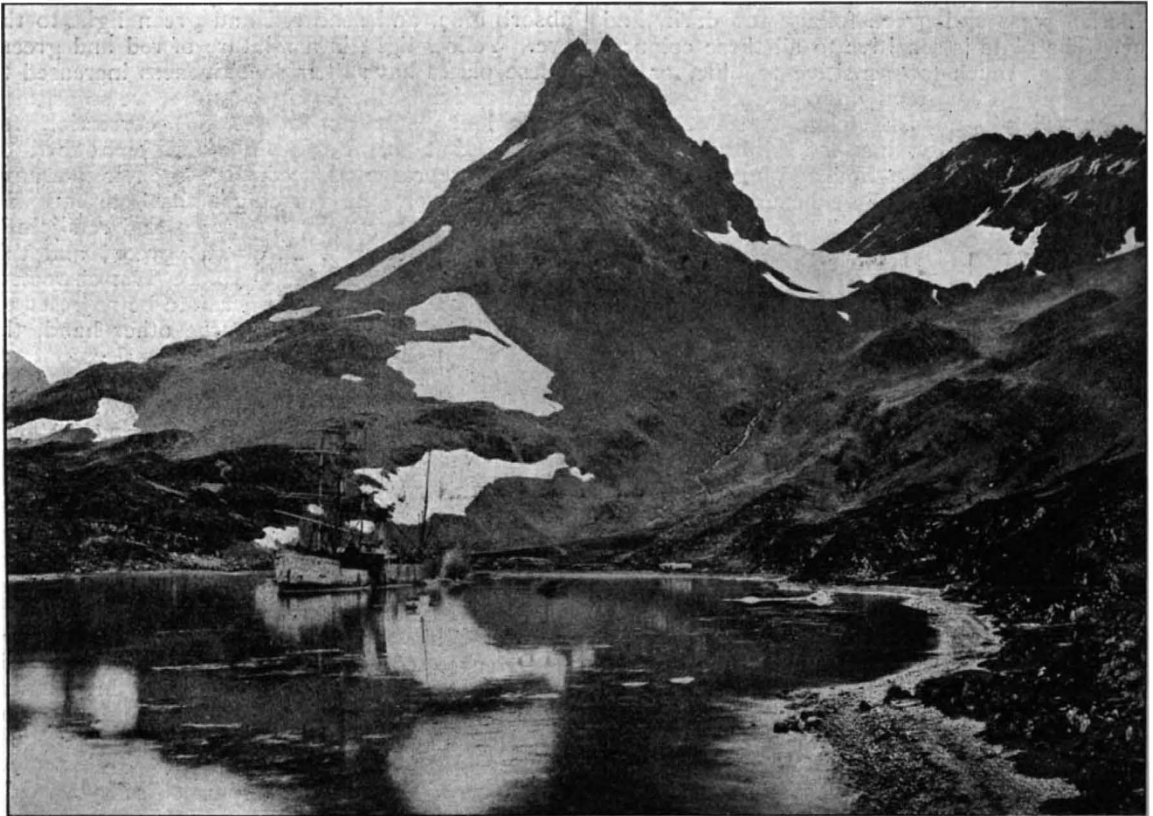


WHALING IN SOUTHERN SEAS.

MR. THEODORE E. SALVESEN makes a very interesting report¹ on the whale fisheries of the Falkland Islands and dependencies. Whaling in southern seas began, he tells us, with the eighteenth century, the first British fleet of twelve vessels sailing in 1725. They went after sperm whales or cachalots (*Physeter macrocephalus*) and southern right whales (*Balaena australis*), which were harpooned from rowing boats. In the first half of the nineteenth century there were as many as 500-600 whalers so employed—wooden sailing ships, complete in themselves, the blubber being rendered into oil on

physalus), to the small fish whale (*B. borealis*), and to the humpback whale (*Megaptera boops*)—all of them often called “finners.” As they are more active than the sperm whale and the right whale and only awash for a very short time when breathing, and as they sink after being killed, they were left entirely unmolested in the old days. But now their turn has come.

It was a Norwegian captain, Svend Foyn, who worked out, in the north, about 1866, the method of capturing finner whales, and his devices, with improvements, are now in use by all the modern whaling companies. The whale-catcher is worked by steam, not by men with oars; the whale gun is a finely fashioned cannon; the harpoon carries



Floating factory S.S. *Restitution* of North Shields, Possession Bay, South Georgia. From “Report on the Scientific Results of the Scottish National Antarctic Expedition.”

board. But this kind of vessel is now practically unknown, its place having been taken by the modern steam whaler; and the venue has changed, in the far south at any rate, from sperm whale and right whale to the finners. The sperm whale is seldom met with in the waters round the Falkland Islands and dependencies, its normal habitat being in warmer zones, and the southern right whale is no longer specially sought after, since the price of baleen has fallen so low. Thus attention has been directed to the blue whale (*Balaenoptera sibbaldii*), the largest living animal in the world, to the finner whale (*B. musculus* or

a shell, the whale line is connected with springs or accumulators; if the whale be not mortally wounded the gunner plays it as an angler his salmon; to keep the carcass afloat it is inflated with air by means of a steam air-pipe from the engine-room! Everything is specialised. And another difference as compared with old days is that the reduction of the carcass is accomplished in a factory on shore or in a large vessel (up to 7000 tons) moored in a harbour.

