doubt change the channel itself in places. It appears that no feasible channel exists in the Kusilvak mouth for vessels of over ten feet draught.

Magnetic and gravity determinations were also made by the party while at St. Michael. The party eft the Yukon delta and returned to St. Michael on September 13th, in order to haul out the vessels before the freezing up of the river, which occurs some time in the atter part of September.

The astronomical observations were obtained only after long waiting because of the continued cloudy weather, while the frequent storms of wind and rain interfered much with the other work in hand.

The hundreds of square miles of mud lying between high and low water of the delta, which was found navigable for neither boats nor boots, presented a problem not usually encountered in surveying. After the low grass flat which lies above the ordinary high water of the delta was finally reached, the surveyors were greeted by myriads of mosquitoes, whose vexatious assaults are the crowning difficulty to be encountered in charting the Alaskan coasts.

Another Coast Survey party charged with the topographic reconnaissance of the headwaters and passes of the Lynn Canal, Alaska, arrived at Haines' Mission on May 7th, where the party separated, one part going up the Chilkat River and the other taking up the work in the Khatschin Valley. Each party was composed of a chief and five men.

The rivers forming the head waters of Lynn Canal have very swift currents and they were ascended under great difficulty and with much loss of time, as the loaded boats had to be tracked the entire distance, the men generally wading in the ice-cold water, overhanging alders precluding shore-tracking, excepting such stretches where gravel and sand-bars are deposited along the river shores. The water level fluctuates with the weather, rising rapidly after a day or two of clear weather, when the snow and ice of the adjoining mountains undergo a rapid melting. The main channels of these rivers change with every freshet, new bars being formed while old ones are washed away. This fact, together with numerous snags scattered about between islands and on sand bars, makes navigation, even with small boats, difficult and risky. The Khatschin party, while descending that river in June, lost one boat and a part of the outfit and records by being wrecked on a snag, the men barely escaping with their lives.

The parties suffered little from rainy weather, but the fogs and mists rarely left the higher altitudes for more than a day at a time, hiding from view the mountains which were to be located cartographically. Owing to the small number of clear days that are generally met with in the mountains of this region, it had been decided to use the photo-topographic surveying method, as it had given good results for the topographic reconnaissance of southeastern Alaska made under the direction of the Alaskan Boundary Commission.

Both parties were supplied with plane-tables for mapping the valleys and photo-topographic outfits. They have returned with instrumental and photographic records, which, when mapped, will cover an area of about 500 square miles, distributed over the valleys of the Chilkat, Tsicku, Tlahini, Khatschin, Skagway and Dyea Rivers, including the tributaries near their heads.

NOTES ON INORGANIC CHEMISTRY.

THE *Chemical News* contains a paper by Robert Meldrum on the action of water and saline solutions on metallic iron. In each experiment six feet of piano wire were exposed in the solutions in a four-ounce bottle. In many of the experiments with

distilled water the water was sterilized, and the author concludes that the oxidation of iron takes place in water in the absence of bacteria and other forms of life, and of ammonia and carbon dioxid. As in no case was air vigorously excluded, the author concludes that it is as yet an open question whether it is the water or the dissolved oxygen which acts upon the metal. In the second series saline solutions were used, alkalies and alkaline salts being experimented with. In general the alkalies prevented action on the iron, but many alkaline salts, as potassium carbonate, hydrogen sodium phosphate, sodium meta- and pyrophosphates and the bicarbonates, do not prevent action. Sodium peroxid had no effect. Alkaline potassium salts act more strongly on iron than the corresponding sodium compounds.

In a recent letter to *Nature*, Sir William Crookes corroborates the observations of Friedlander and Kayser and of Baly, that helium is a constituent of the atmosphere. In examining the more volatile positions from liquid air no difficulty was found in observing the lines of helium. A sample of helium separated by Professor Dewar from Bath gas showed the undoubted presence of neon. The presence of helium in the atmosphere is at variance with the theory advanced, that owing to its great molecular velocity any helium in the atmosphere would escape from the influence of gravitation, unless, indeed, helium is present in space.

J. L. H.

BOTANICAL NOTES.

THE FLORA OF THE UPPER SUSQUEHANNA.

Mr. Willard N. Clute has been studying the flowering plants and ferns of the region drained by the upper Susquehanna and its tributaries, mainly in southern New York, with a small area in northern Pennsylvania, and has brought out his results in the form of a pretty little book of about 170 duodecimo pages. He has not attempted to make a phytogeography of the region, but has given us a local list, which the phytogeographer may profitably take, with similar lists of other regions, in attempting to present a general view of our flora. The book opens with a short introduction, in which there is a little about the topography, geology, rivers and streams, lakes and ponds, bogs and swamps, mountains and ravines, elevations, temperature, rainfall, etc., with brief observations upon the characteristics of the flora, the lesser floras, statistics, etc. No less than 1105 species are catalogued, a very good showing when it is remembered that only Spermatophytes and Pteridophytes are included.

The nomenclature is quite appropriately the modern one, in accordance with the much discussed 'Rochester Rules,' and the families appear to agree with those of Engler and Prantl's *Pflanzenfamilien*, but their sequence is that of the Sixth Edition of Gray's Manual, even to the position of the Gymnosperms, between the Dicotyledons and Monocotyledons. The record of localities given with the species will be of much service to the phytogeographer, for which purpose the citations should have been still more explicit in many cases. The rarer plants fare better in this regard than do those which have a rather wide distribution.

BOMBAY GRASSES.

There has recently appeared from the government printing press of Bombay, India, an important work on the grasses of the Bombay Presidency, from the hand of the lamented Dr. J. C. Lisboa. The region covered extends along the Arabian Sea, from 14½ to 28 degrees of north latitude, or about one thousand miles, and from the coast to an irregular interior line distant from one to three hundred miles, and includes nearly two hundred thousand