
Spitsbergen in 1914

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Source: *The Geographical Journal*, Vol. 46, No. 1 (Jul., 1915), pp. 10-21

Published by: geographicalj

Stable URL: <http://www.jstor.org/stable/1779957>

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I cannot conclude without some reference to the services rendered by Sir Duncan Johnston during several years, as one of our Honorary Secretaries. During the past year he has, at my request, though living at Edinburgh, continued to work for the Society, and it is impossible for us to impose on him a further tenure of office. We shall, I believe, find a very competent Honorary Secretary in Mr. Maudslay, whose travels in Central America have led to important results touching both on geography and archæology.

SPITSBERGEN IN 1914.*

By R. N. RUDMOSE BROWN, D.Sc.

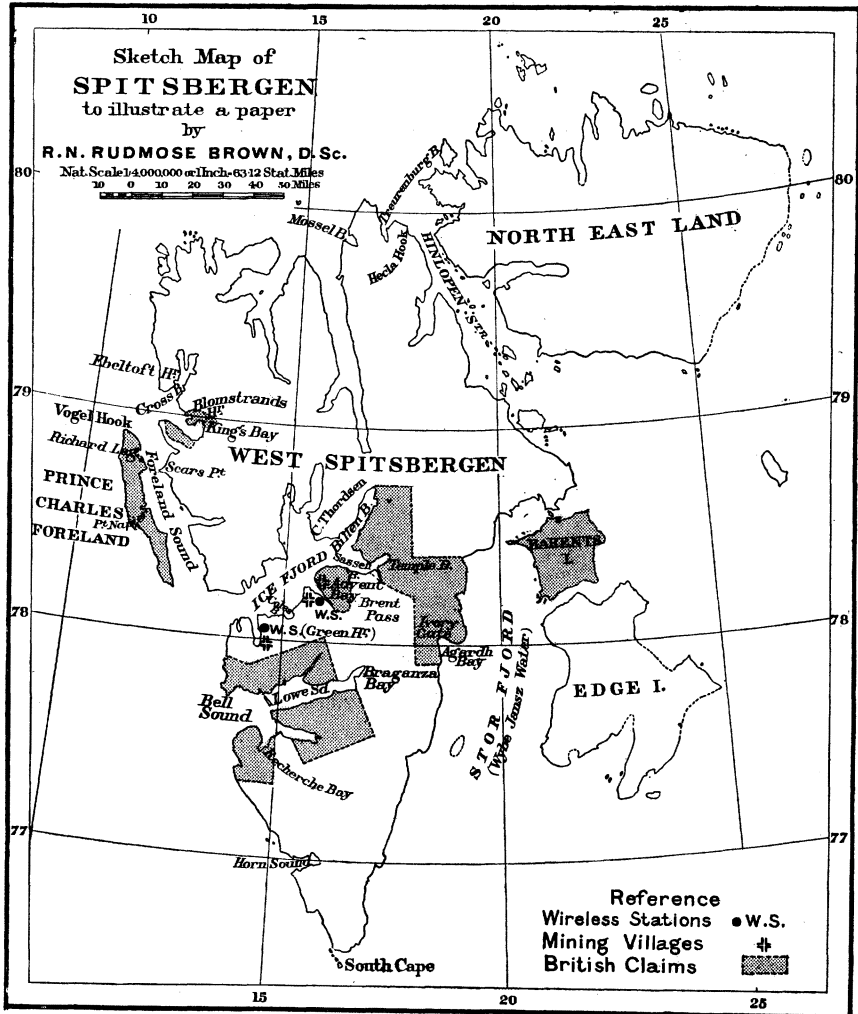
EARLY in July, 1914, Dr. W. S. Bruce left Edinburgh on his eighth expedition to Spitsbergen. The expedition was supported by a grant from the Royal Geographical Society, as well as another of the same amount from H.S.H. the Prince of Monaco. The greater part of the outlay, however, was borne personally by the members of the expedition. Dr. Bruce was accompanied by Mr. J. V. Burn-Murdoch, who had visited Spitsbergen in 1907 and 1909; Mr. R. M. Craig, B.Sc., of the University of St. Andrews; and Mr. J. H. Koeppern. Tromsø was reached on July 17, and there was chartered a sailing ketch of 46 tons, the *Pelikane*. Owing to the scarcity of funds it was impossible to charter outright this Norwegian ship and have absolute command of her movements. Consequently it was arranged that she should be allowed to carry a cargo of petroleum to the Norwegian wireless station in Green Harbour, and a cargo of coal to the meteorological station at Cross Bay on the north-west. The arrangements stipulated that after she had discharged these cargoes, the *Pelikane* was to be at the disposal of Dr. Bruce, and her captain to be under his orders. It is necessary to say this by way of explanation of the difficulties which later arose.

