Note D.

The Government of the United States, through the Hon. Levi Woodbury, late Secretary of the Navy, being made fully acquainted with the merits and great utility of the Marine Telegraphic Flags, and knowing they had already been adopted by fifteen hundred sail of vessels engaged in the commerce of this country, has furnished the Government Vessels of War with sets of the Marine Telegraphic Flags,—and has, since his accession to the Treasury Department, ordered all the Revenue Cutters throughout the Union to be furnished in like manner, thereby enabling all the public vessels to communicate, by the Marine Telegraphic Flags, with the commerce of their own country, as well as to communicate with the respective Telegraph stations on our seaboard.

Note E.

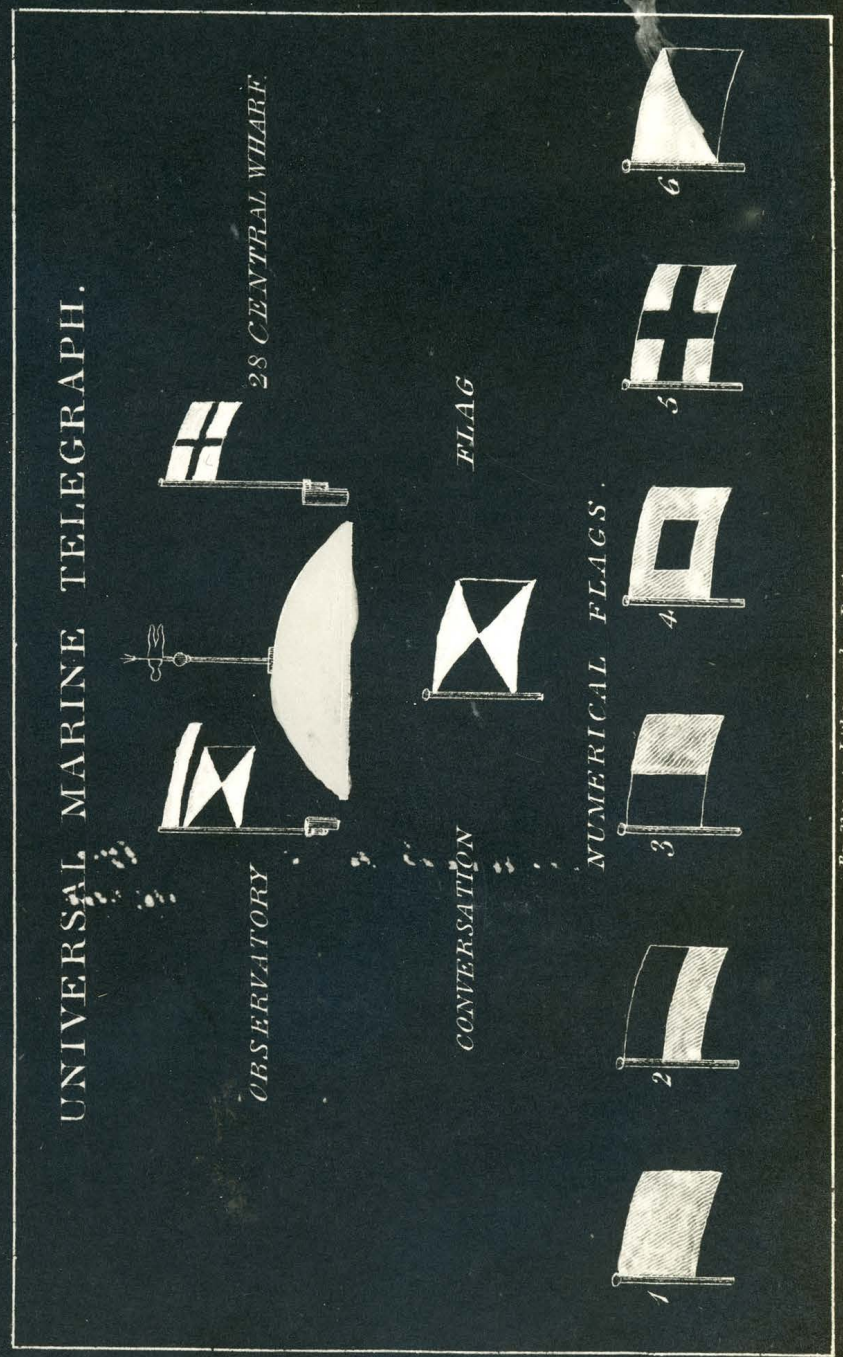
This establishment was commenced ten years since, and employs *five persons* constantly on duty from sunrise to sunset, who never quit their stations at any interval without giving previous notice to all the other stations of their intended absence, by a concerted signal to that effect.

