

Scientific American.

NEW YORK, SEPTEMBER 5, 1857.

The End of our Twelfth Year.

The present number of the SCIENTIFIC AMERICAN closes this volume, and brings us to the end of our Twelfth Year.

As editors and publishers, we have every reason to feel satisfied with the results of the past twelve months, yes, for the past twelve years. The number of our readers has been considerably increased within the last year; and we have cause to believe that we have been the means of doing some good in the world. From every direction we have received the most emphatic assurances of benefits positively conferred by our publication; every subscriber who expresses an opinion, states that he reads the SCIENTIFIC AMERICAN with increased satisfaction.

In the world of science perhaps the greatest event of the year has been the construction of the cable for the Atlantic Ocean Telegraph. We had hoped to close our volume with a record of the successful telegraphic union of the Old and New Worlds. An accident has, however, temporarily postponed the consummation of that extraordinary enterprise; but the history of its success will, we trust, be written in our next volume.

The Ocean Telegraph, although it rises above all other scientific enterprises of the year, is not, however, the only great thing attempted. Our inventors have been as busy as bees. The number of new inventions produced in this country during the past year, exceeds, by full one-third, that of any preceding year. And the demand for labor-saving machinery and new articles of manufacture was never so strong as at present. The value of patent property is greater than ever before, although the number of patents granted has wonderfully increased. Five years ago we congratulated our readers upon the then unusual activity of the United States Patent Office, in issuing seventeen patents per week. But now it is not uncommon to see a weekly list of seventy patents granted. We take pride in believing that the SCIENTIFIC AMERICAN has contributed, in no small degree, to this increase and development of new inventions. Their numerical augmentation is indicative of great progress in the realm of thought, for inventions are not the work of the hands, but of the mind.

Our arrangements for the forthcoming year are such as cannot fail to please every reader. Volume XIII will be printed upon new type; improvements will be made in the general appearance of our publication; and its contents, we are sure, will be found more interesting and necessary to the subscriber than they have heretofore been.

We most earnestly desire to increase the circulation of the SCIENTIFIC AMERICAN during the forthcoming year. Already our paper enjoys a far greater distribution than any other publication of the kind in this or any other country. But there are many active and vigorous minds that have never read or known our journal; they would be benefited by its teachings. But how shall we reach them? If the many friends who now surround us will lend their assistance, the work may soon be done. Reader, show our paper to your friends and neighbors, allow them to peruse it, and invite them to subscribe. You shall receive our thanks for this service, and no doubt those whom you influence will also have reason to thank you.

Persons who will volunteer to take a little extra trouble in inviting attention to the SCIENTIFIC AMERICAN, will receive a handsome pecuniary reward. We have set aside the sum of one thousand five hundred dollars for this purpose, to be paid, in suitable sums, for the fifteen largest lists of subscribers sent in to us between the present time and the first day of January next. Read the announcement of our prizes in another column. To the enterprising this is a grand opportunity.

With the present number of our paper we send to each subscriber an extra sheet, containing a carefully prepared Index of Contents for

the closing volume, and an ornamental title page, for binding.

With this number of the SCIENTIFIC AMERICAN nearly all of our annual subscriptions expire. It has been our rule for years to erase every name from our books as soon as the term paid for expires. Those who do not wish to have the paper discontinued, will, therefore, please remit at once for a new year.

We have now to present our customary parting salutation to readers and friends. We return our hearty acknowledgments for the kind favor with which our humble endeavors of the past year have been received by you. We wish you prosperity and happiness in all things. We invite you to close the finished volume, and help us to open and conduct the new one. We shall endeavor to show our appreciation of your past goodness by renewed exertions for your benefit during the future.

The Failure of the Atlantic Cable.

The great experiment has failed. The arrival of the *America* on the 24th brought a very brief despatch, announcing that the cable, after 343 miles had been paid out, parted, and they were obliged to abandon the enterprise for the present. One steamer returned, and Mr. Field hurried to London to confer with the directors, while the other steamers remained to try some experiments, the nature of which is not stated. The value of the stock in London, on the arrival of the vessel, sunk very low at first, but subsequently rose again to some extent before the sailing of the *America*.