The objects of the expedition were twofold. Firstly, to carry on hydrographic and geological research in the little-known Wybe Jansz Water (Stor-fjord) on the east of Spitsbergen; and secondly, to investigate further the geology of Prince Charles Foreland on the west.

Dr. Bruce's plan was to be landed on the shores of Wybe Jansz Water with a boat. Two men would remain with him, and meanwhile the ship was to go round to the west coast, discharge her cargoes, land the remainder of the expedition on Prince Charles Foreland, and then return to the east to pick up Dr. Bruce and his party to conduct hydrographical

* Royal Geographical Society, March 22, 1915. Dr. W. S. Bruce, who was to have given this paper, left England in March before he had written it. The present paper is written with the help of his notes, supplemented by my personal knowledge of Spitsbergen.—R. N. R. B.

research. In the event of the *Pelikane* not returning to the east, for one reason or another, Dr. Bruce had a line of retreat by crossing Spitsbergen by the easy route from Agardh Bay to Ice Fjord by the Ivory Gate, the Brent Pass, and Advent Dale to the American coal-mine in Advent Bay. This route had been followed by Sir Martin Conway in 1896, and



in 1912 Dr. Bruce and I had traversed part of it on our journey from Temple Mountain to Advent Bay without encountering any serious difficulty.

In Tromsø the Expedition heard many discouraging reports of the state of the ice around Spitsbergen; but it left on July 25, and steered straight for Wybe Jansz Water. On August 3 the *Pelikane* was at the entrance to that fjord. On several days efforts were made to enter it,

but all failed on account of its being filled with heavy pack from Edge Island to 40 miles south of South Cape. Dr. Bruce decided, therefore, to make for Green Harbour and Cross Bay to get rid of the *Pelikane's* cargo, and then decide if another attempt should be made.

In the early summer heavy pack on the east and to the south of Spitsbergen is not uncommon. It comes from the Arctic Ocean, passing south between Franz Josef Land and Novaya Zemlya. Streams of it frequently pass to the west coast round the South Cape. This pack collects in Wybe Jansz Water and in bays on the south-west coast, notably Horn Sound and Bell Sound. Ships approaching the west coast of Spitsbergen are often met by streams of loose pack some distance from the coast in early summer. But if these streams cannot easily be traversed, they can usually be circumnavigated—as a rule by steering east towards the land and getting in behind the stream between the ice and the land. In late July and August there is seldom any pack to be seen on the west coast and its bays, while Wybe Jansz Water is often open. The more northerly bays on the west coast are easier to approach, even in early summer, though in a bad year I have seen Ice Fjord blocked in August. But all the ice on the west coast in summer comes round by the south. Ice conditions proved to be exceptionally bad in 1914.

In Green Harbour Dr. Bruce and his party first heard of the war. Delayed by unfavourable weather, combating heavy ice, and then finally hearing that Europe was ablaze with war, and receiving only news of German manufacture, the expedition was confronted with utterly unforeseen circumstances. However, the *Pelikane* was a neutral ship, and part of her contract was to deliver coal to the German scientific station in Cross Bay. Dr. Bruce had no power to cancel this obligation, and the captain insisted on fulfilling it. Therefore, unless the expedition was to be abandoned and the explorers to leave the ship, trusting to find another on which to return to Norway, the visit had to be made to Cross Bay. Dr. Bruce and his companions then decided to attempt first to carry out part at least of their programme. A suggestion by Dr. Bruce to transfer the coal to some other Norwegian vessel in Spitsbergen waters was held by the Norwegians to be a breach of contract and an inadmissible policy.