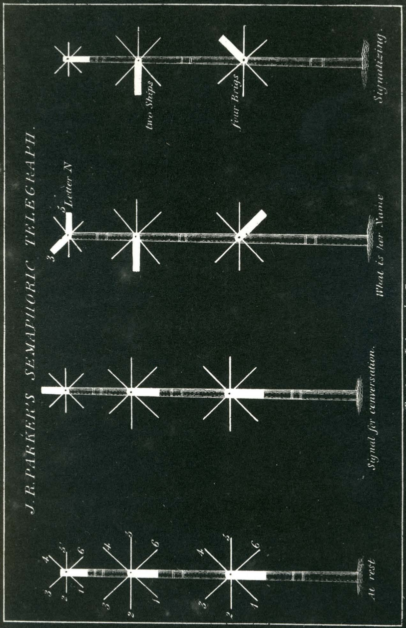
The following abstract statement gives an annual account of the aggregate number of vessels, whose arrivals have been announced and reported to the Commercial interests in this city:

Vessels telegraphed from	Oct. 1824, to Oct. 1825,	799
" "	Oct. 1825, to Oct. 1826,	897
" "	Oct. 1826, to Oct. 1827,	923
" "	Oct. 1827, to Oct. 1828,	1010
" "	Oct. 1828, to Oct. 1829,	1309
" "	Oct. 1829, to Oct. 1830,	1435
" "	Oct. 1830, to Oct. 1831,	1583
" "	Oct. 1831, to Oct. 1832,	1809
" "	Oct. 1832, to Oct. 1833,	1856
" "	Oct. 1833, to Dec. 31, 1834,	2104
Whole number of vessels telegraphed,		13,725

— 1 January 1830 — 6911

29416





A

TREATISE

UPON THE

SEMAPHORIC SYSTEM

OF

TELEGRAPHS.

BY JOHN R. PARKER.

BOSTON.

DEDICATION.

TO THE HONORABLE LEVI WOODBURY,

SECRETARY OF THE TREASURY,

AND LATE SECRETARY OF THE NAVY OF THE UNITED STATES.

SIR:

The adoption of the Marine Telegraphic Flags by the United States Vessels of War, as well as the Revenue Cutters throughout the Union, has become the means of facilitating the intercourse between the public vessels, and that portion of the commerce of our country, which has adopted that mode of communication; and it having been sanctioned by your acquiescence and approbation, permit me, with a just deference to your talents, public spirit and philanthropy, to inscribe the following pages to one who has, on every occasion, manifested a patriotic zeal in advancing the interests of the public service, and promoting the comfort of his fellow citizens.

With much respect, I remain, Sir,

JOHN R. PARKER.

A TREATISE

UPON THE

TELEGRAPHIC SCIENCE.

A PROFOUND statesman has pronounced "*the Telegraph Science to be a very important subject, that highly merited the serious attention of the Government of the United States.*" The same opinion being entertained by several naval and military characters of distinction, the following pages are presented, with the intention of showing the situation and present state of this useful science, and the vast importance it would be to the prosperity of this country, if carried to the extent and perfection of which it is susceptible.

