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ANTARCTIC EXPLORATION.

There is good reason to believe that the exploration of the Southern Polar regions will in the future be entered upon with something of the zeal which has marked the persistent quest of the North Pole. Unless the present plans miscarry, it is likely that three well found expeditions will shape their course this year for the unknown land and sea that lie within the line of the Antarctic Circle. Of these, one will start from the Old and two from the New World, and all three from the Northern Hemisphere.

Belgium will dispatch an expedition from Antwerp; another is projected in New York by Dr. Frederick N. Cook, of Brooklyn, an Arctic explorer of considerable experience; and the third will probably make ready in Philadelphia, under the auspices of the American Society of Naturalists. All of these are being organized strictly in the interests of geography and general science; and it is safe to say that before many summers and winters have passed the spell of mystery which now broods over the vast regions that are shut in behind the majestic wall of the "Antarctic Barrier" will be broken.

How comes it that through all the long centuries of Arctic exploration, with its lavish expenditure of life and treasure, men have been content to let the secrets of the Southern Polar regions lie so long undisturbed? Perhaps the broadest explanation is to be found in the fact that the activity and intelligence of the world, its wealth and resources, and indeed the bulk of its population, have always been found in the Northern Hemisphere, and interest has naturally centered in the Pole which was nearest and most readily accessible. The particular causes in the earlier explorations were to be found in the effort to discover a northwest passage from the Atlantic to the Pacific, and in later times in a certain spirit of emulation and romance which has led successive Polar explorers to select that field which was already rendered famous by the successes and failures of their predecessors.

But whatever may be the explanation, the fact remains that while we probably know, either by observation or well founded inference, the main facts regarding the North Polar regions, those to the south are relatively as much "terra incognita" as they were a century ago; for whether the interminable wall of towering ice-cliffs hides a sea or a continent remains to be proved, and is one of the most interesting problems which the projected expeditions will endeavor to solve.

Our present knowledge of Antarctica is extremely limited, and the sum of it is soon told. What we do know seems to indicate that the South Polar regions consist either of a vast ice-covered continent or of a collection of islands cemented together, as it were, and capped with ice. From the earliest records of discovery down to the accounts given by Borchgrevink of the late voyage of the Antarctic, navigators have reported the existence either of high land or lofty walls of ice. A glance at any map of Antarctica will show where this continent of land or ice or both has been touched and named by various voyagers. The line which indicates their actual exploration of the coast line is so fragmentary as to give as much reason to believe that these regions are filled with scattered islands as that they contain an unbroken continent.

Victoria Land, with which are associated the names of Ross, Wilkes and D'Urville, is the most extensive tract. It lies between 110° and 170° east longitude; and it was here that Captain Ross, the most distinguished and successful of all Antarctic explorers, made the longest continuous exploration of the coast or ice line that has ever been attempted. He found it to present a perpendicular wall of ice, two hundred feet high, through which at times the land promontories protruded, and he kept in touch with it for four hundred and fifty miles without noticing a break. The same expedition in 1842 penetrated to the most southerly point ever reached by man, latitude 78° 11' south, where they found themselves among icebergs of colossal size. If we follow along the Antarctic circle, the next stretch of supposed continent is found between 45° and 65° east longitude, and is known as Kemp Land and Enderby Land. Following the circle to 50° west longitude, it intersects Graham Land, which lies between 50° and 60° west longitude, or to the south of Cape Horn and the Falkland Islands.

Compared with the North Polar regions, those at the South Pole present a much smaller proportion of land to water. The Arctic circle, 8,640 miles long, passes over less than 900 miles of water; whereas present indications show that on the Antarctic circle, the proportions of sea to land are about as five to one.

Beyond the facts which we have broadly stated above, practically nothing is known of the vast Antarctic tract. As one contemplates its unknown solitudes a hundred questions arise in the mind. Is it inhabited, and by what manner of people? of what nature are its flora and fauna, what wonders or wealth of mineralogy can it disclose, and what is the geography of its interior? To all of which there is no answer, nor even such indications as might form the basis of reasonable conjecture. It is true Mr. Borchgrevink observed on Cape Adare rocks composed of fragments of quartz, garnet, and feldspar, which he thinks gives reason to

"hope that minerals of economic value may be found in these regions." He also observed certain remarkable scars upon many of the seals in these waters, which he thinks might indicate the existence of an enemy answering to the white polar bear of the north.