The *Pelikane* therefore left Green Harbour for Foul Sound (Foreland Sound). Unfortunately, the incompetent captain put his vessel aground off Michael Sars Point, but the opportunity was taken of doing some theodolite work ashore to check the relationship of Prince Charles Foreland to the mainland. An extraordinary current at fully 3 knots was found to run past this point with the rising tide. Eventually the *Pelikane* was floated by jettisoning half the German coal, and she proceeded to Point Rottenburg at the north-east end of the foreland. This is at the south end of the large Richard Lagoon, which averages 8 miles long by 2 wide, and is the largest of the many lagoons which occur on the rising coasts of Prince

Charles Foreland. The Dutch whalers evidently navigated this with their sloops in the seventeenth century, for I have found the remains of fairly large vessels on its south-west coast. The entrance is deep but narrow, and on account of the current can be navigated only at slack water. At low water the mouth is obstructed by shoals both inside and outside the entrance. The whale boat of the *Pelikane* was successfully navigated into the lagoon, and a camp was formed on the shore, where Mr. Craig and Mr. Koeppern were left to carry on geological work, while the ship went over to Cross Bay to discharge what remained of the coal.

On his return to Prince Charles Foreland Dr. Bruce joined Messrs. Craig and Koeppern in the geological examination of the northern end of the island.

In a previous paper on Prince Charles Foreland (*Geographical Journal*, August, 1908), accompanied by a preliminary map, the geology of the island was sketched, but the following extracts from Mr. Craig's report may be added in amplification: The island consists of a long narrow ridge of steeply folded rocks belonging to the Hekla Hook series, which is considered to be of Silurian age. The overfolding is to the north-east, that is, nearly parallel to the long axis of the island. The rocks of Vogel Hook, belonging to this series, consist mainly of quartzites and grits. In the neighbourhood of Glen Mackenzie they consist of limestones, and cleaved black shales with subsidiary bands of grit and quartzites. The Northern Grampians consist of a great thickness of quartzites (possibly a repetition of those at Vogel Hook), along with grey cherts and a number of thick bands of a calc-chlorite schist, which may represent basic igneous intrusions. Specimens collected by Dr. Bruce indicate a repetition of these features in the south of the island, but examples of phyllites and crushed quartzites and limestones from the south indicate either older rocks of the Hekla Hook series or greater disturbance. The central ridge of Hekla Hook rocks is flanked on the west and east by younger formations. Thus the coarse conglomerates, possibly of Devonian age, which form the south and north Sutors, have probably been derived from the Hekla Hook series and rest upon them with a marked discordance, dipping steeply to the west.

On the east coast beds of Tertiary age form a narrow and almost continuous strip from Vogel Hook to Point Napier. These rocks consist of conglomerates, sandstones, shales, and mudstones, and have yielded plant remains of lower Tertiary age.

Evidence of recent uplift is afforded by well-preserved raised beaches which rest upon a rock platform of pre-glacial age.

Extensive banks of wave-driven shingle, which flank the coast where the water is shallow, indicate rapid erosion of the coast, especially in the less resistant Tertiary rocks. These shingle banks have caused numerous lagoons which have evidently been modified by the action of stranded

pack-ice. Examples of these lagoons also occur on raised beaches up to a height of 150 feet.

On August 24, Dr. Bruce decided to leave Spitsbergen, but there were unexpected delays, and Tromsø was not reached until September 10. Thence the members of the expedition returned home.

In view of the exceptional circumstances it is not surprising that the expedition failed to accomplish its chief aim—the investigation of Wybe Jansz Water—but at the same time some valuable deep-sea soundings were taken, and hydrographic observations were made in all Spitsbergen waters visited. Such observations are much needed around Spitsbergen, for exploration has been largely concentrated on the land so far, and on the investigation of certain of the more important fjords. On the west the land surveys are fairly complete now, but there is still room for some detailed trigonometrical work. The most exhaustive survey is that of Prince Charles Foreland based on the work of Dr. W. S. Bruce in 1906–1907 and 1909, and published by the Prince of Monaco in 1913 (scale 1:40,000). Reference to this important map was omitted in Major Gunnar Isachsen's list of maps published in the *Geographical Journal*, March, 1915. The whole of the east coast, North-east Land, and Edge Island should be recharted. The east interior is practically unknown except for a few tracks. The difficulties lie in the frequent inaccessibility due to pack-ice, but even if the ship is lost there is always a line of retreat across Spitsbergen to the mining settlements on the west coast. Even in winter Spitsbergen can no longer be looked upon as uninhabited. But the exploration of the east could not adequately be carried out by a mere summer expedition. The task is in many ways more formidable than on the west, and an expedition should be prepared for at least eighteen months. One difficulty in survey work, which is often overlooked by those not familiar with Spitsbergen, is the frequency of fog. On the extreme west coast fog is normal. On Prince Charles Foreland work was interrupted or stopped altogether on at least three days out of five for this reason. In clear weather the surveyors must work continuously throughout the twenty-four hours, and sometimes longer. Inland fog is less frequent, and the main reason that Ice Fjord was the first part of Spitsbergen to be explored and accurately surveyed is the persistence of clear weather at this distance from the open sea. On the east coast fog would certainly be an obstacle, especially in more open seasons.