"It must," says a learned lecturer, "be evident to the most common observer, that no means of conveying intelligence can ever be devised, that shall exceed or even equal the rapidity of the Telegraph; for, with the exception of the scarcely perceptible delay at each station, which is necessary in repeating a communication, its rapidity may be compared to that of light itself."* The celerity of intercourse which would thus be established, would, in the abstract, confer incalculable benefit on mankind, and would be peculiarly subservient to the interests of commerce and of all mercantile transactions, while science, philosophy and belles-lettres would be particularly aided by a speedy communication of discoveries and physical improvements, tending to the advancement of human knowledge. It would be almost superfluous to dwell on the incalculable benefit that would arise to our country, to the public revenue, to private convenience, and to public safety and security, by establishing a ramified Telegraphic System, extending from the metropolis to the principal seaport towns and cities, situated to the right and left

* See Note A.

of such lines of communication. Such an undertaking would be a sublime attempt at an approximation of time and space, and would be truly worthy of the high and enterprising character of our nation.

Let it be recollected that it is only a few years since, that the establishment of the mail coach system, the projection of canals and rail roads, together with the wonderful operation of steam engine machinery, were deemed visionary, and almost impracticable. Man is a progressive animal, and it is the press only that points out to him *what he ought to do;* and assuredly no one will oppose the march of mind and knowledge, and of public instruction, alone calculated to lead to perfection, a *maximum* of which is wisely denied on this side of time.

The Telegraphic Science is yet in its infancy in this country. Very few have turned their attention to it. In theory it appears to have made great progress, but in practice little has been done. Under these circumstances I should be deficient in that duty and respect I owe to the public, were I to omit placing its importance in a fair light, with a view of advancing its interests, and superinducing its farther utility. The practical facility of the telegraphic art, is apparent to those only who have long studied it, and, like other things, *it cannot be acquired intuitively.*

The word Telegraph is derived from two Greek words, "*teele*," at a distance, and "*grapho*," to write; its practice and use was not unknown to nations of antiquity, and is traced back to a very early period. The manner of communicating is variously stated, by fire signals, flags, shutters and arms, fixed upon a post, displaying a variety of positions, denoting the several letters of the alphabet. Later experience has produced a dictionary of numerals, of great extent and comprehensiveness, which is applied to commercial, political, or other purposes.

The history of the Telegraph, so far as the ancients were acquainted with it, commences with Homer, Æschylus, and Julian Africanus, all of whom make mention of fire signals. Livy, Vegetius and Plutarch state that the Roman generals made use of Telegraphs. Brumoi, in his account of the "*Theatres of the Greeks*," gives an account of the fire signals used in war. Among the Chinese, Scythians and Gauls, and by almost all barbarous nations, such signals were prevalent. Polybius gives the name of *Pyrsia* to

telegraphing, meaning that *fires* were the means made use of.* He gives a full account of a Telegraph, invented by Cleoxenus or Democlitus, and improved by himself. It was a mode of indicating letters of the Greek alphabet by the display of torches; it would appear that each letter required two torch signals, and that the communication was made between two stations only. It would have been much easier to have shortened the process by one half of the time, and to have made it a day Telegraph, by substituting flags for torches. We hear little more of Telegraphs till 1663, when the Marquis of Worcester describes a species of day and night *lettering plan.* Above forty years afterwards, Monsieur Amontons recommended the holding up of large letters, to be viewed by telescopes, and communicated from station to station. Little more was done until the French invented their *indicators*, which were semaphoric wings, which could be put into seven distinct positions, and this originated a variety of descriptions of semaphores, all differing from each other in *principle of motion, degree of power, and mechanical contrivance.* Guided by principles laid down by Dr. Hook, in 1684, Dupuis in France invented a Telegraph, improved by an ingenious monk of the order of Citeaux, in 1781. Milli, Condorcet and Dr. Franklin recommended it to the French government. Monsieur Chappe modified the principle of this invention, and introduced this Telegraph, which, with others, was made use of during the revolutionary period.†

