Communications.

Our Washington Correspondence.

To the Editor of the Scientific American:

Notwithstanding the amount of business done by the Patent Office during the last two months, there is a considerable falling off in the number of patents issued last year as compared with those issued in 1876, as will be seen on inspecting the following figures:

	Patents.	Reissues.	Designs.	Trademarks.	Labels.
1876....	14,172	621	802	959	472
1877....	12,920	568	679	1,216	392
Decrease	1,252	53	123	Incr. 257	Dec. 80

The work of cleaning the models damaged by the late fire has commenced, and the office is overrun with applicants for employment in consequence. About fifty hands are employed, who are at present mostly engaged on the sewing machines, which, although they were not directly exposed to the fire, received considerable damage by water and steam.

THE NAVY.

The Secretary of the Navy has organized a commission of bureau officers consisting of Rear Admirals Howell and Ammen, Commodore Shufeldt, Engineer-in-Chief Shock, Captain Jeffers, and Constructor Easby, to investigate and report upon the class of vessels best adapted for service in the United States Navy; the dimensions, tonnage, and battery of each particular class; the number of each class required, and the material of which they are to be built. The commission will examine and discuss the qualification of ships of other navies, their batteries, steam power, etc., and the subject of torpedoes and rams will be thoroughly investigated.

The subject of educating boys in practical seamanship so as to fit them for service in the navy having been tested and found to work satisfactorily, is to be presented to Congress with the view of making such changes in the law as will result, it is hoped, in having our navy manned entirely by seamen educated to the business. Commodore Shufeldt, who has given much attention to the perfection of the system, will explain the advantages thereof to the House and Senate Navy Committees, and will recommend the passage of a law authorizing the enlistment of 750 boys annually, or ten per cent of the seamen now allowed to the navy. Congress, a year ago, reduced the number of seamen from 8,500 to 7,500, and the boys now enlisted and undergoing instruction, numbering about 470, are included in the 7,500 seamen authorized by law. It is proposed to retain the full number of seamen if Congress will consent, and in addition thereto enlist 750 boys annually, who, after serving on the school ships one year, will be distributed to the ships already in commission, by which means it is hoped that in the course of ten years our whole naval force will consist of thoroughly trained seamen, all of which will have been educated in the service.

CONGRESSIONAL MATTERS.

The Sub-Committees on Ways and Means are diligently engaged upon the proposed revision of the tariff, which is to be reported to the House after the recess of Congress. The changes of the rates of duty have not yet been determined upon, but there is little doubt that a great number of articles which now produce little or no revenue will be placed upon the free list, and that the duties on others will be greatly reduced and simplified. It will matter but little, however, in what shape the Committee reports its bill, for when it comes into the House it will be greatly changed by the log rolling of members representing different interests, each one of whom will endeavor to shape legislation to favor the local interests of his own district. Tariff legislation in general, instead of proceeding on any fixed principles, has been a scramble of different interests for the highest protection, and those branches of industry that could bring the strongest influences to bear upon individual members have had their wishes most respected, while weak and struggling interests not wealthy enough to subsidize a powerful lobby have had to suffer.

Admiral Rodgers, the Superintendent of the Observatory, has a project that he wishes to bring before Congress, to which he has been devoting considerable attention, intended to do away with the inconveniences which arise from the difference in local and railroad time. His idea is to have Congress pass a resolution which will require all railroads to have the clocks in their depots constructed with a double pair of hands—one pair to mark the local time and the other pair, of different color, to give railroad time, which shall be Washington time throughout the United States; so that at a glance one can tell the different times without confusion. If this is done, and the public have their clocks and watches fitted with hands on the same principle, the Admiral thinks the great trouble now existing in some localities from the difference in local and railroad time would be fully overcome.

FORESTRY.

