks for carrying whale oil (Sledge, 1974).

Firebricks, similar to those forming the Garrett boiler fire-box, were found scattered on the seabed. Also present were numerous modern glass bottles. A representative collection was obtained, comprising:

- a pale green pickle jar;
- a clear glass pickle jar marked 'JOHN SUTHERLAND & SONS PTY LTD., MELBOURNE, PICKLES';
- a beer bottle marked: 'BCD & PIESSE LTD. PERTH';
- a beer bottle marked: 'SWAN BRAND PRODUCTS';
- a pale green condiment bottle marked 'REINDEER BRAND, H. RAYNER & SONS PERTH';

- a tall blue/green bottle with a Japanese monogram and marked 1800cc;
- a brown beer bottle marked 'PROPERTY OF AUSTRALIAN GLASS MANUFACTURERS';
- a small dark green bottle with Japanese writing around base.

Owing to lack of time, the underwater remains were not accurately surveyed. Positions of the piles and main wreckage were recorded using a tape and compass only.

Clearly, the jetty was an important part of the shore station, particularly pre-1952 when there was no road access to the site. It is described thus by Stewart-Dawkins (1929):

> "Jetties and Platforms etc.: 1 strongly built main jetty 200' (or more) long provided with double set of tram rails and also with steam winch and crane at head. There is fairly deep water at this jetty especially at high tide and all cargoes inwards and outwards passes over same.
>
> Note: The smaller whaling steamers at ordinary tide are able to steam within ½ mile or less of the jetty.
>
> 1 Platform 115' x 83' - complete system Oil, Water and Steam fittings as arranged throughout works and jetty.
>
> Special tanks, pumps, piping and tramways with mobile trucks have been provided for the economical and expeditious shipment of oil and guano for export, also for the handling of all kinds of cargoes, coal, stores etc. for the station from ships in the Harbour". (1929:8)

Photographs taken in 1924 (Morrissy collection) show the jetty in situ to the south of the flensing platform. Stephens (1982: pers.comm.) reports that it was rebuilt in the 1950's and it is shown on Australian Admiralty Chart Aus.72, based on R.A.N. surveys in 1953.

Along with the storage tanks, the 'cutting up-boiling down Factory with slips' (Stewart-Dawkins, 1929) form the most substantial and prominent structural remains on the site. Standing approximately 5.5 m above the ground and occupying an area of some 27 m x 16 m, is the supporting framework of the flensing deck. It is strongly built of rolled steel joists (R.S.J.'s), wooden uprights and crossbeams and bears the remains of wooden deck planking.

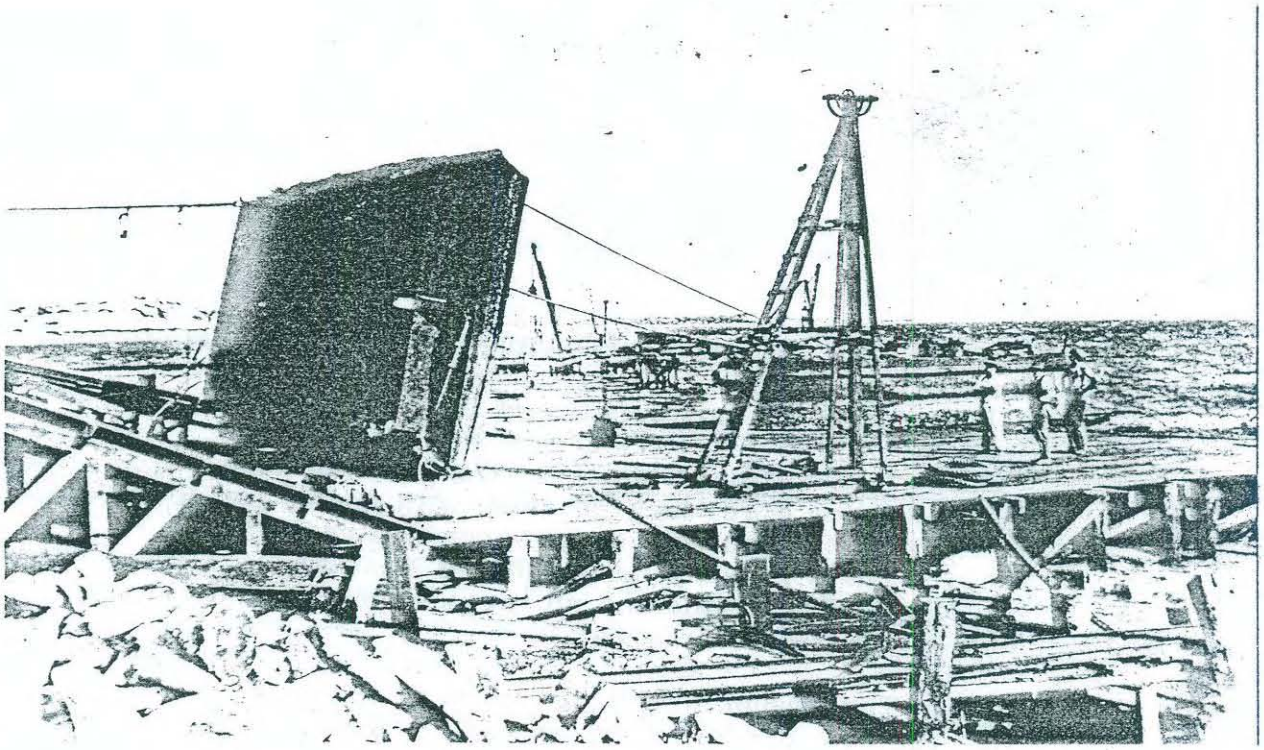


Fig. 32. The "new" lower flensing deck built c.a. 1924.

On the north side of the steel framework on the upper level, a small platform appears to jut out from the main deck. According to Stephens (1982, pers.comm.), this platform held a steam driven saw some 8-9ft. in length, for cutting up the heads of the whales.(1) High steel derricks mounted on the deck were used for lifting the "wings" (carcass) and hoisting the blubber.

According to Morrissy (1982, pers.comm.), prior to 1924, the whales were flensed on the upper deck. On completion of a new lower deck, however, all flensing was carried out here. The "new" lower deck is shown in Figure 32, and extended between 80' (24.4 m) to 100' (30.5 m) out to sea. Wooden piles may still be seen protruding from the sea, especially at low tide, and would have formed part of this structure.