But while much of Spitsbergen is quite inadequately explored, and even unknown, other parts have come within the range of commerce and are being actively exploited. In giving some account of this modern phase of Spitsbergen I have thought it best to arrange the facts about the mining activity under the heads of the various countries concerned, for it is intimately connected with the question of political control.

Although Spitsbergen still remains a No Man's Land, that is not for

want of claimants. In 1614, only eight years after its discovery, Britain gave authority to the ships of the Muscovy Company to annex it, and it was taken possession of as "King James his New Land." That claim has never been actually repudiated from that day to this, but was lost sight of when the bay-whaling lapsed, about the middle of the seventeenth century. The only other claim was made in the year following by Denmark, but was dropped on the discovery that Spitsbergen was not part of Greenland as had been supposed. Spitsbergen is therefore British by right of prior claim, for the Dutch, although the discoverers, appear not to have laid claim to it.

Norway and Sweden, however, cast longing eyes on it as far back as 1871, and in the following year the Swedish and Russian Governments decided that Spitsbergen was a *terra nullius*, open to the subjects of all countries for economic development. In 1909 the Foreign Office of the United States of America suggested extending American protection over Spitsbergen. This was four years after the Americans had acquired their coal-bearing territory in Advent Bay. This project, however, was dropped, and latterly American subjects in Spitsbergen have been emphatically in favour of British jurisdiction over the islands.

At the first Spitsbergen conference, which met at Christiania four years ago, very little was done. Despite the growing interests of her nationals in Spitsbergen, Britain was not represented. In May, 1912, Norway, Sweden, and Russia decided that Spitsbergen should remain neutral territory, open to all nations and under a joint administration carried on by a committee of the three powers party to the agreement. It was also suggested to form an international police to maintain order in Spitsbergen, and to protect certain animals in the interests of science. The police force was to be paid for by taxation of the mining claims. Any dispute with regard to existing claims was to be submitted to the Hague at a court consisting of representatives of Sweden, Norway, Russia, Britain, Germany, and the United States of America. These proposals were to be submitted for ratification or alteration to a future conference at which Britain and other powers were to be represented. After many delays the conference met in Christiania in June, 1914, but its labours were interrupted by the war. Agreement with these proposals would mean that Britain loses all say in the destinies of Spitsbergen despite her prior claim by annexation, exploration, and preponderating commercial interests. It would probably mean the virtual surrender of Spitsbergen to Russia as the strongest voice in the joint tribunal. In any case such a divided authority could not enforce laws on the country, and would always incur the charge of partiality. At the best it would mean that Spitsbergen remains a *terra nullius* in which British subjects would have the least security of all. In these criticisms of the suggested control of Spitsbergen I am voicing also the opinions of men of many nationalities interested in the development of that land. Nor can we consider the

reference to the Hague court of disputes concerning rival territorial claims as other than a circuitous solution and somewhat impracticable. That, as far as I know, is where the settlement of the Spitsbergen question stands to-day. Last November an unofficial report appeared in the press that Russia had annexed the group, but of this I have seen no confirmation.

