

original implements in the auriferous gravels underlying the basaltic deposit on the summit of Tuolumne Table Mountain. His remarkable statements were confirmed by the affidavits of the workmen who discovered the implements. He was followed by Professor Cope, and Thomas Wilson, curator of the Smithsonian Institution, and others, the outcome of it all being that fully 300 specimens of the sort have been found in a formation usually regarded as Pliocene. The discussion of these extraordinary facts bearing upon the antiquity of the human race was so absorbing that it lasted until nearly midnight, the final impression seeming to prevail among those that took part in it that the glacial age on the Atlantic side of the continent must have long antedated the glacial age as developed on the Pacific coast. Of course a discussion of this kind brought up to view the little image found in boring, also the famous old Calaveras County skull, and similar debatable matters, but the whole discussion was carried on in the greatest spirit of fairness and good feeling.

Prof. W. N. Davis, of Cambridge, Mass., described two fossil-bearing belts found in the Triassic formation of Connecticut. This formation, as interpreted by the dislocation of the trap sheets, is found to be divided by oblique faults into a number of blocks with displacements, varying up to 2,000 ft. All the known fish-bearing shales have been correlated as the disjointed outcrops of only two shale belts. It will certainly be a surprise to the general reader to be told that, following these indications, Dr. E. O. Hovey found last summer fossil fish in the vicinity of New Haven.

Among other notable papers read were those describing the glacial lakes of Canada, the coal-bearing rocks of Montana, the geology of Georgia, the phosphate deposits on the island of Nevassa, the nickel and copper deposits of the Sudbury district in Canada, the occurrence of Medina sandstone on the summit of the Blue Ridge at Harper's Ferry, etc.

We have the promise for early publication of Prof. N. H. Darton's description of the formations characterizing the region immediately around the city of Washington, D. C., which, of course, will have more than a purely local interest.

By the courtesy of the authors we are also able, in the SCIENTIFIC AMERICAN SUPPLEMENT of this week, to publish Prof. Orton's remarkable account of a finely preserved megalonyx found within the past month by Mr. W. S. Hanna, of Millersburg, Ohio; and an exceedingly interesting paper by Prof. Henry McCally on the "Coal Fields of Alabama."

THE NEW COPYRIGHT BILL NOW BEFORE CONGRESS.

The copyright bill which passed the House December 3, 1890 (H. R. 10,881) contains nearly all of the objectionable features of the original Senate bill. It is now before the Senate, and there is opportunity for amendments. We hope strenuous efforts will be made in this direction; but the most satisfactory way would be to postpone the matter until the next session of Congress; thus giving chance for further and more deliberate discussions than the limited time now permits. The subject is one of paramount importance to the public, deserving the most careful study and cautious action on the part of the national legislature.

We had occasion some time ago to discuss the merits of a bill substantially similar to this one, and perhaps we cannot do better than repeat in substance some of the principal points then presented.

The bill has for its ostensible motive the grant of book patents to foreign authors; but it is well understood the real object of the bill is to facilitate, by aid of Congress, the formation of book trusts, by which the prices of books will be advanced throughout the country, the rich publishers made richer and the printers of cheap literature driven out of business. Under the law as it stands, only the books of American authors and of foreign authors resident here can be patented; all others are free, and there is no mode by which the people can be deprived of cheap books, or those who make them deprived of occupation. But if this foreign copyright bill passes, all books can be patented, the rich publishers will purchase the patents and put up the prices, and only those who control the patents can continue in business.

Probably there are few who will dispute the propriety of granting copyright patents, in some form, for a limited period, to foreign authors; but in doing so every care should be taken to preserve existing advantages and to prevent injury to established industries. The present bill appears to be lacking in these respects, and is open to other objections.

