

of the ocean over which the Gulf Stream flows. Instead of a deep channel, which has been previously reported, our soundings show an extensive and nearly level plateau extending from a point to the eastward of Bahama Banks to Cape Hatteras. Off Cape Canaveral it is nearly 200 miles wide, and gradually decreases in width to the northward until reaching Hatteras, when the depth is more than 1,000 fathoms within 30 miles of the shore.

"This plateau has a general depth of 400 fathoms, suddenly dropping on its eastern edge to 2,000 fathoms. The soundings in the strength of the current were all taken with the 60-pound shot-sinkers, the time allowed for the sinker to reach the bottom being less than one minute to each 100 fathoms in depth. Most of the soundings taken each side of the stream when not in strong current were taken with a 36-pound lead on the sounding-wire, the lead being reeled back. . . . It will be observed from the bottom specimens that the course of the Gulf Stream can almost be traced by the character of the bottom.

"On each side of the stream the sounding-cylinder brought up ooze. In the strength of the current, the bottom was washed nearly bare, the specimens being small broken pieces and particles of disintegrated coral rock. This bare portion was very hard, and the sharp edge of the brass sounding-cylinder came up very much dented and defaced."

During the summer of 1882 the Blake, under command of Lieut.-Commander W. H. Brownson, was engaged in sounding off New-York entrance. The charts have hitherto shown a spot about 100 miles south-east of Sandy Hook known as the '145-fathom hole.' In her soundings, the Blake discovered this hole to have a most remarkable character.

Its depth varies from 150 to over 450 fathoms, the bottom being mud; and in about the centre a knoll of mud, gravel, and shell rises up to within 64 fathoms of the surface. The dividing-ridge between the hole at its deepest point and the deep water outside has a least depth of 129 fathoms. There seems to be a continuation of irregular character of bottom, which extends from Sandy Hook about south-east; for about 200 miles farther the depth is over 3,000 fathoms, surrounded by very much shallower depths.

During the past winter the vessel has been engaged in developing the limit and general character of the great Atlantic basin between Bermuda and Bahama, and along the outside of the West India Islands as far to the eastward as St. Thomas. This cruise has been of

great interest. The bed of the Atlantic is shown to have a general depth of 2,700 or 2,800 fathoms; and depths of over 2,000 fathoms are found almost if not quite in sight of most of the islands along the outside of the Bahamas, and even in the narrow passages between them. In one place the 2,000-fathom curve was found to approach the shore to within two miles and a half, giving an inclination of the bottom of over 38 degrees.

Not the least gratifying point of interest of this cruise was the successful sounding taken at the enormous depth of 4,561 fathoms, which, it is believed, is the greatest depth from which bottom specimens and temperature have been obtained.

The soundings shown on the sketch represent but a small part of the work performed by the officers of the Blake, as only the characteristic ones have been selected from a total of nearly 2,000. During the time actually engaged in sounding, the Blake has steamed over 7,000 miles, and probably as much more in going to the working-ground, and in gaining positions after being obliged to abandon them from heavy weather, want of coal, or from other causes.

Bottom-soil specimens have been saved for examination, and densities of the sea-water obtained at nearly all the greater depths. About 1,200 surface temperatures have been taken; and the observations of the temperature of the water between the surface and the bottom will number about 1,300.

THE PROTOZOAN PARASITES OF THE OYSTER.

M. CERTES has recently described the protozoan parasites or commensals of *Ostrea edulis* and *angulata*, resorting to a method used by the writer in studying the contents of the stomach of the *O. virginica* during the past summer. A pipette is introduced through the mouth of the animal into its stomach. After it is filled with the brownish, dirty-looking contents of the gastric cavity, the pipette is withdrawn, and emptied upon a slide or compressor, and the material carefully examined under the microscope, in order to learn the nature of the bill of fare of the animal, and to detect the presence of endoparasitic organisms. As found by the writer in the American oyster, *M. Certes* states that the oyster is omnivorous. Amongst the contents of the stomach, more or less disorganized, grains of pollen, mites, algae, crustaceans, diatoms, foraminifera, radiolarians, and, at certain times of the year, a

great abundance of eggs and spermatozoa, were noticed by the above-mentioned observer. Amongst this *débris*, however, certain living organisms are always met with, often in great numbers, which may be regarded as parasites, or at least as commensals, inhabiting the digestive canal of the animal.

