Measures Service. As this is the result of the thermometric studies pursued at the International Bureau for several years, it seems desirable to give it a wider publicity than is offered by the publications of that bureau alone, from which these statements have been collected by me.

The standard scale adopted is, by the wording of the resolution "the centigrade scale of the hydrogen thermometer, having for its fixed points the temperature of melting ice (0°) and that of steam (100°) of water boiling under a standard atmospheric pressure. The hydrogen being taken under a manometric pressure of 1 metre of mercury, i.e., $\frac{1000}{760} = 1.3158$ times the standard atmospheric pressure." The standard atmospheric pressure is that exerted by a column of mercury (density = 13.596) 760 millimetres long at 0° C., at the mean sea-level in latitude 45°. An increase of pressure of one atmosphere lowers the melting point of ice about 0°.008.

All the thermometers used at the bureau are made of the same kind of glass, the composition of which was found by chemical analysis to be —

	Stem.	Bulb.
Silica	71.45	71.52
Sulphuric acid (SO_3)	0.74	0.72
Chlorine	traces	traces
Aluminum	1.26	1.57
Peroxide of iron	0.29	0.22
Lime	14.52	14.55
Soda	11.17	10.81
Potassa	0.30	0.37
Magnesia	traces	traces
Protoxide of manganese	traces	traces
	99.73	99.76

The exclusive use of this glass has several advantages.

1. The changes of the zero point are relatively very small, and its depression due to increase of temperature is practically a rectilinear function of the latter within the limits — 10° + 100°.

2. The thermometers are comparable among themselves, and it was found practicable to establish a general formula for reducing their indications to the standard hydrogen scale. A table of corrections based on this formula is given below, but of course it is applicable only to thermometers of this kind of glass. The reduction of the indications of mercurial thermometers to a gas thermometer depends on the kind of gas used and on the glass of which the mercurial thermometer is composed.

T hydrogen = T mercury + correction.

T m	− 20°	− 10°	0	+ 10°	+ 20°	+ 30°	+ 40°
Corr.	+ 0°.172	+ 0°.073	0.000	− 0°.052	− 0°.085	− 0°.102	− 0.107

T m	+ 50°	+ 60°	+ 70°	+ 80°	+ 90°	+ 100°
Corr.	− 0°.103	− 0°.090	− 0°.072	− 0°.050	− 0°.026	0.000

O. H. TITTMANN.

Washington, D.C., July 27.

Turner's Explorations in Alaska.

IT is with no small degree of satisfaction that naturalists are regarding the publications that are appearing from time to time from the office of the Chief Signal Officer of the Army at Washington, referring, as we do more particularly, to the reports made under the auspices of that office by the Alaskan explorers. The last one of these, very recently issued, is now before us, and presents in an admirable manner the results accomplished in that region by Mr. Lucien M. Turner, during the years 1874 to 1881, who carried on his explorations there under the direction of the Chief Signal Officer, and in connection with the National Museum.

Issued in the usual Government form, this quarto volume of some 225 pages, with its twenty-six plates, makes a very handsome work. It has been entitled 'Contributions to the Natural History of Alaska,' and is the second of the series, — its author dividing its contents into six parts for treatment. Of these, Part I. presents a very short and concise general description of the regions explored, and we learn that Mr. Turner was at various times stationed at Saint Michael's, Unalashka, the islands of Saint Paul and Atkha, at Attu, and many other points of interest. Part II., occupying about forty pages of the work, is devoted to meteorological observations, and presents in a fairly-well digested manner, the author's labors in this direction, and it is needless to add that the data here collated are not only of interest but of great scientific value. In Parts III.–VI., inclusive, the plants, fishes, birds, and mammals are dealt with, and in a very thorough manner when we consider many of the difficulties the author was obliged to overcome. Perhaps the botany of the region gained the least at Mr. Turner's hands, and it consists simply of his field-notes, added to Rothrock's list of 1867, the author stating "in this connection that of all great difficulties the most troublesome was to preserve the plants after I had collected them. The constant moisture of the climate has frequently ruined my entire collection of a summer's work. All that remained after supposing the plants were sufficiently dried would be a mass of mould and dry edges of paper, this being apparently done in less than forty-eight hours' time."

A frog (*Rana sylvatica ?*) was the only reptile collected; and at Fort Yukon, just within the Arctic circle, this species is reported to be quite plentiful. Some excellent work was accomplished in ichthyology, and a number of species added, new to science, and several rare forms collected. Fourteen beautiful plates of fish are given, and one of a lamprey (*A. aureus*), and it would be not easy to overestimate the interesting and valuable field-notes here presented. Habits, uses, geographical ranges, and other matters, are treated with distinguished ability, and in this, much is due to the assistance of Dr. Bean of the Smithsonian Institution.

What we have just said in reference to the ichthyological part, applies with more than equal force to the work done in ornithology; and to state the fact that no less than ten elegantly colored plates of birds by Robert and John L. Ridgway are given, is equivalent to saying to ornithologists and others, who may not yet have seen the work, that a feast for their eyes is still before them. The whiskered auklet (*S. pygmæus*) is figured in full breeding plumage; Turner's ptarmigan, male and female, are both given; excellent figures of the Lapp and Hawk owls, and others of special interest. Through the published field-notes much has been added to our knowledge of the habits of many of these arctic bird forms.

No mammals, unfortunately, are figured, and this part of the report has evidently not received the attention it so justly deserves, and in speaking of Cooper's shrew, our author evidently confuses that diminutive insectivore with the rodents. The volume is completed by a very full and useful index, and Mr. Turner is to be congratulated, not only upon the appearance of his work, but upon the successful termination of his explorations and labors.

Another volume by the same author is promised soon by the Signal Office, also one from Mr. E. W. Nelson, upon the same region; and finally General Greely's own report upon the Lady Franklin Bay Expedition, which will be looked for with very general interest.

It is to be hoped that the government will appreciate more and more such works and the reports thereon, and be induced to aid and encourage them as much as possible.

R. W. SHUFELDT.

Fort Wingate, N.Mex., July 22.

The Use of the Microscope as a Practical Test for Oleomargarine.

THE act passed by Congress entitled "An Act defining butter, also imposing a tax upon and regulating the manufacture, sale, importation, and exportation of oleomargarine," approved August 2, 1886, commonly known as the 'oleomargarine law,' makes it the duty of the Commissioner of Internal Revenue to prescribe all needful regulations for carrying it into effect.

From the 1st of November, 1886, when the law first went into effect, to October, 1887, one hundred and thirty-one samples of substance supposed to be oleomargarine were submitted for the decision of the commissioner under sections 14 and 15 of this act, twenty-one of which proved on analysis to be oleomargarine, and one hundred and ten were found to be butter. Most of these latter were old and rancid. The very prevalent idea that rancidity is the most characteristic property of oleomargarine may account for the