A NOVEL ENGINE REGULATOR.

The accompanying engraving represents two different styles of regulator, invented by Mr. Stenberg, in which the effect of centrifugal force is utilized. In a vessel, A, of parabolic shape is placed a disk, C, which floats on glycerine contained by the vessel, and is attached to the walls of the vessel by an annular membrane, so that it may rise and fall in a vertical direction as the glycerine is carried with more or less force toward the edge of the vessel by centrifugal action. The inner surface of the vessel, A, is provided with radial grooves, by which the rotary motion of the vessel is communicated to the glycerine. To the center of the disk, C, is attached a vertical rod, which extends downward through the hollow shaft and is connected with governor valve. An increase of speed throws the glycerine toward the periphery of the valve, and, raising the disk, C, closes the steam valve; a diminution of speed permits the glycerine to fall back, when the disk descends and the valve opens.

The disk, C, has a small aperture for the admission and escape of air, and the apparatus is adjusted by pouring lead into the groove in the disk.

The regulator shown in Fig. 2 operates upon the same principle, but it is adjusted by means of a spring.

This apparatus is manufactured by Blancke Bros., Magdeburg.—*Musée de l'Industrie.*

A Strange People.

Botel Tobago is an island in the South Seas which has lately been visited by a party of United States naval officers. They were surveying a rock east of the South Cape of Formosa, and called at this island. They found a curious race of Malay stock. These aborigines did not know what money was good for. Nor had they ever used tobacco or rum. They gave the officers goats and pigs for tin pots and brass buttons, and hung around the vessel all day in their canoes waiting for a chance to dive for something which might be thrown overboard. They wore clouts only, ate taro and yams, and had axes, spears, and knives made of common iron. Their canoes were made without nails, and were ornamented with geometrical lines. They wore the beards of goats and small shells as ornaments.

Such is the account of these strange people given by Dr. Siegfried, in a letter read at the last meeting of the Philadelphia Academy of Natural Sciences.

REMEDY FOR THE NEW CARPET BEETLE.

Noticing a statement made by Mr. J. A. Lintner, to the effect that the Persian insect powder would probably prove unavailing as a remedy against the ravages of the new carpet beetle (*Anthrenus*), W. L. Carpenter, of the U.S.A., was led to institute some experiments with this well known insecticide, the results of which he communicates to the current number of the *Naturalist.* A small quantity of the powder was introduced, on the point of a penknife, under a tumbler beneath which various insects were consecutively confined. The movements of the insects brought them in contact with the poison, which readily adhered to their body; in endeavoring to remove it from their appendages a few particles would be carried to the mouth and thence to the stomach, with fatal effect. The results were briefly thus: A honey bee became helpless in 15 minutes; a mad wasp in 8 minutes; a small ant in 5 minutes; a large butterfly resisted the effects for over an hour, and apparently recovered, but died the next day; a house-fly became helpless in 10 minutes; a mosquito in 15; and a flea in 3 minutes. In experimenting on beetles, an insect was secured as nearly the size of the carpet beetle as could be found. It was easily affected, and became helpless in 12 minutes.

In these, and experiments with various other insects, the scent from the powder did not produce any bad effect on those subjected to its odor where actual contact was not possible; but when carried to the mandibles the effect was to produce complete paralysis of the motor nerves. The experiments prove that all insects having open mouth parts are peculiarly susceptible to this popular insecticide. As a result, the writer does not hesitate to recommend the powder to housekeepers as an infallible agent in destroying the carpet beetle and preventing its ravages. The Persian insect powder liberally sprinkled upon the floor before putting down a carpet, and afterward freely placed around the edges, and never swept away, will suffice to preserve a large sized carpet. No ill effects from its use need be feared by the householder, since the drug is poisonous to no kinds of animals except insects.

Banana Flour.

The banana has recently found a new use in Venezuela. It has the property of keeping the soil moist round it, in a country where sometimes no rain falls for months; so it has been employed to give freshness, as well as shade, to the coffee plant, whose cultivation has been greatly extended (Venezuela produced 38,000,000 kilogrammes of coffee in 1876). The Venezuelans can consume but little of the banana fruit thus furnished, so that attention is being given to increasing its value as an export. At the Paris Exhibition were samples of banana flour (got by drying and pulverizing the fruit before maturity) and brandy (from the ripe fruit) The flour has been analyzed by MM. Marcano and Muntz. It contains 66·1 per cent of starch, and only 2·9 of azotized matter.