The Commissioner of Agriculture has addressed a letter to the President recommending an appropriation of $8,000 to prosecute during the next year the inquiries into the subject of forestry which were begun last year under the auspices of the department by Dr. Hough of New York, who was selected by the Commissioner of Agriculture for the purpose, under authority granted by Congress in 1876. Dr. Hough has diligently prosecuted the inquiry, not only in the United States, but has corresponded with the officers of foreign governments connected with the forest management and forest schools which abound in Europe, where the vital importance of taking care of this great interest is well understood, and where for a long time an intelligent and settled policy has prevailed, looking to the increase of the woods, the equal seasonable distribution of the rainfall, the maintenance of forests upon the higher lands, and the subsequent preservation of the regular supply of water for the springs, rivulets, and rivers, and the prevention of those terrible floods which wash bare the unclothed mountain slopes, and by sudden overflows destroy the agriculture and manufactures of the valleys in those regions where proper care is not taken to avert these troubles. In the report which Dr. Hough will make to Congress he will recommend that in any legislation which may be enacted on the subject it shall be prescribed that a certain amount of land must be planted with trees by the settlers before any title be given; that instead of selling timber lands, only the privilege of cutting timber shall be sold; that foresters shall be regularly trained and appointed by Government. He also thinks that the different State Governments could promote the growth of forests by offering premiums, exempting forests from taxation, dispensing with needless fences, preventing forest fires by law, levying a tree tax similar to the road tax, planting edges for wind and snow breaks, aiding educational institutions to give instruction in silviculture, and by conferring upon municipal authorities power to lay out parks for the growth and improvement of trees. A bill drafted by Mr. Andrews, ex-United States Minister to Sweden, will accompany the report, which requires that in all future clearing of public pine lands trees be left for seeds at intervals of 70 feet in each direction.

FISH CULTURE.

From a recent report on the above subject it appears that there are now twenty-seven States who have fishery commissioners that receive and hatch the eggs of fishes furnished by the United States Fish Commission, and distribute the young fish in the proper localities. About 4,000,000 California salmon were thus distributed in October. The Wisconsin Fish Commissioners report a large amount of work, having hatched and distributed 1,736,000 lake trout, 6,295,000 white fish, and smaller amounts of brook trout and California salmon. The question whether our lakes are fitted for the last-named fish will soon be determined. The hatching has been successful with about 90 per cent of the eggs. The Maine Commissioners report an unusually large quantity of salmon, principally due, it is believed, to the efforts at fish culture in most of the rivers of the State. Several ponds have been stocked with black bass as an antidote to the pickerel. In the Mattawaukeag river 80,000 shad fry have been placed.

According to a late letter received here the

SUTRO TUNNEL

has attained a length of 18,400 feet, and is now within fifty feet of the great combination mining shaft at the Comstock lode, where its usefulness and value will be tested. The sounds of the blasts can be heard in the Comstock workings, complete connection with which it is thought will be made about April next. Thus far the expenditure has been $2,830,597; about $250,000 will be required to complete the work, and $500,000 more to equip it. When completed the tunnel will form a natural outlet for the waters of the bonanza mines, now pumped up from the depth of 2,300 feet, at an annual cost of nearly $3,000,000; with the tunnel it will be only necessary to raise it to the 1,800 feet level. In addition to this saving it is said that the cost of moving the ore from the bottom of the shafts to the open air by means of the tunnel will only be $150 a day as against $4,500 by the present system of hoisting. Besides this great economic advantage the tunnel will afford such a good ventilator that the mining can be carried on to much better advantage, for under the present system the miners have frequently to labor in an atmosphere heated to 120°, and cannot work more than a few minutes at a time without resorting to the cooling chambers.

OIL PIPE LINE.

A company is said to be in process of formation to lay a pipe line from the oil-producing region to our neighboring city of Baltimore. The starting point, it is believed, will be in some prominent place in Butler county, Pa. It is estimated that by the proposed line oil can be transported to the seaboard for six cents per barrel, but the company proposes to charge forty cents, which is considerably below the present railroad charges of from $1.20 to $1.45 per barrel. The transportation of oil is now, to a considerable extent, a monopoly in the hands of the Standard Oil Company, and it is the object of the company now organizing, and those who are backing it (the Oil Producers' Association), to break up this monopoly. As by the proposed line oil can be taken to the seaboard much cheaper than by rail, the Standard Company it is thought will be compelled to build an opposing line, which will make full and open competition and destroy the present monopoly.

A NEW STORM SIGNAL.

General Myers, the Chief Signal Officer, has issued a notice that there will be used hereafter an additional cautionary signal, to be known as "The Cautionary Off-Shore Signal." This signal, when shown, will indicate that while the storm disturbance is considered by the Signal Service as not yet passed for the place where the signal is displayed, and the winds may yet be high and there may be danger, the winds are expected to blow from a northern or western direction, or "off-shore," at or near the port or place where the signal may be. The cautionary off-shore signal, that is, a white flag with black square in the center, shown above a red flag with a black square in the center by day, or a white light shown above a red light by night, therefore is "cautionary" with reference to winds expected to blow from a northern or western direction or "off-shore" at or near the place at which it may be. The use of the regular cautionary signal will be continued as heretofore, retaining its former significance.

