

## END OF THE JEANNETTE EXPEDITION.

[SEE FRONTISPICE.]

The curtain is about to fall upon the sad tragedy of the Jeannette expedition. This enterprise, begun five years ago under such very auspicious circumstances with everything to aid it that human intelligence and worldly wealth could furnish, will soon celebrate its mournful failure in the funeral of the gallant leader who sacrificed his life, his all, to the cause of discovery and science. The bodies of Capt. De Long and his companions are now on the ocean, and in a few days will be received with civic and military pomp, and laid away to rest amid the tears of a sympathetic and appreciative country.

The 8th of July, 1879, was a gala day at the Golden Gate of San Francisco. The Jeannette was setting sail "for that strange land beyond whose bourn," it may almost be said, "no traveler returns." Previous Arctic expeditions had left the region north of Behring Strait comparatively unexplored, while the seas north of Europe and Iceland and about Greenland had often been the subject of the explorer's attention, and too often had proved ultimately to be their graves. Here was a new field, however, and the opportunity was by no means to be lost. The object of the expedition was to pass Behring Strait, touch at Wrangell (or Kellett) Land, determine the character of this unexplored region, whether it were continent or island, and, if the latter, sail due north in search of that open Arctic Sea so long the object of Arctic research, and which occupies, or is supposed to occupy, that mysterious portion of the map marked "unexplored."

On the side of Behring Strait no ship had ever reached a higher latitude than 78°, while on the other side of the globe Capt. Nares, in 1875, coasting along the western shore of Greenland through that expansive strait known as Smith's Sound, had attained the highest latitude ever reached by man (of which there is any record), namely, 83° 10' 26" north. However great this achievement may appear, this hardy explorer had 410 miles of ice between him and the Pole.

The Jeannette, 420 tons, was formerly the Pandora, one of the steam gunboats of the Royal Navy, and was fitted out for this expedition by Mr. James Gordon Bennett of this city. The latter deemed it to the advantage of the expedition that the Jeannette should be officered and manned from the United States Navy, and the following officers whose names are now so famous were selected: Capt. De Long, commanding officer; Lieut. Chipp, executive officer, Lieut. Danenhower, navigation and ordnance officer; Dr. Ambler, Surgeon; Chief Engineer Melville; Ice Pilot Dunbar; Mr. Newcomb, collector of specimens and taxidermist; and Mr. Collins, meteorologist and scientific observer. There were 32 souls on board all told, and the ship was provisioned for a 3 years' cruise.

After leaving San Francisco, the Jeannette touched at St. Michaels, in Alaska, where 40 dogs and 2 drivers were added to the ship's equipment. After leaving the Strait, Wrangell Land was the point of destination. This proved to be a rather insignificant island. Soon after leaving this island an ice pack was met with, and on the night of September 20, 1879, the ship was frozen in. Herald Island was soon passed, and then there was a tedious period of 21 months of drift. For the first 5 months only 40 miles were made, and Wrangell Land was often visible 75 miles distant. After this the drift became very rapid.

During this period of drift several islands were discovered and named. Jeannette Island was sighted on May 16, 1880, in latitude 76° 47' N., 158° 58' E. This island was quite small, and was not visited. On May 27, Henrietta Island was sighted in latitude 77° 8' N., longitude 157° 32' E. This is quite a large island, as is also Bennett Island, in latitude 76° 38', longitude 148° 20'. On the shore of this last island were found specimens of drift coal and old horns. There were no seals or walrus, although birds were to be seen in abundance.

The temperature ranged from 44° above zero to 58° below. During the first summer the mean temperature was 40° above zero. During first winter mean temperature 33° below; while during second winter mean temperature was 39° below zero. The greatest velocity of wind recorded was 50 miles an hour.

For nearly two years nothing was heard of the Jeannette, and during all this period she was drifting helplessly, but surely, to destruction. On the 11th of June, 1881, the end came, and the Jeannette was crushed to dust beneath a mountain of ice from one of those sudden upheavals that had so often threatened her during her sojourn upon this floating island.

Fortunately, De Long had anticipated the catastrophe. He divided the crew into three parties, which embarked immediately in the small boats, No. 1 carrying De Long and Dr. Ambler, No. 2 being officered by Lieutenant Chipp, and No. 3 officered by Chief Engineer Melville, Danenhower being compelled to give up the command, owing to the terrible suffering he experienced from the loss of his eye.

The Jeannette met her fate in latitude 77° N., longitude 157° E., near New Siberia Island, 500 miles from the mouth of the Lena.

