

A SYNOPTICAL INDEX OF CURRENT ELECTRICAL LITERATURE.

ACCUMULATORS.

"The Use of Accumulators in Telephony." (The Boese-Lütke cell in telephone service, discussed at the January meeting of the Electro-technische Verein. 800 words.) *Electrical Review*, May 13.

"Electrical Distribution." (Describing the Crompton and Chamen system to overcome the difficulties from the charging and discharging pressure of accumulators. 1,300 words, 3 illustrations.) *London Electrical Engineer*, April 21.

"Peyrusson Accumulator." (Details of the accumulator presented by M. Edouard Peyrusson to the Société Française de Physique having a "large surface formed of lead plates of only half a millimeter thickness, but rendered strong by 'armatures' of antimony-lead alloy. The positive electrode formed of a central rod round which radiate the positive plates, is assured of a long life, as wearing takes place from the circumference to the center, to which it only penetrates slowly, so that the conducting part is the last attacked, exactly contrary to the usual case." 300 words.) *London Electrical Engineer*, May 12.

"The Preparation of Gelatinous Electrolyte for Storage Batteries." By Dr. Paul Schoop. (Complete description of the preparation and use of the Schoop gelatine cell, with record of Tudor plates. 2,000 words.) *Electrical Engineer*, May 17.

ADVERTISING.

"A Technical Paper." (Editorial advisement on the functions of the technical paper. "That is the best technical paper that devotes its energies to the instruction, advancement, improvement and uplifting of the personnel of the industry to which it caters; it then becomes a power." 600 words.) *Street Railway Journal*, May.

AGRICULTURE.

"Electricity in Agriculture." (Report from Commercial Agent Washburn, of Magdeburg, on the influence of the electric current upon vegetation, as shown in experiments since 1859. "To sum up, then, the question of the propitious or unpropitious influence of the induction or galvanic stream upon plant life has found in Germany, up to the present moment, no real practical solution; nor is one believed to be easily possible. While it is true that some few isolated experiments have been highly favorable to electricity, those conducted on the most extensive scale have resulted in very indifferent success." 3,500 words. Editorial

comment: "The difficulty involved in its extensive application would always preclude its adoption to any practicable extent." 300 words.) *Electricity*, May 3.

"The Effect of Dynamo-Electric Energy upon Horticulture, as a Promotor of the Chemical Changes by which the Plant takes its Chief Ingredients of Food from the Atmosphere." By Sir William Siemens. A paper read before the English Society of Telegraph Engineers on June 3, 1880. 5,000 words, 1 illustration.) *Reports from the Consuls of the United States*, No. 150, March, 1893.

"Electricity in Agriculture." (Consular reports on the use of electricity for propelling farm machinery and in the propagation of plants, including reports from Austria, France, Germany, Great Britain, Italy, Spain, British America, Colombia, Cuba, Dutch Guiana, Peru, Venezuela, Ceylon, China, Morocco, Australia, Fiji and Malta, all reporting negatively except from the first four countries. 46 pages.) *Reports from the Consuls of the United States*, No. 150, March, 1893.

"The Geomagnetifere." By Crepeaux. (Abstract of an article in *L'Illustration*, describing the Paulin process of electro-culture, by means of which the atmospheric electricity is to be collected and distributed about the roots of plants. 1,300 words, 1 illustration.) *Western Electrician*, May 13.

"Electro-Culture." (Editorial comment on a carefully prepared review of the results hitherto achieved in the *Journal d'Agriculture Pratique*, 1893, Vol. I, No. 14, April 6, pages 483-486, by Camille Pabst. The author considers first the effect of the electric light upon the growth of plants, and second, the effects of atmospheric and terrestrial currents of electricity when applied in agriculture. 900 words.) *London Electrical Review*, May 12.

"Electricity on the Farm." (Details of a turbine-driven plant supplying current by underground mains to two sets of storage batteries from which current is drawn to operate motors for sawing, threshing, corn-crushing, etc., and all the lighting required in the residence and buildings of Mrs. Omannay McTaggart, Ardwell, Wigtonshire. 350 words.) *London Electrical Review*, May 12.

ALTERNATING CURRENT APPARATUS.

(See *Dynamo Electric Machinery and Power Transmission*.)

"Theory of the Transformer." By F. Bedell and A. C. Crehore. (Part I, March 25; Part II, April 8.) (Part III: Introductory to the transformer diagram; the transformer diagram established upon an analytical basis; the resultant magnetization of the field. 4,000 words.) (Part IV, 3,300 words, 5 illustrations.) *Electrical World*, May 6 and 27.

"Non-Synchronous Alternating Current Motors." By Doctor Behn-Eschenburg. (Indorsing Elihu Thomson as the inventor of the induction motor, detailing the principles of the single-phase built by the

Maschinenfabrik Oerlikon, and criticising the claims of Leblanc and Hutin. 6,000 words.) *Electrical World*, May 13 and 20.