A NEW PLANET?

Professor Henry, of the Smithsonian Institute, reports that Professor Foersten of Berlin telegraphs that Palissa discovered on the 29th ult. a planet of the eleventh magnitude, in seven hours eight minutes, right ascension, thirty-nine degrees thirty-seven minutes, north declination. Professor Henry, however, thinks this may possibly be the one discovered in 1876, and named Eva.

Washington, D. C. OCCASIONAL.

Practical Utilization of Natural Gas.

To the Editor of the Scientific American:

For the past five years I have used natural gas exclusively for heating, lighting, and cooking purposes. The gas is supplied from a well 700 feet deep, located not far from the house. I estimate the quantity furnished at from four to five thousand feet every twenty-four hours.

For heating and cooking purposes gas stoves are used, the air supply being adjusted so as to secure perfect combustion. For these stoves no chimney is required, so that all the heat is utilized, without odor or other bad effects. Seven fires are used in the winter time night and day, and the house never gets cold.

The heat is pleasant, and, being moist, does not shrink the woodwork. For lighting purposes the gas is used as it comes from the well, with the ordinary lava tip or argand burner. The light produced is very uniform and steady. No gas receiver or water is used, the excess of gas being allowed to escape when a certain pressure is reached. The water pipes never freeze. Our carpets last much longer than before, as there are no ashes or dirt. Miner's strikes, the prices of gas, oil, and coal, the rates of transportation, etc., do not disturb us. We have no reason to be dissatisfied with the investment.

East Rockport, Ohio. E. NICHOLSON.

[What becomes of the thousand or more feet of carbonic acid daily produced in the rooms by the combustion of the gas?—"no chimney being required." We have the impression that an atmosphere thus constantly vitiated cannot prove very conducive to the health of people subject to its influence.—EDS.]

The Bellophone.

To the Editor of the Scientific American:

Bell is everywhere fully credited with the telephone's origination. Let your paper, then, be the first to start his name down the stream of time with his great invention. Let us all call it the "Bellophone."

Philadelphia, Pa. J. C. H.

Carbon in Chemistry.

The elements carbon, hydrogen, oxygen, and nitrogen have been called *organogens*—that is, organ producers—from the important part they play in the organic world. They make up the great bulk of the vegetable and animal creation, the other elements that enter into the composition of organic substances forming comparatively an insignificant part of their structure. But among these four organogens carbon holds a peculiar and prominent place, as the one element that seems indispensable to the existence of an organic compound. It is preëminently the organic element, not merely because it is always present in animal and vegetable substances, but because they appear to owe their existence to its remarkable properties. These compounds, although they contain but a few elements, are numberless and of almost infinite diversity of constitution and properties; and this is due, not to the so-called "vital force," but to the singular capacity of the carbon atoms to bind together a great number of other atoms into a complex molecule. This makes a great variety of molecular structure possible with a limited number of elementary atoms. The materials are few and simple; the forms into which they are arranged by the cunning hand of the master-builder, Carbon, are of inconceivable diversity. In fact, as Professor Cooke has said in his "Chemical Philosophy," organic chemistry "is simply the chemistry of the compounds of carbon, and has no distinctive character except that which the peculiar qualities of this singular element give."

In the department of inorganic chemistry we often find two elements uniting in several different proportions to form compounds whose properties are very dissimilar; but here the limit of possible changes is soon reached. An atom of one element combines with one, two, or three, or at most five or seven, of another, and there is an end of it; while the carbon compounds run on in long series, adding atoms to atoms, until the numbers that represent their chemical constitution are high among the tens and even into the hundreds. The formulæ of many of these series are tabulated in manuals of chemistry. The law of their formation is as clear as that of an arithmetical progression. In some of them most of the compounds forming the regular succession of terms are already known, while in others many remain to be discovered by chemists. There is a series of organic acids, for

example, of which formic acid, or CH_2O_2, is the first, and the successive members of which add an atom of carbon and two atoms of hydrogen to the formula of the next preceding in the list: as $C_2H_4O_2$ (acetic acid), $C_3H_6O_2$ (propionic acid), $C_4H_8O_2$ (butyric acid), $C_5H_{10}O_2$ (valerianic acid), and so on until we get up to $C_{30}H_{60}O_2$ (melissic acid), and we know not how many beyond.