As is well known, the three boats separated from one another during a fearful storm on the night of September 12th. Four days later Melville's boat reached land at Byko, 40 miles south of Cape Barkin, near a mouth of the Lena. De Long landed at another mouth of the Lena at about the same time, but unfortunately the land was completely uninhabited and he found the much longed for terra firma as little a place of

rest and safety as the snows and ice of the Arctic seas. The unfortunate Chipp and his crew have never been heard from, and the probability is that they, like the gallant seamen which they were, found their graves in the ocean depths.

Melville, ever forgetful of self and faithful in duty, has no sooner placed the unfortunate Danenhower in a place of safety than he starts with a supply of provisions and with native guides in search of his missing companions. Week after week he continues the search, and finally discovers tracks and instruments, and then he comes across the guides Noros and Ninderman, who had been sent forward for assistance. With untiring effort and the assistance of these guides, the party at last were successful in finding the location of the last bivouac. De Long was lying with his feet toward the fire, with his diary by his side, and with his pencil dropped from his fingers. The delicious rest of that sleep which precedes death by freezing had overtaken him in the act of making an entry in that sad record of his sufferings. His companions were round him in more or less close proximity. On April 7, 1882, the bodies of the whole party were buried in a common grave, with simply a pile of stones and a single cross to mark the spot of their interment.

Here they rested until arrangements had been completed for transporting them to America. During the winter of 1882-3 the bodies of De Long, Dr. Ambler, Mr. Collins, and two others, were transported to Yakutsk, in Siberia, the other bodies being left till the following winter, owing to the impossibility of procuring enough dogs and sleds for the transportation of all the remains. The journey from Yakutsk was commenced on sleds on November 28, 1883, and Orenburg, the eastern terminus of the railroad to Moscow, was not reached till January 17, 1884, the whole distance traversed by the sleds being 5,761 miles. All along the route of travel, from the most obscure villages of Siberia to the gayest capitals of Europe, peculiar and special honors were paid to this solemn funeral cortege. The Frisia, from Hamburg, which has the honor of bearing the bodies of these heroes upon their last voyage, is due at New York in a few days. A military escort will receive the bodies and accompany them to the Navy Yard, where they will lie in state. A naval representation will have position immediately about the hearses as an appropriate funeral escort, and will probably be preceded by United States troops and State militia. The following organizations will form in line: Battalion of the army, the battalion of the navy, 23d regiment, N. G. S. N. Y., 69th regiment, N. G. S. N. Y., Grand Army of the Republic, the Geographical Society, New York Herald Club, officers of school ship St. Mary, Officers of Navy, and classmates of Lieut. Com. De Long, survivors of Jeannette and other Arctic expeditions.

## On the Manufacture of Sulphuric Acid from Pyrites in the United States.

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It is not generally known that pyrites is now extensively used for making sulphuric acid in this country. It may, however, be stated for a fact that fully two-thirds of the acid manufactured at the present time is made from pyrites. Prior to 1882 only two concerns were using pyrites for acid making; now at least eighteen firms are using pyrites ore, while many others are either preparing to use the ore or have the matter under grave consideration. Of the larger concerns now making use of pyrites may be mentioned the Pennsylvania Salt Co. and the U. S. Chemical Co., of Pennsylvania, the Laurel Hill and Bergenpoint Chemical Companies of N. Y., the Cochrane Chemical Co., and the Bradley and Barker Fertilizing Works, of Boston.

Many attempts were made some eight or ten years ago to use pyrites for acid in different places in this country, resulting in failure in every case. This was undoubtedly caused, not by want of knowledge on the subject, so much as by lack of proper material to work upon; zinc blende and low grade earthy pyrites were then used, containing not more than 30 or 33 per cent of sulphur, and of this amount not more than 15 or 20 per cent was available for acid. Like many other chemical industries, the manufacture of sulphuric acid is imported from England, where acid has been made from pyrites for the past twenty years.

As might be expected, the introduction of the use of pyrites in this country at once caused a fall in the price of acid, so that now acid may be obtained almost as low in this country as in the English market. From the fact that acid is so largely used in the manufacture of chemicals, and more especially fertilizers, it follows that cheaper sulphuric acid cannot fail to exert an immense and a beneficial influence upon the chemical manufactures of the United States as well as upon the agricultural industries.