The bill in substance provides that on and after July 1, 1891, book patents shall be granted to foreigners; they may hold these monopolies for forty-two years; the assigns of foreigners may also obtain such patents. The Postmaster-General and the Secretary of the Treasury with their aids and assistants throughout the United States are constituted pimps and ferrets for these foreigners; it is made their duty to spy out and seize all books going through the mails that infringe the copyrights of foreigners; if an American citizen coming home from abroad brings with him

a purchased book on which he has already paid royalty to the author, it is to be seized on landing unless he can produce the written consent of the man who owns the copyright for this country, signed by two witnesses. Who the said owner may be, in what part of the world he lives, the innocent citizen must find out as best he can, or be despoiled of his property.

The bill also provides for book patent reciprocity with other nations—a very taking idea, but without real merit. Is it desirable to saddle the people of the United States with a mass of 42 year book patents because other countries do so?

These are some of the strange provisions of the Senate bill, which, it is obvious, needs amendment.

The period allowed for these monopolies, namely, forty-two years, is altogether too long. The ordinary patent for an industrial improvement, such as the sewing machine, the planing machine, the telegraph, the telephone, or any other invention, however wonderful or vast its benefits to the people, is only granted for seventeen years. The patent then expires, the monopoly ceases, and the people are at liberty freely to copy and duplicate the invention.

It would be much more satisfactory to the public if the term of the foreign copyright were reduced to five or ten years, and we trust an amendment to this effect will prevail. At the time the House was engaged in passing this objectionable bill the Grangers, then in session at Osceola, were discussing a resolution demanding that all patents should be limited to ten years, and it was only by a narrow vote that it was not made a prominent plank in the platform. The popular feeling is unquestionably adverse to the grant of patent monopolies of any kind for so long a period as 42 years, and it will be well for our statesmen to respect this feeling.

In considering the question of changing the statute, we ought not to overlook the benefits that have accrued to the country from the law as it now stands, and which has worked satisfactorily for more than fifty years. It would be folly to change for the worse.

Under the influence of the present copyright laws, our home publishers have for years been enabled to fill the country with the choicest books and periodicals at the lowest prices. The educative effects of this vast supply of standard literary matter have been astonishing. We have become the greatest reading people in the world.

Says Mr. Andrew Carnegie in his "Triumphant Democracy": "It is estimated there are twenty-three thousand school libraries in America, containing forty-five million books—twelve million more than all the public libraries of Europe combined. Other educational establishments increase this number by two and a half million volumes, and thirty-eight State libraries contribute over a million more. The Congressional library, the Astor, the Boston City, the Philadelphia, the various mercantile libraries, the Watkinson reference at Hartford, and many others will raise the grand total to much more than fifty million volumes—a book almost for every man, woman, and child in the United States. More than three hundred libraries contain ten thousand volumes each, twelve contain more than a hundred thousand volumes each, and two contain four hundred thousand volumes each. Even this statement but feebly shadows forth the truth as to the books and periodicals of the country, as compared with those of other lands, for the American is not only a reader, but he is above all other men a buyer of books. Circulating libraries are not so generally used as in Europe. It is when you enter the home of the American farmer or artisan that you are struck with the number of books and magazines you see—the two or three shelves and often far greater number filled with them.

"Triumphant Democracy is triumphant in nothing more than in this, that her members are readers and buyers of books and reading matter beyond the members of any government of a class, but in this particular each system is only seen to be true to its nature. The monarchist boasts more bayonets, the republican more books."

It is not unreasonable to assume that the greatest impulses toward the attainment of our present position in respect to popular education, intelligence, and native authorship have been derived, directly or indirectly, from the existing copyright law, which excludes foreigners and encourages American citizens. Independently of these advantages, the law has helped to develop some of the largest industries. It has created enormous establishments for the manufacture of paper, chemicals, types, printing presses and engines. It has called to employment multitudes of operatives. It gives volume to the mails, helping to freight and support the railways, steamers, telegraphs, and other adjuncts of civilization.

Upon the American author the copyright law, as it stands, confers important benefits. It secures to him the exclusive right to his writings for forty-two years. No citizen who can produce anything worth reading lacks for employment or emolument. It is agreed on all sides that no country was ever blessed with so many able authors as the United States. They ought to be well rewarded, and under the law as it stands they are.

