The decaying soft parts of all these animals undoubtedly have their influence upon the chemical process by which the limestone particles of their solid frame are cemented together, in the formation of compact rocks. Upon this point we may expect further information from Professor Horsford, who is now submitting to chemical analysis all the variety of rocks and the solid stems of the different corals obtained in Florida.

Respecting the relations of the solid and soft parts of the living coral, and their mode of growth, we would refer to a paper of ours now in press, to appear in the next volume of the Smithsonian Contributions to Knowledge.

CORAL REEFS.

After examining a growing coral reef, so full of life, so fresh in appearance, so free from heterogeneous materials, in which the corals adhere so firmly to the ground, or if they rise near the surface, seem to defy the violence of the ocean, standing uninjured amid the heaviest breakers, an observer cannot but wonder why in the next reef, the summit of which begins to rise above the level of the water, the scene is so completely changed. Huge fragments of coral, large stems, broken at their base, gigantic boulders, like hemispheres of Porites and Macandrina, lie scattered about in the greatest confusion; flung pell mell among the fragments of more delicate forms, and heaped upon those vigorous madrepores which reach the surface of the sea.

The question at once arises, how is it that even the stoutest corals, resting with broad base upon the ground, and doubly secure from their spreading proportions, become so easily a prey to the action of the same sea which they met shortly before with such effectual resistance? The solution of this enigma is to be found in the mode of growth of the corals themselves. Living in communities, death begins first at the base or centre of the group, while the surface or tips still continue to grow, so that it resembles a dying centennial tree, rotten at the heart, but still apparently green and flourishing without, till the first heavy gale of wind snaps the hollow trunk, and betrays its decay. Again, innumerable boring animals establish themselves in the lifeless stem, piercing holes in all directions into its interior like so many augurs, dissolving its solid connexion with the ground, and even penetrating far into the living portion of these compact communities. The number of these boring animals is quite incredible, and they belong to different families of the animal kingdom: among the most active and powerful we would mention the date fish, lithodomus, several saxicava, petricola, area, and many worms, of which the serpula is the largest and most destructive, inasmuch as it extends constantly through the living part of the coral stems, especially in macandrina.

On the loose basis of a macandrina measuring less than two feet in diameter, we have counted not less than fifty holes of the date-fish—some large enough to admit a finger—besides hundreds of small holes made by worms.

But however efficient these boring animals may be in preparing the coral stems for decay, there is yet another agent, perhaps still more destructive. We allude to the minute boring-sponges which penetrate them in all directions, until they appear at last completely rotten throughout. * * * * *

The experiments of the late Sears C. Walker* on the subject of galvanic wave time, furnish very valuable information on the propagation of the electric current. The results arrived at by that distinguished astronomer are given below:—

1. That the average of all our experiments to that time (1850) indicates a velocity of propagation of the inducing waves of 15,400 miles per second in the iron wires of a telegraph line.

2. That the velocity of propagation through the ground appears to be less than two-thirds of the velocity in the iron wires.

These conclusions were in accordance with the independent results of the researches of Dr. B. A. Gould and Mr. Karl Culman, previously read, and since published in the proceedings of the American Association for the Advancement of Science, at their meeting in New Haven in August, 1850.

There have been three independent series of observations for the value of wave-time, made since October last, 1850. The first experiment was repeated on several nights, between Seaton Station and Portsmouth, Va. The distance on the iron wires is 268 miles, and the distance through the ground is 180 miles, The clock station excess, in the electrotonic readings, by a mass of 221 measures, was +0s.024, while the computed excess for the assumed velocity of 15,400 miles per second, in the iron wires, was +0s.035. The difference between theory and computation is, theory greater by +0s.011.

The second experiment was made from Charleston, S. C., to Augusta, Ga, in the winter of 1851. The distance on the iron wire from Columbia (where the Charleston end went to the

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* At a meeting of the officers and members of the U. S. Coast Survey, the Superintendent, Professor A. D. Bache, delivered the following sketch of Mr. Walker's scientific attainments:—

We have met to pay our tribute of respect and feeling to one of our most distinguished and valued associates, Sears C. Walker, Esq., whose failing health for more than a year past has kept us in anxiety and fear for the result which has now come. Mr. Walker was attacked by bilious fever some weeks since; and though his mind was clear, his physical strength was not adequate to resist the effects of the disease.

The services which Mr. Walker has rendered to the coast survey are known in a general way to most of those whom I address. He had made the largest collection of American observations of moon culminations and occultations ever made in the country, and prepared to discuss them thoroughly for longitudes, and to bring them to bear, as far as applicable, by the geodetic results of the coast survey, upon the longitude of a central point. The magnitude of this labor would have appalled an ordinary mind. He knew that by perseverance it could be accomplished. During this discussion he reached the conclusion that the longitudes from moon culminations could not be reconciled with those from occultations, and that the theory must be re-examined for an explanation. His published reports show the successive steps of his investigation, which was not completed at the time of his decease. In the midst of it, the new, attractive, and important subject of determining differences of longitude by the telegraph was committed to him, and he threw all his zeal and knowledge into the solution of this problem, and brought it to the successful condition in which it now is. He early saw the impossibility of reading a near result by merely repeating the transmission and reception of signals, beats of a clock or chronometer, and that the beats sent and received must be of time-keepers regulated to different times—as, for example, mean solar and sidereal, and seized all the consequences flowing from this principle. The telegraphing of transits of stars was original with him.

He soon became satisfied of the necessity for graphic registry of the time results, and invited the co-operation of Mr. Saxton, of Mr. Bond, of Prof. Mitchell, and of Dr. Locke in the solution. With him originated the application of this method to the registry of time observations for general astronomical purposes, now developed by so many ingenious modes, and known as the "American Method." His researches on galvanic wave-time, growing out of these experiments for difference of longitude, are by far the most valuable contributions yet made to this branch of science. In this subject alone Mr. Walker accomplished a most remarkable five years' work; but this was only a part of what his mind found there to do, and, aside from this and labors of daily and nightly routine in computing and observing, he accomplished a work—investigation of the orbit and computation of an ephemeris of Neptune—which of itself would have given him an undying reputation. I cannot in this place describe how the training of a life was obtained which led to these brilliant results for our work, and for American science; nor can I trust myself now in an analysis of the mind and heart of this friend for many years. I have faintly pencilled his doings while closely connected with our work, shadowing merely his claims to our admiration, respect and gratitude.—*Republic, Feb 8.*