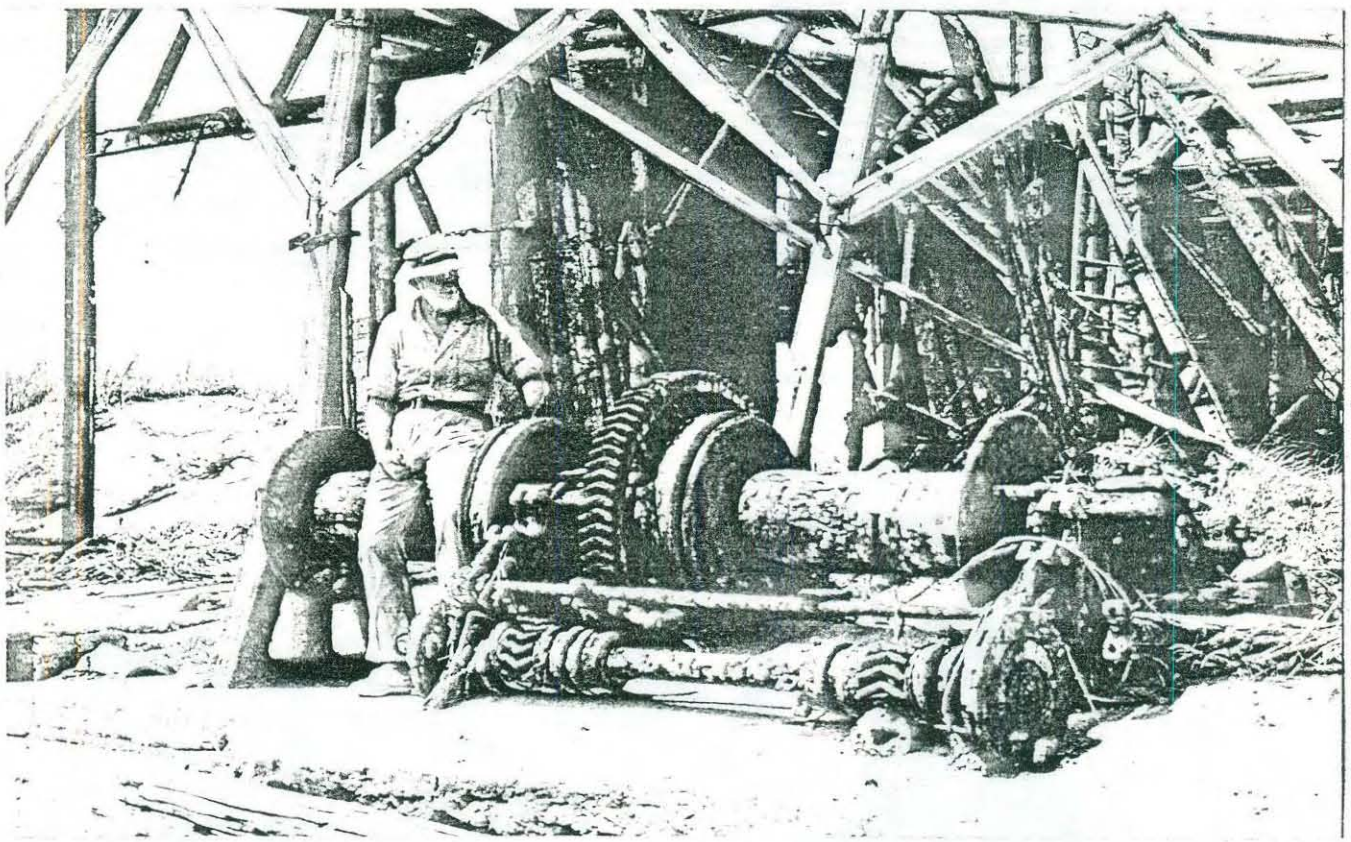


Fig. 33 Remains of steam winches at seaward end of the flensing deck.

(1) It is uncertain who invented the steam-driven bone saw but it was believed to have been used for the first time in South Georgia in 1921-2; they were made in the workshop at Grytviken from a drawing from the Framnaes shipyard in Sandifjord: see Tønnessen & Johnsen, 1982:262.

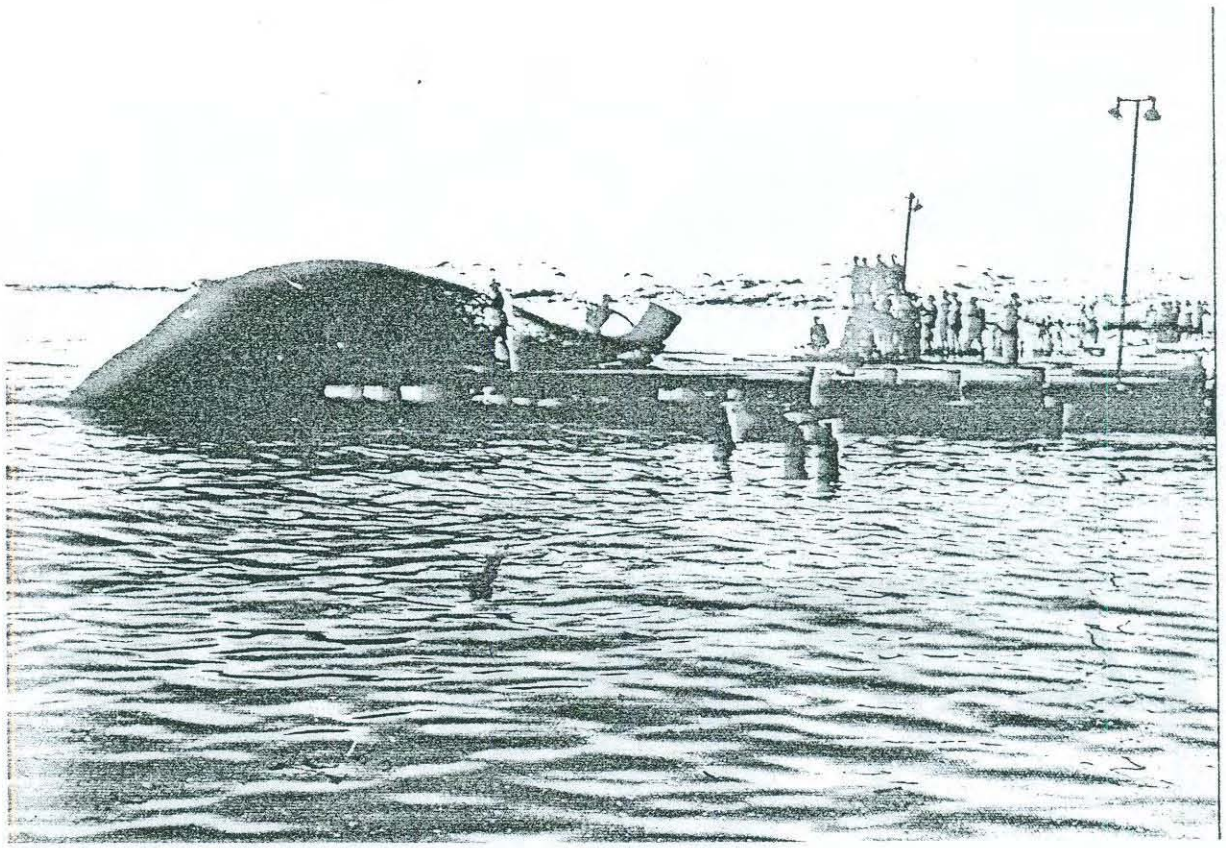


Fig. 34 Bringing a whale alongside the lower flensing deck (c.a.1950)