It would be easy to give many examples; a few must suffice. Of "Uncle Tom's Cabin," by Mrs. Stowe, some two millions of copies have been sold; of "Ben Hur," by General Wallace, 250,000 copies; of Roe's works, hundreds of thousands of copies. Some of the story papers, filled with copyrighted tales, sell four hundred thousand copies of each issue, aggregating many millions per year. Mark Twain is said to have made five hundred thousand dollars clear profit within five years from his copyright patents. He receives a handsome royalty on every volume sold. Mr. Blaine has derived a great fortune in the same manner. Mrs. Grant is reported to have received three-quarters of a million dollars as her share of proceeds from the sale of the great general's book, and the copyright patent has forty years still to run.

The money paid to American authors remains within the country. The extension of copyright monopoly to foreigners will enable them to draw millions out of the country.

To this it may properly be answered, if we grant copyright to foreigners, then foreign nations will in duty be bound to allow similar rights to Americans; and so the money will come back. But we fear there is little equality in the matter. American readers and book buyers are as five to one, the world over. The financial result of the patent book extension would be in the same ratio adverse to the United States.

Everybody wants a patent, especially every book publisher. The real though hidden object of this bill—the negro in the fence—is to increase the price of books, and thereby swell the profits of publishers. But the "hurrah" on which the bill was carried in the House was "the natural right of every man to the enjoyment of his own property." It was claimed that when a man invents a new thing or writes a new book, it is his property, in which he has an inalienable personal, exclusive, natural, divine, perpetual property right. But this is fallacious. No man has a natural right to any species of property. His person, his time, his efforts, his productions, all belong, by natural law, to the community of which he is a member; this natural law requires that every individual shall, at all times, employ his best powers of body and mind for the benefit of the community. In so doing he promotes his own welfare as well as that of his fellows. The bosh and nonsense of the book patent people, who claim divine patents and property rights for authors, and denounce others as thieves, has been exposed on various occasions by the Supreme Court of the United States; for example, in *Dable v. Flint* the court said:

"To the argument of the plaintiff's counsel, that the statute is unconstitutional, as depriving the inventor of his property without compensation, there is a two-fold answer. *The patentee has no exclusive right of property in his invention, except under and by virtue of the statute securing it to him, and according to the regulations and restrictions of those statutes.*"

The object of our statesmen should be to encourage and promote the printing of books as much as possible, secure reasonable rewards to authors, and protect them from the grasp of greedy publishers. This might be accomplished by making a few simple amendments to the present law, among them the following:

"Sec.—No assignment of a copyright by the author shall be valid, but the copyright shall remain vested solely in the author, or in his wife or children if he be dead; and any persons desiring to publish a copyrighted work may do so on payment to the author of a royalty not exceeding ten per cent on the lowest price at which said work is sold by said publisher."

An amendment of this kind would be likely to prove beneficial to the public. It would not seriously interfere with free printing. It would promote rivalry between publishers in their endeavors to supply the people with the best editions at the lowest prices; this everybody wants; it would also secure to authors, native or foreign, a reasonable reward for their labors; and this also would give general satisfaction.

Col. Wm. H. Paine.

We regret to announce the death of Col. Wm. H. Paine, which occurred in Cleveland, O., on December 31, 1890. He was born in Chester, N. H., in 1828. He was from early life a surveyor and engineer. He won his reputation in the army by his exploits in the engineering corps during the civil war. He went into the field in advance of the Northern army and obtained dimensions for the construction of bridges where the Confederates had destroyed the old ones. His connection with the Brooklyn bridge, where he was assistant engineer from the beginning of the work to its completion, made him well known in this city. He studied the cable system of traction, and it is his system of grip that is used to-day on the bridge. The 125th Street cable road in this city was built from his plans.

