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COAST SURVEY.

Prof. Bache presented an account, history, &c., of the Coast Survey. The principle of it is, First, a base line is measured, from six to ten miles in length, as accurately as it is possible to make it. From this, by measuring again at the extremities of the base, a system of Triangulation is procured, of gradually increasing size. The base is enlarged, extended to a greater distance, and thus the surface of the earth is covered with a network of triangles, each side of which is calculated from the measure of the angle, and from the originally determined length of the base. This would be easy if the triangles were upon a plane surface; but it is not so simple as it would at first appear. In these large triangulations the earth is not considered as a plane surface, but as a spheroid.

The triangulations, it will be perceived, have the advantage that distances of points between which we cannot measure, can be determined, by this system of calculations, with any required degree of accuracy.

The next step in the proceedings is the Astronomical character of the Survey. This series of observations having been settled, we can now determine, by computation from the triangles, the longitude of any place, or the connection of different phenomena.

A point of the scheme has now been reached where progress may be very rapid. The chief points being so fixed, a second triangulation is formed within the first, for shorter calculations and observations—and there is a still more convenient, less exact mode of calculation, by the use of the plane table. While, by the Hydrographic Corps, a picture is made of the ground beneath the water in a similar manner to that of the Topography above it——making the matter complete in all its parts.

COMETS.

Prof. Pierce—He observed that there had been a century of accurate observations upon the phenomena of Comets, so that the inquiry may now well come up, whether they are component parts of the Solar System, or strangers visiting us from other systems. His own opinion was that they are component parts of our own system; and that, as a general rule, Comets in different systems belong to and are likewise essential component parts of that system. He came to this conclusion strengthened by two classes of arguments—the first arising from the nature of their orbits, from their not being hyperbolic. Of the hundred Comets which have been carefully observed and their orbits accurately computed within the last century, not one has been shown to have a decidedly hyperbolic orbit. While, if they do not belong to our system, he held that at least one-half of them, upon the average, ought to move in precisely that kind of orbit.

In this connection, Prof. Pierce combatted La Place's doctrine of chances, illustrating his objections by sundry charts, &c. He protested against using the doctrine of chances for the absolute determination of laws; and passed into a mathematical investigation of the whole matter, to establish his belief.

MOISTURE AND ORGANIC MATTERS IN THE ATMOSPHERE.

Prof. Horsford commenced observations in this department on the last day of February, and continued there until the 12th of April—and thence occasionally, down to the 20th of July. They were accompanied by notes of the barometer, the temperature, and the direction and force of the wind. Among the results obtained were the following, as briefly given by Prof. Horsford:

That, other things being equal, the moisture is in general proportionate to the temperature; that slight variations of temperature are not accompanied by corresponding variations in the quantity of moisture—and that great variations in the quantity of moisture may take place, while the temperature and altitude of the mercurial column remain constant. The quantity of the moisture, too, has even doubled in the course of an hour, although the temperature became reduced. In general, again, the moisture on the same day seems to depend chiefly on the direction of the wind.

The least quantity of moisture was observed during a N. W. or N. N. W. wind; the largest during a S. W. or S. S. W. wind. The former occurred on the 12th of March, and the latter on the 23d of June last. The quantity on the latter day, remarked the Professor, was to that on the former as more than fifty to one.

The quantity of Ammonia in the air was determined by an apparatus of Prof. Horsford's own construction, through which a known volume of air was transmitted. Several determinations having been made, it was ascertained that the quantities of Ammonia in the *east wind* varied considerably from each other; and such was the discrepancy of the Professor's results that he forbore a statement of the quantities ascertained—only so far as to remark that they very greatly exceed those obtained by Fresenius in his recent determinations at Wiesbaden.

THE RELATION BETWEEN THE ELASTIC CURVE AND THE MOTION OF THE PENDULUM.

Prof. Pierce—The Professor called attention to the similarity between the problems of the elastic curve and the pendulum. The external sensible phenomena, he said, are very dissimilar, but intellectually they are the same, and the same principle is applicable to the solution of each. The elastic curve is that formed by an elastic rod bent from its direction. The tendency of the rod to restore itself is proportioned to the amount by which it is bent from a straight line. The square of the velocity of the pendulum, when starting from a state of rest, is proportioned to the space through which it falls. Prof. P. developed the equation derived from these principles, and showed them to be identical. The same formula are applicable to the solution of the two problems, although different designations must be given in the two cases, to the letters involved in the formula. Those denoting, in the problem of the elastic curve, the angular deviation from the primitive direction of the straight rod, the actual removal from the primitive position, and the length of the rod, are, in the case of the pendulum, respectively the angular deviation from the statical position, the velocity and the time. The intellectual phenomena are precisely the same in both problems, but have a difference of material form corresponding to this difference of notation.