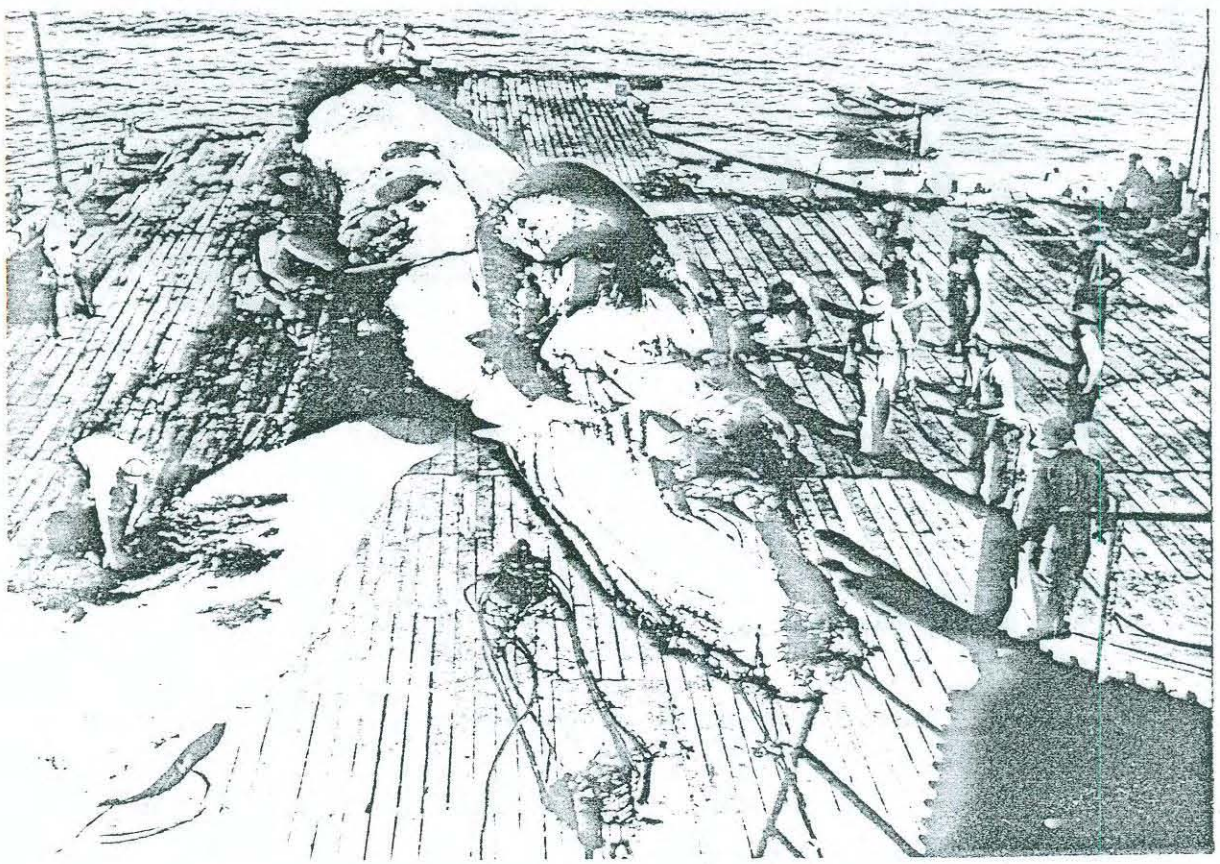


Fig. 35 Flensing a whale (c.a. 1950)

At the sea end of the framework are two twin cylinder steam winches mounted on a concrete ramp. These were used to haul the whales up the slipways onto the lower deck. When the Norwegians left the station, they plastered the winches (and other moveable machinery) with whale oil, which together with a coating of sand, protected them from seizing up. When cleaned, they were still operative, and were used until the closure of the station (Coleman, 1982 pers.comm.). In the years following, the winches were broken up by "scrap merchants" to obtain the brass bearings (Sledge, 1974, pers.comm. with Lefroy).

Morrissy (1982, pers.comm.) reports that in the early 1920's the whales awaiting processing were moored to buoys in the bay. Two elderly men would go out in flat bottomed punts with wire ropes and attach these to the whale. On a given signal, the whale would be unshackled from the buoy and winched ashore. As Tønnessen and Johnsen (1982:39) point out, the importance of the steam winch cannot be underestimated. Prior to its invention, the whales had to be towed to the shore station and attached at high water as far up the beach as possible. Flensing had to be done at low water in the shortest time, before the tide turned.

After the whale had been flensed on the lower deck (Fig. 35), the carcass was hoisted up to the upper deck in three pieces. The head was sawn off with a steam (or "mechanical") saw, and the rest cut into small pieces. After being moved further along the deck, the meat was stripped off to the bone. Blubber, meat and bone were then placed into separate digesters, the flippers, tail, fin and backbone being added to the bone digester (Morrissy, 1982, pers.comm.).

Underneath the flensing deck platform on the northern side, are the remains of four digesters, 2.46 m in diameter and 3.6 m high (see Fig. 36). A number of supporting stands indicate the positions of other digesters, several of which were found lying elsewhere on the site.

Based on the positions of the steel uprights it was found that four rows of ten digesters could be fitted underneath the frame. This number corresponds with figures given by Stewart-Dawkins (1929). He states that the floor of the platform which was covered with 'chequer plating and stout timber' was 'trimmed to secure the tops of the 40 steam Boiling down Digesters which are erected under the platform and are fitted with removable covers to facilitate easy handling and treatment of the raw materials' (1929:10). The digesters had a capacity of 50 tons and were built of steel.