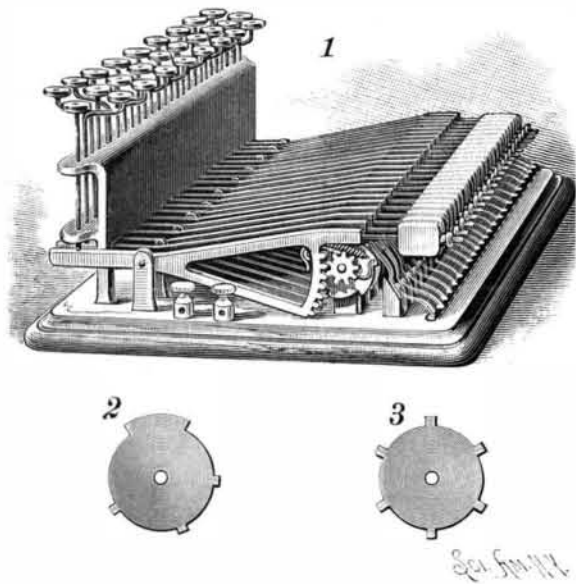
At the time of his death he was in charge of the construction of the cable road in Cleveland, as he had come to be recognized as an authority on cable traction.

A French Fast Train.

A new locomotive built in the shops of the Northern Railroad has been tried at high speed, with a special train of 16 carriages, having a total weight of 667,800 lb. Lead bars were put in the carriages to represent the average weight of passengers, baggage, etc., carried on an express train. This train ran from Paris to Calais by the direct line, a distance of 184.56 miles, in 3 hours, 53 minutes; two stops were made, one of five minutes at Amiens, the other of two minutes at Abbeville. The average speed, making no allowance for stops, was 47.53 miles an hour. The run from Paris to Amiens was made at the rate of 51.58 miles an hour, the train going up the Surveilliers grade—0.5 cent., 11.19 miles long—at the rate of 46.6 miles an hour. On the return trip another carriage was added, making 17 in all. From Calais to Lille the average speed was 49.7 miles an hour, the highest speed 59 miles. Between Lille and Paris the average speed was about the same, but a speed of 71.46 miles an hour was reached in going down the Surveilliers grade.—*Iron Trade Review.*

AN EASILY OPERATED TELEGRAPH INSTRUMENT.

The illustration represents an instrument designed to facilitate the transmission of telegraphic messages with speed and accuracy. It has been patented by Dr. Samuel W. Smith, of No. 24 West Thirtieth Street, New York City. Aligning vertical supports on a suitable base carry horizontal shafts on which are disks having projections varying in length, and adapted by means of varying contact with the trailer to transmit dots and dashes. The disk used in sending one of the longer characters is shown in Fig. 2, which represents a "v" in the Morse alphabet, requiring a dash and three dots, Fig. 3 showing a disk used in sending one of the shorter characters, as the letter "e," which would be represented by a dot. Fixed on each disk-carrying shaft is a ratchet wheel, adjacent to which is a pinion



SMITH'S TELEGRAPH TRANSMITTER.

carrying a spring-pressed pawl, with other mechanism, the arrangement being such that the character disks may be given a whole revolution or any part of a revolution by each movement of the key, the motion being limited and regulated by the mechanism. Each key rests on an outer projecting end of a carriage pivoted between vertical supports, there being near the opposite end of the carriage a segmental rack meshing with the pinion on a disk-carrying shaft, the carriage also having a projecting screw-threaded portion carrying a weight adjustable by means of a nut. Each key is marked with a letter corresponding with the projections on one of the disks, and any person who can read the letters can operate the transmitter, it being only necessary to depress a key to transmit a letter. The movement of the sending mechanism is regulated by the downward movements of the weights, whereby the motion of the character disks is made steady, and accuracy and rapidity are assured. Each key and its mechanism works independently, forming a transmitter in itself. This instrument may be adapted to any code of signals.

The Bordeaux International Exhibition of 1891.

