IN THE FIELD OF ELECTRICITY

Use of Steel and Aluminum in Electric Wire Construction.

AMERICAN TELEGRAPH CORPS IN PEKIN

Electric Phenomena on Mountain Tops—Steam and Compressed Air Superseded by Electricity in Mining.

There has been some talk in financial and mining circles indicating a fear that recent improvements in telephony would greatly lessen the demand for copper as a metal for line construction. Such a fear the Boston Transcript pronounces utterly unfounded, as it is likely that the adoption of Dr. Pupin's method of improving long-distance lines will tend to increase greatly the number and distribution of such circuits. The only rivals of copper for electrical uses are steel and aluminum. Under certain conditions, steel, of which from six to eight times the weight of the equivalent copper is required for the same effective conductivity, may be used, especially as a conductor for heavy currents and in situations where its weight would cause no inconvenience. For example, it is likely that for distributing feeders from the sub-stations on the elevated railways in New York City, when these are equipped for electric traction, steel will prove the cheapest material. Aluminum is cheaper than the equivalent copper, and considerably lighter, but about 60 per cent bulkier. It has found much use already for lines where bare wire can be used, as power-transmission circuits, for example. Many indications point to the increasing use of this metal as an electrical conductor, though much has still to be learned about it and the question of its weather-resisting qualities is still unsettled. It is almost certain to be made for a lower price in the near future, it being already possible to manufacture it at a figure to compete with copper at 11 cents, or about 60 per cent of its present price.

First Wire in Pekin.

According to the Electrical World and Engineer, the assertion that the Japanese were the first to enter Pekin with their telegraph line on the occasion of the relief expedition is not correct. It says that the honor belongs to the United States signal corps, which reports as follows through the chief signal officer: "The conditions under which these operations were conducted in the field were most trying. They entailed not only marching as fast as the army and the construction of a telegraph line equal in length to the daily marches, but also the establishment of telegraph stations at night, their dismantling in the morning, and the dispatch of telegrams during a considerable part of the night. The difficulties were greatly enhanced by the fact that for days at a time the detachment was obliged to work without escort or any protection other than reliance on its own members. Most unfortunately this labor, exhausting at the best, was done under most unfavorable climatic conditions, the heat being so excessive as to frequently disable for hours the most energetic men of the signal corps. Many of the Chinese laborers were prostrated, and in one day two of them dropped dead from heat and over-exertion. In view of the trying and unfavorable conditions recited, it is a source of gratification that the signal corps detachment justified the confidence placed in it by General Chaffee and by the chief signal officer. Through the labors of Lieutenant Stamford's men the American army carried the first telegraphic wire into Pekin, where the first telegraph office was installed in the house of Minister Conger. Fortunately, this action permitted General Chaffee in Pekin to extend courtesies in the way of transmitting telegrams to officials of the British, Russian, French, German, Italian, and even Chinese governments, and likewise to the press. So strenuous were the labors of the enlisted signal corps men, both before and after their arrival at Pekin, that it was with difficulty that telegraphic work was maintained at Pekin, owing to the large number of operators incapacitated by sickness."

Novel Electro-Magnetic Brake.

The British Westinghouse company, says the Scientific American, has recently acquired the patents of a novel electro-magnetic brake, invented by Mr. Newell, for utilization on street tram-cars. It consists of a horseshoe electro-magnet, suspended on spiral springs, so that the poles hang directly above the rails. When the magnet is excited, it forces down these poles, so that the shoes grip the rail in a similar manner to the ordinary track brake. But there is a wide difference between the effects of the application of the Newell brake and those of the conventional track brake. In the case of the latter, the braking effect is obtained at the expense of the weight of the car; that is, by reducing the grip of the car wheels on the rails, and therefore nullifying to a considerable extent the effect of the wheel-rim hand-brake. In the case of the Newell brake, however, by means of a simple arrangement of levers connecting the electro-magnet with the shoes of the wheel-rim hand-brake, the reaction of the shoes on the track results in an increased thrust or pressure on the shoes of the wheel-rim hand-brake. By this means an increased braking effect on the wheel rims is caused, and the effective weight of the car on its wheels is not changed by the application of the track-brake. Another important feature of this brake is that it is not actuated by the current supplied by the conduit mains, but by power produced by the loading of the car motors as generators. The momentum of the cars, after the supply circuit has been interupted, drives the motors as generators, and it is the resulting current which furnishes the power for the electro-magnetic brake.

