

pose of avoiding paraphrastic or descriptive titles, the use of which has been found inconvenient, and they can be changed when more important developments, proved to be the equivalents of the series, are met with elsewhere.

MINERAL WATERS.

Mr. T. STERRY HUNT read a paper on Mineral Waters, and on the Origin of the Magnesian Rocks. He alluded first to the deposits or mineral springs, and especially of calcareous waters as having played an important part in the formation of rocks. The deposits of such waters are, however, generally destitute of carbonate of magnesia, which is held in solution by them, and only precipitated on evaporation. Carbonate of soda is very abundantly distributed in certain mineral waters, and these mingling with sea-water, or with mineral waters analogous to it in their nature, have at first the effect of eliminating the lime as a carbonate, leaving the greater part of the magnesia in solution, ready to be precipitated in part by evaporation, or more completely by the further addition of carbonate of soda. In this way dolomites may occasion deposits in the open sea, and may form, as they often do, the cementing material of conglomerate or coralline limestones, or they may be formed by the evaporation in limited basins or lagoons of waters holding carbonate of magnesia, dissolved in the manner above described; in the latter case, we can easily understand the precipitation of magnesian carbonate unmixed with lime. The interstratification of dolomites with pure limestones in the Silurian rocks of Canada were described as irreconcilable with the hitherto received theories of the origin of dolomites, and it was maintained that the hypothesis now proposed is the only one which meets the conditions of the problem.

SUBSIDENCE OF COAST.

Prof. COOK, of Rutgers College, read a paper on a subsidence of the coast of New Jersey, and of some of the adjoining States. The object of this paper was to show that there is taking place a gradual subsidence of this portion of the coast, amounting to about two feet in a century. This is evident from the increasing depth of water in several harbours, from the discovery of stumps and entire trees beneath the surface in salt water marshes and other localities, which were apparently remaining *in situ*, and by the present position of the water, with respect to several mills erected many years ago.

THE NATURAL HISTORY SOCIETY CONVERSATION was given in the evening in the Bonsecours Concert Hall, which was tastefully decorated with flags and the names of Watt, Laplace, Morse, Lavoisier, Brunel, DeWitt, Clinton, &c. Principal Dawson made a brief address, expressing the pleasure with which the Natural History Society welcomed the American Scientific Association. The people of Canada regarded themselves as forming the connecting link between the United States and England, and wished to hold out the hand of friendship to the representatives of the former, here in the outskirts of the dominions of John Bull. Science, from the necessity of the case, cannot be limited by the geographical boundaries. He did not regard the present meeting as the ultimatum of attainment, but looked forward to the time when not only the American, but the British Association would be convened upon Canadian soil. Prof. Caswell then introduced the retiring President of the Association, Professor Hall, of Albany, who proceeded to deliver an address upon the "Recent Progress of Geology and Paleontology in the United States."

THIRD DAY.

METAMORPHISM OF SEDIMENTARY ROCKS.

Mr. T. STERRY HUNT read a paper on the Metamorphism of the Sedimentary Rocks. This treatise evinced much research and ability. At its close Prof. Silliman, jun., expressed himself much pleased with the statement just read; it coincided, he was happy to say, with his views. Prof. Chapman expressed himself much pleased, as also did Mr. Ramsay.

Mr. B. STEEMAN read a paper on the Parthenogenesis of Animals and Plants.

DRESSING METALLIC ORE.

Prof. B. SILLIMAN, jun., gave an explanation by experiment of a new system of dressing metallic ores. The object of this communication was to describe the general principle of a system of ore dressing, devised and put in practice in the copper mines of the Bristol Mining Company in Connecticut, under the direction of Mr. Silliman. The main features of this system are, (1) the perfect separation of the finer portions of the product of stamping and crushing (commonly known as *sterne ores*) from the coarser portion without the aid of silver. (3.) The adoption of such mechanical arrangements as have rendered the whole process of ore dressing a continuous and self sustaining system, in which human labor bears an exceedingly small ratio to the results obtained compared with any system hitherto devised.

THE WINDS OF THE PACIFIC COAST.