According to the greater velocity given to it, the pendulum moves from a state of rest, vibrating in a greater arc, till at length it may be started so rapidly as to turn completely over, in which case the motion will always continue in the same direction. In the same way the elastic curve may bend back and forth in a tortuous course, or by a great increase of force it would pass round and round without any point of contrary flexure. But whereas the motion of the pendulum is perfectly monotonous, the variety in the forms of the elastic curve is curious and interesting. The straight line, the circle, and a form similar to the figure 8, are different examples of the elastic curve; and intermediate between these simple cases are other forms singular in their grace and apparent complexity.

MAMALIAN REMAINS IN NEW YORK.

Mr. Redfield, of this city, exhibited specimens of mammalia remains which had been found in Broome County, on an elevated ridge separating the Delaware from the Susquehannah rivers. Whatever causes, observed Mr. Redfield, may be assigned for the occurrence of these animal remains in this locality, we must admit that their deposit took place at a period anterior to that in which the present level of the railway and the general surface of the adjacent country became covered with the drift in its existing form; or at least anterior to the vast period in which the incumbent materials, forty feet in depth, have been accumulated. The overlying deposits appear not to differ materially from those which cover many other portions of the contiguous country; while there are other portions and positions, more exposed, in which large and rounded boulders and worn pebbles are thickly dispersed. He also presented specimens of fossils taken from two boulders of rocks in the Drift at Orange, N. J., which belong, generally, to the Delthyris Limestone and the Oriskany Sandstone of the New York System. These boulders must have had their origin at a point not less distant than the Valley of the Rondout, the nearest outcrop of these rocks—having thus been carried over the mountain elevations of the Shawangunk and the Highlands by the active agencies of the Drift period.

This remarkable occurrence elicited considerable discussion among the geological portion of the members, and was justly considered important and interesting.

LAKE SUPERIOR COPPER.

Dr. Jackson gave a very interesting history of the Lake Superior Copper Mines. He stated that the Indians considered the huge pieces of native copper found there, as presents from the Great Spirit of the waters who threw them from the bottom of the Lake They were considered objects of mysterious reverence; cart loads of old Indian tools had been excavated from the mines, tools which were of Chippeway origin and not of an extinct superior civilized race.

ROTATIONS OF THE PLANETS ON THEIR AXIS.

Sears C. Walker, Esq., read a letter from Mr. Daniel Kirkwood, of Pottsville, Pa., giving an account of a new discovery of that law which governs the planets in their rotation on their axis. This is the first time that any thing like a demonstration of a law regulating the rotation of the planets on their axis, has been presented. Mr. Walker said that he had verified the correctness of Mr. Kirkwood's discovery, and said that no discovery of equal interest or importance had been made during this century, and in his opinion Mr. Kirkwood's name would in after time be placed by the side of Kepler's, as the discoverer of the law which, from the days of the primary planets, bore a close resemblance to the third immortal law of Kepler for their years. The formula of the law is: The square of the number of a primary planet's days in its year, is as the cube of the diameter of attraction in nebular hypothesis.

Prof. Haldeman presented some information about a new wingless grasshopper, found in Santa Fe. It has been learnedly dubbed with the title *Daikinia*, from the Sanscrit word of massiveness. The Prof. also presented some interesting papers on the languages of the Indians of this continent.

The next annual meeting is to be held at New Haven, Conn.

Plaster of Paris.

This is the sulphate of lime of the theorists. The raw stone called gypsum, plaster stone, or alabaster, is gotten in many places of England, as at Chelaston, near Derby, and Beacon Hill, near Newark. The former pits yield about 800 tons by the year, saleable at $1,25 by the ton. It is ground and used for manure, or rather as a stimulant for grass.