Tercentenary of Electricity.

At the London institution the other day Prof. Silvanus P. Thompson gave a lecture on the "Tercentenary of the Science of Electricity." This tercentenary, he said, was to be dated from 1600, because in that year appeared Gibert's treatise "De Magnete," in which it was shown that the attraction of the lodestone for iron was not the same as that exerted by amber for small particles of chaff, feathers, etc., and that this property of amber was shared by many other substances. In the century 1601-1700 Guericke constructed the first electrical machine, using a ball of sulphur, but very little more was discovered. In the next century there was a galaxy of names illustrious as contributors to the progress of the science of electricity; still the real beginning of its useful applications dated only from the earliest part of the nineteenth century. Volta, in 1800, gave an account of the voltaic cell, and in 1802 Sir Humphrey Davy, experimenting at the Royal institution with a large battery of cells, produced the electric arc for the first time. About 1836 Daniell constructed a cell whose current was constant, though not very strong, and a few years later Grove invented his more powerful zinc-platinum cell, showing in 1841, in the theater of the London institution, that a battery of 100 of these cells could yield an electric arc four inches long. So impressed were the managers with this achievement that they made Grove a professor of the institution, where for some years he carried on researches on his cell and also on the gas battery. On the occasion of one of his lectures he illuminated the theater with electric light produced by incandescent lamps with platinum filaments. In 1820 Oersted discovered the connection between electricity and magnetism, and in 1825 William Sturgeon, to whose name sufficient honor was not paid, described what was literally the foundation of electrical engineering—the electro-magnet. This was applied to the purposes of telegraphy in America by Morse and in England by Wheatstone and Cooke. Finally, Faraday, arguing that, if electricity could produce magnetism, the converse should be true and magnetism should produce electricity, invented the first mechanical method of generating electrical currents by rotating a coil of wire in such a way that it cut the lines of force proceeding from a magnet; the magneto-machine thus made was improved by Wilde, Gramme and others into the dynamo of today. The lecture was illustrated with experiments and with a number of lantern pictures both of men and apparatus.

Mountains Throw Bolts at Each Other.

Prof. Ellsworth Huntington says that during a geological trip through an almost unvisited part of the Taurus mountains in Turkey he heard of a peculiar electrical phenomenon. One of the natives told him that one mountain near his village fought with another mountain on the other side of the Euphrates river. The weapons were balls of light, which the mountains threw at each other. Prof. Huntington thought at first, as the region was one of volcanic activity in comparatively recent times, and as hot springs and extinct craters are still to be seen, that this must be a traditional account of a volcanic eruption. He was, however, convinced subsequently that the story had its origin in a meteorological phenomenon. The story as detailed to him by ten or twelve men whom he saw at five different places within an area of forty miles was as follows: A ball of fire would start from one mountain and go like a flash to another. At the same time there is a sound like thunder. This occurs by night or by day, although by day no light is seen. It always occurs when the sky is clear and never when it is cloudy. It sometimes happens two or three times a year, and then again is not seen for several years. For the last two years it has not been seen. It hardly ever happens except in the fall, at the end of the long dry season of three months. One of the mountains which he visited was composed of metamorphic schistose shale of cretaceous age. Its height is 7,350 feet, and the top is comparatively flat. According to one account the ball of fire was at first small, but grew larger as it passed over, and then grew smaller again. Prof. Huntington believed that in this case the observer was standing between the two mountains. While meteorologists have not been ready with explanations of these mysterious lightnings, it is mentioned that there are peaks on the Rocky mountains on which almost continuous electric discharges have been observed, but they pass off into the air quietly, like St. Elmo's fire, never in great flashes from peak to peak. It is also known that a cloud or a mass of electrified air that has not quite attained the cloudy condition may lie between two peaks and flashes may proceed from it simultaneously to the two peaks in such a way as to lead a careless observer to say that one peak discharged over to the other. If this should be the approximate explanation of the Euphrates phenomenon, then it will happen only when the wind is in certain directions, such as to cause the formation of an incipient cloud and thunderstorm between the two peaks, and this wind direction will depend upon the relation of the peaks to the course of the river valley below. So that if the phenomenon is attributable to this source it is not so very rare. On the other hand, if it is a myth, based upon some historical event or some misinterpretation of ancient names, the explanation will at all events be most interesting to students of history and philology.