Capt. Ross discovered lofty volcanic mountains between latitude 76° and 77° south, though Borchgrevink states that the land in the neighborhood of Cape Adare showed freedom from volcanic action. Observations show the temperature to be uniformly higher than at the opposite pole, and the ice formation is less broken and more massive. Add to these facts the records of soundings taken by various navigators, and we have substantially the sum of our knowledge of Antarctica, a knowledge which is so limited as to render this pre-eminently the "unknown land" among the unexplored regions of the earth.

Leaky Camera—To Test and Remedy.

Every now and again we meet with some one who is quite nonplussed in trying to account for streaks and fog marks "which only occur now and then." The plates and chemicals are often blamed, but frequently it is the camera which is at fault. Some tiny hole or chink lets in light. Sometimes the evil effect is only appreciable when direct sunlight happens to fall in a certain direction. To test for light leakage, cap the lens, remove ground glass, cover the head with focusing cloth, and turn the camera about in every conceivable direction in strong sunlight. Try the bellows when full out, half out, and so on, and when the rising front is in various positions. Look out for light finding its way in the diaphragm slot or between the front and lens flanges, or through the screw holes of the rising front. Make a second similar investigation, but this time remove the lens and look through the lens hole. Insert a dark slide in its proper place and draw the shutter. You will very probably find that a slight glimmer does find its way along the edge nearest to the draw slide, and this will fully account for the foggy streak along various negatives.

The remedy depends upon the place where the light leaks into the camera. If in the bellows, a tiny patch of black court plaster (inside and out) will probably meet the case, or a bit of black kid glove and a touch of liquid glue. If in the woodwork, a bit of black sealing wax may answer. If between the lens flange and camera front, try plugging with stiff yellow soap, or putty may do. If the diaphragm slot of the lens is at fault, a broad rubber band or one made of black elastic or velvet ribbon will meet that case. If light gets in between the camera back and dark slide, this should be trapped by gluing (not on the top of, but in place of the old) a new piece of soft close pile velvet ribbon. Liquid glue, diluted with vinegar, is a convenient adhesive. Have a care that this is confined to the back of the velvet, otherwise its use is obviously destroyed.—The Amateur Photographer.

The St. Louis Breaks Her Own and the St. Paul's Record.

It is gratifying to learn that the American line steamship St. Louis on her arrival at Southampton on her last trip completed the fastest trip to the eastward ever made by the ships of this line. The eastward record is held by the Fuerst Bismarck, which at the present writing is in trouble on the other side, being fast aground near her home port. The latter ship has crossed in six days, ten hours and fifty-five minutes, which is one hour and twenty-five minutes faster than the recent trip of the St. Louis, which was made in six days, twelve hours and twenty minutes.

When it is remembered that this was done in the unsettled winter weather, it is an excellent performance, and gives reason to hope that before the year is out both the eastward and westward records will be held by the American line. The westward record for this route was captured last summer by the St. Paul, and now stands at six days and thirty-one minutes.

To Limit the Height of Tall Buildings.

At the recent annual meeting of the Board of Trade and Transportation in New York, the report of the special committee on the subject of the limitation of the height of buildings recommended that a law be drafted and presented to the Legislature providing that, on the wide streets and avenues of this city, no building hereafter erected shall exceed 200 feet in height, and that no building used as a hotel or apartment house shall exceed 165 feet. These measurements shall be from the curb level to the highest point of the cornice or roof beams of a building. Justly proportionate lesser heights should be provided for the erection of structures on the narrower streets and avenues of the city. This law should also provide that in every building erected to a height of 137 feet and over there shall be two separate stairways leading from the ground floor to the roof, one of which shall be remote from the elevator. It was further recommended that the law shall require that all buildings over 137 feet in height shall have a complete fire fighting plant, this obligation to apply to all such buildings that are already in existence. It was also recommended that the present building laws be revised.