Mr. Field telegraphed a report, setting forth that the last 100 miles were laid successfully in water over two miles deep; that at the time of the fracture, the brakes had just been applied with more force, and that the fracture occurred at a considerable distance from the vessel. We believe the last two points, but mistrust the literal accuracy of the first. The soundings taken by the *Arctic*, preliminary to the commencement of the enterprise, did not indicate a depth equal to two miles at any point so near the coast of Ireland as the fracture must have occurred, and we should only term a portion of the cable laid successfully which was laid nearly straight, or sufficiently so to enable the whole cable to be successful, if laid in the same manner. The proportion between the distance traveled and the quantity of cable laid will, we think, be ultimately shown to be too great, especially in the deep water, to be called a success.

There are great difficulties at the root of the matter. Laying a long cable at such immense depths may be accomplished by repeated trials, and so may navigating the air. The latter operation would require means not yet within the compass of engineering skill, and the same may be the case with the Atlantic telegraph. But the original plan for the grand telegraph was very promising. To start from the middle with a very liberal quantity of cable, and steam as rapidly as possible for the shore in each direction, paying out the thread nearly as fast as it wished to run, would seem a pretty certain method of getting the material down to the bottom in a continuous line, whether it would be of any service afterward or not.

There is a limit to the speed with which any object will sink through any dense fluid. A telegraph cable extended horizontally sinks with a certain determinate velocity; and the angle at which it stretches downward in the wake of the ship from which it is delivered, must depend mainly on the speed of the ship. To illustrate this, suppose a vessel could start from one shore, and move quick as thought to the opposite shore, it is evident that a cable paid out freely on its rapid flight would lay in a tolerably straight line on the surface, and would commence sinking uniformly at all points. Now if the vessel moves more moderately, the sinking cable will obviously trend downward from the stern, the few fathoms last paid out being just descending beneath the surface, that delivered one minute before being at the depth of 1,000 feet, that two minutes before being 2,000 feet, and so on, until it rests on the bottom. The angle, therefore, at which the cable lies as it sinks through the water, must depend on the speed of the

ship, or on the length of the horizontal path described by the ship during each minute of time. It is vain to attempt to support it materially by any strain applied to it, like the cables of a suspension bridge, as the distance between the supports is, in this case, too great to make tension of any service in this respect. The cable will sink freely as rapidly as its gravity can induce it to overcome the resistance of the water.

When, in consequence of a low speed of the vessel, the sinking cable stands inclined to a very great degree, it tends to move backward from the ship, sliding downward on the inclined frame formed by the resistance of the water. In other words, the cable finds less resistance in sinking endwise than sidewise; and so soon as it becomes much inclined, it endeavors to run out lengthwise, like a sounding line. This motion of the cable backward, when once commenced, is difficult to check, as the mass in motion is great, and the momentum due to such motion assists the generating cause in straining the cable when the brakes are applied to retard its delivery.

The more rapidly a ship advances, the less serious is the inclination of the cable thus to slip backwards, and the less liability is there to deposit it in serpentine folds on the bottom. The method finally adopted by the conductors of this enterprise was evidently not the best, as the vessel moved only three or four miles per hour, and the disposition to slide backward had to be resisted by main force. The brakes were gradually applied with more force to effect this, and the cable parted. It broke at a distance from the vessel, because, although the strain was greatest at the point where it left the reel, the pressure of the water at a considerable depth had probably compressed the core, and allowed the wires to stand unsupported.

It is now late, and the stock of the cable (never too liberal) has been reduced by the loss. The experiment will not probably be repeated this season in any form.

Before our next we shall probably receive full reports on the subject. The experiment had proceeded far enough to be of great service. There are a score of important questions relative to the evenness of the strain on the cable, or the existence of pulsations or waves in it, the increase or diminution of the twist, etc., all of which the results of this effort will probably solve when fully known.

Secretary Thompson and the Patent Office.

We understand that the present Secretary of the Interior, Hon. Jacob Thompson, takes a deep interest in the success of the Patent Office. This is as it should be, and if it proves true from his official acts, he will enjoy a reputation on this point which we do not feel willing to ascribe to any of his predecessors.

