

of this State was ordered, and \$104,000 appropriated for the purpose (\$26,000 a year) on condition that annual reports, &c., should be presented by the surveyors, the whole country was amazed—people could not credit such liberality. The law was framed with care; it contemplated magnificent results. Four things in it reflected honour on the liberality and wisdom of the Legislature and people of this State. 1st. The general provision that was made for all branches of natural history. 2d. The provisions for extensive collections. 3d. The provisions requiring accurate descriptions and figures as well as specimens. 4th. The wide range of publications fore-ordained. Of those, nineteen quarto volumes had already appeared; and and three more on palæontology were expected. The work was magnificent in point of cost. Already over \$600,000 had been expended, which he presumed to be twice or thrice as much as had been spent by all the other States together. Had the Legislature known this, the law would never have been passed, for men were then in that state of ignorance which is bliss. Now we might rejoice at the results; and now we have a geological museum where we could spread out our treasures, and bid strangers come and admire them throughout all coming time. Did anybody know how many kind of fossils had been discovered in the State? When the first volume of palæontology appeared, 370 species were the utmost limit; the second volume disclosed 340 more; and 1,000 more would be contained in the three remaining volumes—making altogether 1,742 separate species of fossil—models of creation spread over the surface of the State.

Prof. Hitchcock, of Amherst College, spoke next. He said that the County of Albany was the district where the first Geological Survey was undertaken, on this side of the Atlantic, and, perhaps, the world. This was in 1820, and ordered by that eminent philanthropist, Stephen Van Rensselaer, who three years later, appointed Prof. Eaton to survey, in like manner, the whole region traversed by the Erie Canal. This was the commencement of a work which, during the last thirty years, has had a wonderful expansion, reaching a large part of the States of the Union, as well as Canada, Nova Scotia and New Brunswick, and, he might add, several European countries where the magnificent surveys now in progress did not commence till after the survey of Albany and Rensselaer Counties. North Carolina was the first State that ordered a Geological survey, which was executed in 1824-5, by Prof. Olmstead. South Carolina followed in 1825-6. Massachusetts, after a long hiatus, employed the speaker to do the same for her in 1830. Tennessee, Maryland, and New Jersey followed. In 1836, New York began the work on a larger and more liberal scale. She then appropriated \$100,000, to the Survey. One result of this survey was the formation of the American Association for the advancement of science. This was first suggested by Prof. Mather, through Prof. Emmons, to the New York Board of Geologists, in November, 1838. The first meeting took place in Philadelphia, in April, 1840, when only 18 were present. The next year the number had increased to 80. In 1842, they changed the name to that of the Association of American Geologists and Naturalists, and in 1847 to that of the American Association for the Advancement of Science.

THE BRITISH ASSOCIATION.

The British Association for the advancement of Science, held its annual series of meetings this year, at Cheltenham, Gloucestershire. The inaugural meeting was very largely attended. The Duke of Argyll, in resigning the Presidentship of the Society into the hands of Daubeny, made an excellent speech, and the new President pronounced an elaborate oration on the progress which has been made in physical science during the last twenty years. As was expected, the present meeting proved one of the most interesting and useful series of meetings that have been held by this learned body for a long period.

METEOROLOGICAL OBSERVATIONS AT SEA.

Her Majesty's government having undertaken to promote and take part in an extended system of meteorological observations at sea, and having caused the requisite instruments, forms of register, and instructions, to be provided and placed at the principal seaports of the United Kingdom for the use of the mercantile marine—the Lords Commissioners of the Admiralty direct that all captains and commanding officers of her Majesty's ships will co-operate in this undertaking, whenever, and as far as their respective opportunities and means will admit. Standard barometers, tested thermometers, and registers with the necessary instructions will be supplied from her Majesty's dockyards, in the usual manner, on demand. The observations are to be carefully made, and recorded in the mode pointed out in the instructions; and the registers when filled up are to be transmitted to the Admiral-

ty through the same channels as the ship's log-books. Stationary ships, or ships fitting or refitting in a home port where a regular series of meteorological observations is established, will not be required to make the above observations while remaining at such port. The order does not effect Art. 1, sect. ix., chap. v. of the Admiralty printed Instructions, which still remain in force.