Active steps are being taken in the preparation of this exhibition, which will be opened on the 1st of May, 1891. The exhibition will cover an area of 60,000 square meters, and will be divided into five sections, viz.:

- I. Education, liberal arts, furniture, textiles, and clothing.
- II. Miscellaneous industries, machinery, mineralogy, chemistry, electricity, etc.
- III. Food stuffs, import and export trade, navigation, salvage, fishery, and fish culture.
- IV. Agriculture, viticulture, horticulture, etc.
- V. Fine arts.

Exhibits are invited from all countries, and applications for space should be addressed to Henri Garcin, 7 Allees de Tourny, Bordeaux.

AN IMPROVED PARALLEL RULER.

A simple and convenient device to facilitate ruling with a pen, pencil or brush is shown in the accompanying illustration, and has been patented by Mr. Reginald Forwood, of Paris, Texas. It is made of three



FORWOOD'S PARALLEL RULER.

rollers journaled triangularly in end bearings, the bearings not extending marginally beyond the peripheries of the rollers. The rollers may be made of metal tubing, with plugs in the ends of the tubes to receive screws to act as journals. The ends of the rollers, at one or both ends, have peripheral graduations set or gauged to an index pointer on the adjacent end bearing, whereby, after one line is drawn, the ruler may be rolled a measured distance for the ruling of the following line. These graduations may be spaced differently on the different rollers, to facilitate making evenly spaced parallel lines at different distances apart. The ruler may be set or run along on any two of the rollers.

A Great Magnet.

Hughes & Gawthorp had on exhibition at the Pittsburg exposition an electro-magnet designed for lifting pig iron from the pig bed in the cast house. It was manufactured by the Thomson-Houston Motor Company. This magnet had a lifting capacity of 7,200 pounds. In shape it somewhat resembled a bell with nearly vertical sides, standing about 20 inches in height, and measuring about 24 inches across the bottom. The thickness of the sides of the bell, if it may be termed such, is about 3 inches, and within the bell and being flush with it at the bottom was a large coil forming a powerful electro-magnet. The coil is made a magnet by the passage of a current of electricity through it. The magnet, which is attached to a crane, can be raised and lowered. The lode can be dropped by simply shutting off the current.

The Prophylaxis of Diphtheria.

A resume of this subject is furnished by Prof. Löffler, of Greifswalde. The cause of diphtheria is a bacillus, which, contained in the exudation on the affected mucous membranes, is liable to be disseminated in the vicinity of the patient, together with particles of the false membrane. The infectivity of the patient may even persist for some days after all traces of diphtheritic exudation have disappeared. The strictest isolation of cases is necessary; children who have suffered from the disease should be kept from school for at least four weeks. The bacilli have been found to retain their vitality in dry membranes for from four to five months. It is therefore essential that all clothing, bed linen, and utensils likely to have been contaminated should be disinfected, either by boiling or by exposure to steam. The room occupied by the patient should be disinfected by washing the floors with warm sublimate solution (1 in 1,000), and cleansing the walls and furniture with bread.

It is uncertain how long the bacilli may exist in the moist state, but it seems probable that moisture is more favorable to their vitality than dryness. Thus, diphtheria would seem to be favored by the dampness of dwellings, and also by absence of light. These organisms can exist outside the body at a temperature of 68 degrees F., and they develop well in milk. The sale of milk should, therefore, be carefully supervised. The diseases affecting pigeons, fowls, calves, and pigs which resemble diphtheria are not caused by the bacillus of human diphtheria. These diseases in the lower ani-