In the selection of R. R. Rhodes, Esq., of Louisiana, as the successor of Dr. Breed, in the Chemical Department, it appears that his qualifications were vouched for to Judge Mason by the Secretary, and we are happy to learn that evidence of his fitness is already seen. As a general thing, the examining corps are able, faithful and capable, and we should be sorry to learn of removals on mere political grounds. The guillotine, however, could be usefully employed in two or three departments, and we shall be glad to see it put to work, as we doubt not it will be in due time. We presume, however, that no removals will be made until a new Commissioner is appointed.

Polytechnic College.

We call attention to the advertisement of the Polytechnic College of Philadelphia, which is inserted in another column. It is conducted somewhat on the plan of the industrial colleges of France and Prussia, and affords a thorough professional education in civil, mining and mechanical engineering, industrial, analytical and agricultural chemistry, metallurgy and architecture. Why shall we not sustain such institutions in our own country instead of sending our sons to Paris, Göttingen, or Berlin, where, as it too often the case, they make shipwreck of themselves amidst the loose and corrupting influences of European city life?

Fifteen Hundred Dollars in Prizes.

Don't stare, reader! we have not opened a lottery office, nor have we opened our columns to others who are engaged in that nefarious business; but we have a scheme to offer, laudable and worthy of consideration by any person who would like to receive a few dollars, or a few hundred dollars, as a New Year's present. The amount of \$1500 will be paid to some persons on the 1st of January, 1858; and those who exert themselves the most, and obtain the largest lists of subscribers, will be the best rewarded. Annexed we give a list of the premiums which will be paid in cash to the successful competitors on or immediately after the 1st of January, 1858, which list we commend to the attention of all readers and friends of the SCIENTIFIC AMERICAN:—

For the largest List,	\$300
For the 2nd largest List,	250
For the 3rd largest List,	200
For the 4th largest List,	150
For the 5th largest List,	100
For the 6th largest List,	90
For the 7th largest List,	80
For the 8th largest List,	70
For the 9th largest List,	60
For the 10th largest List,	50
For the 11th largest List,	40
For the 12th largest List,	35
For the 13th largest List,	30
For the 14th largest List,	25
For the 15th largest List,	

Total, \$1500.

Names of subscribers can be sent in at different times and from different Post Offices. For further information, see Prospectus on another page of this sheet.

Those who compete for the prizes will please to write the words, "Prize List," on the left hand upper corner of the first page of every letter containing a list of subscribers; as this will enable us to distinguish, at a glance, the letters of prize competitors from those of other correspondents, and will facilitate the crediting of names to the respective senders. Competitors will please bear this request in mind, especially when sending only a name or two at a time, as their claims will be likely to be overlooked by neglecting to do so.

Testimonial to Miss Maria Mitchell.

Preparations are making to procure a testimonial for Miss Maria Mitchell, of Nantucket, Mass., the celebrated female astronomer, who is now absent in Europe. It is thought that, if a sufficient sum is raised, the present to her will be the "Sharon Observatory," so called. Of the \$3000 required for its purchase, more than one-third has been pledged by ladies in and near Philadelphia, to whom the Observatory is well known.

Gas Light on Steamers.

We see it stated that a firm in England has received instructions to fit the steamship *Great Eastern* with gas works and all necessary gas fittings, on a most elaborate scale. Some of the steamers on our rivers have been lighted with gas with tolerable success, and the effort will probably be highly conducive to economy, as well as safety and convenience, on so large a ship as the *Great Eastern*.

A Philadelphia dentist is stated, in an exchange, to have invented what he calls a galvanic forceps, which is intended as a relief to the pain of extracting teeth. It is a combination of the ordinary forceps, with a galvanic arrangement attached, whereby the nerve of the tooth may be so charged with the galvanic influence that its sensibility will be partially suspended.

California has passed a law to make the scientific development of the human body the order of the school hours upon the Pacific. All her common schools are to have apparatus and teachers of gymnastics; and with her delicious climate and extraordinary civilization, she will keep the lead she has got of all the States.

The Portuguese Government has invited tenders for the construction of an artificial port at the island of St. Michael, in the Azores, individuals or companies, native or foreign may join in the competition.