NEW STENCIL PEN.

The accompanying engraving shows new form of stencil pen invented by Mr. J. W. Brickenridge, of La Fayette, Ind. In Fig. 1 the entire apparatus is shown in perspective; Fig.

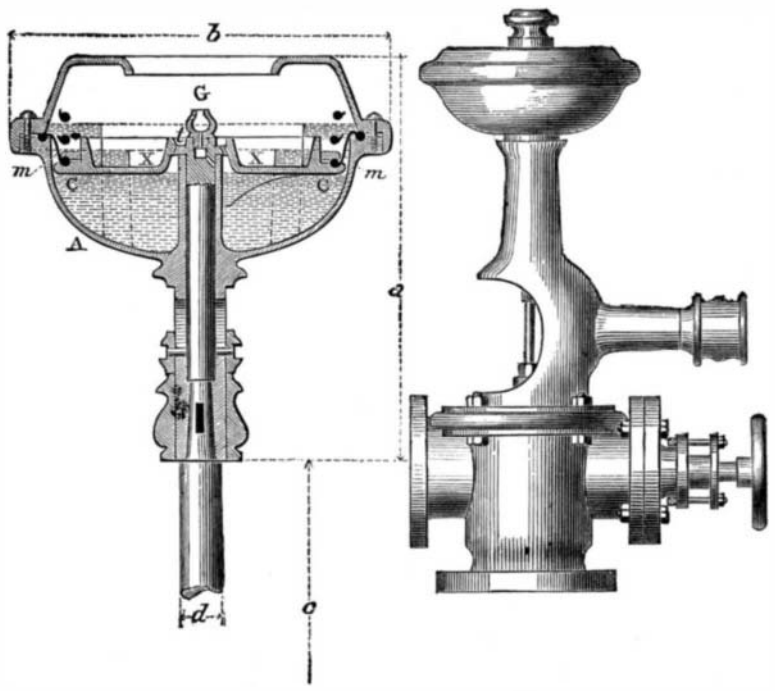
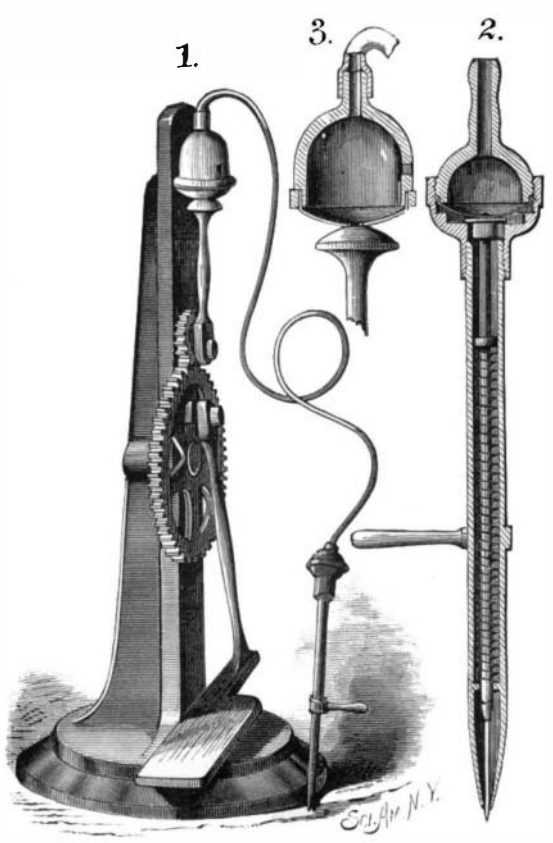


Fig. 1 Fig. 2.

STENBERG REGULATOR.

2 is a longitudinal section of the pen; and Fig. 3 is a vertical section of a portion of the driving apparatus. In this instrument compressed air is used as a motive force for driving the perforating needle. The inverted cup, shown in detail in Fig. 3, has its mouth closed with a flexible diaphragm, which is vibrated rapidly by a pitman having a convex end attached by its center to the middle of the diaphragm. The pitman is reciprocated by a simple treadle motion, which will be readily understood by reference to Fig. 1.

