We recently called attention to a report made by Professor Leeds to the Chemical Society, of New York on the adulterations of certain articles of food. The tenor of the report was to show that food products in general were unadulterated and pure, and to cast ridicule on those who asserted to the contrary. Among other specific statements Prof. Leeds stated that he had made a special examination of sugar syrups, and asserted that the result of his investigations showed, that they were free from any admixture of glucose.

Side by side with Prof. Leeds' report we gave the statement of Prof. Wiley that 500 tons of glucose was made daily in the United States, the bulk of which was used for adulterating cane sugars, and that the glucose of commerce as sold in the Western States was largely composed of syrup made from starch.

We publish in this issue a letter from Prof. Wiley in confirmation of his report, stating that the manufacture of a sugar, which is a mixture of glucose and cane sugar, is carried on in New York city or its vicinity.

AMYLOSE.

As a thousand tons of sugar made from starch will within a few months be placed on the market daily, half that amount being already the consumption of that article of commerce, it appears desirable to make use of some name by which this substance may be known and at the suggestion of Prof. Wiley, we propose "AMYLOSE" as an appropriate term.

AMYLOSE will include all varieties of syrups and sugars manufactured from starch. (Lat. *Amylum*, *Starch*).

NOTE ON PHOTOGRAPHS OF THE SPECTRUM OF THE COMET OF JUNE, 1881.

BY PROFESSOR HENRY DRAPER, M. D.

The appearance of a large comet has afforded an opportunity of adding to our knowledge of these bodies by applying to it a new means of research. Owing to the recent progress in photography, it was to be hoped that photographs of the comet and even of its spectrum might be obtained and peculiarities invisible to the eye detected. For such experiments my observatory was prepared, because for many years its resources had been directed to the more delicate branches of celestial photography and spectroscopy, such as photography of stellar spectra and of the nebulæ. More than a hundred photographs of spectra of stars have been taken, and in the nebula of Orion details equal in faintness to stars of the 14.7 magnitude have been photographed.

It was obvious that if the comet could be photographed by less than an hour's exposure, there would be a chance of obtaining a photograph of the spectrum of the coma, especially as it was probable that its ultra-violet region consisted of but few lines. In examining my photographs of the spectrum of the voltaic arc, a strong band or group of lines was found above H, and on the hypothesis that the incandescent vapor of a carbon compound exists in comets this band might be photographed in their spectrum.

Accordingly, at the first attempt, a photograph of the nucleus and part of the envelopes was obtained in seventeen minutes on the night of June 24th, through breaks in the clouds. On succeeding occasions, when an exposure of 162 minutes was given, the tail impressed itself to an extent of nearly ten degrees in length.

I next tried by interposing a direct vision prism between the sensitive plate and object glass to secure a photograph which would show the continuous spectrum of the nucleus and the banded spectrum of the coma. After an exposure of eighty-three minutes, a strong picture of the spectrum of the nucleus, coma and part of the tail was obtained, but the banded spectrum was overpowered by the continuous spectrum.

I then applied the two-prism spectroscope used for stellar spectrum photography, anticipating that although the diminution of light would be serious after passing through the slit, two prisms and two object glasses, yet the advantage of being able to have a juxtaposed comparison spectrum would make the attempt desirable, and moreover, the continuous spectrum being more weakened than the banded by the increased dispersion the latter would become more distinct.

Three photographs of the comet's spectrum have been taken with this arrangement with exposures of 180 minutes, 196 minutes and 228 minutes, and with a comparison spectrum on each. The continuous spectrum of the nucleus was plainly seen while the photography was in progress. It will take some time to reduce and discuss these photographs and prepare the auxiliary photographs which will be necessary for their interpretation. For the present it will suffice to say that the most striking feature is a heavy hand above H which is divisible into lines and in addition two faint bands, one between G and *h* and another between *h* and H. I was very careful to stop these exposures before dawn, fearing that the spectrum of daylight might become superposed on the cometary spectrum.

It would seem that these photographs strengthen the hypothesis of the presence of carbon in comets, but a series of comparisons will be necessary, and it is not improbable that a part of the spectrum may be due to other elements.

271 MADISON AVENUE, NEW YORK.

OBSERVATIONS ON SIREDON LICHENOIDES.*

BY WM. E. CARLIN.

Como Lake is a body of water about two miles and a half in circumference. It has no known outlet, but is fed by a stream of pure spring water about two feet wide and a foot deep, which, continually running, prevents the lake's absorption by evaporation. The lake is quite shallow and can be easily waded at almost any part, being not more than 10 feet deep in the deepest place that I have been able to find. The bottom of the lake is soft and is covered in most places with grass and weeds. The water is strongly impregnated with alkali, and a large number of cattle are said to have died a number of years ago from drinking it. It is very disagreeable to the taste. The amount of water varies about 14 inches during the year, being highest in the spring from the melting snows, and lowest in the autumn. This is the home of the *Siredon lichenoides* (Baird). They never enter the stream of fresh water, preferring the alkali water of the lake. They seem to suffer no inconvenience, however, if placed in fresh water. I have caught as many as a hundred and fifty and

*From the Proceedings of United States National Museum.