## SOURCES OF PYRITES SUPPLY.

Since the demand has arisen for pyrites in this country, America has shown herself equal to the occasion by unearthing several good deposits of pyrites. Especially is this the case in the Southern States, where acid is much in demand for the manufacture of superphosphates. Several good deposits occur in Virginia and South Carolina, containing ore fully equal to the famous Spanish pyrites. In the New England States are several deposits, but two only are now worked extensively for pyrites, namely, the Milan Mine, of Milan, N. H., and the Davis Mine, of Charlemont, Vt.; both of these mines are successfully worked on a large scale, and the product finds ready sale. Considerable ore comes from Canada, being mined at Capelton, P. Q. There is also an inferior ore mined at Ogdensburg, N. Y., which is used to some extent in the West; there are also deposits in New Hampshire, at Lisbon, and Thetford, not, however, now

worked for acid making. The competition now most strongly brought to bear against the American ore is that of the Spanish mines Tharsis and Rio Tinto. Ore is shipped here in large quantities, and actually sold for a less price than in England, and it is a noteworthy fact that the American acid makers are enabled to-day to buy ore for less money than their English cousins.

As to the quality of the ores great variation is noticed; the following table gives the range of the most notable constituent parts in each ore now in use:

	Spanish Pyrites.	Milan.	Davis.	Capelton.	Ogdensburg.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Sulphur.....	46'00 to 49'00	44'00 to 50'00	42'00 to 49'00	40'00 to 42'00	30'00 to 35'00
Arsenic.....	0'25 to 0'80	traces.	traces.	0'20 to 0'50	unknown
Copper.....	2'00 to 3'50	2'25 to 4'00	1'00 to 2'00	3'00 to 6'00	none.
Silica.....	1'5 to 4'00	2'25 to 7'00	2'00 to 10'00	12'00 to 20'00	15'00 to 25'00

It will be seen in the above table that the Milan and Davis ores contain only traces of arsenic, while the sulphur contents are fully equal to the Spanish ores, in fact, acid made from these two ores is practically free from arsenic, and ranks as well in the market as acid made from the best Sicilian sulphur. In the matter of making fertilizers, however, arsenic is no hinderance.

In burning the ore several points must be taken into consideration; the ore must yield its gas easily and strongly without sintering in the kilns; it must be somewhat granular, yet not have a tendency to crumble or break down in the kilns; moreover, it must give a good yield of acid. Most of these ores will burn down to four per cent of sulphur left in the cinder, and that may be considered good work. No trouble has yet been experienced in this country in making acid from pyrites, and it is safe to say that within a short time about all sulphuric acid makers will use pyrites. There is one concern already established at Elizabethport, N. J., for the treatment of the cinder resulting from burning the pyrites. This cinder is treated for the copper and the small amount of gold and silver contained in it, by net extraction; the residue, or "blue billy" as it is called, is used to some extent by the rolling mills as a "flux" in the puddling furnaces. The greater part of the cinder is, however, now thrown away. This cinder, by the way, is a perfect flux for smelting any kind of silicious copper, silver, or gold ore, and were it not for excessive freights would soon find a market in the West for smelting purposes. On the whole, it may be said with truth that acid making from pyrites is now firmly established in the United States.

## Weighing Milk.

To those who have no lactometer, or who find difficulty in reconciling its readings with their experiences in judging of milk, it may be interesting to know that a quart of good milk should weigh about 2.15 pounds, or nearly 2 pounds 2½ ounces. Water, at 60 degrees Fah., weighs 2.0835 pounds. Of course, skimmed milk shows a heavier gravity, in proportion to the amount of cream taken off, as the addition of water also lightens the milk. Weighing milk will give the monthly yield in quarts more exactly than measuring. Probably not one farmer in ten has any definite idea as to the average yield of his cows in pounds or quarts. Those who have never tried keeping a record of the milk yield will find it a profitable and perhaps a surprising experiment. One thousand pounds of average milk contains:

Casein.....	32 pounds.
Fat.....	36 pounds.
Milk sugar.....	45 pounds.
Mineral matter.....	7 pounds.

## To Determine the Adhesive Power of Glue.

Weidenbusch has devised a practical method for determining, approximately, the adhesive power and quality of glue. He first prepares a set of plaster prisms by mixing gypsum and water together in the proportions of one to five. These prisms are 9.2 cm. (about 4 inches) long, with a cross section of 4 millimeters (¼ in.), and each weighs 1.7 grammes (26 grains).