There is no positive information that any methodized code of signals was made use of in the fleets by the ancients. Such celebrated commanders as Themistocles and Conon, must have directed their marine manœuvres by so obvious a mode as signals, made by flags or lights. That flags were made use of, is evident; for it is written, that if the ship which carried Ægeus to Crete returned in safety, a white flag was to be hoisted. Polybius, in his history of the Punic wars, makes indirect mention of naval signals. The Speculatores and Vexillarii, mentioned by Ammianus Marcellinus, must have been persons whose duty it was to observe and report signals made. The coins of the Greeks and Romans have on them flags and pendants.

As the Telegraphic art appears to have been practised on shore, the conclusion must follow that it was prevalent at sea. In the

* See Note B.

† See Note C.

reign of Queen Elizabeth, we meet with the first regular set of signals and sealed orders to the commanders of fleets, which were to be opened and acted upon when a certain latitude was attained. James the Second, when admiral, was the first who introduced a system of methodized signals, by means of which, divisions of fleets as well as single ships could be directed to act in any specific manner.

Previous to his time, the principles of co-operation, connected procedure, and changes of position adapted to circumstances, were very imperfectly, if at all understood. When once an action commenced, every idea of regulating its farther progress was abandoned; the degree of naval science then practised became nearly useless, and daring resolution, and the physical power of grappling with the enemy, decided the fortune of the day. The Duke of York, (afterwards James the Second,) first adopted a scientific formation of line, and an order of battle calculated for various situations in respect to the enemy, their number, and the state of the wind and weather. The Duke of York's fighting and sailing instructions, classed according to their various heads, were referred to by a specific signal pointing to each movement or manœuvre in the class. This groundwork resting upon unchangeable general principles, though it may have received many additions, and may have been simplified by the *numerical order of signals*, remains to this day as the basis of evolutions, and the germ from which has sprung the British Naval Code.

Le P. Hôte, in his *Art des Armes Navales*, printed at Lyons in 1827, has given a system of signals, with sails, varying flags, and guns fired in slow and quick time at night. Some of his signals were of a clumsy description,—such as suspending a water cask from the yard arm, to indicate want of water; and a large *hatchet*, to show *want of wood or fuel*. To express a numeral, he recommends hoisting or lowering a flag, till the number meant was thus *counted out*.

The most essential improvement in naval signals has arisen from the invention and application of the *numerical order*. This simple but luminous improvement is generally ascribed to Monsieur de la Bourdonnais, but those who have looked closer into the subject know that Bishop Wilkins, in his *Secret and Swift Messenger*, not only recommended the method of signalising by *notation*, but described the mode of execution. Doctor Hook, who is the inventor of the Land Telegraph, a species of which he mentions, recommends a

numerical plan to the Royal Society of London. Kircher very nearly hit on the same invention; and Gaspar Schottus, in his *Technica Curiosa*, expressly mentions it. With all this, it must be confessed that Monsieur de la Bourdonnais brought the plan to considerable perfection. In the British Navy it has been carried nearly to its acme, by improvements introduced by different admirals, commodores, and men of science.

I have already stated that telegraphing sentences, and consequently words, were known to the ancients. It appears, from the works already quoted, that the idea originated in France long before it was adopted in England.

It is the opinion of the best informed naval characters in this country, that our naval code of signals is deficient in comprehensibility, arrangement and method; and that a Board of Tactics, formed of the most scientific officers in the service, ought to be employed to draw up a complete system. Such a procedure, established upon the *numerical system*, would doubtless be scientific and unexceptionable.

The multiplicity of flags, many of which resemble each other, burthens the memory; and, amidst the hurry, smoke, and confusion incident to action, creates a constant liability to errors and mistakes. The *numerical system* was happily invented to obviate all the difficulties by the principle of simplification, which is its distinguishing characteristic.