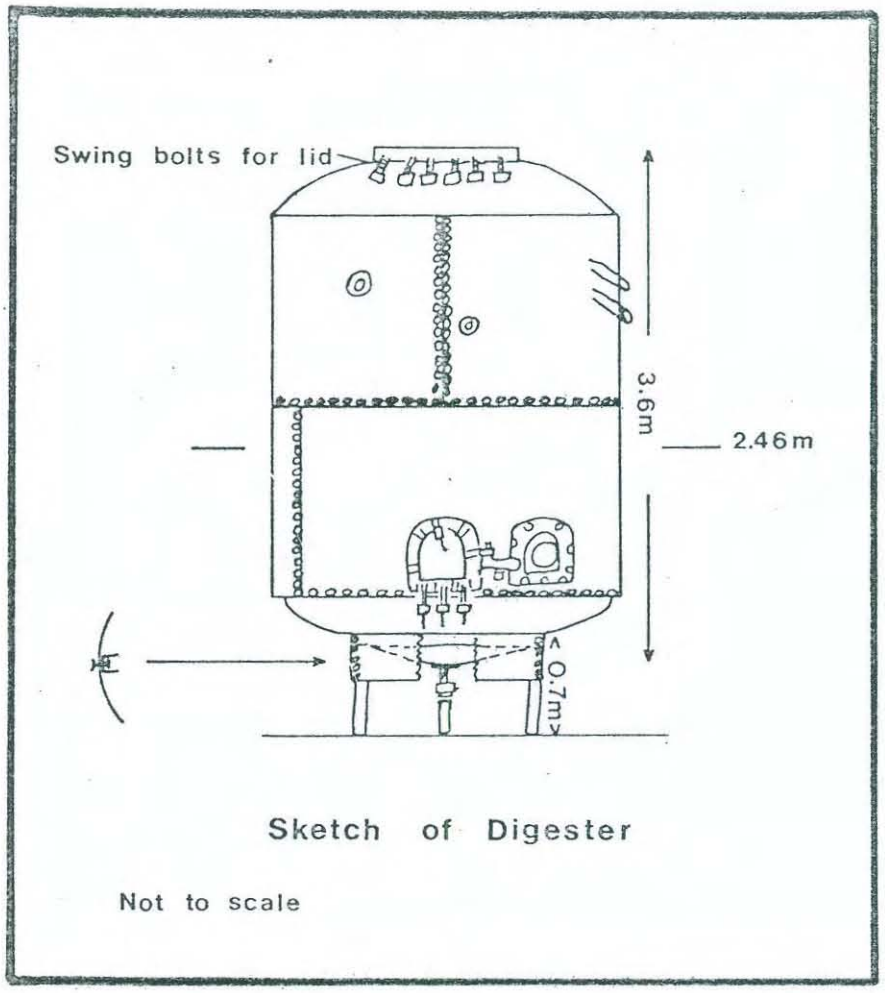


Fig. 36.

The liquidator's list indicates that the North West (Aust.) Whaling Co. Ltd. owned 40 enclosed steam digesters complete with steam and internal fittings in addition to open digesters. Morrissy (1982, pers.comm.) recalls however, that there were only 16 digesters in operation in 1924. The additional digesters must, therefore, have been erected after this date, possibly just prior to the Company's liquidation.

Various types of boilers are associated with different functions, and their operational principles also differ. They are illustrated and described in detail by Tønnessen & Johnsen (1982).

Essentially, the open digesters were used for boiling the blubber whilst the closed digesters (or pressure cookers) were used to boil the meat and bone (Tønnessen & Johnsen, 1982:40). The main difference between the two was that they operated on different boiling principles.

In the open digester, none of the contents was run off during the boiling process but remained in the cooker until a few hours after boiling had ceased. The oil, which had by then floated upwards, was drained off into clearing tanks, and the grax and gluewater removed from the bottom. By contrast, in the pressure cooker, once the boiling process had commenced, the oil and gluewater were each separately blown out of the boiler with the aid of steam pressure. A grid situated a little way up from the bottom allowed the fluid material to pass out while the solid residue (grax) was left behind. After the boiling process was complete, the latter was raked out via a hatch near the bottom of the boiler - a job detested by the whalers (Tønnessen & Johnsen, 1982:40). The grax was then dried and ground into whale meal for use as animal feed or fertilizer.

The early types of digesters were fairly expensive to run, consuming a considerable volume of steam and in consequence, large amounts of coal and water. Gradually, however, their efficiency was improved until cookers, such as the Hartmann(1) and Kvaerner(2) models, were developed which could deal with the bone, meat and blubber all together (Stephens, 1982: pers.comm.).

To the north of the flensing platform are two large soaks (or "dams") with a little brackish water. On the Blueprint , water pipes are shown carrying water from a 'reservoir' situated somewhere to the north of the flensing deck to various parts of the site. From the 1925 inventory, it would appear that a 3 inch steam water pump was used to pump water from the soaks to feeding tanks for the boilers. Opinions as to the quality of the water appear to vary. Norwegian reports indicate the water was of a generally poor quality (Tønnessen & Johnsen, 1982:224), whilst Stewart-Dawkins (1929:23) states that the drinking water was 'pure and good'. The latter view is upheld by Morrissy (1982, pers.comm.) who indicates that the quality of the water depended on the amount drawn off. As the water levels in the wells diminished, so the quality deteriorated. Special tanks were provided for storing drinking water and several of these were found in various parts of the site, notably close to the mess quarters.

(1) The so-called Hartmann apparatus was a rotary cooker, first designed by the German engineer August Sommermeyer and constructed by the firm of R.A. Hartmann of Berlin in 1911. For details see: Tønnessen & Johnsen, 1982:256ff.

(2) The Kvaerner cooker, developed in 1930-31 by the firm of Kvaerner Brug of Oslo, was based on the same principle as the Hartmann cooker but differed in its construction. The largest Kvaerner cooker had 50% greater capacity than any previous apparatus and provided a strong competition for the Hartmann models: see Tønnessen & Johnsen, 1982:707ff.

Also scattered throughout the site are square steel tanks (2.16 m x 1.55 m x 1.55 m) with reinforced corners and circular openings. Adjacent to the ablution block on the west side of the site, ten of these have been buried in the beach berm with openings uppermost to form a sea wall (Fig. 30). According to Stephens (1982, pers.comm.), the square tanks were used in the 1950's as receiving tanks on top of the oil room where the oil was purified: the oil was gravity fed from these to the purifying machines. Whether this was their purpose in earlier days is not known.

From the Blueprint, it would appear that oil from the digesters was fed into 'clearing tanks' and from these to the oil storage tanks, without any intervening processing. Oil was generally left standing in the clearing tanks for a day or so in order that the sediment could sink to the bottom. In the 1925 inventory the 'settling tanks' are cited as being 30 tons and 25 tons suggesting tanks of much larger dimensions than the square tanks.

Shipping the oil from the shore station was a problem for the Norwegians and later operators alike. The passage through the reef into Norwegian Bay was hazardous and large vessels preferred to anchor outside. Indeed, it was not until 1953 that a sizeable vessel negotiated the reef entrance for the purpose of loading whale oil: this was the Norwegian motor tanker *Sandar*, under charter to the Nor'West Whaling Company (Moore, n.d.).