In the eighteenth century a number of Russian trappers were to be found in Spitsbergen every winter, but they ceased about 1850, and Russia had no further interest in the islands until her arc of meridian expedition in 1898. Since 1900 no Russian expedition visited Spitsbergen till 1912. The object of this last expedition was the acquisition of coal-bearing strata either by claim or purchase, in order to strengthen Russia's voice in the settlement of the political ownership. The following year another Russian expedition went north with the same object and more success. They acquired land in Coles Bay, Ice Fjord, by purchase from American owners. In 1913 negotiations were in progress for the sale of the American coal-mines to Russian owners, and in that year—September—the first cargo of Spitsbergen coal to reach Russia arrived in Petrograd. Last summer Russians were said to be prospecting in the east, or had intended to do so.

Norwegian claims to Spitsbergen are based mainly on geographical proximity and her extensive surveys of the west of the mainland. This has been carried on since 1906 by Norwegian Government expeditions, whose members have in cases made claims of land, sometimes trespassing lawlessly on pre-existing claims. The details of the west coast and the immediate hinterland are due to these expeditions. Prince Charles Foreland, as I have pointed out, is an exception. This is entirely the work of Dr. Bruce and his staff.

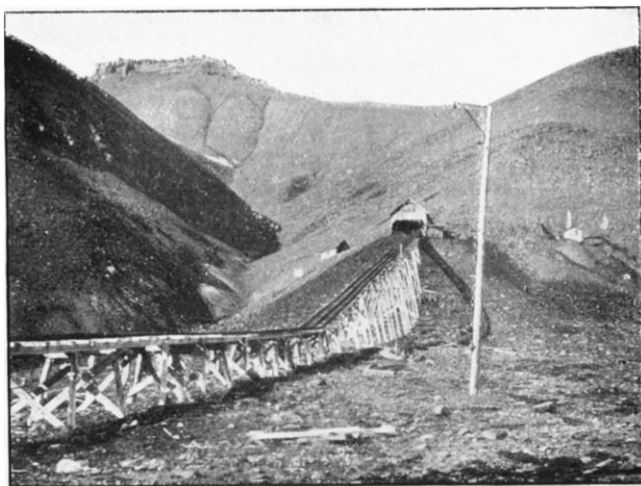
The Norwegians have a number of mining claims, but most of them of little value and none of them much developed. In total area they are far behind the British. In 1911 Norway erected in Green Harbour a powerful wireless installation with 60-metre masts, at a cost of over £10,000. This station communicates with one at Ingö, in the north of Norway, erected for the purpose, but it can receive messages from Christiania, Paris, and Berlin, and even Cornwall. I have heard the Paris time signal received from the Eiffel tower on one occasion. It is from here that the meteorological data are sent daily to our Meteorological Office. A staff of six men is maintained here all the year round; but except for weather telegrams the station serves only the mining camps and affords amusement for summer tourists. Certainly it can never pay a fraction of its initial cost and annual upkeep. The wireless station is also a Norwegian post office, where letters can be posted at Norwegian postal rates and with Norwegian stamps. They are carried to Tromsö at infrequent intervals during the summer by a subsidized motor sloop. I believe a steamer took its place last year. But the service is of little use, since the large mining camps send and receive their own mails with



SUMMER TRAVELLING ON PRINCE CHARLES FORELAND, WITH
WHEELED TRANSPORT.



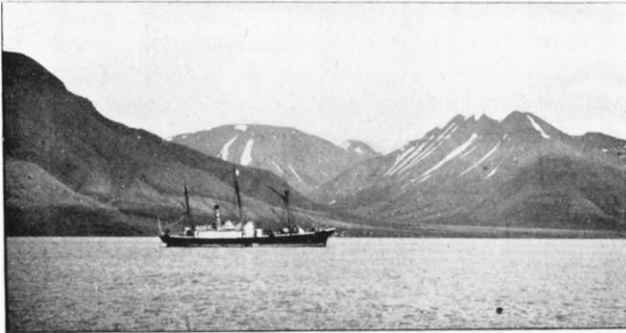
ENTRANCE TO COAL-MINE, GREEN HARBOUR.



MINE AND TRAMWAY, SHEFFIELD COAL CO.'S SETTLEMENT, ADVENT BAY.



LONGYEAR CITY, AMERICAN COAL-MINE, ADVENT BAY.



AMERICAN COAL CO.'S S.S. W. D. MUNROE IN ADVENT BAY.