In the stomachs of specimens of *O. edulis*, from Cancale and Marennes, the author discovered *Hexamita inflata* Duj., which was also observed in the act of division in this unusual position; and, as it is also found in infusions and stagnant water, it is proved that it is a true commensal under certain circumstances.

Another organism was observed amongst the contents of the stomach, principally at its anterior part, which might at first be regarded as a *Spirillum* of relatively large size. It varied in length from 0.04 to 0.12 mm., and in thickness, from 0.001 to 0.003 mm. It was found to have a vibratile frill attached, which was arranged spirally on the body, making two, three, rarely eight or ten, turns around it. This thin vibratile film was demonstrated in the living specimens by the use of aniline colors, dahlia, and methyle blue, and also by killing the creatures with the fumes of osmic acid, and afterwards staining with the colors named. M. Certes regards this organism as related to *Trypanosoma sanguinis*, — described and figured in 1843 by Gruber as a parasite of the blood of the frog, and rediscovered by Ray Lankester, and named *Undulina ranarum*, — and *Trypanosoma Eberthii* of Saville Kent, found in the intestine of the duck. For the parasite found in the oyster, M. Certes proposes the name of *Trypanosoma Balbianii*.

Besides the foregoing, a small species of *Euchelyodon* was found in the liquor which had been kept covered for some days from Marennes oysters, as well as in the fresh juices which escaped when the shell was opened. *Prorocentrum micans* Ehr. was also noticed. A plate containing twelve figures accompanies the paper noticed (*Bull. soc. zool. France*, vii. 1882).

The organism which M. Certes has described as *Trypanosoma Balbianii* is probably the same as that commonly met with in the stomach of *Ostrea virginica*, and which I had proposed to call *Spirillum ostrearum* in a paper prepared last September for the census report. Its behavior was so like that of a *Spirillum* which I have at times found in the foul, stagnant waters of the gutters in the streets of towns, that it seemed to me that it was a vegetable organism belonging to the schizomycetous fungi. The French naturalist is probably right,

however, as to its systematic position, unless the form found in *Ostrea virginica* is entirely different, which I think altogether unlikely. Sachs (Text-book of botany, 2d ed., 1882, p. 248) says, "The Schizomycetes live in fluids which contain organic substances (albuminoids) liable to putrefaction, from which they obtain their nutriment, and of the putrefaction of which they are the cause." While it is hardly fair to say that putridity characterizes the contents of the alimentary canal of the oyster, yet the conditions favorable to the growth and multiplication of low organic forms are probably present. We usually found this organism present in oysters examined by us: in fact, sometimes countless multitudes were present, especially in the stomach and around the crystalline style and the intestinal pouch or fold in which the latter is lodged. Yet, upon eating these same individuals known to be infested with parasites, no inconvenience was experienced, showing that these organisms, whatever they may be, are probably harmless to man.

I have alluded to a singular association of messmates, found inhabiting the cavity of the mantle of the American oyster, in my report to the Maryland commissioner for 1881 (Appendix A, pp. 24-25). The little oyster-crab *Pinnotheres ostreum* Say was found to support colonies of the vorticellid *Zoothamnium* on its back and legs. The infusorian, in its turn, supported on its stalks very minute Bacteria and Vibriones. In such a case, the colonies of infusorians may be of actual benefit to the oyster, since many of the zooids thrown off doubtless become food for the host.

J. A. RYDER.

THE USE OF STEEL SOUNDING-WIRE
BY LIEUT. J. C. WALSH, U.S.N., ON
THE TANEY, IN 1849-50.

Two notes on this subject have been published by Mr. W. H. Dall in SCIENCE (No. 3, p. 65; and No. 7, p. 191). In these, Mr. Dall refers to the log-book of Lieut. Walsh, when in command of the Taney, as if it were still unpublished. Nor does he give any references to the detailed report of the expedition, made by Lieut. Walsh to Lieut. Maury, as ordered by the secretary of the navy. This report was dated Aug. 15, 1850, and was printed in 1851 in connection with the 'Abstract log of the Taney,' which includes all the observations in tabular form, with a column of remarks, as a part of 'Lieut. Maury's Investigations of the winds and currents of the sea,' Appendix to