national Congress is required, since the abbreviations present no difficulties.

A. L. HERRERA.

MUSEO NACIONAL, MEXICO.

TIDES AND CURRENTS IN CANADIAN WATERS.

TO THE EDITOR OF SCIENCE: Permit me to invite your attention to the latest report of the engineer in charge of the survey of the tides and currents of the coast waters of Canada, Mr. W. Bell Dawson, M. A., M. E., etc., a copy of which has been addressed to you. This survey, commenced by the government of Canada in 1894, is of great importance, not merely in the interest of hydrographical science, but of the large and increasing trade which finds its way along the Gulf and River St. Lawrence, the greatest waterway from the north Atlantic into the northern part of the American continent, and which, like all similar tide-ways, is affected by the complex action of the tides and consequent currents.

It is much to be regretted that the economy or parsimony of the government has caused a suspension for the present of the special survey of the currents, and has restricted the work to tidal observations, which, though of great value to the shipping interests, can only be considered as preliminary in regard to the investigation of the currents themselves, which lead to so many losses of property and life, and tend to high rates of insurance, injurious to the ship owners and merchants of Canada, and, through them, to those of an empire as a whole.

The present report, in addition to what can be done with the insufficient grant allowed in the matter of tide-gauges and tide-tables, has reference to the behavior of the gigantic tides of the Bay of Fundy, when confined by the converging coasts at the head of the bay, and their relation to the smaller tides on the opposite side of the isthmus connecting Nova Scotia and New Brunswick, at Bay Verte, on the Gulf of St. Lawrence. These and the phenomena of the 'bore' at the head of the Bay of Fundy are here for the first time described, illustrated by maps and sections, and tabulated, and will be found of the greatest interest by all who desire information as to the exceptional tides of this region.

NATURAL HISTORY OF THE TRES MARIA ISLANDS, MEXICO.

THE latest publication from the Division of Biological Survey of the U. S. Department of Agriculture, being 'North American Fauna, No. 14,' bears the title at the head of this notice. It contains the result of an exploration made in the spring of 1897 by Mr. E. W. Nelson and Mr. E. A. Goldman during the month of May of that year, and adds largely to our previous knowledge of the fauna and flora of these islands. The more appropriate title to the paper would be 'Contributions to the Natural History,' etc., for no *insecta* are mentioned and *only six* species of mollusks; of these *four* had not been previously known to occur. The author, after mentioning the names of Col. A. J. Grayson and Alphonse Forrer, says 'no other naturalist is known to have visited the islands until the spring of 1897,' the season of his visit. He should have known that the islands were visited in the spring of 1876 by Mr. W. J. Fisher, previously naturalist of the Tuscarora Telegraph Sounding Expedition, directed by Commander George E. Belknap in 1873. Mr. Fisher made a large collection of molluscan forms as published in the Proc. U. S. Nat. Museum, pp. 139–204 of Volume XVII., 1894, wherein 89 species are listed.

It is not unlikely that both Grayson and Forrer collected many insect species which have been published somewhere. Only the mollusks collected by Fisher have come under my notice.

ROBERT E. C. STEARNS.

LOS ANGELES, CAL., June 26, 1899.

NOTES ON INORGANIC CHEMISTRY.

No little work has been done on the compounds of sulfur and iodin, but with no very satisfactory results. The latest contribution is by L. Prunier in the *Journal de la pharmacie et de la chimie*, and it can hardly be said that the subject is left in a much clearer condition. Prunier distinguishes between what he calls 'iodized sulfur' and 'sulfur iodid.' The former is made by adding the desired quantity of iodin to sulfur at 115° to 120°, stirring, cooling and preserving in a stoppered bottle. The iodin

volatilizes very readily and is rapidly extracted from the finely pulverized substance by sodium thiosulfate solution. The sulfur left after the extraction of the iodin is readily soluble in carbon bisulfid. It would seem that in the 'iodized sulfur' the iodin is merely dissolved in the sulfur. The 'sulfur iodid' is prepared by adding pulverized iodin to sulfur heated to 200°. While cooling, the mass is poured into cold water and then powdered. The iodin cannot be dissolved out by thiosulfate solution and seems to be in chemical combination. The color of the sulfur iodid is yellowish red; that of the iodized sulfur brownish black. Both substances, especially the latter, are energetic therapeutic agents.

The question of the form in which iodin occurs in the sea water has received a new answer from Armand Gautier in the *Comptes Rendus*. It is questionable how much experimental evidence can be deduced to show the presence of sodium iodid or calcium iodate, though both of them have been proposed. Gautier claims that all the iodin in sea water is in the form of organic compounds. About one-fifth is combined in algæ and spores, and the remainder in the form of soluble organic compounds; the latter are in part derived from the decomposed algæ, and are in turn assimilated by other algæ. It would be an interesting thing to have this question settled once for all, but the problem is one of great difficulty.

There is also presented in the *Comptes Rendus* a study by M. De Forcrand of the chemical function of water compared with that of hydrogen sulfid. From the heats of formation of the oxids of sodium the author concludes that the two hydrogen atoms in a molecule of water are distinctly different in function, and hence that water possesses an asymmetrical formula which he would represent by H—OH. In hydrogen sulfid, on the other hand, he considers the hydrogen atoms of equal value, and it consequently possesses a symmetrical formula H—S—H.

According to the *Pharmaceutische Central-Halle* Varino has succeeded in preparing a colloidal form of bismuth. The very diluted solution of bismuth tartrate in potassium tartrate is treated with a solution of stannous chlorid in caustic potash. A clear brown fluid results, from which very little bismuth precipitates, and which acts toward the electrical current in a similar manner to colloidal gold.

According to the *Chemical News*, one of the the most interesting exhibits at the recent Royal Society Conversazione was the series of experiments by Mr. W. A. Shenstone and Mr. W. T. Evans, showing the manufacture of tubes of rock crystal in the oxyhydrogen blowpipe flame. Tubes of one centimeter in diameter, composed of rock crystal, can now be made of considerable length at the rate of about three centimeters an hour. This is of great practical as well as theoretic interest.

J. L. H.

RECENT PROGRESS IN THE EXAMINATION OF FOODS AND DRUGS.

PLANT PRINCIPLES.

As the result of some investigations on the carbohydrates in bulbs, tubers, etc., L. du Sablon* gives the following information: The reserve materials in the tubers of potato, rhizomes of *Arum* and *Iris* and the corms of *Colchicium* and *Ranunculus* consist almost entirely of starch, with small quantities of dextrin and sugar. In the tubers of *Ophrys* and the bulbs of *Lolium*, *Tulipa* and *Hyacinthus* the reserve is made up of starch and dextrin. In the corm of *Ficaria* starch, dextrin and non-reducing sugars are present. In the tubers of *Dahlia* inulin and levulin are found; whereas in the tubers of the artichokes, besides the inulin and levulin, non-reducing sugars are present. Chiefly reducing and non-reducing sugars are to be found in the bulbs of *Allium* and *Asphodelus*. The experiments of du Sablon seem to show that the starch is transformed into dextrin, then into non-reducing sugars and finally into reducing sugars.

Inulin has been found by H. Fischer† to occur in most of the tribes and a large number of genera of the N. O. Compositæ. It is also found in the Campanulaceæ, Lobeliaceæ, Goodeniaceæ, Stylidaceæ, etc. He assigns to it the formula 333 $C_6H_{10}O_5$ or $C_{1998}H_{3330}O_{1665}$.

* Bonniers Rev. Gén. de Bot., 1898; Ibid., p. 295.

† Cohn's Beitr. Biol. Pflanz., 1899, p. 53.