The cup has a small aperture covered by a valve to admit of the entrance of air when the diaphragm is drawn down. The pen, shown in detail in Fig. 2, has a cup and flexible diaphragm similar to the one already described. The diaphragm rests upon the enlarged end of a bar which carries at its lower end a perforating needle. The pen is connected with



BRICKENRIDGE'S PNEUMATIC STENCIL PEN.

the driving mechanism by a flexible tube. The needle bar is pressed lightly against the diaphragm by a spiral spring.

When the treadle motion is operated the impelling diaphragm is rapidly vibrated, and through the medium of the air contained in the flexible tube it communicates motion to the pen diaphragm and consequently to the needle bar and needle. If, while the needle is reciprocated in this way, the pen is moved over the surface of the paper, a line of fine perforations will be made. With this instrument stencils may be made for making multiplied copies of maps, drawings, and manuscripts.

Origin and Progress of Ocean Telegraphy.

At the celebration in this city of the twenty-fifth anniversary of the formation of the company for laying the first Atlantic cable, Monday, March 10, the projector of the enterprise, Mr. Cyrus W. Field, spoke as follows:

NEIGHBORS AND FRIENDS: Twenty-five years ago this evening, in this house, in this room, and on this table, and at this very hour, was signed the agreement to form the New York, Newfoundland and London Telegraph Company—the first company ever formed to lay an ocean cable. It was signed by five persons, four of whom —Peter Cooper, Moses Taylor, Marshall O. Roberts, and myself—are here to-night. The fifth, Mr. Chandler White, died two years after, and his place was taken by Mr. Wilson G. Hunt, who is also present. Of my associates, it is to be said to their honor—as might have been expected from men of their high position and character—that they stood by the undertaking manfully for twelve long years, through discouragements such as nobody knows but themselves. Those who applaud our success know little through what struggles it was obtained. One disappointment followed another, till "hope deferred made the heart sick." We had little help from outside, for few had any faith in our enterprise. But not a man deserted the ship: all stood by it to the end. My brother Dudley is also here, who, as the counsel of the company, was present at the signing of the agreement, and went with Mr. White and myself the week after to Newfoundland, to obtain the charter, and was our legal adviser through those anxious and troubled years, when success seemed very doubtful. At St. John's the first man to give us a hearty welcome, and who aided us in obtaining our charter, was Mr. Edward M. Archibald, then Prime Minister of Newfoundland, and now for more than twenty years the honored representative of Her Majesty's Government at this port, who is also here to-night. It is a matter for grateful acknowledgment that we were spared to see accomplished the work that we began; and that we meet now, at the end of a quarter of a century, to look with wonder at what has been wrought since in other parts of the world.

Our little company came into existence only a few weeks before the Western Union Telegraph Company, which is entitled to share in our congratulations, and has kindly brought a connecting wire into this room, by which we can this evening communicate with every town and village from the Atlantic to the Pacific; and by our sea cables, with Europe, Asia, Africa, Australia, New Zealand, the West Indies, and South America. While our small circle has been broken by death but once, very different has it been with the Atlantic Telegraph Company, which was formed in London in 1856, to extend our line across the ocean. At its beginning there were eighteen English and twelve American directors, thirty in all, of whom twenty-nine have either died or retired from the board. I alone still remain one of the directors.

Many of the great men of science on both sides of the Atlantic, who inspired us by their knowledge and their enthusiasm, have passed away. We have lost Bache, whose Coast Survey mapped out the whole line of the American shores; and Maury, who first taught us to find a path through the depths of the seas; and Berryman, who sounded across the Atlantic; and Morse; and last, but not least, Henry. Across the water we miss some who did as much as any men in their generation to make the name of England great—Faraday and Wheatstone, Stephenson and Brunel—all of whom gave us freely of their invaluable counsel, refusing all compensation, because of the interest which they felt in the solution of a great problem of science and engineering skill. It is a proud satisfaction to remember that while the two Governments aided us so generously with their ships, making surveys of the ocean, and even carrying our cables in the first expeditions, such men as these gave their support to an enterprise which was to unite the two countries, and in the end to bring the whole world together.

Others there are, among the living and the dead, to whom we are under great obligations. But I cannot repeat the long roll of illustrious names. Yet I must pay a passing tribute to one who was my friend, as he was the steadfast friend of my country—Richard Cobden. He was one of the first to look forward with the eye of faith to what has since come to pass. As long ago as 1851 he had a sort of prophet's dream that the ocean might yet be crossed, and advised Prince Albert to devote the profits of the great London Exhibition of that year to an attempt thus to unite England with America. He did not live to see his dream fulfilled.