Among familiar compounds we may find some of the most unlike thus built up of atoms of the same elements, but differing slightly in their atomic proportions. For instance, sugar, starch, alcohol, and vinegar are as different in their properties as four substances well could be; yet all four are composed of carbon, hydrogen, and oxygen in slightly varying proportions. The formula for sugar (our common cane sugar) is $C_{12}H_{22}O_{11}$; that of starch is $C_6H_{10}O_5$; that of ordinary alcohol is C_2H_6O; and that of acetic acid (which when diluted with water constitutes vinegar) is $C_2H_4O_2$. We need not wonder, then, at such chemical magic as the transmutation of starch into sugar, of sugar into alcohol, and of alcohol into vinegar. These are only examples of the sleight-of-hand at which this prestidigitateur among the elements is an expert. It is but dropping an atom or two of oxygen, and picking up an atom or two of hydrogen, or some such dexterous manipulation, and presto! the compound undergoes a sudden and mysterious metamorphosis. A little water, or the hydrogen and oxygen thereof, is added to the starch, and we have sugar—that is, grape sugar—and dextrine, the gum used on the back of postage stamps. Dissolve the sugar, cause it to undergo fermentation, and straightway alcohol and carbonic acid are the results. Dilute the alcohol, let it ferment again, and acetic acid and water make their appearance.

RAG SUGAR.

One of our subscribers in a distant part of the country has just written to us, stating that he has heard of "old rags being changed into sugar," and wanting "to know if it can be done." He is evidently incredulous as to the possibility of such an operation, but we can assure him that there is no doubt of it. The process is not at all a new one, having been described in an article on the "Chemistry of Sugar," which appeared in the *Journal* some ten years ago. This transformation, which appears so miraculous to one unfamiliar with chemical reaction, is akin to those we have just mentioned. Linen and cotton rags are simply forms of woody fiber, which has the same chemical constitution as starch, and like starch may be easily converted into glucose, or grape sugar. Paper, sawdust, or any form of woody fiber will answer the purpose equally well. Of course woolen rags will not do, though the first edition of a certain popular text-book of chemistry contained the rather startling statement that sugar had been made out of an old flannel shirt.

But the most wonderful metamorphosis of these carbon compounds takes place in the cells and tissues of plants and animals. In these microscopic laboratories what marvels of chemical manufacture are perpetually being effected! What myriads of curious and complicated products are here concocted! Every vegetable and animal substance that serves our use or our pleasure is thus prepared for us. It is interesting to visit a manufactory where the brilliant aniline dyes now so extensively used for coloring textile fabrics are made from the filthy coal tar, which is a waste product of the gas works; but a far more wonderful transmutation is continually going on in the rose in your garden or the violet by the wayside. The flower derives the materials of its beauty and its fragrance from the air and the earth, and elaborates these into the exquisite products that so delight our senses. The delicious juices of the grape and the peach are distilled in the alembic of the vine or the tree by a like subtle alchemy. The rich spices of "Araby the blest" have the same origin; hence, too, come the healing balms and balsams, the potent alkaloids of the medical art, and whatever else we draw from the vegetable kingdom to supply our needs or gratify our tastes.

All the processes of animal life are likewise illustrations of this chemistry of the carbon compounds. Our bodies are built up of these compounds, fabricated in the minute cells of the system from materials already prepared by the plant, which is the pioneer of the animal in the great march of organic life. Even the subtle processes of thought are dependent on the transformation of carbon compounds. The fires of feeling are fed with fuel which does not really differ from that burnt on the household hearth.

It may be added, in conclusion, that the allotropic forms in which carbon exists as an element are suggestive of the protean aspects under which it appears in its compounds. Carbon is found in nature as the diamond, as graphite or plumbago, and as coal. The diamond is the purest and most transparent of crystals, the hardest of known substances, unaffected by the atmosphere and all ordinary chemical agents, the type of permanency and indestructibility. Graphite we might at first take to be a metal, from its texture and lustre; it differs from the diamond in all respects except that it is practically indestructible. It is at once very soft and very hard and refractory. We make from it our lead pencils, which are worn away by the slightest friction on paper; and we shape it into crucibles which endure the fiercest heats of our furnaces. Coal, whether charcoal or cannel or anthracite, resembles neither the diamond nor graphite. It is indeed black like the latter, but without its peculiar metallic lustre; and whereas neither graphite nor the diamond can be ignited in any ordinary way, the most marked characteristic of coal is its ready combustibility. Its obvious end and purpose is to be burned, and it keeps up the fires, domestic and industrial, of almost the entire world. There are other elements—like sulphur and phosphorus, for example—which are remarkable for the allotropic forms they assume, but carbon must be regarded as surpassing them all in this respect, and the peculiarity seems typical of the imperial place it was destined to hold in the realm of organic nature.—*Boston Journal of Chemistry.*

Astronomical Notes.