The Davy-Faraday Research Laboratory.

In Albemarle Street, London, adjoining the imposing facade of the Royal Institution, is an old fashioned mansion, which was once the residence of Lord Cowley. Like most of these West End residences that antedate Nash and the age of stucco, its lofty rooms and handsome staircase recall the spacious hospitality of bygone days when Albemarle Street was very "West" indeed and fashionable society groped its way home by aid of the linkboy's fitful torch. But it will henceforth subserve the genial purposes of hospitality no more. Peering through the deep Queen Anne windows to-day, you will see without difficulty that in some way or other science has set her seal on it. The walls have lost their somber paneling and gleam with the cleanest of white tiles. You get a glimpse of long, severe teak tables, fitted up with curious metal taps, glass vessels with crooked necks, rows of Bunsen burners, and a miscellaneous population of professional looking stoppered bottles. No. 20 Albemarle Street, in fact, looks like a branch of the Royal Institution next door, only more so. The explanation is that what was Lord Cowley's town house is now an important national institution—the Davy-Faraday Research Laboratory, to wit—founded and endowed by that generous and enthusiastic man of science Dr. Ludwig Mond, F.R.S. It will be practically the first great public laboratory ever established in England purely for the purposes of chemical and physical research. Dr. Mond has lavished money on the alterations, fittings, apparatus and appliances required to convert this roomy old building into a place where the patient and delicate work of scientific exploration may be fitly carried on, and he has crowned all with a splendid endowment to meet its heavy working expenses. The Royal Institution next door is to act as a sort of godfather and guardian to the Davy-Faraday Laboratory, but otherwise it is to remain an entirely independent institution. The keynote of Dr. Mond's public spirited scheme for the advancement of science is simple. The laboratory, with its splendid equipment, is open as a free workshop to every man of science who wishes to enter the field of pure research and can show the trustees that he is the right man for the work.

Externally there are only trivial signs of the splendid accommodation that Dr. Mond has provided inside No. 20 Albemarle Street for the men of research. A London Daily Graphic representative who recently went over the laboratory found that the numerous spacious rooms extending from the basement to the fourth floor had all been admirably utilized. No fewer than sixteen separate laboratories for research work, each capable of accommodating one or more investigators with their assistants, have been provided, besides a large museum of apparatus and various rooms for special experiments. It is interesting to note how the specialisms into which all scientific research tends to divide itself appear to have been provided for. On the ground floor, for instance, is a fine room specially fitted for the delicate work of organic chemistry—that progressive branch which has given us the myriad useful products of coal tar and has the loftiest aims, perhaps, of all. You can see in all the beautiful fittings and apparatus the experience which Dr. Mond has borrowed from the great German laboratories.

At the rear of this is an equally fine room for "inorganic" research, and between the two a balance room, where the subtle compounds under treatment by the chemists are weighed down to the tiniest fraction of a grain. Solidly bedded on masses of stone projecting from the walls, nothing short of an earth wave would give them a tremor. When you are weighing to the 5,000th part of a grain, you require precautions of this sort.

On this same ground floor is a useful little ironclad den. This is the explosion room, and the post of observation is at a small hole in the iron door. Down in the basement are rooms for thermo and pyro-chemistry. The latter means research with the all-conquering electric furnace. Great batteries of electrical accumulators are to be found here, and deep down below the level of Albemarle Street we find Lord Cowley's wine cave converted to the nobler uses of a "constant temperature" vault. A beautiful room is the museum of apparatus on the second floor, where everything will awe and bewilder the layman. For here are stored all the fearful and wonderful tools with which the researchers will work. It is a blaze of glass and brass. By the time the visitor has got up to the third floor he gets bewildered with the apparently endless succession of handsome workrooms, all splendidly fitted with teak operating tables, glazed fume chambers, slate reagent racks, gas furnaces, blowpipe stands, stoneware sinks, and what not. On the fourth floor it is still the same, varied by a dark room for electric discharge observations, and another absolutely black for photographic work. Even the roof comes in; the eternal red gas and blue water pipes which crawl about everywhere are found writhing up here. In a word, this is a place where the chemist can be happy. It is kept at the even standard chemical temperature (62 deg. Fahrenheit) throughout by steam radiators, and there is a lift reaching every floor. Dr. Alexander

Scott will be the superintendent of the laboratory, and Lord Rayleigh and Prof. Dewar its directors.