Sensible of the operose and creeping tediousness of the lettering plan, I cannot but persevere in representing its inefficiency and want of science, and as it is generally abolished, I may add that the experience of many years has abundantly justified the propriety of the measure; and all who understand this interesting science must be averse to the practice of combinations, as used in the lettering plan. I have invariably established a rule, that every Telegraph station is to keep up their communicating signal till the next has been seen to take it accurately, and till the preceding one has dropped it. But where every combination is as it were a new study, a person might, under such a personal exertion of thought of things differing but little, be apt not to remember precisely the combination, even on his own Telegraph.

By a constant, close and strained attention, these errors and mistakes may not be so liable to happen; but this necessary attention

must unavoidably occasion the taking up of a great deal of time, at every station along an extensive line. Besides all this, much time is comparatively lost in reading off the combination at each station, on the part of the observer at the telescope, who must frequently be obliged to repeat what must be nearly new to him, and to those working the Telegraph. Thus it appears, that so far from accelerating communication by the use of complicated and troublesome combinations, it may be proved, experimentally, that it is a mode not only more tedious, but much more liable to error and uncertainty than any other mode, independent of increasing the expense, in enlarging the Telegraph, and obscuring its visibility, of whatever description it may be.

The numerical plan, on the contrary, is so simple and familiar, that mistake is next to impossible. The persons employed have only to recollect the movements of the arms, indicating the numerals, and the giving the figures, they are set up in an instant without hesitation or doubt.

Among the numerous plans of Telegraphs which have been devised, we find that the Shutter Telegraph originated in Sweden. It consisted of nine boards, and was found to succeed remarkably well for low situations, where a back horizon could not be obtained. This Shutter Telegraph was introduced into England by Lord George Murray, in 1793, and simplified by the use of *six boards or shutters only*. It was used at the Admiralty until 1816, and was hung in a frame and turned by pulleys, connected with cranks below, so that they may either present their whole surface, or only an edge, to view. It was capable of making sixty-three signals, and practised upon the *lettering plan*.

In 1816, Sir Home Popham, of the British Navy, invented what he called the Semaphore Telegraph, which was immediately adopted by the Board of Admiralty, and continues in use to the present time. It consists of an upright post or mast, with two arms moving vertically on their respective centres, one at the top of the mast and the other half way down, each arm being made to perform an entire revolution, and being turned with facility and despatch, so as to take any position that may be required; differing, however, from each other in principle of motion, degrees of power, and mechanical contrivance. These arms expressed *letters* or *numerals*, according to the system agreed on.

Of all the ingenious inventions for Telegraphic operations, none exceeds in simplicity, and none equals in rapidity, this *semaphoric system*. The word semaphore is derived from the Greek "*seema*," a sign, and "*phero*," to bear or carry. The manner of operation is derived from the French, and includes three distinct principles. The *first*, is the projection of an arm from a post, either from the top or the side. The *second*, is the construction or mechanical contrivance by means of which the numerals are formed. The *third* principle comprehends the limits of power furnished by the single and conjoined action of the wings and arms.

The Semaphoric Telegraph used in the Observatory in Boston, and at the several stations in the inner and lower harbor, is of very simple construction, and is certainly the cheapest of any description extant. It requires but little machinery, and possesses no intricate work. It consists of an upright post, fifty feet in length, (as in the annexed plate,) having a small moveable arm at the upper end six feet in length and one foot in breadth, called the indicator, and two larger arms at convenient distances below the indicator, eight feet in length by eighteen inches in breadth. The indicator, (which is used by itself, as will be hereafter explained,) and the arms, revolve each into six different positions, the indicator showing seven positions. These several positions denote the numerals from one to six, so that the two arms together may take twice six or twelve positions; and this number, by the familiar principle of permutation, affords sufficient signs to express any numeral, from one to many hundreds.