BRITISH SETTLEMENT, MARBLE ISLAND, KING'S BAY.

greater frequency and regularity by their own cargo boats. These services are used, where possible, by the smaller mining camps and by exploring parties. Needless to say, there is no postal delivery, even by the Norwegians, beyond the port of arrival, but letters wander to and fro by various ships on the coast of Spitsbergen until they find their destination. Norway's chief object in erecting this wireless station and maintaining her post office and mail service was to increase her stake in the country.

It should be mentioned that two smaller wireless installations exist in Spitsbergen that can only communicate with Europe *via* the Norwegian station.

The Swedes have done a very considerable amount of exploration, particularly in the past, and especially around Ice Fjord. A great part of our geological knowledge of Spitsbergen is due to Swedish endeavour. At Treurenburg Bay and Mossel Bay in the north, and at Cape Thordsen, in Ice Fjord, well-built Swedish houses exist, but have been unoccupied some time. The last is quite elaborate, but sadly in need of attention lest it fall to ruins. Like many other houses and huts in Spitsbergen, it has suffered wanton damage by Norwegian hunters. This house was used by the meteorological expedition of 1882-83, but was originally built by the first commercial concern in Spitsbergen—a company which hoped to obtain phosphates from concretions in the Triassic shales. The venture proved profitless, and was abandoned the same year. In addition to the houses and workshops, a tramway was built to the sea a quarter of a mile long, but there is no harbour or any possibility of making one.

At present Sweden has few claims in land. Most of those that she had have been sold to a British company, but I do not know whether her mine of Carboniferous coal in Klaas Billen Bay is still being worked.

German activity was confined to Cross Bay, and was principally manifest in the maintenance of a meteorological station at Ebeltoft harbour, said to be chiefly in connection with a projected Zeppelin voyage to the Pole. This did not materialize. But land was also claimed by the Nord-deutscher Lloyd Company and by a mining company. The latter's claims were not of great value. In recent years the only German exploring expedition, that of Lieut. Schroeter Stranz in 1912, met with dire disaster.

The American claims are localized, but most important. They were the first actively to develop mining in Spitsbergen, and have confined their attentions to coal. The existence of coal in Spitsbergen was first noted by Poole as long ago as 1610. Scoresby noted it in King's Bay early last century. The Swedes discovered it in Ice Fjord over fifty years ago. The question of exploiting Spitsbergen coal was discussed in England on the return of Mr. B. Leigh Smith's *Sampson* in 1873. For many years whalers were in the habit of digging small quantities in King's Bay and Bell Sound. In 1898 Dr. Bruce brought back samples

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from Advent Bay. Analysis proved it to be of good steam quality. A cargo of coal was brought to Europe in 1899 by a Norwegian captain. In 1905 the Americans started to mine the Tertiary coal at the head of Advent Bay which had been prospected previously by Norwegians.

The coal occurs in a 3-foot seam dipping gently to the south-west, and occurs again in Coles Bay and Green Harbour. Wherever it outcrops it has been claimed by one, or more than one, company. Claims overlap and there is much confusion. Everywhere it has been prospected, and several mines have been opened, but the American one in Advent Bay is alone of importance as regards this coal. The seam is at a height of 400 feet and outcrops near the water's edge. It is worked by a 200-foot level adit. A second adit is being run into the opposite side of the valley. The coal is easy to mine, requires little timbering, and is easily and cheaply put on board ship, being taken from the pit mouth down to the wooden jetty by a wire ropeway and loaded direct into steamers. Forty thousand tons were exported in 1912, and the amount has increased since, as the mine has been more developed. Most of it goes to Tromsø, Narvik, and Trondhjem. It is of high calorific value, and has been proved in use to be good steam coal remarkably free from ash. Yorkshire foremen are employed under American engineers, and the miners and labourers are chiefly Norwegians, who recently replaced Swedes and Finns. Longyear Valley city, as the Americans style this settlement, is growing rapidly and accommodates more than three hundred men in summer and about one hundred in winter in some twenty large wooden houses. Many pigs, and several cows and horses, are kept at the camp, but poultry do not thrive well. There is practically no illness, and the men appear to like the life.

In addition to the Tertiary coal, Carboniferous and Jurassic coal occur in Spitsbergen. The Tertiary strata are underlain by Jurassic beds, and all dip at a low angle towards the north-east. The Tertiary coal is also being mined by British enterprise in Lowe Sound, while at the head of that sound in Braganza Bay a Swedish company started work on what was claimed to be a 5-foot seam, but a narrow entrance to the bay and much ice are obstacles that will hinder the development of this mine.