Electricity in Mining.

Electricity is rapidly replacing steam and compressed air in mines all over the country. One after the other is taking up that kind of power and it seems as if within a short space of time most of the underground work would be carried on by electric force. There is no doubt of its cheapness for drills as compared with the other kinds of power and it certainly is much more convenient. To bring steam or compressed air to the heading of tunnels, sometimes many hundred feet under ground, it has been necessary to build long pipe lines and to meet with delays through broken joints and many other accidents which are likely to happen to pipe lines. On the other hand, the electric power wires are flexible, do not require to be laid in any particular way and are always ready for use.

One of the objections to the use of electricity instead of compressed air might be overcome without much trouble. In using the high explosives in the heading of a long tunnel where there is no means of ventilation the pipe which furnishes the air for the drills is left open and the gases from the explosion are quickly driven out of the tunnel, so that the men can get to work again in a short space of time. This has always been one of the great advantages of this method of drilling. This result can be reached as well with electricity by building a big exhaust blower at the mouth of the tunnel, using the electricity to drive it, and clearing the tunnel of the noxious gases in even less time. Thus there would be a gain in time usually lost while waiting for the air to clear, as well as in economy in running the drills.

One of the latest applications of electricity is in the Cornucopia mines in Oregon. At present the mines are worked by steam and the fuel is wood. As the boilers at the mines require about fifteen cords of wood a day, the timber in the neighborhood of the mines is practically exhausted and the wood used in the future will have to be hauled a long way, the question of electricity was taken up and it was decided to erect a 500-horse power plant about two and a half miles from the company's property on Pine creek, where, by the use of a short flume, 300 feet fall of water is secured. The necessary works are nearly complete and wires are to be strung from the plant to the mines in a few days, and it is believed that the cost as compared with the present steam will be but trifling. Although several wood-choppers will be thrown out of work, they will find employment on the extra drills and the ore breakers which will become necessary through the increased work practicable because of the new power.

The Trolley Did It.

The Iron Age sees in the checked rate of growth of American cities proof that "forces are at work tending to check the progress toward centralization which was so strikingly indicated in previous enumerations." Till 1890 the rural districts seemed to be losing population rapidly, while the cities gained. "The tendency to urban growth at the expense of the country," says the Age, "was recognized as the inevitable result of the fact that in the eastern states the mechanical industries offered larger returns to labor than farming or the precarious and seasonable employment of the villages and rural districts. Every city, large or small, seemed to exert a magnetic attraction for a greater or less distance in all directions, drawing to itself those not tied to the land through the ownership of meagerly productive and practically unsalable farms. The young and ambitious migrated to the towns and cities so naturally that their going seemed to be in obedience to the inevitable trend of national development. The larger the city the more powerful its attraction for the population of outlying districts; hence, while the small towns grew relatively slowly at first, when they reached a certain point their growth was rapid, and often phenomenal. The most reasonable and the most plausible explanation of the apparent check to this tendency is that which attributes it to the trolley car and the telephone."