But though men die, their works, their discoveries, and their inventions live. From that small beginning under this roof, arose an art till then scarcely known, that of telegraphing through the depths of the sea. Twenty-five years ago there was not an ocean cable in the world. A few short lines had been laid across the channel from England to the Continent, but all were in shallow water. Even science hardly dared to conceive of the possibility of sending human intelligence through the abysses of the ocean. But when we struck out to cross the Atlantic, we had to lay a cable over 2,000 miles long, in water over 2 miles deep. That great success gave an immense impulse to submarine telegraphy

then in its infancy, but which has since grown till it has stretched out its fingers tipped with fire into all the waters of the globe. "Its lines have gone into all the earth, and its words to the ends of the world." To-day there are over 70,000 miles of cable, crossing the seas and the oceans. And, as if it were not enough to have messages sent with the speed of lightning, they must be sent in opposite directions at the same moment. I have just received a telegram from Valentia, Ireland, which reads, "This anniversary witnesses duplex working across the Atlantic as an accomplished fact"—by which the capacity of all our ocean cables is doubled.

Who can measure the effect of this swift intelligence passing to and fro? Already it regulates the markets of the world. But better still is the new relation into which it brings the different kindreds of mankind. Nations are made enemies by their ignorance of each other. A better acquaintance leads to a better understanding; the sense of nearness, the relation of neighborhood, awakens the feeling of brotherhood. Is it not a sign that a better age is coming, when along the ocean beds strewn with the wrecks of war, now glide the messages of peace?

One thing only remains which I still hope to be spared to see, and in which to take a part, the laying of a cable from San Francisco to the Sandwich Islands—for which I have received this very day a concession from King Kalakaua, by his Minister, who is here to night—and from thence to Japan, by which the island groups of the Pacific may be brought into communication with the continents on either side—Asia and America—thus completing the circuit of the globe.

But life is passing, and perhaps that is to be left to other hands. Many of our old companions have fallen, and we must soon give place to our successors. But though we shall pass away, it is a satisfaction to have been able to do something that shall remain when we are gone. If in what I have done to advance this enterprise, I have done something for the honor of my country and the good of the world, I am devoutly grateful to my Creator. This has been the great ambition of my life, and is the chief inheritance which I leave to my children.

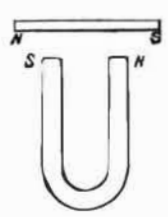
Correspondence.

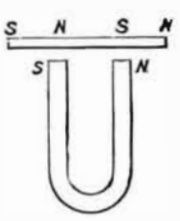
The Gary Motor.

To the Editor of the Scientific American:

In your article on the "Gary Motor," issue of March 8, page 144, you say: "There is no neutral line in the sense that polarity changes when Mr. Gary moves his piece of sheet iron with its attached shingle nail across the pole or near the pole of a magnet." "The most delicate instruments fail to detect such a change of polarity," etc. Mr. Gary's claim of a neutral line is of course absurd, but you are wrong in saying that the polarity does not change under the conditions described in the *Harper's Monthly* article. Mr. Gary is perfectly correct in claiming a change of polarity in that experiment, although his other claim of deriving from this change of polarity a continuous motion without consuming energy are manifestly absurd.

The change of polarity is easily explained. If a bar of soft iron, whose length is two or three times the distance between the poles of the horseshoe magnet, be placed in front of the latter as in the sketch, and at some distance, poles will be induced, as shown by the letters N S. Now let the bar approach the magnet. When within a short distance consequent points will be formed and the polarity at the ends will be reversed, the bar having four poles, as in the second sketch. The bar of soft iron must have certain dimensions depending on the size and power of the horseshoe magnet. By using a powerful electro-magnet in place of a permanent one, a soft iron bar of considerable size may be used, and the change of polarity exhibited by showing the repulsion in one case for the south pole and in the other for the north pole of a heavy permanent magnet. When in the proper position a very small movement of the soft iron bar is sufficient to produce the change.





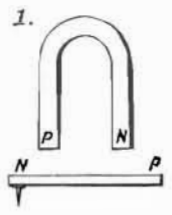
WM. A. ANTHONY.