Gypsum is prepared for plaster of Paris in two ways, either by burning or boiling. It is burned by the masons, who use it for making floors or ceilings to houses. The operation is usually performed at night, that they may be the better able to see when the lumps become red hot, at which time they judge it to be sufficietly burned. It loses from four to six Cwt. in a ton. The parts which have been overheated acquire a yellowish cast, or a sulphurous odor, and are rejected, as causing the work to rise in blisters. After burning, it is beaten to powder with flails, or ground in a mill, and being mixed with water, is spread upon a bed of reeds. 30 Cwt. of the raw stone are required to make twenty square yards of flooring, two inches and a half thick.

The potters and figure makers boil their plaster by first grinding the raw stone, and then put it into a long brick trough, having a flue under it, or if a small quantity only is required, by putting it into a crucible set in a stove hole. The water escaping from the lower part of the mass, causes an apparent effervescence and decrepitation.

When the stone has not been boiled sufficiently, the plaster of Paris is a long time before it sets; and if boiled too much, it is called burnt plaster, and will not set when mixed with water.

Plaster of Paris is used by the potters to form moulds for their vessels, and also shelves on which to dry their articles; by the figure makers to form copies of statues; as also, by other artists, to form the basis of artificial marbles, or scaglioli, the different colors being given by the addition of colored powders; and to form a cement of a smoother aspect, and finer grain than lime cements. It is also used to form certain salts, by forming sulphuric acid.

Discovery in Oregon.

It has been supposed until lately, that the shores at Oregon, south of the Columbia river, was without indentation or harbors. Explorations for a considerable distance south of the Columbia have been made, which is producing an entire change in public opinion, and not only bays are found, but beautiful prairies, fine timbers, rivers and water power.

Tilamuke bay, situated about fifty or sixty miles south of the mouth of the Columbia river, is several miles in extent, receiving five rivers, some of which are good mill streams. Two miles back of this bay a prairie commences, varying from one and a half to three miles in width, and eight miles long. Below the Tilamuke bay two others have been discovered, which are worthy of being noticed; the first of which is known to the natives by the name of Celeste, and the second by the name of Yacquina. The bay is from a fourth of a mile to a mile in width, three miles long, and receives the waters of two rivers. A bed of excellent stone coal has been discovered on the bank of the Celeste river, ten miles from its entrance into the Celeste bay. There are several small rich level prairies on the Celeste river. The Yacquina bay is three fourths of a mile wide at its mouth, from a mile to two and a half miles wide, extends parallel with the coast from six to ten miles in length, and is perfectly sheltered from the ocean winds. There is considerable prairie in the immediate vicinity of Yacquina bay. All the rivers emptying into these bays abound with salmon and other fish, and the bays all afford clams, crabs, &c., in abundance. Within the Yacquina bay the water is deep, and the waves roll into the mouth from the ocean without any apparent obstruction.

Tea.

To have good tea the whole quantity of boiling water intended to be used should be as is the case in all infusions, poured at once on the leaves, previously bruised, left to stand until sufficiently impregnated, then strained off, and the auxiliaries, milk, cream, and sugar, added.

A still better method to preserve the flavor of the tea is, to pour the requisite quantity of cold water upon the bruised leaves, and put the vessel into a pan of water boiling on or beside the fire, until the tea is sufficiently heated to be poured off and drank, observing that if much milk, or the like is added, the tea must be made so much the hotter, that they may not cool it too much. This is the usual method in China.

A variety of British plants have been proposed as substitutes for Chinese tea, but they do not possess the quickly diffusible stimulus of the real tea. Besides, they are used too fresh; the Chinese keep their tea two years before they use it; and from their cheapness are employed in too great proportion to the water.

Punctuality.

Method, as Mrs. Moore says, is the very hinge of business, and there is no business without punctuality. Punctuality is important, because it subserves the peace and good temper of a family; the want of it not only infringes on necessary duty, but sometimes excludes this duty. Punctuality is important as it gains time; it is like packing things in a box; a good packer will get in half as much more as a bad one. The calmness of mind which it produces is another advantage of punctuality; a disorderly man is always in a hurry; he has no time to speak with you, because he is going elsewhere; and when he gets there he is too late for his business, or he must hurry away to another before he can finish it. It was a wise maxim of the Duke of Newcastle—"I do one thing at a time."—Punctuality gives weight to character—"such a man has made an appointment; then I know he will keep it." And this generates punctuality in you; for like other virtues it propagates itself.