placed them in a cauf, and have never had one die from the change. The change to fresh water undoubtedly hastens the metamorphosis into the *Amblystoma* form, as I have noticed quite a change in the course of twenty-four hours in individuals placed in the cauf, while an equal number kept in the alkali water in the boat have shown no change in any of them in several days. I have kept six at different times in jars of fresh water until they have completed their metamorphosis. I made no systematic note of appearance from day to day, but my observation was careful and regular. In two cases the change in external appearance was so abrupt that I would have been almost certain that another salamander had been substituted for the one in the jar had I not had him so completely under observation that it was impossible. The gills had assumed a stubby form about half the length that they were the night before, and the gill on the back on the back of the body was nearly half gone; it took air quite often, and I removed it from the jar and placed it in a box with some lake grass around it to keep it moist. It completed the metatmorphosis in a few days. I did not feed it any during this time. While it was in the jar it was well fed with flies. The jar was placed upon a table in the telegraph office. The flies at first had to be pushed in front of it with a pencil. It finally got to know that tapping the jar with a pencil meant a fly, and would rise to the surface immediately and snap at whichever it saw first, pencil or fly. It furnished train-men continual amusement while here, and they kept it constantly gorged. Those that I kept well fed in jars and seldom changed the water, say once in three days, usually began to show a slight change in from two to three weeks, and all of them completed the change into the *Amblystoma* inside of six weeks, while I have had but three changes of those kept in the cauf (sixty of them) in three months. During that time they have not been fed at all. The *Siredon mexicanus* is said to never undergo the transformation in its home, and Professor Marsh doubts that it ever makes it here. This doubt I can put at rest. They do make the change here, and in large numbers. During the latter part of the month of July and the entire month of August, if the day is rainy or misty, they come from the lake to the shore in large numbers, and secrete themselves under some piece of wood or rock where they can keep moist. Sometimes they venture out in a shower, and the sun catches them before they can obtain shelter either in the lake or under cover, and in a few minutes kills them. They can be found dried hard anywhere about the lake, on the shore or in the grass. While catching *Siredon* I have seen and caught a number of *Amblystoma* in the lake, with the metamorphosis, as far as I could see, as complete as those we find half a mile from the lake. They cover the ground by thousands during a warm summer rain, coming from every conceivable place where they could have found shelter, from under rocks, boards, old ties, and out of gopher holes. I have a cat that eats them greedily. She has fished several out of jars on the table and devoured them during the night when there was no one to watch her; and I am told by a resident that the numerous skunks that live around the lake live principally on them. They are of two colors, a blackish green and a yellowish green color. I have had two of the blackish green complete the change in sequence, while one of the yellowish green was completing it under the same circumstances of change of water and food. I think this will be found to be the result in all similar cases. I have caught them in all stages of growth and in all stages of their changes into the *Amblystoma* state. During the months of July and August they lie close to the shore of the lake, where it is shallow; but after the first frost they disappear completely, or at least I have never been able to find them. I think they must bury themselves in the mud at the bottom of the lake, as I have stirred up the grass often and have not seen them issue from it.

AN ANALYSIS OF WATER DESTRUCTIVE TO FISH IN THE GULF OF MEXICO.*

BY F. M. ENDLICH.

Having completed the examination of sea-waters from the Gulf of Mexico, so far as the scant supply would permit, I have the honor to offer the following report thereupon, the water in which the fish die being designated as A, the good water as B:

	A.	B.
Specific gravity	1.024	1.022
Solid constituents (total), per cent	4.0780	4.1095
Ferric compounds, per cent	0.1106	0.0724
Injurious organic matter	ratio=3	ratio=2

I find that the water A contains a large quantity of *Algæ* and *infusoria*. It is eminently probable that the former may have had an injurious effect upon the fish. Specimens of the algæ have been submitted to Professor Goode, who will send them to some expert, in order that their specific gravity may be determined.

The "dead fish" in possession of the United States National Museum are such that any examination of the organs of respiration will be of no avail.

I cannot find, even by spectroscopic analysis, any mineral constituents in the water A which could noxiously affect the fish.

In my estimation the death of fish was caused by the more or less parasitic algæ, which are found in large quantities in water A, but do not occur at all in water B.

In case the same phenomenon should recur, the presence of an expert in the questions involved, more particularly chemistry and botany, would most likely lead to definite results,

Prof. S. F. BAIRD,
Secretary the Smithsonian Institute,
WASHINGTON, D. C.

A MICROSCOPICAL STUDY OF THE IRON ORE, OR PERIDOTITE OF IRON MINE HILL, CUMBERLAND, RHODE ISLAND.†

BY M. E. WADSWORTH.

The attention of the writer was first particularly called to this formation by some specimens presented to him by Mr. H. B. Metcalf in the Spring of 1880. These did not appear to the writer to be any common ore of iron, but rather fragments of a basic eruptive rock containing much iron. Sections were accordingly made which revealed its true character.

The formation was described by Dr. Charles T. Jackson in his report on the Geological Survey of Rhode Island in 1840. He states that Iron Mine Hill "is a mountain mass of porphyritic magnetic iron ore, 462 feet in length, 132 feet in width, and 104 feet in height above the adjoining meadow. From these measurements, which were made over only the visible portion of this enormous mass of iron ore, it will appear that there are 6,342,336 cubic feet of the ore above natural drainage. ... Its specific gravity is from 3.82 to 3.88.... This ore is remarkable both on account of its geological situation and its mineralogical and chemical composition. It appears to have been protruded through the granite and gneiss at the same epoch with the elevation of numerous serpentine veins which occur in this vicinity. This will appear the more probable origin of this mass, when we consider its chemical composition in comparison with that of the iron ore, which we know to have been thrown up with the serpentine, occurring on the estate of Mr. Whipple, and the fact that the ore at Iron Mine Hill is accompanied by serpentine mixed with its mass in every

* From the Proceedings of United States National Museum.

† From the *Bulletin of The Museum Comparative of Zoology*.—Harvard College.