Powell has distinguished five kinds of bats here, none of which, however, are of unusual size or appearance.

That the cave was known to the early settlers and explorers of this region is shown by the notched poles which were found in the cave when it was first rediscovered, and which evidently served as ladders for entrance into the cave. Two of these are now to be seen in the Mother Hubbard Room. Local supposition is that these notched trees were used by the Spaniards, as it is known that they occupied the land in this region before the English settlers took possession of it.

The cave as thus described is of considerable extent and possesses variety in scenery and interest. It is well worth a visit, and when the projected railroads from Aurora and Springfield pass near it, it will undoubtedly become a summer resort; but the estimates of the distances, heights and depths which have appeared in certain usually responsible papers and magazines are very wide of the truth. Its unexaggerated beauties are enough to recommend it to the popular favor. The accompanying map represents, as accurately as the circumstances would permit, almost all of the cave that has been explored. It is certain, however, that the cave is by no means fully explored and that further investigation will add largely to this map. At present even Blonde's Throne and Springsted's Throne are practically inaccessible to the average visitor, but a not excessive amount of work would materially lessen the most serious difficulties in the routes.

My special thanks are due Mr. J. D. Robertson, assistant on the Missouri State Geological Survey, and Mr. H. D. Card, draughtsman for the Missouri World's Fair Commission, for their painstaking assistance in making the accompanying map and measurements and the thermometric determinations that are given herewith. To Mr. Powell and his family is due the credit for almost all the exploration that the cave has received.

An exceptionally low temperature, 48° F., was observed at the lowest point of the Grand Amphitheater and in the air and water of the Spring Room. Throughout the rest of the cavern the temperature seemed to be about that usually found in caves, 54° F.

In considering the scientific value of this cave, the fact should not be overlooked that this is the first cavern reported in this country containing mummified animal remains in large quantities.

North Greenland.

Professor Angelo Heilprin recently gave a very interesting address on "The Scientific Results of the Peary Expedition," illustrated by photographs projected by the lantern, before the Engineers' Club of Philadelphia.

The expedition under Lieutenant Peary did not have for its object, as many erroneously supposed, a nearer approach to the North Pole than had yet been reached, but was planned with a definite object, the determination of the northern boundaries of Greenland, which was carried out with unusual fidelity. The basis of operation was not, as usual, the steamship, but the mainland, and the trip extended from McCormick Bay northeastwardly across the ice cap. The entire return distance—1,300 miles—was accomplished on foot, sledges being used only to carry supplies, etc.

The country was found to be bounded by a chain of mountains on both the eastern and western shores, and the trip started at the western shore at an elevation of from 2,500 to 3,000 feet, and continued rising to the apex of the Humboldt Glacier. The ice cap terminated at about 82° north latitude, and open country followed it northward. The northeastern coast was reached in latitude 81° 37′, about 4½° further north than had yet been discovered. From this point the directions and general character of the coast in both directions were established for a considerable distance, although it could not be closely explored, on account of the rugged basaltic bowlders with which it was everywhere covered. The physical features were found to be quite uniform throughout the country. The mountain ranges averaged about 5,000 feet in height, occasionally reaching 10,000 feet or higher. The basaltic bluffs and bowlders on the coast, and the numerous fiords, made it very similar to that of Norway. Inland, between the mountain ranges, there is an apparently endless sea of ice, entirely covering and hiding the true topography.

The expedition solved the problem of the northern termination of Greenland, by showing that it does not extend to near the pole, or northeastwardly, as has been generally supposed. It was also found that glaciers were projected northward toward the pole, and therefore Greenland could hardly have had any connection with the American ice of the great Ice Age, as has often been supposed by geologists.

A narrow border country, having a good vegetable growth and an animal life identical on the east and west sides, extends all around Greenland. The summer temperature there is about the same as that of a mild winter here; the winters are much colder than in this locality, but not more so than in some of our Western States.

There is a very perfect, but very diminutive, forest growth of birch and willow. Poppies, anemones, buttercups, and other bright colored flowers bloom in favored localities, and butterflies and mosquitoes are abundant.