The glue solutions were made from 1 part of glue in 25 parts of water, and the plaster prisms soaked in them for 5 minutes, then dried in the air. Each is then placed on a horizontal iron ring in such a position as to form its diameter, and from its center is suspended a pan in which weights are placed until it breaks. The strain it can withstand is proportional to the adhesive power of the glue.—*Deut. Industrie Zeitung.*

## Silk Exhibition.

A silk industrial exhibit, to cover the agricultural, mechanical, and manufacturing interests of that industry, is to be held in Philadelphia, continuing two weeks from April 21. The co-operation is invited of culturists, manufacturers, art schools, and all those who have odd or curious articles of old or new designs. The Serrill automatic reel, brought from Lyons, and constructed by a young American inventor, will be shown in operation.

# SCIENTIFIC AMERICAN

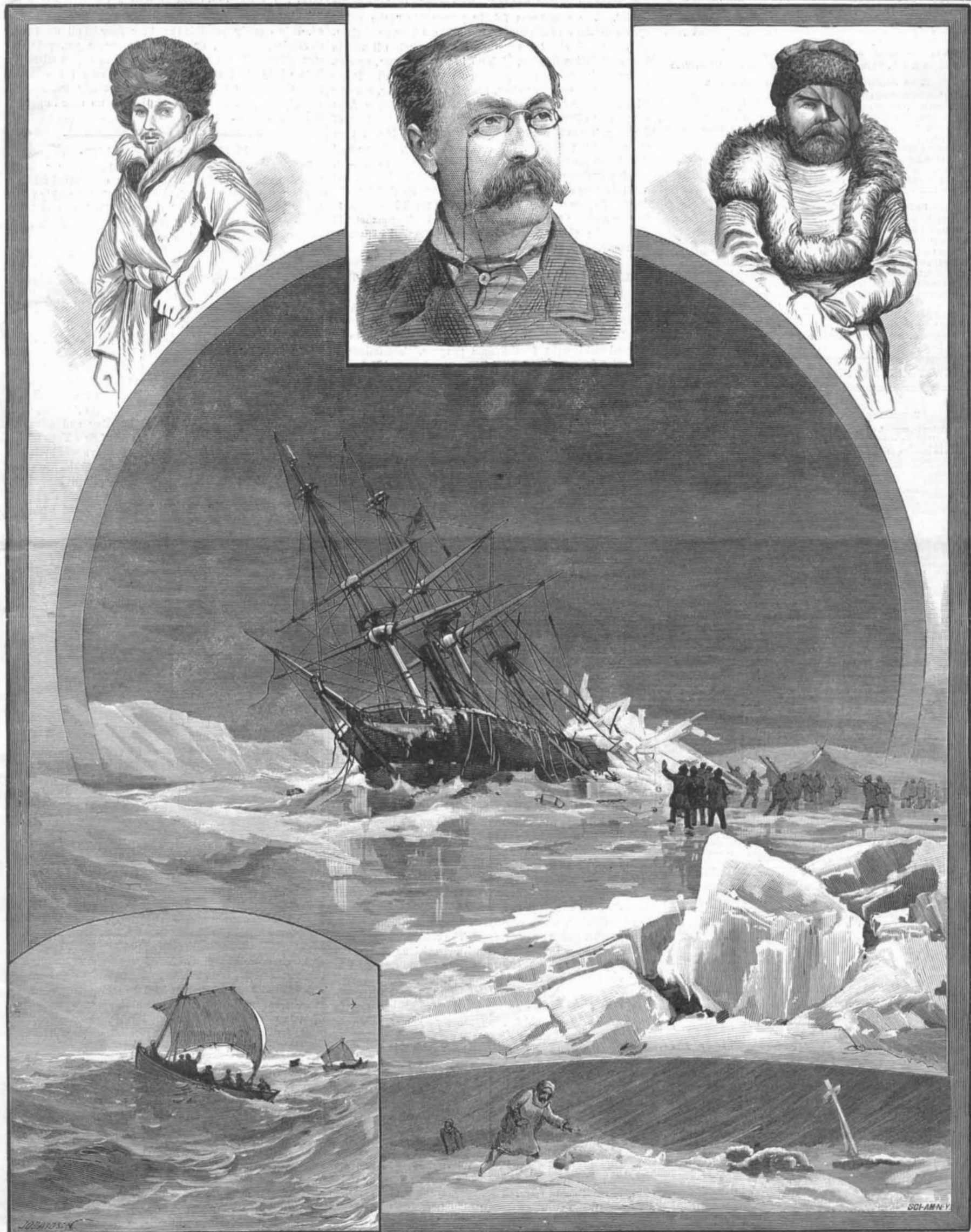
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