BY BERLIN H. WRIGHT.

PENN YAN, N. Y., Saturday, January 26, 1878.

The following calculations are adapted to the latitude of New York city, and are expressed in true or clock time, being for the date given in the caption when not otherwise stated.

PLANETS.

	H.M.		H.M.
Mercury rises	5 48 mo.	Jupiter rises	6 26 mo.
Venus sets	8 03 eve.	Saturn sets	8 31 eve.
Mars in meridian	5 17 eve.	Uranus rises	6 52 eve.
Mars sets	11 56 eve.	Neptune in meridian	5 48 eve.

FIRST MAGNITUDE STARS.

	H.M.		H.M.
Sirius rises	5 15 eve.	Altair sets	5 50 eve.
Antares rises	3 40 mo.	Fomalhaut sets	6 26 eve.
Regulus rises	6 53 eve.	Algol (2d 4th mg.) in merid.	6 36 eve.
Spica rises	11 30 eve.	Capella in meridian	8 43 eve.
Procyon in meridian	11 08 eve.	7 stars (cluster) in meridian	7 16 eve.
Arcturus rises	10 33 eve.	Betelgeuse in meridian	9 24 eve.
Aldebaran in meridian	8 04 eve.	Rigel in meridian	8 44 eve.
Vega sets	7 02 eve.		

REMARKS.

There will be an annular eclipse of the sun February 2, visible only in Australia and vicinity, and there as a partial eclipse on the southern limb, the visible portion of the sun appearing as a large crescent with the horns down. The eclipse begins at Adelaide 5 h. 39 m. P.M., size 10 digits; Melbourne, 6 h. 1 m. P.M., size 11 digits; Sydney, 6 h. 34 m. P.M., size 4⅓ digits. At all the above places the sun sets eclipsed. Mercury rises 1 h. 28 m. before the sun, and 2° 50′ 30″ south of the sunrise point, being 27° 45′ 20″ south of the east point. Venus commences to retrograde January 29, being at that time apparently stationary. Jupiter rises 50 m. before the sun, and 1° 28′ south of the sunrise point, being 26° 23′ south of the east point.

Cost of a Pennsylvania Railroad Passenger Car.

Engineering gives in detail the cost of constructing one first class standard passenger car, at the Altoona shops of the Pennsylvania Railroad, the total cost being $4,423.75. The principal items are as follows:

Labor	$1263 94
Proportion of Fuel and Stores	28 61
2480 feet poplar	86 80
3434 feet ash	127 08
1100 feet pine	20 90
2350 feet yellow pine	70 50
500 feet oak	10 00
450 feet hickory	13 50
700 feet Michigan pine	49 00
400 feet cherry	16 00
439 feet maple veneer	24 14
4 pairs wheels and axles	332 85
2 pairs passenger car trucks, complete	533 62
13 gallons varnish	52 34
45 lbs. glue	14 33
2925 lbs. iron	87 75
792 lbs. castings	16 99
Screws	51 88
Gas regulator and gauge	25 25
2 Two-light chandeliers	50 72
2 Gas tanks	84 00
1 Air-brake, complete	131 79
57 Sash balances	44 61
61 Lights glass	65 83
2 Stoves	77 56
25 Sets seat fixtures	50 50
3 Bronze lamps	13 50
2 Bronze door locks and fittings	15 20
Butts and hinges	15 58
13 Basket racks	77 35
12 Sash levers	42 00
61 Bronze window lifts	24 40
61 Window fasteners	16 47
238 Sheets tin	41 44
273 lbs. galvanized iron	25 31
96 yards scarlet plush	228 87
44 yards green plush	109 99
61 yards sheeting	10 30
243 lbs. hair	72 95
12 Springs	22 96
12 Spiral elliptic springs	20 29
1 Head lining	80 63
2 Packets gold leaf	14 58
Various small items	261 44
	$4423 75

Postal Certificates in England.

Representations having been made to the Postmaster-General that it would be very desirable in many cases to have a certificate showing that a letter, newspaper, or book-packet had been posted without registering it or obtaining for it any special security, it has been decided by the Post-office authorities to try the experiment of issuing certificates of this description at Liverpool, Manchester, Birmingham, Bath, and some of the principal offices subordinate to those places. Forms of certificate, with an embossed half-penny stamp, will be sold to the public, on which the sender of a letter, etc., must write the address, and present it with the letter to the clerk at the counter. After examining the address, the clerk will retain the letter, newspaper, or book-packet, and return the certificate to the sender, impressed with the dated stamp of the office as evidence of posting. The subsequent treatment of the letter will be precisely the same as if posted in a letter box.