In the days when the Norwegians were operating the station, Morrissy (1982, pers.comm.), reports that the oil was taken away by the mother (or factory) ship. These vessels never came inside the reef to load oil, but stayed at anchor in the waters outside. Oil, therefore, had to be delivered to the mother ship in lighters. From the large storage tanks, oil was pumped directly to compartments (50' x 20' x 6') in the lighters and from there to storage tanks on the factory vessel. Lighters were also used to tranship the sacks of guano and pick up supplies. It is possible that oak barrels were originally used to transport the oil as some early photographs of the whaling station show stacks of wooden barrels similar to those forming the foundations of the oil storage tanks. However, there is no mention of wooden barrels on the inventory of 1925, strongly suggesting they had fallen out of use.

In the post World War II period of whaling, the oil was collected by overseas tankers. But the problem of transhipment remained: few vessels were prepared to negotiate the reef passage. Purified oil was now shipped in drums and taken to the tankers on landing barges. Obtaining empty drums for filling was perhaps the biggest problem of the time as these had to be brought from as far south as Albany and north as Darwin (Moore, n.d.).

SUMMARY AND CONCLUSIONS

The remains of the Norwegian Bay Whaling Station represent a period of shore-based whaling dating from 1915 to 1957. Once hailed as the most modern station of its kind in the world, its rusting structures and equipment are now the only testimony to its Norwegian innovators.

Built at a time of rapid expansion in Norwegian whaling technology, the station was a landmark in the transition from the 'old' to the 'modern' methods of whaling. The equipment installed was the most up-to-date of its time and was designed to 'increase the processing value of the raw material by means of a complete exploitation of its potential'. (Tønnessen & Johnsen, 1982:252).

Catching techniques had been vastly changed with the development of the steam driven whale chaser and the grenade harpoon and larger quantities of raw materials had to be processed. Unless this was done quickly and efficiently, the result was poorer quality oil and a high level of wastage from putrefaction.

The early twentieth century, therefore, saw considerable advances in the techniques of boiling the blubber, meat and bones to ensure the complete extraction of oil. In addition, new equipment was designed to utilize the solids of the whale, the grax, thus maximising the use of the entire raw material.

Throughout the intermittent use of the shore station at Norwegian Bay, many of the original installations remained operative until the last. Changes were inevitable following periods of disuse and cyclonic damage, but Norwegian engineering still made its presence felt. New, and more modern whale cookers, in addition to other equipment, continued to be imported from firms in Norway.

In 1957, when the station finally closed down, most of the serviceable equipment was taken to Carnarvon. Over the years, human salvors have likewise removed anything of value from the site. All that remains at Norwegian Bay now stands in remembrance of the humpback whales which were once caught in these north western coastal waters, and the men who hunted and processed them.

Specifications of Whale Catching Steamers which operated at Point Cloates Whaling Station last season, 1928.

	Tonnage	Type	HP	Cylinders	Dia.	Stroke	Length	Breadth	Depth
S.S. Fynd	168 154-56	Triple "	71	3	12" 20" 32"	24"	104'	20'2"	11'8"
Ingeborg	160 155-57	Triple	80	3	12" 20" 33"	24"	104'1"	20'3"	11'8"
Hauken	172 168-62	Triple	80	3	12" 20" 34"	3"24"	110'7"	20'8"	11'6"
Havorn II	224 213-77	Triple	84	3	12" 19" 33"	24" 5"	110'1"	22'1"	13'3"

The principle Builders of this type of ship were:

Smiths Dock Coy - Middle Bros. Eng
W.V.V. Lidgewood - Coathbridge. Eng
Nylands Verkoted - Oslo, Norway

N.B. Imported whaling steamers are now allowed to enter the Commonwealth "Duty Free"

(Stewart-Dawkins, 1929:26)
Battye Library, Acc.No.1497A.Ms.223

APPENDIX 2

Point Cloates Whaling Station

Liquidator's List

Property belonging to Norwegian Bay Whaling Co.

4	1½ inch patent tackle
4	Settling tanks (2 each 30 tons, 2 each 25 tons)
1	New steam pump for settling tanks 2 inch
	Machinery for blubber factory including: Elevator, Engine, and Blubber cutter and fitting
1	New winch, double for heaving up whales
1	Oil lighter fitted with pump 3 inch for 25 tons
2	Combined oil water and cargo lighters each 30 tons
1	Wooden water lighter, 18 tons
1	Flat bottomed punt
1	Power bone saw (top platform)
3	Winches on top slip
1	Centrifugal pump and steam engine for driving same
	Piping leading into digestor
	Steam piping for digestor renewed by Norwegian Bay Whaling Co.
	Decking on top platform renewed by Norwegian Bay Whaling Co.
1	3 inch Steam water pump from soaks to feeding tanks
2	New Cockran boilers (750 square feet and 1,000 square feet)
1	Second-hand Marine boiler (750 square feet)
1	Feed pump 2 inch
	Shelter for boilers (Corrugated Iron)
	Manager's House (6 rooms, bath and kitchen)

Guano Factory

1	Bone Crusher
1	New Disentigrater
5	Prams
2	Sheds containing consumable stores
	Spare boiler tubes (400) for four boilers
	Quantity of wire ropes
5	Forerunners and one whale line and coils of rope
	Quantity steel flexible hose
	Quantity whale towing chains
	Quantity Grenades 2¼ inch tap
	Piping for tankers decks (outside)
	Galvanized and steam piping on top of girders in roof and some on floor

Outside

	Stack of iron plates
	Quantity of iron and steel bars and angles
	Rack containing different sizes galvanised pipes
	Quantity of Fire bars
	Steam oil pump 3 inch connected with oil tanks
500	Tons approx. Welsh coal
10	Tons coal in bags
100	Tons whale bones

Workshop

1	Lathe
81	Harpoons
	Water and steam pipe on girders in roof
2	Cylinders and pistons for motor boats
1	Hand force pump
1	Steam pump
	Racks containing fittings, steam and water

Property belonging to the North West (Aust) Whaling Co. Ltd.