The Jurassic coal was first mined on the north-eastern side of Advent Bay by a British company in 1903. The seam crops out on that side in a position as favourable for exploitation as the Tertiary seams worked by the Americans on the other side, except that the anchorage is more exposed to winds blowing up Ice Fjord and bringing ice with them. The mine is a gently sloping adit about 150 feet long. The coal is of good quality, but not equal to the Tertiary coal. Considerable progress was made before work was stopped in 1908. Advent city then consisted of over a dozen well-constructed log houses with a tramway from the mine to the sea. The settlement and mine were lit by electric light in winter.

In 1909 I visited this mine, and though work was suspended, everything was in good order and repair. In 1912 Dr. Bruce and I, in the course of a long march from the interior, made for Advent city in the hope of obtaining some food of which we were in want. We found a mere wreck of the former settlement. Everything portable had been removed, but not by the owners, and the rest had been wantonly destroyed. Machinery, tools, stores, the stoves and windows of the houses, everything except the solid frameworks of the buildings had been wrecked. Even the roofs had been stripped of their felt. Only with the greatest difficulty did we find enough food among this wreckage for a scanty meal. This is an example of what occurs in a land where there is no law and no means of enforcing order, and no redress for wrongs except through long channels with no certain success at the end.

Coal also occurs in King's Bay and probably in Cross Bay, as well as in other places all claimed by British companies.

British enterprise is responsible for the exploitation of other minerals. Gypsum of great purity occurs in enormous quantities in Sassen and Temple Bays, near excellent harbours. In Blomstrands Harbour in King's bay a London company has opened marble quarries. During the last three or four years a great deal of marble-cutting plant has been erected and much marble exported. Besides real marble a great deal of breccia and conglomerate are quarried, but all seem to have a high value. The range of colour is quite extraordinary.

The same company has recently opened up large deposits of Swedish iron ore (magnetite) in Recherche Bay. This ore is slightly better than the Gellivare ore of Sweden, and contains an average of 64.4 per cent. of iron with only a trace of titanium, or none at all, and very little sulphur and phosphorus.

British companies in Spitsbergen claim over 7000 miles of territory, an area not exceeded by the subjects of any other country. Among other minerals on these properties, not yet exploited, are iron pyrites, copper pyrites, graphite, lead, and mineral oil. British and American subjects have put the largest amount of capital into this No Man's Land in the development of its resources.

Spitsbergen offers far more advantages for mining than are at first apparent. It is on the Atlantic seaboard near to Europe, being less than 400 miles from Norway, and only fifty hours' steaming by a fast cruiser from our shores. The warm Atlantic drift keeps the west coast so free of ice that ships can reach within 2 or 3 miles even in winter. The entrance to King's Bay could probably be reached in midwinter without any obstacles in the way of ice. A few powerful ice-breakers would keep a channel open up the fjords to the coal-mines all the year round. The climate is no drawback to mining, and electric light dispels the winter darkness in the settlements. Several of these mining camps are active throughout the year, and although outdoor construction work cannot

well be done in winter, the long summer daylight compensates for this. Harbours are good and plentiful, and there is practically no cost in land transit. Absence of taxes, duties, and custom charges no doubt cheapen the cost of extracting the minerals, but this advantage is outweighed by the insecurity of tenure now existing in Spitsbergen. At present land is claimed by the erection of a notice board stating the claim and defining the area, followed by an intimation to the Government of the claimants concerned. But claim-jumping is not uncommon, and increases yearly as the more favourable land is taken up; nor is there any certain and speedy mode of redress. The unwritten law that a claim is respected if work is done thereon within two years, or buildings erected, is not invariably recognized, and there is no power to compel rival prospectors to obey that custom. In any case much latitude is, and must be, exercised in its interpretation, and there are cases of its flagrant violation in recent years. The jumping of claims as well as the overlapping of ill-defined territories is bound, within a very few years, to cause serious conflicts in Spitsbergen. This can only be obviated by some strong power taking possession of Spitsbergen, and making itself responsible for law and order therein, and there is every reason why, in her own interests and by her former claim, Britain should be that power.