With the Semaphoric Telegraph are used three books like dictionaries, containing sets of numerals placed in order with the words denoted by them, standing against those numerals, exactly upon the principle of a dictionary of any language. The Telegraphic dictionary differs from any other, only in having a series of numerals in regular progression, instead of a series of words, under each letter of the alphabet, with the meaning of the numbers affixed to them, just as in a French dictionary, for example,—the French word would be put first, and then the English meaning by its side. Now the arms of the Telegraph being placed in certain positions, denote the particular numbers; the observer, then, upon seeing the positions of the arms, looks into the Telegraph dictionary for the number denoted by them, and by the side of that number he finds the word signified by it.

This is a general view of the principle of the inventor. The numerical dictionary embraces, so far as can be anticipated by experience, all the questions and answers which are likely to occur between vessels at sea, or at the Telegraph stations on the coast.

As an auxiliary to the Telegraph dictionary, which is designated by the numbers 6—4 with the indicator, a very copious appendix is added, comprehending twenty thousand words, phrases and sentences, arranged in alphabetical order and succession, denominated the *United States Telegraph Vocabulary*. Each letter of the alphabet has its designating number, to be given by the indicator, or top-board, which is used for no other purpose than a key or direction to which letter of the alphabet the communication will be found. In this appendix is inserted, under its proper head, a numeral for auxiliary verbs, principal countries, ports, towns, cities, rivers, capes, headlands, and every subject, whether mercantile, commercial, political or civil.

A *third* book is used by the Telegraph stations in this harbor, denominated the *Boston Harbor Signal Book*, which is designated by the numbers 6—5 by the indicator; each of these three books having its appropriate name in figures, no embarrassment can ever arise as to the particular one to which the observer is to refer. It also contains the designating numbers of all those vessels which have adopted the use of the Telegraphic flags, amounting to ~~fifteen hundred~~ sail, belonging to different seaports in the United States, which, when meeting with vessels at sea, display their number, and consequently are reported on their arrival in port, as having, on such a day, in such a latitude and longitude, passed a ship, brig or schooner, showing such and such Telegraph numbers.

Having described the Semaphoric Telegraph for operations upon land, with the books attached to them, we now proceed to explain the use of the Telegraphic Flags, for the use of vessels either at sea, or when approaching the shore. They are six in number, and correspond to the six positions of the arms of the Semaphoric Land Telegraph, denoting the numerals 1, 2, 3, 4, 5, 6.* They are blue and white, and all of the same size, with duplicate numbers of each flag. To these is added a conversation flag, which, like the *indicator* of the Land Telegraph, shows that the vessel making the signal wishes to *converse*. Nearly ten thousand changes can be made,

* See Plate.

denoting the words, phrases or sentences contained in the above mentioned books. By such means, vessels at sea can communicate any species of intelligence, either their names, from what port they come, what voyage they have had, what vessels they have met, what vessels they have left in port, or that had preceded them,—if in want of provisions, stores, water, or assistance of any kind,—their latitude, longitude, casualties, or any observations they may have made during their voyage, &c. &c.

From this illustration of the uses of the Marine Telegraphic Flags at sea, an opinion may be easily formed of their vast importance to a great commercial country, possessed of such an extensive sea coast as the United States, not only in continual intercourse with each other, but with the whole commercial world. Nothing can be more important than the means of facilitating that intercourse, and promoting the comfort and safety of those engaged in carrying it on. It is, therefore, in a NATIONAL point of view that they should be regarded.*

With a view of illustrating the extreme facility of a Telegraphic operation, I have inserted two actual cases which happened, wherein the rapid communication, and by being possessed of these flags, and through the Telegraph at the outer station, was the means of relieving and preserving the lives of the seamen in instances of extreme urgency and distress:

Indicator.	Nos. by the Arms.	Explanation of the Numbers.
3	62.24	Ship Undine, of Duxbury,
4	1664	57 days' passage
5	3162	from Cadiz.
1—4	2634	Ship's crew
5—1	13	unable
4—6	455	to
5—3	1345	work.
4—5	525	Will you send
4—5	1512	six
3—4	424	men
2—5	65	immediately?
ANSWER.		
6—4	4	Yes.