The List

3	Large marine type high pressure boilers
1	Vertical marine Cockrane high pressure boiler
6	Worthington type Horizontal feed pumps
4	Single cylinder horizontal feed engines
40	Enclosed steam digesters complete with steam and internal fittings
3	Oil storage steel tanks (size 32' diam x 19'6" high capacity about 100,000 gallons each).
	Steel tanks of various sizes consisting of open top digestors
	Oil clearing and water tanks
6	Enclosed bucket elevators
2	Revolving brakers, complete with bone mill and hopper etc.
2	Latest type patented vertical dryers
1	Horizontal revolving dryer and furnace
1	Hot air furnace
1	Hexagonal revolving screen and screw conveyor
1	9" buffalo blower with piping and connection
1	12" exhaust fan with piping and connections
1	Thume patent engine
1	Likestrom dynamo with switch board self starter and all fittings necessary for electric lighting
1	Engineers 6" lathe
1	Engineers screwing machine
1	Engineers drilling machine
1	Engineers planing machine
1	Engineers punching machine
1	Engineers power hack saw
1	Double head emery grinder
1	Oxyacetylene plant
1	Complete tramway system throughout works and jetties with turntables, steel tip wagons (25) and 4 trucks
1	Main jetty 200' long strongly built andprovided with double set of tram rails steam winch and crane at head
1	Platform 115' x 83' complete system of water, oil and steam and fittings as arranged throughout the works and jetty
1	Motor launch 38' in length fitted with a 25hp semi diessel engine
1	Ship's boat
	Quantity of anchor chain
	Large mooring anchor

4	2 ton anchors (used for moorings)
1	large steam winch
1	large set valve reseating tools
1	Ratchet drill with attachment for angle work
1	Breast drill
4	Engineers ratchet braces
2	Carpenters ratchet braces
2	Ratchet clamps
1	Ratchet pipe screwing stock with dies 1 3/4" to 3"
1	Set Cleveland No. 42 pipe screwing stocks and dies
1	Set Cleveland No. 44 " " " "
1	" " No. 45 " " " "
1	Set Little Giant No. 150 taps and dies $\frac{1}{4}$" to $1\frac{1}{2}$"
15	Whitworth taps 7/8" to $1\frac{1}{2}$"
13	Gas taps $\frac{1}{4}$" to 1 3/4"
16	Assorted taps $\frac{1}{4}$" to 3/4"
13	Tap holders
11	Punching machine dies
2	Punching die holders
3	Ratchet drills $\frac{1}{2}$" to 1"
31	Morse taper twist drills $\frac{1}{4}$" to 3/4"
32	Morse taper twist drills $\frac{1}{4}$" to 1 3/4"
1	Duck chuck
3	Boiler reamers
3	Small reamers
3	Belt punchers
20	Machine punchers $\frac{1}{2}$" to 3/4"
2	Bears for punching plates
3	No. 2 Barnes pipe cutters
1	No. 3 Barnes pipe cutters
1	No. 4 Barnes pipe cutters
1	Bolt cutter
12	Spare cutters (small size)
45	Trenches (medium size)
12	Spare cutters (large size)
9	Pipe wrenches (1/10", 1/14", 2/20", 2/24", 1/27", 1/36", 2/22")
	Stillson wrenches (1/10", 1/17")
2	No. 2 Alligator wrenches
1	No. 10 Tiger pipe grip
15	Spare rings for Stillson wrenches
1	No. 20 pipe grip
1	No. 30 Tiger grip
1	20" pipe grip
1	24" pipe grip
2	46" chain tongs
1	No. 2 Vulcan chain pipe vice
1	Parallel bench vice 5"
3	6" leg vices
1	Spur wheel 2'6" diameter
1	Propellor blade
7	Air cocks for pumps
	Semi rotary pump
	Cakes of magnesite
	Set guage glass mountings

	Elbows
	Nipples
	2" plug cock
	2" flange
	3½" C.L. reducer with brass cock
	7" C.L. Bend
	C.I. Tee 3 3/4" x 3 3/4"
	Hand levers for winches
	Foot lever for winch
	Winch pulley
	Blubber cutter blades
	Elevator links
	Cylinder cover 13" diameter
	Quantity of nails
1	B.B. elevator link chain
1	Length flat packing 12" x 58"
1	Piston head
27	Guage glasses ½" x 10½"
20	Guage glasses ½" x 14½"
6	Guage glasses ½" x 16"
1	Buffalo blower
1	Gun
1	Portable pipe vice
6	Tube expanders
	Shifting spanners
1	Carpenters spanner
6	Box spanners
6	Sledge hammers
2	Sets hammers
6	Hand hammers
6	Chipping hammers
1	Top swagers
2	Bottom swagers
3	Fullers
1	Sterling emery wheel
	Quantity of long screws
	Quantity caps
	Quantity reducing sockets
	Quantity nipples
	Quantity union joints
	Quantity brass steam valves with flanges
	Quantity brass steam valves without flanges
	Quantity brass steam taps flanged box
	Quantity brass steam taps screwed hose couplings
2	Thrust washers
4	Steam cocks assorted
7	Steam guages
2	Pieces copper piping flanged for winches
	Brass rod
	Quantity pieces packing asbestos
7	Balls asbestos twine
	Quantity steam piping
	Quantity water piping
	Quantity old belting
3	Semi rotary pumps
4	Chain slings

2	5" 20ft long steel wire straps
35	Lengths angle steel 2" x 5/16ths each length 18ft.
4	Each plasterers trowels squares and wooden trowels
15	Sections tramway rails and sleepers
38	Stell straps or sleepers
	Quantity of anchor chain
	Quantity of angle iron for tanks
	Quantity 2" x ¼" angle iron
8	2" lengths angle iron
16	3" lengths angle iron
6	Bags assorted sheaves
	Cooper's bench
10	Pieces coopers tools
70	lbs. brads for casks
56	lbs. brads for hoops for casks
6	Bags assorted bungs
160	Sheets Muntz metal
1	Coil (90 fathoms) 1 3/4" steel wire rope
1	Coil 2¼" steel wire
1	Set 16" blocks
2	Sets 14" blocks
	Quantity not quite in order
	Blocks
8	Bone saws
12	Meat forks
20	Rakes
16	Shovels
2	Patent tackles (not quite in order)
2	Large grindstones
1	Coil (120 fathoms) rope Manilla 2½"
12	Brushes steel wire
100	2cwt digestor bolts
10	Emery stones
3	Bulbs for Bolinda engine (motor launch)
2	Complete whale hauling tackles (consisting 180 fathoms steel wire rope 2½")
1	10" block
2	14" blocks
	Whale flensing tackles
100	Ft. steel wire rope 1 3/4"
4	Blocks large
3	Complete meat dragging tackles consisting each set 200ft. steel wire rope 2" - 2'10" blocks for same
4	Lengths hauling tackles, lengths each
	4" steel wire rope each
9	30lbs Chain slings about 8' long very heave
7	Leed blocks each 8"
2	Chain tackles patent each 1 ton
1	Hand winch
2	Grindstones power driven
	Bundles iron lagin from 3" x 1/8" to 1½" x 7/8"
	Quantity steam cross pieces
	Quantity steam T pieces
	Quantity water T pieces
	Quantity elbow pieces
	Quantity reducing elbows