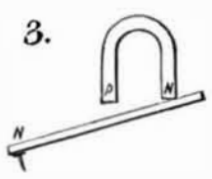
Cornell University, Ithaca, N. Y., March 2, 1879.

Gary's Neutral Line.

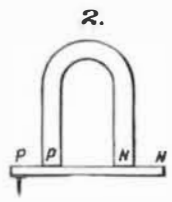
To the Editor of the Scientific American:

I have just read the article in the issue of March 8, on the Gary Motor, and cannot refrain from offering a suggestion on the subject. When I read the article referred to in *Harper's*, I formed the same opinion of the so-called invention that the writer in the SCIENTIFIC AMERICAN has expressed, and, in the main, such is my opinion still. I, however, tried the experiment by which Gary claims to prove the existence of his neutral line, and soon found the same explanation that the writer in the AMERICAN has given. I then, curiously enough, modified the experiment in precisely the manner he suggests, placing the magnet in a vertical position, and using first a piece of sheet iron and then an iron wire under it. This was before seeing the article in the SCIENTIFIC AMERICAN. My experiment is well illustrated by the writer's diagram, except that the nail should be a the end of the iron wire, where its polarity is of course most strongly marked. But the result is not as he states it. For, as the wire is brought up toward the magnet, the nail drops off before the wire touches the magnet. When the sheet iron is used, the point at which the nail drops off is farther from the magnet than in the case of the wire, and when it is brought nearer it will again pick up the nail, which then continues to cling until the iron touches the magnet and afterwards. Thus the existence of a line in which the soft iron, or induced magnet, does not attract the nail, and above and below which it does attract it, is demonstrated. That the polarity of the induced magnet is reversed when it crosses this line may be demonstrated as follows: When it is held beyond (or below) this line (Fig. 1), the negative pole of the permanent magnet, the positive being kept at a distance, may be made to approach the iron and touch it, without causing the nail to drop. (Fig. 3.) But when contact occurs, the whole of the iron must possess the polarity of that part of the magnet which it touches, namely, negative. Hence in the position indicated in Fig. 1, the polarity of the induced magnet does not correspond with that of the permanent magnet, but is as indicated by the letters. On the other hand, if the positive pole alone be made to approach, the nail will drop; but when it is very near, or in contact, it again holds the nail, and the iron is now positive; and if the negative pole also be now brought into contact, the polarity of the soft iron will correspond with that of the magnet, as shown in Fig. 2.





These experiments should be performed with the soft iron under both poles of the magnet, and the ends of the former should extend somewhat beyond the poles of the latter, or the nail is liable to jump to the magnet as the "neutral" line is crossed. The position of the letters in Fig. 1, of the previous article, represents the polarity of the induced magnet to be the same as that of the permanent, which is true only within (or above) the line described; and this, together with his statement that no such line can be discovered, appears to indicate that the writer relied upon his knowledge of the laws of magnetism to state what would be the result, without testing it experimentally. It is probable that this reversal of polarity is susceptible of explanation by the known laws of magnetic currents, but if it has hitherto escaped observation, its discovery is certainly deserving of notice, and may lead to valuable results. Of the fact, any one may easily convince himself by the simple experiments above described.



G. H. FELTON, M.D.

Haverhill, Mass., February 28, 1879.

Pneumatic Clocks.

To the Editor of the Scientific American:

In the description of the pneumatic clock, copied from *La Nature*, and published in your journal of date 1st of March, the invention is credited to me. Such is not the case. By an arrangement between Mr. Wenzel, Mr. Brandon of Paris, and myself, patents have been obtained in France, England, etc., for the clock, and issued in my name; but the honor of the invention belongs exclusively to Hermann J. Wenzel, of San Francisco.

Yours faithfully,

E. J. MUYBRIDGE.

San Francisco, Cal., February 27, 1879.

The Ice Cave of Decorah, Iowa.

To the Editor of the Scientific American:

Some years ago I visited the "Ice Cave" of Decorah, Winneshiek county, Iowa, and having since been unable to receive any explanation of the wonderful phenomenon exhibited by it, I write, hoping that you or some correspondent may explain the paradox.