NEW BOOKS AND MAGAZINES

New Edition of an Early Novel by the Late Maurice Thompson.

VALUABLE INSTRUCTIONS FOR ORATORS

Other Books Just Published or to Be Published in the Near Future—Announcements of Spring Books.

Following the death of Maurice Thompson a reprint of his early books will probably be made. The first to appear is "Milly: At Love's Extremes," a southern romance. The scene is laid near Birmingham, Ala., and is somewhat conventional, in that it has its quota of southern beauties and manly heroes. One, and perhaps the chief, character of the book, at least the one to whom our sympathy clings and whose name gives the book its title, is anything but on the conventional order. A simple, unlettered, childlike mountain girl, hardly grown to young womanhood, she is endowed with a face and form that is simply perfect. The author himself thus impersonates Milly: "It would be impossible to give in words any fair idea of her beauty or her ignorance; to attempt either would appear like exaggeration. In so far as her vision could go, she peered into the paradise coveted by all girls and dreamed the dreams of unselfish love." With such a character the author has done wonders and arrests and holds our sympathy to the end. The hero of the mountain maid is a fascinating man of the world who makes the mountain cabin home his hermitage and of course the simple-hearted child could not fail to bestow upon him her love. After accepting her devotion, her hero goes back to social life, falls in love with a young widow whose husband he is supposed to have killed in a duel several years before. His fondest hopes of marrying the widow are frustrated at the last moment by the return of the former husband and, in despair, the recluse again seeks the mountain cabin and fills with joy the life of the mountain sweetheart who was there pining his absence. While Mr. Thompson has drawn with exquisite touches the character of the simple-hearted, untutored mountain girl, he has made the hero a fickle-minded, rather heartless specimen of mankind whom we can hardly admire, or feel very sorry for in his disappointment. There are beautiful descriptions throughout the work and the character drawings are especially good. New Amsterdam Book company, New York. Price, $1.50.

F. Frankfort Moore, whose novel, "The Conscience of Coralie," was reviewed at length in these columns last fall, is out with a new story entitled, "According to Plato." This latest work of Mr. Moore's is a satire on London life, London letters and London love. It is somewhat epigrammatic in style, while the story itself is quite diverting. Mr. Moore has proven himself quite a voluminous writer. Among his other works which have become quite well known to the reading public might be mentioned "The Jessamy Bride," "Phyllis of Phillistia" and "The Fatal Gift." Dodd, Mead & Co., New York.

John P. Altgeld has published a little volume of sixty-five pages entitled "Oratory: Its Requirements and Its Rewards," which contains more good advice and positive instruction than is to be found in any of the more voluminous works. The author has the happy faculty of saying a great deal in a very few words and saying them so directly and unequivocally that there is no such thing as misunderstanding them. Within the brief space of this little volume, printed in large type, the author has compacted practically all that it is possible for an experienced public speaker to tell the beginner. The young man with the ambition to become an orator should possess himself of a copy of this book and follow closely its instructions and advice. Charles H. Kerr & Co., Chicago.

"Starboard Lights; Salt Water Tales," by A. B. Hawser, is a small volume of sea tales, many of which have already appeared in the New York Press. The stories themselves might be described as pretty big yarns, such as the typical sailor is popularly supposed to spin when surrounded by a group of landsmen. They are all very funny and some of them decidedly witty. The reader is forced to laugh at the serious tone which the author employs in telling of the most improbable events. It is just the kind of a book to while away an idle hour or dispel an attack of the blues. Quail & Warner, New York.