* See Note D.

In the second instance, the following Telegraphic communication was made :

Brig—Boston,—sixty-seven days' passage—from Newcastle;—lost overboard—one man—twenty-seven days out;—two—men—unable—to do—duty.—Will you—send—three men—immediately—aboard—to work—brig—up to town ?

The above communications were made to the Conductor of the Telegraph at the Observatory, Central Wharf; and, in the case of the brig Boston, when that vessel was relieved, the wind was blowing so strong off shore that it would have taken her boat several hours to have come up to the city for assistance ; it would have been night time, too, when she reached the wharf; then there would have been much delay and trouble in getting ready the necessary articles to be sent down to her, which would have required, in the whole, several hours ; and perhaps by the time assistance had reached the spot, the vessel, with her exhausted crew, would have been swallowed up in the depth of the ocean. But by means of the Boston Telegraph establishment, which despatches its intelligence without regard to winds or waves, requisite information reached the city in *ten minutes ;* and in the short space of *fifty-five minutes* from its reception, a boat was fitted out with every thing necessary for the occasion, and in about two hours, was actually on the spot, affording relief to our perishing brethren.*

From these illustrations of the uses of the Telegraph by land and by sea, some idea may be formed of its vast importance to the mercantile, commercial and trading interests of our country. In case of a war, when rapid communication of intelligence may be of vital importance to the whole population of a town or city, its benefits are incalculable. And even in ordinary times of peace, and in the usual course of business, when the preservation of property and, above all, the lives of our sea-faring brethren are in jeopardy, we cannot sufficiently appreciate the great value of this invention.

The application of the art to other subjects will naturally follow the progress of those rapid improvements, which are the characteristics of the present age. We are well aware what a change has taken place in the transmission of intelligence relating to business, within a

* See Note E.

few years past. An additional impulse has rendered it necessary to add new energy to our means of communication. If there are now essential advantages to business in obtaining intelligence from New-York, at the rate of *ten or twelve miles per hour*, any one must perceive that there must be a proportionate benefit, when *information by Telegraph can be transmitted to New-York at the rate of ~~six~~ miles per minute.*

The rapidity of the public mail is not sufficient, in many instances, to supply the demands of a business community. Expresses, at an enormous expense, are employed to convey intelligence from the seat of government to the principal cities. When we witness the extraordinary resources of this growing country ; when we observe the wonderful results of an intelligent and active population, incessantly occupied in developing their powers and resources, and stimulated, by the circumstances in which they are placed, to greater and more intense exertion than the same number of people have probably ever been ; when we see, too, that all ordinary calculations, founded upon the precedents of other nations, fall short of what is here actually accomplished ; when we witness all this, we cannot believe that it is being too sanguine to expect the establishment of a permanent line of Telegraphs throughout the Union.

APPENDIX.

Note A.

Instances have been known of the transmission of important intelligence at the rate of one hundred and forty-four miles in a minute—more than eleven times faster than the speed of sound, and seven times faster than a cannon ball. Not twelve years since, the French papers stated that three thousand messages could be conveyed from Paris, in one day, to any extremity of France, and that answers could be received to them.

Note B.

Account of the improved Telegraphic System of the Greeks, extracted from Polybius's History, Book x. ch. 46. (B. C. 203.)

The last method which I shall mention, was invented either by Cleoxenus or Democlitus, but perfected by myself. This method is precise, and capable of signifying every thing that happens, with the greatest accuracy. A very exact attention, however, is required in using it. It is this which follows.