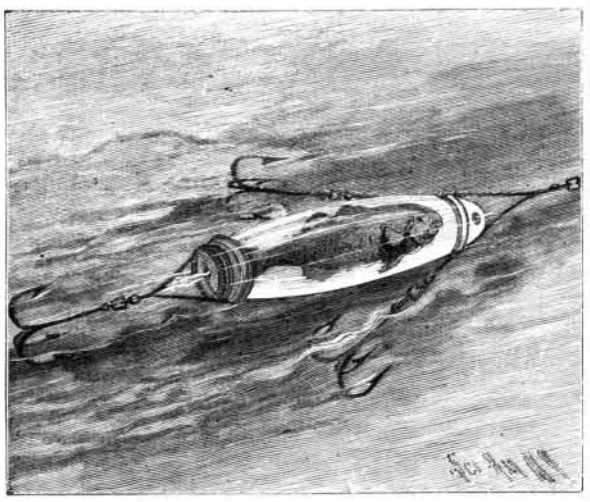
The country, up to the 73°, belongs to Denmark; north of that is No Man's Land, probably because its resources have not made it worth an official claim and protection.

The true Esquimaux are found north of Melville Bay, and now number approximately 250. They seemingly observe no religious forms whatever; they live largely upon uncooked food, are quick of perception and in adapting means to ends, and are absolutely honest.

The expedition to be undertaken next season will attempt to completely locate the northern boundary of the country and to study the open sea beyond.

TROLLING WITH LIVE FISH BAIT.

The improved fishing device shown in the accompanying illustration, and which has been patented by Mr. Henry J. Welch, is designed to keep the bait used alive for an indefinite period. The hooks, instead of being attached to the line in the usual way, are white, and are secured by a swivel and white wire leaders to an annealed, flanged, flint glass tube, through which the water circulates, and in which is held a live minnow, or other living bait, the glass magnifying the size of the fish in the tube, and its effect being such that, at a distance of a foot, only the bait fish in the tube is seen by the fish in the water outside, the hooks escaping observation. An opening in the front of the tube and one in the cap closing its rear provides for a free circulation of water through it, so that one small bait fish may last for a day, the fish being inserted in the tube by unscrewing the rear cap. It is said that this



AN IMPROVED TROLLING DEVICE.

device has been successfully employed in catching muskallonge, pickerel, pike, and bass, being equally adapted for taking either salt or fresh water game fish, whose natural bait consists of small fish.

The tubes are preferably made of different sizes, from 3½ to 5½ inches long, and proportionately trimmed with hooks, according to the kind of fish it is proposed to catch. Further information relative to this improvement may be obtained of Mr. Calvin V. Graves, Natural Bridge, N. Y.

Plaster of Paris Floors.

The French, who have carried the art of hardening plaster to where it is utilized for flooring, either in place of wood or tile, use six parts of good quality of plaster intimately mixed with one part of freshly slaked white lime finely sifted. The mixture is then laid down as quickly as possible, care being taken that the trowel is not used on it for too long a time. The floor, adds the *National Builder*, should then be allowed to become very dry, and afterward be thoroughly saturated with sulphate of iron or zinc, the iron giving the strongest surface, the resistance to breaking being twenty times the strength of ordinary plaster. With sulphate of zinc the floor remains white, but when iron is used it becomes the color of rusted iron; but if linseed oil, boiled with litharge, be applied to the surface, it becomes of a beautiful mahogany color. Especially is this the case if a coat of opal varnish is added.

Paste for Attaching Paper to Glass.

Flour	2 teaspoonfuls.
Water	4 ounces.
Bichromate of potash	5 grains.

The flour must be rubbed to a smooth paste with the water, then placed in a saucepan over the fire and kept stirred until it boils. Add the bichromate slowly, stirring all the time; then stand to cool. The paste must be kept in the dark, and used as soon as possible. Soak the paper in it, and attach to the glass, then place in direct sunlight for a day. This sets up a chemical change in the bichromate, and renders the paste insoluble.