Besides the baleen, which no longer pays well or at all, and the oil which is graded into qualities according as it comes from the blubber, the fat of the tongue and kidneys, the flesh and bones, and the refuse, there remains the dried flesh and bones.

¹ “Scientific Results Scottish National Antarctic Expedition,” iv. (1914) pp. 475-486, 10 plates and map.

The absolutely fresh flesh is used to form whale meat meal, a nutritious and wholesome food-stuff, containing $17\frac{1}{2}$ per cent. proteid, largely used for feeding cattle. From the remaining flesh and about a third of the bones whale guano is made; and from bones alone, bone meal.

The modern whaling operations were started by Captain C. A. Larsen in 1904; and his satisfactory results led to the formation of a large number of companies, which now carry on, in the dependencies of the Falkland Islands, the largest whaling business in the world. The season from November 1, 1912, until the end of April, 1913, yielded, at South Georgia, about 5000 whales (52 per cent. humpbacks, about 42 per cent. finners, and about 6 per cent. blue whales). These produced about 200,000 barrels of oil and about 8000 tons of guano. At the South Shetlands and Graham Land the much shorter season yielded also about 5000 whales; at the South Orkneys the still shorter season yielded about 800 whales; at the Falkland Islands only 87 whales were brought in. The total production was about 430,000 barrels of oil—more than half the world's output for that season—and 8375 tons of guano, the gross value being about 1,350,000*l.* sterling. The industry gives employment to about 3500 men. The report is a business-like document, very lucidly presented by one who evidently knows what he is talking about. No indication is given of the probabilities of continuance. We hope that the shortness of the season will suffice to give the finners a chance for many a year to come.

CHEMISTRY AND INDUSTRY.

WE live in an age of specialisation; in no era has the statement that "monomania is the secret of success" approached more closely to the truth. Business is an instinct, chemistry a science, and although it is conceivable that it is of advantage for the chemist to possess some business instinct, and for the business man to have some knowledge of chemistry, the combination in one person of acute business instinct and scientific genius is so rare as to be negligible. Both these great qualities are needed for the solution of our industrial problems—the nation lacks neither the one nor the other, but they reside in different individuals who possess entirely different types of mind. Co-ordination is the sole solution.

It has been stated that the German chemical industries have been built up by men who possess both business acumen and scientific ability. This is not the case. Men of science, such as Caro, Berntsen, Gläser, and Graebe, and business men such as Brünck, have collaborated, and the collaboration has been successful.

Again, it is remarkable that this country should have adopted the view that there is some essential difference between the scientific chemist and the technologist; the former is dubbed "theorist," and is ignored; the latter is the "practical man,"

and is belauded. One of the chief reasons for German success lies in the fact that they have realised that the terms man of science and technologist are complementary, that the one must discover while the other adapts.

No chemical process, unless it is based on mere rule of thumb, can be discovered without the aid of the knowledge and experience which can only be gained by many years of scientific training. Such discoveries have to be made and worked out, in the first instance, on the laboratory scale, and this is the province of the scientific chemist. The discovery having been made, and the conditions for production, dictated by considerations of economy, having been determined, it is then the business of the technologist to adapt the process to commercial conditions. It is the lack of a true appreciation of these matters which has hampered the development of scientific industry in this country, especially in those directions in which highly trained specialised knowledge is required.

At the present time many potentially useful discoveries are made in the chemical laboratories of our universities, university colleges, and technical schools, and there are isolated instances in which enlightened manufacturers have made use of them, but in the majority of cases the scientific worker has found by sad experience that little financial profit accrues to him even though he goes to the trouble of obtaining patent protection. He is so rarely a man of business that, if he co-operates with a manufacturing firm, his elimination, from a financial point of view, is usually an easy matter. In consequence, the greater number of scientific chemists, to whom the joy of discovery is everything, and the adaptation of minor importance, prefer to publish their discoveries in the scientific periodicals, where they serve as useful suggestions to others both at home and abroad.

This unfortunate and wasteful condition of affairs can be altered if some body in authority would undertake to organise the scientific ability which is available in our educational institutions. The function of this organising body would be to receive from and to make suggestions to manufacturing firms, and to allot the problems to the scientific laboratories. The scheme would in no way affect the works laboratory, which would still fulfil its proper function of adapting the scientific details to commercial conditions. Moreover, the works laboratory could be recruited from the scientific laboratory, as is the case in Germany, by the enrolment of those men who show themselves fitted by temperament for such work.

It must not be imagined that this article is in any way a plea for the curtailment of research in pure science, which means research of a purely abstract kind, having for its object the discovery of the natural laws underlying the science, and which is, of course, absolutely indispensable. It is merely stupid to decry this form of research or to speak of its apparent lack of utility; if the laws of organic chemistry had not been determined by abstract research there would have been no coal-tar industry.