	Quantity reducing couplings
	Quantity couplings
	Quantity plugs
	Quantity reducing nipples
	Quantity flanges
	Quantity nuts
	Quantity taps
	Quantity steam valves
	Quantity pipe fittings
2	Bottle jacks
1	15" hack saw
2	Pairs snips (1/9" and 1/14")
1	Saw set
3	Caulking chisels
1	Drift
5	Steel square 20"
1	Steel square 24"
6	Carpenters bits
1	Belt tightening frame
1	Bearing scraper
1	Harpoon straightening block
2	Smith forges complete with bellows and firing tools
3	Anvils
1	Ratchet crane
1	Small pipe carrier
1	5' double hand saw
1	7' double hand saw
5	15" single sheave blocks
4	15" treble sheave blocks
2	Chain blocks
1	Set coopers tools
3	1 7/8" S.C. bearings
6	2½" S.C. bearings
2	1 3/4" ordinary bearings
2	3" ordinary bearings
69	C.I. brusher for bearings
1	Pair shaft couplings
1	2¼" M.S. shaft 5' long
2	2½" M.S. shaft 2'2" long
1	2½" M.S. shaft 4' long with sprocket
1	2 3/4" M.S. shaft 7'3" long
	1½" S.C. bearings
4	6" whaling line forerunners
1	4" whaling line forerunners
	Granades 1450
2300	Concussion caps powder propelling
1362	lbs. bursting
1300	1500 detonators Taendskruer (primers)
600	Recylitide-brandrer
	Spare gun for whaler Fin (2nd hand)
	Spare gun stand for Fin
	Spare trigger for Fin's gun
40	Harpoons
15	Flensing knives
30	Flensing knives with handles

Guano shed (100' x 66' x 20')
Workshop (Blacksmith, Carpenter and Engineer) 60' x 34'
Hospital, surgery, firemen (6 rooms)
(Late Manager's office) 40' x 25'
Mens Quarters (10 rooms) 117' x 20'
Dining Room and Kitchen 50' x 75'
Storeroom and Bakehouse 40' x 35'
Foreman's Quarters 50' x 28'
Oil Shed 24' x 16'
Powder house 8' x 8'
Factory 120' x 100' x 15'

N.B. Misspelled words are as per liquidator's list and have not been corrected.

(Battye Library Manuscripts
Acc.No. 1497A)

APPENDIX 3

Whale Catches at Norwegian Bay

1913-1955, Based on Figures from Literary Sources

Year	Company	No.Whales Caught (Quota)	Oil	Guano
1913	Western Australian Co.	900	24,000 Casks	
1914	(Norwegian)	2,000	54,000 Casks	
1915		1,500	30,000 Casks	
1916		Not known	9,000 Casks	
Rest Period		Nil		
1921				
1922	North West (Aust)			
1923	Co. Ltd.	323		
1924				
1925	The Norwegian Bay	670		
1926	Whaling Corporation	740		
1927	(Norwegian)	999	2,225	
1928		1,036	35,400 Casks	532 tons
Rest Period				
1949	Nor'West Whaling Co.	194(600)	950 tons	
1950	Ltd.	348(600)		
1951		574(600)		
1952		536(600)		
1953		603(603)		
1954		600(600)	4,700 tons	
1955		500(500)		

Refs: Chittleborough, R.G. (1965)
Dakin, W.J. (1963)
Moore, R.B. (Nd.)
Stewart-Dawkins, R. (1929)
Letters relating to whaling (1925) (Battye Library)

Compiled by M. Stanbury

APPENDIX 4

North West (Australia) Whaling Company, Limited
(In Liquidation)

Statement of Whaling Operations Carried out at Point Cloates Western Australia, by the Norwegian Bay Whaling Company.

Season	Catch of Whales	Gross Realization of Products	Royalty Paid to Liquidator
June - Oct.			
1925	670	103,193.15.0.	5159.13.9
1926	740	130,741.13.4.	6537. 1.8
1927	999	139,896.18.4.	6994.16.11
1928	1036	180,000.0.0.	9000. 0. 0

Estimated Realization and Royalty for North West (Australia) Whaling Company, Limited (In Liquidation).

Liquidator

FORD, RHODES AND DAVIES
Chartered Accountants (Aust.)
St. George's Terrace,
Perth, W.A.
10th April, 1929.

(Battye Library, Acc.No.1497A)

APPENDIX 5

Copy of Agreement with the Australian Workers' Union

Season 1928

THIS AGREEMENT made this 6th day of June One thousand nine hundred and twenty eight between the NORWEGIAN BAY WHALING COMPANY in the State of Western Australia (hereinafter referred to as the Employer) of the one part and the AUSTRALIAN WORKERS' UNION - WESTRALIAN BRANCH (hereinafter referred to as the Union) of the other part witnesseth that for the consideration hereinafter appearing the parties hereto mutually convenant and agree the one with the other as follows.....

THIS AGREEMENT shall operate at or in connection with the POINT CLOATES WHALING STATION.

1. The employees shall work in the capacity of a GENERAL WORKER excepting those employed as cooks and waiters who have special agreement relating to wages.

2. The wages shall be 5 pounds 7 shillings per week commencing from date of embarkation and terminating on date when work ceases providing he gets transport the following day. In addition to the wages a bonus will be paid on the production of oil and guano on the following basis:

OIL	for the first	1,500 tons	1d per ton
	for the next	1,500 tons	2d per ton
	for the excess of	3,000 tons	2½d per ton

GUANO 1d per ton providing same is being produced.

The production of oil and guano will be published weekly at the Station, and a deduction of 5% will be made to allow for wastage, leakage, etc. Should an employee be engaged after the season has commenced his bonus shall be calculated on the oil and guano produced from the date of his engagement.

3. OVERTIME All time worked outside of, or in excess of the usual working hours shall be paid for the first four hours - tim and a half, double time thereafter. Sundays double time. Overtime shall not be paid to the kitchen staff (cooks, baker, butcher and waiters).

4. WORKING TIME The working time shall be 44 hours per week. Workers may be required to work shifts.

5. FOOD AND ACCOMMODATION The Employer shall provide the Employee with good and sufficient rations cooked by a competent person, and with hut accommodation, also free medical attention and medicine prescribed by the Doctor while on the Station, for which a charge of 30/- per wek is made, which sum the Employee agrees shall be deducted from his wages. (The Employee must find his own bedding including mattress).

6. The Employee shall not, during the course of his employment, engage himself in any strike for higher wages or conditions of labour not expressed herein.

7. In the event of an Employee committing any breach of this Agreement, or is incompetent, unable or refuses to perform the duties assigned to him, the Employer may dispense with his services forthwith, and return the said Employee to the nearest and convenient Port at first opportunity and such Employee shall not be entitled to the payment of any bonus.