A VALUABLE NAUTICAL INVENTION.

A correspondent of the *Leader*, signing himself G. W. Carlton, Cobourg, U. C. says: "I have constructed an apparatus by which at the distance of 20 miles on water, a conversation can be carried on, nearly equal in rapidity to the electric telegraph. The chief object I have in view, is in having a more ready communication between the several ships belonging to the British fleet. At present, from what I can learn, only flags are used, which answer very well in giving signs, but they can give only certain signs; on the other hand I have an alphabet which will enable any conversation to ensue which the officers in command may wish. The second advantage is, that three words can be given to their one, with but few exceptions. But the greatest difficulty they have to contend with is the fog or mist—likewise night. Only in the clearest weather can they work at all, and even then only at the distance of eight miles, whereas I can work twenty in the darkest night, mist or fog. The present line of mail ships can by this means have an hour's conversation at the rate of 40 words per minute without a moment's detention—if in distress she can sweep the ocean twenty miles in every direction. I am prepared at any time to test or convince as to its feasibility."

SCIENTIFIC AND PHENOMENAL DISCOVERIES OF THE LAST FIFTY YEARS.

This is the age, among other things, of discovery. The human intellect has employed itself upon scientific investigation within the last fifty years, with wonderful energy and wonderful success. Among the great discoveries of the last half century are—

The Steamboat.—Fulton launched the first steamboat in 1807: Now there are three thousand steamboats traversing the waters of America. The rivers of nearly every country in the world are traversed by steamboats.

The Railroad.—In 1800 there was not a single railroad in the world. In Great Britain alone there are now 8,797 miles of railroad, costing \$286,000,000, to build, and 31,000 miles of railroad in England and America. The locomotive will now travel in as many hours a distance which, in 1800 required as many days to accomplish.

Magnetic Telegraph.—In 1800 it took weeks to convey intelligence between Philadelphia and New Orleans; now it can be accomplished in minutes by electric telegraph, which only had its beginning in 1843.

Concerning this wonderful discovery, Professor Morse narrates a most interesting fact in a recent speech:—

"The bill for establishing a line," he says, "was before Congress, had passed the House, and was on the calendar of the Senate, but the evening of the last day had commenced, with more than one hundred bills to be considered before mine could be reached. Wearied with the anxiety of suspense, I consulted with one of my Senatorial friends;—he thought the chance of reaching it so small, that he advised me to consider it as lost. In a state I must leave you to imagine, I returned to my lodging to make my preparations for returning home the next day. My funds were reduced to a fraction of a dollar. In the morning, I was about to sit down to breakfast, the servant announced that a young lady desired to see me in the parlor. It was the daughter of my excellent friend and college classmate, the Commissioner of Patents. She called, she said, by her father's permission, and in the exuberance of her own joy, to announce the passage of the telegraph bill at midnight, but the moment before the Senate's adjournment.

"This was the turning-point of the telegraph invention in America. As an appropriate acknowledgment for her sympathy and kindness—a sympathy which only a woman can feel and express—I promised that the first despatch by the first line of telegraph from Washington to Baltimore should be indited by her. To which she replied, 'I will hold you to your word.' In about a year from that time the line was completed, and every thing being prepared, I apprised my young friend of the fact. A note from her enclosed this dispatch: 'What hath God wrought?' These were the first words, that passed over the electric wires on the first completed line in America.—None could have been chosen more in accordance with my own feelings. I baptised the American telegraph with the name of its author. It placed the crown of success and honor where it belonged."

Voltaism was discovered in March, 1800; the electro-magnet in 1821. Electrotyping was discovered only a few years ago.