Take the twenty-four letters of the alphabet, in order, and divide it into five parts, with five letters in each. In the last of these parts, indeed, one letter will be wanting; but this is of no importance. Then let those who are to give and receive the signals, write upon five tablets the five portions of the letters in their proper order; and concert together the following plan. That he, on one side, who is to make the signal, shall first raise two lighted torches, and hold them erect, till they are answered by torches from the other side. This only serves to show, that they are on both sides ready and prepared. That afterwards he again who gives the signal shall raise first some torches upon the left hand, in order to make known, to those on the other side, which of the tablets is to be inspected. If the first, for example, a single torch; if the second, two; and so of the rest. That then he shall raise other torches also upon the right; to mark in the same manner, to those who receive the signal, which of the letters upon the tablet is to be observed and written. When they have thus regulated their plan, and taken their respective posts, it will be necessary first to have a dioptrical instrument, framed, with two holes or tubes; one for discerning the right, and the other the left hand of the person who is to raise the torches on the opposite side. The tablets must be placed erect, and in their proper order, near the instrument. And upon the right and left, there should be also a solid fence of about ten feet in length, and of the height of a man: that the torches, being raised along the top of these ramparts, may give a more certain light; and when they are dropped again, that they may also be concealed behind them. When all things then are thus prepared, if it be intended, for example, to convey this notice; "that some of the soldiers, about a hundred in number, are gone over to the enemy;" it will be necessary, in the first place, to choose words for this purpose which contain the fewer letters. Thus, if it be said, "Cretans a hundred have deserted;" the same thing is expressed in less than half of the letters which compose the former sentence. These words, then, being first written down, are communicated by the means of torches in the following manner. The first letter is Cappa, (C); which stands in the second division of the alphabet, and upon the second tablet. The person, therefore, who makes the signal, first holds up the torches upon the left, to signify that it is the second tablet which is to be inspected; and afterwards five upon the right; to show that Cappa is the letter, which he who receives the signal must observe and write. For Cappa stands the fifth in the second division of the letters. Then, again, he holds up four torches upon the left, because Ro (R) is found in the fourth division; and two upon the right to denote that it stands the second in that division. From hence, the person who receives the signal writes Ro (R) upon his tablet, and, in the same manner, all the rest of the letters. By this method, an account of every thing that happens may be conveyed with the most perfect accuracy. It is true, indeed, that, because every letter requires a double signal, a great number of torches must be employed. If the necessary pains, however, be used, the thing will be found to be very practicable. In both these methods it is principally requisite, that the persons employed should first be exercised by practice; that, when a real occasion happens, the signals may be made and answered without any mistake.

Note C.

Dr. Hook was the first person who proposed the idea of a Telegraph, on a construction similar to those now in use. His mind was turned to the subject during the siege of Vienna, by the Turks, in 1683; and in the following year he communicated a paper to the Philosophical Society, containing the result of his deliberations. His plan is full and ingenious, and, though not so perfect as the ones now employed, had it been put in practice would have been attended with good effects. For the stations, he says: "If they be far distant, it will be necessary that they should be high and exposed to the sky. There must be a convenient apparatus of characters, consisting of as many distinct characters as there are necessary letters in the alphabet. [These were to be hung up, one after another, on a frame erected at the stations, in such order as to spell the communication to be made.] If they are to be used in the day time, they may be made of deal boards, and of a size convenient for the several distances—any one of which characters may signify any one letter of the alphabet; and the whole alphabet may be varied ten thousand ways, so that none but the two extreme correspondents need be able to discover the information conveyed. If the characters are for the night, they may be made with links or lights, disposed in a certain order, which may be covered or uncovered, according to the method agreed on."

Notwithstanding the sufficiency of the plan proposed by Dr. Hook, it does not appear that the valuable invention was brought into practice for more than a century after. It was during the French revolution that a report, made to the Convention in August, 1794, by Barrere, ascribes the invention of the Telegraph they were using to citizen Chappe. The machine consists of an upright post, with a bar of wood on the top connected to the post by a joint; and, at each end of the bar, is another piece of wood, attached by a hinge; so that in one position the Telegraph is a perfect representation of the letter T. The little arms at the end of the bar, and the bar itself, are susceptible of being placed, by cords and pulley, in many different positions; and each position conveys some separate meaning. The great objection to it is its complication. It is still made use of in France.