The thriving town of Decorah lies in a romantic valley of the Upper Iowa River, and the cave is almost within its corporate limits. Following the left bank of the stream, one soon reaches the vicinity, and with a hard scramble through a loose shale, up the side of a precipitous hill, forming the immediate bank of the river, the entrance is gained—an opening 5 feet wide and 8 feet high. These dimensions generally describe the cave's section. From the entrance the course is a steep decline—seldom less than 40°. At times the ceiling is so low that progress on hands and knees is necessary. About 125 feet from the entrance the "Ice Chamber" is reached. At this spot the cave widens into a well proportioned room, 8 by 12 feet. The floor is solid ice of unknown thickness, and on the right hand wall of the room a curtain of ice drops to the floor, from a crevice extending horizontally in the rock at the height of one's eyes. Close examination discovers the water oozing from this crevice, and as it finds its way down the side it freezes in the low temperature of the chamber. Singularly this one crevice, and that no wider than a knife edge, furnishes this, nature's ice house, with the necessary water. It was a hot day in August, the thermometer marking 80° in the shade when the visit was made, and comparatively the cold was intense. In common with all visitors, we detached some large pieces of ice and with them hurriedly departed, glad to regain the warmth of the outside world.

The most remarkable fact in connection with this wonder is that the water only freezes in the summer. As the cold of actual winter comes on the ice of the cave gradually melts, and when the river below is frozen by the fierce cold of Northern Iowa, the ice has disappeared and a muddy slush has taken the place of the frigid floor. I would add that the ice chamber forms the terminus of the cave. Beyond a shallow crevice in the crumbling rock forbids further advance. The rock formation of this region is the Portland sandstone.

Why should the temperature of the ice chamber be such as to freeze the water trickling into it? And above all, why should the ice disappear with the cold of winter?

Mansfield, O. H. M. W.

THE WRITING TELEGRAPH.

On the evening of February 26, 1879, the writing telegraph of Mr. E. A. Cowper, of London, was exhibited in operation before the Society of Telegraph Engineers, in that city. It is a curious and remarkable invention. By its use the handwriting of the operator may be transmitted, but a double circuit, that is, two telegraph wires, are used. The operator moves with his hand an upright pointer or stylus, with which he writes the message on paper. The stylus has two arms connected with it, one of which arms, when the stylus makes an upward movement, causes a current to be sent over one wire, while the other arm causes a current to pass over the other wire when the stylus is moved laterally. These two motions are, at the receiving end of the line, made to operate on the needles of galvanometers, and the latter are by silk threads combined or connected with a delicately suspended ink tube, from which a minute stream of ink falls upon the strip of paper below it; the arrangement being such that the combined motions of the galvanometers so move the ink pen as to make it correspond to the motion of the stylus at the sending end. The apparatus is said to work very well, and it is expected that it will form a useful adjunct to the art of telegraphy. We present herewith a facsimile of writing done by this new instrument, which has been worked with success over a line of forty miles length. It is hardly probable that it can compete in rapidity with some of the telegraph instruments now in use; but for many purposes it is likely to become important, while in point of ingenuity it is certainly a great achievement, and the author is deserving of the highest credit.

A Rare Geological Specimen.

Rev. R. M. Luther, while absent in attendance upon the Missionary Convention, held in Addison, Vt., obtained through the kindness of the Rev. Mr. Nott a rare and curious geological specimen from the shores of Lake Champlain. It is a slab of limestone, about eleven inches long by six inches wide, which seems to be composed almost entirely of fossils. There is not half an inch square of the surface which does not show a fossil. There are many varieties, some of which have not been identified, but among those which have been are many remains of the Trinucleus concentricus, some specimens of Petraia, fragments of the Orthis, a number of Discinæ, several well preserved specimens of Leptenæ, and impressions of Lingula. The latter is the only shell which has existed from the first dawn of life until the present time without change. The specimens of existing Lingula are precisely similar to those found in the earliest geological formations. There are also in the slab several rare specimens of seaweed, remains of which are seldom found at so early an age in the geological history of the world. The slab belongs to the lower Silurian formation, the first in which organic remains are found. It is probably from the Trenton epoch of that age. If geologists can be trusted, at the time the little animals, whose remains are thus preserved, were living, the only part of this continent which had appeared above the primeval ocean was a strip of land along the present St. Lawrence River and the northern shores of the great lakes, with a promontory reaching out toward the Adirondacks, and a few islands along what is now the Atlantic coast line.—*Bennington (Vt.) Banner.*