"The Passing of the Dragon," by F. Jay Ceagh, is an attractive booklet, printed in two colors and bound in paper covers. It is a prettily told sketch, or, as the preface puts it, a shadow story about God's love, the devil's guile and the imaginings of children. It is written for grown-up people only, though children take part in the little tableaux. Despondent over the death of his wife, Sir Edward murmurs aloud, "There is no God." Bennett, the butler, overhears and answers that it is true, or else why should there be so much suffering among innocent and Godly people. Sir Edwards' two little daughters, after saying their prayers and being left in bed by the nurse, take it into their childish heads to pray for the reformation of the devil, concerning whose personality they have very weird notions. The little story turns on this act of the children, and Bennett, who, under the cloak of outward good behavior, was an extremely bad man, confesses that he himself is the devil, and repents. It is a story that will unquestionably prove interesting to people of a religious turn of mind. Cassell & Co., Limited, New York.

"Peter Schlemihl and The Story Without End" is the title of the most recent addition to Cassell's National library. "Peter Schlemihl," one of the pleasantest fancies of the days when Germany delighted in romance, was first published in 1814, and was especially naturalized in England by association with the genius of George Cruikshank, who enriched a translation of it with some of his happiest work as an illustrator. Cassell & Co., New York. Paper, 10c.

"Practical Gas-Fitting," edited by Paul N. Hasluck, gives in a form convenient for every day use a comprehensive digest of information, contributed by experienced writers and published from time to time in the columns of the Building World, a weekly journal of which the author is editor. It supplies concise information on the general principles and practice of the subjects on which it treats. Chapters on gas manufacture, on incandescent lighting and on stoves for warming and cooking are included. Within the space of the 150 pages composing this little volume may be found practically everything connected with gas fitting. The Building World is a recognized authority in its special field and its contributors are practical men who know whereof they write. It would seem therefore that this little volume ought to be in the hands of every gas fitter desirous of keeping up to date. Cassell & Co., New York.

A new novel by Maurice Thompson, the first since "Alice of Old Vincennes," appears—complete—in the March "New" Lippincott Magazine. This is a delightful, straightforward love story in Mr. Thompson's sweetest vein. As in "Alice of Old Vincennes," he selects his native state, Indiana, for a background, though some of the most significant incidents occur in picturesque New Orleans and during a trip on the lovely, languid water of Bayou Teche. Three vivid characters in the story compel more than a word in passing, while even the side lights are distinctly original. Frederick Breyton, a young New York millionaire, who yearns for "something different," makes a bicycle trip through the west. When he reaches the little town of Hawford, Ind., he finds what fate had in store for him. No girl has yet made a lasting impression on the fine young fellow, who is a bit of a poet, and when he meets Rosalynde Banderet his heart is ready for the germ of love. This is unfortunate, because the girl is engaged to Alfred Rayle, an impoverished artist, a cripple, whose divine eyes and marvelous magnetism make him a rival not to be lightly considered. The author's skill in dealing with the situation is magnificent. He gives free rein to his imagination and the result is an idyllic, delightful plot which must be read; it cannot be guessed.

Literary Notes.

McClure, Phillips & Co. are offering thirty prizes to children for letters telling what is thought about their juvenile books. For each of the best twenty letters about one of these books the publishers will send two others, and for each of the next best ten letters one book is to be given. The contest is open to all children who read the announcement—which is given in full only in McClure's Magazine for March, and is open until May 1.

"Battles and Leaders of the Civil War," written by distinguished participants on both sides and edited by Robert Underwood Johnson and Clarence Clough Buel, has just reappeared in a new library edition in four volumes, reduced in price to $15 in cloth and $30 in half morocco. This is the so-called Century War Book, an outgrowth of the war papers in the Century Magazine, to which many additions were made, forming a complete history of the civil war.

"A Sack of Shakings," by Frank T. Bullen, F. R. G. S., a collection of essays and stories of sea life from the sailor's point of view. The term "shakings" on board ship is applied to the bits of rope, canvas and miscellaneous waste that accumulate during a voyage and are considered the perquisites of the first mate.