Hunting in Spitsbergen is another, and older, commercial activity than mining. Whaling fell off in the seventeenth century, but there was a brief revival a few years ago of finner whaling. This has ceased the last two years. The walrus has long been extinct on the west coast, and is not hunted on the east on account of ice conditions. Since Russian trappers ceased to visit Spitsbergen in the middle of the nineteenth century Norwegians took up the land hunting, and have worked such havoc that the game is approaching extermination. Over two hundred of these used to winter in Spitsbergen every year, scattered along the coast in twos and threes, each party living in a rude hut. Their hardships were great and the mortality among them was high, due largely to scurvy, the outcome of their habits of life. The occupation was, however, a profitable one, large numbers of bears, blue and white foxes, and reindeer being trapped and shot. But some years ago these trappers abandoned legitimate hunting in favour of the use of poisoned bait, which not only destroyed the game wholesale, but many birds as well. The Norwegian Government tried to prevent the sale of strychnine, but its use continued.

Foxes are scarce and reindeer are seldom seen on the west coast. A few years ago both were plentiful. The diminution in the numbers of reindeer is also due to the activities of so-called sportsmen. In one valley I counted ten carcasses from which neither skin nor horns had been removed. Polar bears visit the islands in winter, but retreat northward with the pack in summer. A stray one occasionally remains on the east coast, but for many years none have been encountered on the west in

summer. On the north coast there are still reindeer, and on the east are many foxes, but the east coast is difficult to approach and has a harder winter. More adventurous hunters who have spent the winter there have generally got plenty of skins, but not infrequently have been forced to abandon them, when their sloop could not get in the following summer, and escape overland to the west coast.

The tourist traffic to Spitsbergen has been growing in recent years, and many hundreds of tourists make a brief visit to Ice Fjord every summer. It began in 1894 with the Orient Co.'s *Lusitania*, and for many years was continued by the P. and O. s.s. *Vectis*, but has latterly passed into Norwegian and German hands.

Finally, I must say by way of explanation that I have put together this paper in a brief interval from more insistent duties, arising out of the war, from the notes of Dr. W. S. Bruce, and what knowledge I have of the localities named, most of which I have visited more than once.

The PRESIDENT (before the paper): To-night we are going to a remote region, where beyond these voices of war there is peace. But even there I am afraid we shall not escape from the political difficulty, for I am assured of a fact which I regret to say was previously unknown to me, that Spitsbergen is under the control of no Power whatever. Further details with regard to the condition of the island will no doubt be given us to-night. The lecturer was to have been Dr. Bruce, who, as you know, has been to Spitsbergen very often, but unfortunately he has been called away upon urgent affairs to the remote Seychelle Islands, and in that state of the case he has handed over his manuscript, which was left in a very incomplete state, to Dr. Rudmose Brown of the University of Sheffield, his companion in Spitsbergen, who has very kindly completed the material for the lecture and come here to give it us. It must, therefore, be regarded as a joint lecture. The islands have many interests connected with them, particularly as regards mines and quarries. They seem to be the object of research and rivalry between explorers of different nations. On all these subjects I have no doubt Dr. Brown will give us a great deal of interesting information.

The PRESIDENT (after the paper): Perhaps Sir Martin Conway, who has travelled in Spitsbergen himself and knows, I think, the story of its exploration and the literature connected with it better than anybody else in England, will say something.

Sir MARTIN CONWAY: I have listened, of course, to the paper which we have heard, with its varied information, and looked as we all have with interest at the great variety of photographic slides which have been shown to us. Spitsbergen, as seen on the screen to-day, certainly does not very closely resemble, except in its great natural features, the country as I saw it. Dr. Brown showed us a photograph of an hotel in one of his later slides, at Advent Bay, and that hotel, or rather the wood of which it is composed, was actually carried up by the steamer on which I went to Spitsbergen nearly twenty years ago, and was the first building erected there, other than the little huts set up by winter hunters; at that time there were neither huts, nor mines, nor mining claims, nor any arrangements of that sort, and the whole place was not merely a No-man's Land in name, but also in reality.

The history of the claims of different countries to the ownership of Spitsbergen is complicated. The main island was in the first instance discovered by a Dutchman, Barents, but when news of the discovery came, little was thought of it. A few years afterward a British expedition went up and found that the island would be an