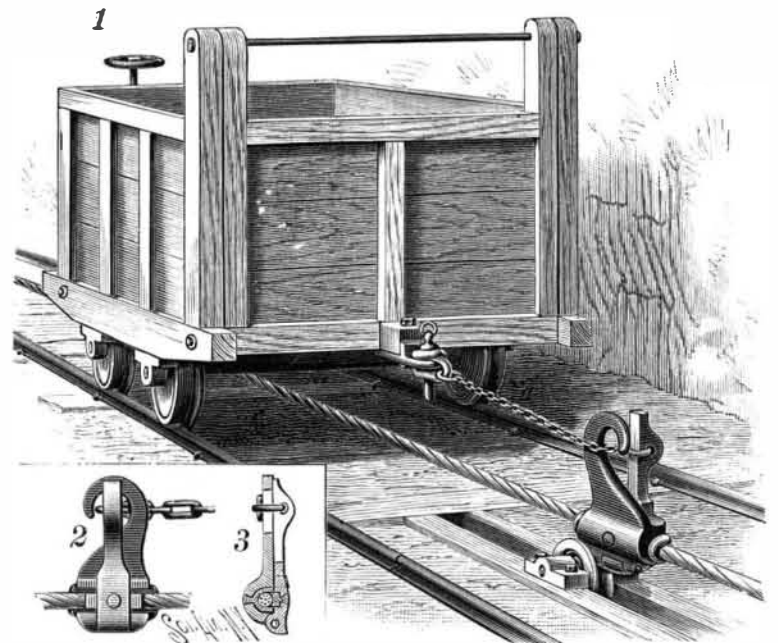
mals are not, therefore, to be feared as sources of the human affection. Professor Löffler thinks that the etiological identity shown by Klein to exist between diphtheria in cats and in man requires confirmation. Although lesions of mucous membranes favor the retention of the virus, yet in disposed subjects the disease may arise apart from such lesions. It is advised that when diphtheria is prevalent, a systematic use of disinfectant gargles and washes (*e. g.*, sublimate solution, 1 in 10,000) should be enforced on all children. The meteorological conditions which favor the spread of the disease are still unknown.—*Berliner Klinische Wochenschrift; Medical Record.*

A Lucky Escape.

An unusual whirr of machinery, a hissing and twisting of a broken belt and a shower of small pieces of broken iron in the dynamo room at the Lowell electric light station, a few nights ago, startled all the employes within hearing. Something had broken. As the engineer rushed in to shut off the steam and stop the swiftly running engine he saw a single black streak cutting the air where once had been a heavy fifty-inch pulley, a network of torn wires and a pile of twisted belting. In this room there are two large dynamos for supplying motor power to the electric railway and a circuit of street lights and private motors. On the main shaft are two large fifty-inch pulleys, one of which burst into a thousand pieces and the other was broken and cracked so that it could not be run. When the pulley broke, the force with which the belt flew off lifted everything loose from the floor above. Small pieces of broken wire were thrown with terrific force in all directions, but strange, and very fortunate, besides the broken pulley and belt, very little other damage was done. At the time of the break there was no one in the engine room.—*Modern Light and Heat.*

AN IMPROVED CABLE GRIP.

The grip shown in the illustration, while designed to be simple and durable in construction, is adapted to reduce the strain on the cable and car to a minimum, and is arranged to pass readily over the cable sheaves without displacing the cable. It has been patented by Mr. Elijah Dainty, of Coal Bluff, Pa. The grip has two members pivotally connected together at their lower ends, as shown in side elevation and transverse section in Figs. 2 and 3, one member having a slot in which is fitted a shoe adapted to receive the cable. The cable is clamped into the shoe by a shoe held in the other member, the cable being clamped when the two members are drawn together. The shoes are of a form to be readily fitted to place in the members, and each has an outwardly projecting pin passing into a countersunk aperture adapted to be filled with molten metal to lock the shoe in place. The free end of one member of the grip is connected with a chain which is passed through an eye or loop of the other member to attachment with the car, so that when tension is put upon the chain the members are drawn toward each other and the cable is firmly gripped. The heavier the pull on the chain, the tighter the members are drawn together. The members of the grip are opened sufficiently to apply it to the cable in starting, and when the car arrives at its destination the clevis pin connecting the chain to the car is withdrawn and the chain is thrown out of the eye of the grip, when the latter drops off the cable. When the shoes are worn out, they can be readily replaced by new ones after first



DAINTY'S CABLE GRIP.

cutting out the Babbitt or other metal around the pins which hold them in place. The lower parts of the two members of the grip are so rounded off that it readily travels over the grooves in the sheaves supporting the cable.