8. TRANSPORT The Employer shall provide free passage to and from the Whaling Station and the Port of engagement including keep from the Station. Workers proceeding by the Company's boats shall, if required, work aboard without additional pay, but work in excess of 8 hours will be paid for.

9. ALCOHOLIC LIQUOR The Employee shall not bring on the Station or on board any Whaler or Transport any alcoholic drink.

10. GENERAL In the event of accident or sickness or other urgent necessity, the Employee (with the permission of the Employer first obtained) may terminate his employment, and in such event happening, he shall be paid his full wages and the bonus accrued determined by the Employer (whose determination shall be absolutely final). In the event of sickness the Employee shall be entitled to full pay for 12 days. In the event of accident compensation will be paid in accordance with the Employers Liability and Workers' Compensation Act of Western Australia.

THIS AGREEMENT is made without prejudice to any future or existing Agreement affecting the North West Coast of Western Australia, and shall be current from the date hereof until the termination of the Whaling Season, 1928.

GENERAL INFORMATION

RATES OF PAY

GENERAL WORKERS

£5.7.0. per week less 30/- per week for board and lodging and medical attention. In addition to wages a bonus is paid on the production of OIL AND GUANO as follows:

OIL	for the first	1,500 tons	1d. per ton
	for the next	1,500 tons	2d. per ton
	for the excess of	3,000 tons	2½d. per ton

GUANO 1d. per ton.

OVERTIME All time worked in excess of 44 hours is paid for the first four hours TIME AND A HALF, double time thereafter.
SUNDAYS DOUBLE TIME.

FIRST COOK

£6.0.0. per week in addition to board and lodging and medical attention.

OVERTIME No overtime paid.

BONUS The same as General Workers with the exception that 3d. per ton is paid on the production of OIL in excess of 3,000 tons in lieu of 2½d.

SECOND COOK

£4.10.0. per week in addition to board and lodging and medical attention.

OTHER CONDITIONS AS FIRST COOK

BAKER

£4.10.0. per week in addition to board and lodging and medical attention.

OTHER CONDITIONS AS FIRST COOK

BUTCHER

£4.10.0. per week in addition to board and lodging and medical attention.

OTHER CONDITIONS AS FIRST COOK

WAITERS

£5.7.0. per week less 30/- per week for board and lodging and medical attention.

OTHER CONDITIONS AS FIRST COOK

CARPENTER

£6.11.0. per week less 30/- per week for board and lodging and medical attention.

OTHER CONDITIONS AS GENERAL WORKERS

STOREKEEPER

£5.0.0. per week in addition to board and lodging and medical attention.

OTHER CONDITIONS AS FIRST COOK

DOCTOR

£12.12.0. per week in addition to board and lodging and first class transport to and from the Whaling Station.

SKILLED NORWEGIAN EMPLOYED ON STATION BROUGHT OUT FROM NORWAY

FLENSER	PAY	Kroner	190 per month
	LAY	Kroner	0.05 per cask of oil and Kroner 0.02 per bag of guano produced
OIL BOILER	PAY	Kroner	190 per month
	LAY	Kroner	0.05 per cask of oil and Kroner 0.02 per bag of guano produced

1ST HARPOONSMITH

PAY	Kroner	210 per month
LAY	Kroner	0.06 per cask of oil and
	Kroner	0.02 per bag of guano produced

2ND HARPOONSMITH

PAY	Kroner	190 per month
LAY	Kroner	0.05 per cask of oil and
	Kroner	0.02 per bag of guano produced.

The above men are engaged for one season only. Pay commences when leaving Norway and ceases upon arrival at their home port. Full maintenance, including medical attention and pay during sickness while out here. Free passage home.

ENGINEER AND FOREMAN EMPLOYED ON STATION AND BROUGHT FROM NORWAY

ENGINEER	PAY	Kroner	350 per month
	LAY	Kroner	0.08 per cask of oil and
		Kroner	0.05 per bag of guano produced
FOREMAN	PAY	Kroner	375 per month
	LAY	Kroner	0.08 per cask of oil and
		Kroner	0.05 per bag of guano produced

The above men's pay commences when leaving Norway and ceases upon arrival at their Home Port. Full maintenance, including medical attention and pay during sickness while out here. Free passage home.

WHALE BOAT CREWS

CAPTAIN	PAY	Kroner	350 per month
	LAY	Kroner	45 per whale captured by his boat.
STEWARD	PAY	Kroner	185 per month
	LAY	Kroner	5 per whale captured by his boat.
MATE	PAY	Kroner	210 per month
	LAY	Kroner	7 per whale captured by his boat.
SAILOR	PAY	Kroner	150 per month
	LAY	Kroner	5 per whale captured by his boat.
CHIEF ENGINEER			
	PAY	Kroner	325 per month
	LAY	Kroner	10 per whale captured by his boat.
SECOND ENGINEER			
	PAY	Kroner	260 per month
	LAY	Kroner	7 per whale captured by his boat.
FIREMAN	PAY	Kroner	160 per month
	LAY	Kroner	5 per whale captured by his boat.
DECK HAND	PAY	Kroner	125 per month
	LAY	Kroner	4 per whale captured by his boat.

The above men are signed on the articles of the ship and are subject to Norwegian Board of Trade Regulations.

TOTAL WAGES PAID TO MEN ON WHALING STATION DURING SEASON 1928 (EXCLUDING MEN BROUGHT FROM NORWAY)

£16,600.0.0.

TRANSPORT STEAMERS

VESSELS: S.S. "OURAL" and S.S. "THOR MINOR"

S.S. "OURAL" arrived at Whaling Station 19th June last year. Left Whaling Station on 21st August with the following cargo:

17,000 casks Whale Oil.

S.S. "THOR MINOR" arrived at Whaling Station 13th August last year. Left Whaling Station 4th October with the following cargo:

13,200 casks Whale Oil.

S.S. "THOR MINOR" returned to Whaling Station about 7th March this year and left on 26th with the following cargo:

7,425 casks Whale Oil
532 tons Whale Guano

TOTAL OF ABOVE SHIPMENTS OF WHALE OIL 37,625 casks of which about 35,000 casks equals 1928 catch balance being 1927 production.

GUANO The whole of the guano shipped by S.S. "THOR MINOR" in March this year represents 1928 production.

COST OF CHARTERING TRANSPORT STEAMERS 1927

Kroner 208,479.73 (£11,455)

COST OF LOADING AND DISCHARGING CARGOES, 1927

Kroner 58,280,58 (£3312)

KRONER about 18.20 equals £1 sterling

CASKS OF WHALE OIL About 6 casks equals 1 ton

BAGS OF GUANO About 11/12 bags equal 1 ton

Permission has to be obtained from the Secretary of Home and Territories Department, Melbourne to bring out skilled Norwegians for work on the Whaling Station.

(Battye Library, Acc.No.1497A)

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