How to Make Pepsin.

Obtain, from any hog butcher, one half dozen dissected membranes of the stomach of the hog, and cut or mince them up finely; and macerate in a menstruum of 1 part muriatic acid to 32 of water, for ten or twelve hours. Decant the liquid, and re-macerate the membrane in a fresh portion of water and acid; throw the whole on a strainer; mix the filtrates together, and add to it a quantity of table salt, until a separation of pepsin ceases to take place. The pepsin impregnated with sodium chloride will float on the surface. This is collected and placed on muslin, folded several times, and submitted to pressure, to free it from adhering moisture. The strength of the moist pepsin can be readily obtained by its power of dissolving albumen; and its strength can be apportioned accordingly, by simply mixing it with sugar of milk, so that 1 grain can be made to dissolve 5, 10,15, or 20 grains of coagulated albumen.

The price asked for standard pepsin, by wholesale druggists, varies from 50 to 75 cents per ounce; at which prices a handsome margin is left for the manufacturers. I see no reason why pepsin, of the strength of those now considered standard, cannot be made for at least one half the price, and afford the druggists' apprentices some means of recreation from their otherwise monotonous duties.

The above remarks are general in their character, and are written in the hope that they will stimulate retail apothecaries to rely more on their own ability to make preparations of this kind than has heretofore been the case.—*Phila. Druggist and Chemist.*

The Satellites.

The following table presents at one view the mean distances of the satellites from their primaries, expressed in equatorial semi-diameters of the latter, and founded upon the most reliable data hitherto available:

	The Earth.	Mars.	Jupiter.	Saturn.	Uranus.	Neptune.
I.	60·27	2·72	5·70	2·98	7·71	14·55
II.	—	6·81	9·07	3·83	10·75	—
III.	—	—	14·46	4·75	17·63	—
IV.	—	—	25·44	6·08	23·57	—
V.	—	—	—	8·47		
VI.	—	—	—	19·67	—	—
VII.	—	—	—	24·80	—	—
VIII.	—	—	—	57·28	—	—

It will be seen that the outer satellite of Saturn, Iapetus, is the only one revolving round its primary at a distance similar to that of our moon, with respect to the semi-diameter of the central body. The exterior satellites of Jupiter and Uranus are similarly placed in this respect, and as regards the former planet the reader will remember a suggestion of Sir John Herschel's, that a distant satellite, by which was intended one situate more nearly, as our moon or the Saturnian satellite Iapetus, might be "worth a search." At the end of the last century it was thought that if satellites of Mars existed, they might be "distant many degrees from the principal planet," upon which idea the late Professor D'Arrest argued that a search after a satellite situate many degrees from Mars would be an almost endless task; and further, that a satellite at a maximum digression of seventy minutes of arc would have a sidereal period greater than the synodical revolution of the primary. The same astronomer endeavored to ascertain, at the opposition of 1864, to what magnitude stars were visible in the vicinity of Mars with the Copenhagen refractor, which has an aperture of about 11 English inches. He considered that a satellite as bright as the twelfth magnitude could hardly have escaped him, and that objects of a fainter class were only visible in such an instrument at distances of eight or ten minutes, and in the case of Mars opportunities of viewing a satellite in such position would occur comparatively seldom. Perhaps the more prevalent idea respecting possible satellites of Mars, prior to their actual discovery, was that they would be "very small and close to the planet."—*Hind, in "Solar System,"* page 78.

A New Telegraph Company.

An organization named the "Continental Telegraph Company" has been formed in this city by parties who have been prominently connected with the Atlantic and Pacific Company. The capital has been placed at $10,000,000. Right of way through New Jersey has been obtained for the new line to Philadelphia and Washington, and work has already been commenced. The first line will run from New York to Philadelphia, and will consist of five wires, the size of the wire being No. 6, with poles 30 feet in height and 7 inches in diameter at the top, 40 poles to the mile. The second line will run from New York to Baltimore and Washington, and will also consist of five wires. Business will probably be opened about the 1st of April. One of the features to be introduced will be a combination of the Morse instrument and the telephone. Lines will be extended only to points where the amount of business will warrant, and the best of materials will be used in construction.