The laboratory was opened by the Prince of Wales on Tuesday, December 22, 1896. Dr. Mond made an appropriate speech in which he gave an idea of the motives which prompted him to make the munificent gift which cost him some \$500,000. He then gave a history of the enterprise from the time when he first brought it to the attention of the scientific world. He said that he "named it the Davy-Faraday Research Laboratory in perpetual memory of those two pioneers of science who carried out their world famed and epoch making researches almost on that spot, and whose example he hoped would stimulate and inspire every one who came under that roof. . . . As soon as his royal highness had declared the building open, persons of either sex or any nationality would be welcome within its walls, if they could satisfy the laboratory committee that they were fully qualified to undertake original research in pure and physical chemistry; the preference would naturally be given to those who had already published original work."

The Prince of Wales, in reply, said: "Prof. Mond, it affords me much satisfaction to assist at the opening of the series of beautifully arranged and well equipped research laboratories which this country owes to your generosity, and I congratulate the members of the Royal Institution of Great Britain upon this most important accession to the resources which have been placed at the command of the institution for the advancement of chemical and physical science. The Royal Institution has long enjoyed a world wide reputation, thanks to the marvelous work of the succession of illustrious men whose researches, carried on within these walls, have very largely contributed to secure and maintain for this country a foremost position as a source of great discoveries and important advances in science and its applications. The identification of the laboratories which you have founded with the names of two of the most eminent of former professors of the Royal Institution and of English men of science—Humphry Davy and Michael Faraday—is a graceful act on your part. The fact that the present distinguished professors of physics and chemistry, Lord Rayleigh and Prof. Dewar, have undertaken the important duties of directors of the new research laboratories without any remuneration must afford most gratifying evidence to you of the great faith entertained by them in the benefit to the promotion of science which your wisely applied munificence is destined to realize." His royal highness then declared the laboratory open.

Favorable Condition of Export Trade.

An excess of exports of \$102,882,264 was the gratifying exhibit made by the records of the fiscal year 1895-96, says the New York Times. A recent tabulation for the calendar year, in part official and estimated for the months of November and December, made it plain that the excess of exports would be much greater for the fiscal year 1896-97, if the tendencies shown during the calendar year were not changed. The detailed report of exports and imports for the eleven months of 1896 will soon be published, and they will support the statements published recently in the same paper.

The figures referred to indicated that the imports for the calendar year would be about \$687,000,000, while the exports would be \$907,000,000. But the detailed statements for the eleven months since made up show that the export trade ran above the average for the preceding months, and that at the close of November the exports were \$870,000,000. During November the exports of domestic merchandise were \$107,830,878. Unless the exports dropped suddenly in December, and there is no indication in the advance figures of the Treasury that they did fall, it is evident that the total exports for the twelve months will be not far from \$970,000,000.

There may have been an increase beyond the average of previous months in the imports, but the figures hardly will go much beyond \$700,000,000, if, indeed, they reach that total. So that the prospect is that it will appear that this country has exported, exclusive of gold and silver, \$270,000,000 more than it imported. If this ratio continues during the next six months, the result will be the largest balance of trade in the history of the country. According to the Treasury report, our largest balance was in 1879, when the exports exceeded imports \$264,661,666.

In view of the warnings that are being thrown out by Canadian and other British interests that they need not expect to receive any concession in the way of low tariffs, or much by way of reciprocity, from the Ways and Means Committee, it is interesting to note the importance of the trade that is to be thus discouraged, while the attractiveness of reciprocity is to be tried upon Central American and West Indian buyers, who have not yet developed wants as many or as imperative as those of the people of the United Kingdom.