Correspondence.

Nitro-Glycerine Should be Kept from Freezing.

To the Editor of the Scientific American:

How long will the community be startled and appalled by such terrible calamities as occurred recently in a Brooklyn suburb? I answer, just as long as workmen are allowed *to thaw out dynamite.* "But it can't be used in its frozen state." No; but it can be *kept from freezing*, just as easily as ink, or vegetables, or anything else. Dynamite, in cold weather, should be kept in a chest impervious to frost; and any box or chest can easily be made impervious by packing. The legislature of every State where the mercury is liable to fall below freezing should enact a law making it a criminal offense on the part of any one storing or using dynamite *to allow it to freeze.* J. T. PETTEE.

Meriden, Conn., January 2, 1893.

American vs. Foreign Files.

To the Editor of the Scientific American:

I have read Mr. J. D. Foot's answer, in the SCIENTIFIC AMERICAN of January 14, to my note on files. I desire to say that my experience with file *manufacture* is quite small and unimportant; but my experience in the use of files is one of thirty years. This experience teaches me that the files made by Mr. Foot's company are inferior to those of the Stubb's make in at least the degree stated in the note referred to.

It is fair also to assume that Mr. Foot has incorporated his whole file knowledge into his product, and those who are familiar with that product may judge said experience and expertness with little room for doubt, and they may thus gauge his criticism of my note so as to do justice to both of us.

A general expression of the opinions of American users of files on the values of Mr. Foot's files, when compared with the Stubb's files, will teach your readers how these tools generally are considered.

Brooklyn, Jan. 16, 1893. ALBERT D. PENTZ.

The Importance of Auxiliary Water Jet Propulsion for Steamers.

To the Editor of the Scientific American:

Your valuable article on "Safety Suggestions on Ocean Steamers," of January 7, 1893, is very timely and to the point. It should be well pondered and carefully considered by the engineering profession and by the public.

When it is considered that thousands of human lives and millions of dollars of property are risked on the ocean every year, thousands of miles from land, it is a wonder to me that not more precautions are taken to protect life and property, and that not more progress has been made by marine engineers to make steamships superior to wind and water. It seems to me man will master the sea when he will perfect his steamship. He has not done it yet; but if an auxiliary propelling force like water jets were introduced, it would go a long way to make safe and perfected steamships, by giving the vessels a steering and propelling power independent of the screw and shafts. If jets were used with the screw, they would produce increased speed to the vessel; but as a ready protection to a vessel disabled on account of loss of screw or fractured screw shaft, the water jet offers the least expensive and most effectual of any means taken to provide safety for a vessel in such an emergency. With a water jet propeller the vessel is reasonably sure of steering and propelling itself to port, and need not depend on the "hawser" and pay heavy salvage. Then collisions will be less frequent, because bow jets enable the vessel to stop much quicker, and if the government put jets on war vessels, it would find it could maneuver war vessels with jets to a much greater degree than is now the case.

The government should carefully consider the merits of the auxiliary water jet, and if it finds it will protect life and prove valuable in case of loss of the screw or broken screw shafts, then it is the duty of government to enact a law that all steamers and war vessels be provided with the auxiliary method of hydraulic propulsion.

There is no question that water jets will propel a vessel; and as the SCIENTIFIC AMERICAN suggested—by use of the pumps in the ship—an inexpensive means would be at hand to provide a propelling force in case of necessity. Then, no doubt, if the system were adopted it could be greatly improved, and obstacles that now appear could be surmounted. I hope the matter will be taken up, now that you have called attention to the importance of auxiliary water jet propulsion. J. W. H.

Newton, Mass., January 9, 1893.

NICKEL is a modern metal. It was not in use nor known of till 1715. It has now largely taken the place of silver in plated ware, and as an alloy with steel it is superior to any other metal, for it is not only non-corrodible itself, but it transfers the same quality to steel; even when combined as low as 5 per cent it prevents oxidation.

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