Prof. BACHE read a paper, on the winds of the Pacific coast of the

United States. He exhibited diagrams showing at one view the direction of the wind as well as its quantity and the time at which it was likely to blow. The westerly winds were here most prevalent—just the reverse of what happened on the Atlantic coast. This was of course to be expected. Indeed no easterly winds blew at all during the summer months. To navigators the facts stated were exceedingly valuable. The difference between the winds of eastern and western coast of America was very great.

ELECTRICAL ACTION.

Prof. HENRY read the next paper. It was by a lady, Mrs. Foote. He prefaced it by some remarks to show that ladies were perfectly able to take part in philosophical discussions. He narrated some of the biography of Mrs. Somerville, who not only directed her household affairs but even made commentaries on Laplace. Mrs. Foote announced that electric action could be produced by the condensation of air. She exhausted a glass tube, in which a wire had been placed. When the air was condensed or rarified, electricity was produced. Mrs. Foote thought that the difference in the pressure of the air, as indicated by the barometer, at different times of the day, might be the cause of the difference in the electrical state of the atmosphere.

CLIMATE OF THE UNITED STATES.

Prof. HENRY read a paper of his own on the Physical conditions bearing on the climate of the United States. Several maps were exhibited by him. One showed the number of stations where meteorological observations were about being made in Upper Canada, and it was stated that the Chief Superintendent of Education and the Director of the Provincial Observatory were about to combine to have proper observations made, in connection with the Smithsonian institute at Washington. The heat of the sun, said the Professor, is the principal cause of wind. At the equator the mean temperature was 80 degrees. At the poles it was about 0. He observed that the heat evolved from the condensation of the vapor taken up in the equatorial regions was the principal cause of the motion of the air. Another map was also exhibited showing the direction of the currents of the Atlantic and Pacific Oceans. The warm current of the Pacific was shown beating against Vancouver's Island—thus accounting for the mild temperature of that place. Other maps delineated the isothermal lines on the American Continent. But the Prof. remarked that there was great difficulty in drawing these lines on a mountainous continent. The Alleghany Mountains, however, seemed to produce no effect on the climate, but the Rocky Mountains caused an extraordinary variation in temperature. The region about them was very warm. An extraordinary effect was produced by the great lakes, especially the eastern ones. The winter temperature in their neighborhood was shown to be much warmer than in a corresponding latitude further west. The summer temperature was not so high as it was further towards the interior of the continent. The moisture which supplied the Mississippi valley must come from the Gulf and the Atlantic. Thus, since the wind from the Gulf of Mexico receives from the motion of the earth a westerly direction, that portion of the great valleys of the rivers coming from the Rocky Mountains must be sterile. This sterility was much greater than was at all supposed. Indeed one half the territory of the United States may be thought entirely barren. A line from Lake Winnipeg, southward, would have to the east of it almost all the fertile land of the Union. Hence the speaker concluded, that in a few years, when all valuable new lands were taken up, more attention would have to be given to the cultivation of the soil along the Mississippi Valley, in the Eastern States, and near the Gulf of Mexico.

THE GULF STREAM.

Dr. WYNNE read a paper on the influence of the Gulf Stream upon the summer climates of the Atlantic Ocean. The recent examinations under the direction of the superintendent of the coast survey, show that the bottom of the Atlantic presents a range of mountains pursuing a similar course to the Apalachian chain. The effect of this range of submarine mountains on the temperature of the ocean is remarkable. It has been shown that the Gulf Stream is not one uniform mass of warm water, pursuing a N.E. direction, but a series of bands of warm water interspersed with smaller colder ones. The position of the submerged mountain chain also affects the temperature of the atmosphere along the coast. The greater part of the winds along the coast come from the S.W., thus blowing along the course of the Gulf Stream. But even hills of slight altitude on shore, affect the temperature by obstructing these winds. They can even be observed in travelling along the railways on the coast.

ETHNOLOGY.

In the section of Ethnology a paper was read by Prof. LESLEY on the word Celt.

Professor James D. DANA read a paper entitled "Thoughts on Species." He said he would divide his subject into—1. What is a species? 2. Are species permanent? 3. What is the basis of variations in species? 1. What is a species? It was common to define