Take agricultural implements, for instance. The United Kingdom, Germany, France, and all the rest of Europe took less of these things from this country in the eleven months ending with November than they did in the corresponding months of 1895. British

North America, taking \$296,159 in eleven months of 1895, took \$370,128 in 1896; Cuba fell from \$50,954 to \$1,306; Argentina dropped about \$240,000; other South American countries took less than they did in the previous year. But British Australasia, taking \$357,336 in 1895, bought \$412,007 in 1896, an increase of \$54,671, or twice as much as the value of all the agricultural implements sent to Brazil.

British North America was one of the few countries that took in 1896 more books, maps, engravings and other printed matter than it took in 1895. In the eleven months of 1895 there was sent to British North America \$470,240 of these goods; in the eleven months ending November, 1896, \$545,035, an increase of \$74,798, more than the total export of such goods to Colombia, or Mexico, or Brazil and Argentina combined, all of which countries took less than they did a year ago, while British Australasia added \$18,959 to her demands of the previous year.

A table will show at a glance the gains of the year in exports of carriages, freight and passenger cars:

	Eleven months ending November, 1895.	Eleven months ending November, 1896.	Increase or Decrease.
Carriages and vehicles.....	\$1,451,736	\$1,733,778	*\$282,042
Cars, passenger and freight, for railroads..	867,851	782,303	+65,548
Total.....	\$2,322,587	\$2,516,081	*\$193,494
United Kingdom.....	326,888	454,495	*127,607
British North America.....	125,010	156,461	*31,451
Mexico.....	398,932	540,189	*141,257
Argentina.....	63,835	105,931	*42,096
British Australasia.....	207,720	260,139	*52,419
Africa.....	134,756	331,560	*196,804
*Increase. +Decrease.			

The trade increase with Africa in carriages and cars was more than the net increase in that of manufactured goods.

The cotton raisers and manufacturers will be interested to see who were our best customers for manufactured cotton and for cotton cloths. The showing is as follows:

	Eleven months ending November, 1895.	Eleven months ending November, 1896.
United Kingdom.....	\$80,942,499	\$102,051,748
Germany.....	33,212,325	38,049,526
France.....	17,027,138	19,089,884
Other Europe.....	23,106,988	23,386,284
British North America.....	2,787,998	2,814,529
Mexico.....	1,288,364	1,303,986
South America.....	4,650	1,764
Asia and Oceania.....	771,327	1,380,677
Other countries.....	823	612
Total unmanufactured.....	\$159,142,113	\$193,139,010

There was a gain in exports of cotton cloths in the eleven months, as compared with 1895, of \$5,764,971, the gains being made almost everywhere except South America. The greatest gain was in China, which bought \$5,534,482 of cotton cloths, or \$3,758,653 more than in the like period last year. British North America exceeded its take of 1895 by \$547,661.

The United Kingdom, British North America and British Australasia were the purchasers of a large part of the total export of \$3,408,612 of bicycles and parts of bicycles. They took more than two-thirds of the whole export. Of builders' hardware, the United Kingdom, Germany, France, Central America, Argentina and Brazil were improving customers, British North America, British Australasia, and Mexico showing the most improved demand.

Almost every country with which this country trades took a great deal more of American machinery in the eleven months than they did in 1895—an increase of \$7,302,970. The United Kingdom took \$2,000,000 of this increase. All through the rest of the list the recurrence of the United Kingdom, British North America, and British Australasia as customers that persist in buying more of the United States is striking, particularly as the evidence is side by side with that showing that the countries with which the United States was at great trouble to make reciprocity arrangements appear to be falling away from this country.

Large Shipment of Mining Machinery.

We publish in another column an account of the vast increase in our export trade during the past year, and especially the increase in our exportation of manufactured goods and machinery.

On the 6th inst., the two steamers Lady Furness and Kurdistan sailed from New York direct for South African ports—Cape Town, East London, Natal, etc. These steamers belong to the Union Clan, and American and African lines, both English companies, and the lines have been established with regular monthly and semi-monthly sailings for the past three years.

On the steamers above named the Gates Iron Works, of Chicago, shipped thirteen carloads of mining machinery consigned to Johannesburg. The total shipment weighed over half a million pounds.

THE Academy of Natural Sciences, of Philadelphia, has decided to confer the Hayden Memorial Award for 1896 on Prof. Giovanni Capellini, of Bologna, the geologist.