"It is now a little over two years ago that the idea of a great Jewish encyclopedia, to be a veritable treasure-house of information relating to the history and antiquities of the Jewish nation, the doctrines, usages and tenets of the Jewish faith, and the great share which men and women of Jewish blood have taken in advancing the civilization of the world, first began to attract the attention of the public. The prospectus is now at hand and the first volume will be out in a few weeks. It promises to be one of the greatest works of the year. It will be something unique—no such encyclopedia ever having been made before. Over three hundred of the most eminent Jewish and non-Jewish scholars of the world are engaged upon the work. It is claimed that the cash outlay will represent $500,000. The Jewish encyclopedia will be wholly free from bias or color, marked by the same scrupulous fidelity to facts and fairness to all sides that have been approved so universally in the Funk & Wagnalls Standard Dictionary, the fairness and scholarship of which no critic has ever challenged. The publishers who will bring out this work are Funk & Wagnalls Company.

In variety and value of contents McClure's Magazine for April will be a notable number. Timeliness, literary worth, historical researches, analysis of character, studies in natural history, and life next to the soil, in the metropolis, in the Orient, all these and more will distinguish the forthcoming issue, and it will be adorned throughout with illustrations contributed by the best artists and reproduced with the extreme of skill in art-process.

The fiction announced by Houghton, Mifflin & Co. for the spring has a surprisingly wide range of interest. Boston appears in a humorous story of the servant-girl problem, "The Successors of Mary the First," by Elizabeth Stuart Phelps; Chicago in a Tolstoian novel by Will Payne called "The Story of Eva," and Paris in Eugenia Brooks Frothingham's "The Turn of the Road." Kate Douglas Wiggin's "Penelope's Irish Experiences" surveys Ireland; Colonial Virginia appears in Burton E. Stevenson's romantic "Soldier of Virginia," and Europe in Clara Louise Burnham's "Miss Pritchard's Wedding Trip." Alice Brown paints a part of New Hampshire in "King's End," and for the sea there is "Dog-Watches at Sea," by Stanton King.

Among the announcements of M. F. Mansfield & Co., for spring, is "First Visit to England," by Ralph Waldo Emerson, a reprint from this famous American author's "English Traits." It is illustrated by a series of contemporary portraits of Carlyle, Wordsworth, Landor, Coleridge and others, printed on Japanese paper. The whole ensemble forms a dainty though dignified setting of a comparatively unknown selection from this standard American writer.

D. Appleton & Co.'s March announcements include several volumes that ought to prove of more than usual interest. "War's Brighter Side" is a unique book in that its contents is made up of sketches, poems, etc., by such writers as Rudyard Kipling, A. Conan Doyle, Julian Ralph, Lord Stanley and others. Two romances of the old colonial days are announced, one of them by J. A. Altsheler. "General Meade" will be the subject of a new volume in the Great Commanders series. The scientific works promised include two works on astronomy, a study of our common birds, and the morphology of seed plants.

Little, Brown & Co.'s spring list includes "Sir Christopher," by Maud Wilder Goodwin; "Ballantyne," a strong novel by Helen Campbell; Richard Le Gallienne's new romance, "The Love Letters of the King, or the Life Romantic;" "A Daughter of New France," by Mary Catherine Crowley; a unique problem story by Ellis Meredith; "Truth Dexter," by Sidney McCall; "Portia, a Story of the Seventies," a powerful story of a North Carolina town by a new writer; Anna Bowman Dodd's new book, "The American Husband in Paris;" new editions of Mrs. Fawcett's "Life of Queen Victoria," and of Prof. Benjamin W. Wells' "Modern German Literature;" and a limited edition of "In and Around the Grand Canyon," by Prof. George Wharton James.

The above books are for sale by the Megeath Stationery Co., 1308 Farnam St.

The books reviewed on this page can be be secured at Barkalow Bros.' "Bookshop," 1612 Farnam street and Union Station.

Fifteen Drowned.

VERONA, Italy, March 21.—Later details of the breaking of a dam, which caused the flooding March 20 of the town of Cologna, by which a number of houses were wrecked, are to the effect that fifteen persons were drowned and a number injured and in the hospitals.