"Alternating Current Motors." (Description of the motor referred to by Mr. Sparks during the discussion of Mr. Snell's paper, and reference to other motors. 650 words, 3 illustrations.) *London Industries*, May 12.

"Alternate Current Transformer Design." By R. W. Weeks. (A brief summary of work to date, followed by the table prepared by Doctor Fleming, to which has been added five columns showing the percentage of magnetizing current and iron loss in each case, and also figures relating to regulation taken from other parts of Fleming's paper, and explanations. 2,600 words, 3 illustrations. Also, suggestions for designing transformers. 1,300 words, 2 curves.) *London Electrical Engineer*, May 12 and 19.

"Higher Frequency." (Illustrated description of Pyke's alternating current transformer, furnishing current at a frequency of 40,000 ~ for laboratory use. Consists of two continuous current motors driving, in opposite directions, the field and the armature of the alternator suspended between the two motors.) *London Industries*.

"Dynamotors, or Direct Current Transformers." (Abstract of a lecture delivered by Professor Crocker before the New York Electrical Society. The historical development, construction, characteristics and applications were referred to. 1,800 words, 1 illustration.) *Electricity*, May 10.

"The Condenser in Alternate Current Power Distribution." By William Stanley, Jr. (Stating that "in all probability Marcel Deprez was the first to clearly describe the operation of multiphase motors," showing that the value of the magnetizing power fluxing the magnetic circuit of an electro-magnet of a transformer depends almost entirely on the number of turns, and not on the ohmic resistance of the coil, as would be the case if steady currents were employed; and giving a combination that materially reduces cost of transformers, mains and generators, by confining the lagging component or magnetization current to a local circuit, "the lagging component of a current being the true access of volt-ampères over watts in circuits." 3,300 words, 8 illustrations.) *Electrical Engineer*, May 3, 10, 17.

"High Frequency Apparatus." (Brief description of the apparatus exhibited at the Royal Society's soirée by Sir David Salomons and Mr. L. Pyke for converting a continuous current of ordinary supply-main potential into an alternating current of 200 volts and about four ampères, having an alternation periodicity of one million per minute. 800 words.) *London Electrical Engineer*, May 12.

"Single-Phase Alternating Motors." By William A. Turbayne. (Description of a one-fifth horse-power motor used in operating an organ bellows. 500 words, 1 illustration.) *Electrical Engineer*, May 24.

"The Circulation of Alternating Current Motors—II." By E. Arnold, (Part I, January 21. Part II, April 8. 1,800 words, 2 diagrams.) *Electrical World*, May 13.

"Professor Ewing's Experimental Dynamo." (Description of machine presented to the Engineering Laboratory of Cambridge, giving at 1,200 revolutions per minute 14,000 complete cycles per second, the output being about five ampères and 100 volts. 500 words, 1 illustration.) London *Electrical Review*, May 5.

"Starting of Synchronous Alternators." By Camillo Olivetti. (Suggestions for starting a four-pole separately excited alternator. 600 words, 2 diagrams.) London *Electrical Review*, May 12.

"Dynamo and Transformer Design." (On Tuesday, May 30, Mr. Swinburne delivered the first of a series of lectures on "The Design and Construction of Dynamo Machines and Transformers" to the students of the Electrical Standardizing, Testing and Training Institution, at Faraday House.)

"A Contribution to the Study of Alternating Currents." (Abstract of an interesting article, signed by P. Marcillac, upon a new development of the "Tesla" researches, in the current volume of the *Journal Universel d'Electricité*. 600 words, 2 illustrations.) London *Electrical Review*, May 19.

"Alternators in Parallel." By Emil Huber. (Giving some facts regarding the parallel connection of alternators under different circumstances, constructed by the Oerlikon Company, in Switzerland. 600 words.) *Electrical World*, June 3.

ATMOSPHERIC ELECTRICITY.

(See Meteorology, and Lightning.)

BATTERIES, PRIMARY.

"Conductors and Insulators." By Reginald R. Fessenden. (Part IV—Treating of the chemical changes that occur in a solution of copper sulphate, and showing that the conductivity of a solution depended upon the sum of the velocities of its ions. 2,000 words. Part V—Showing effects of migration of ions and how to predetermine the conductivity of solutions. 1,800 words, 3 illustrations.) *Electrical World*, May 20.

"The Leclanché Cell." By A. Ditte. (Details of the behavior of an element consisting of a rod of zinc attached to a plate of platinum and immersed in a ten per cent solution of common salt. "Details are also given of the behavior of a cadmium-platinum element, which presents very different results, the electrolysis of the salt taking place by a sort of exothermic action. Mons. Ditte proposes to lay the whole of his investigations, together with the conclusions he deduces, before the Academy in the form of a memoir." Abstract of paper presented to the Paris Academy of Science on April 17, *vide Comptes Rendus*, Vol. CXVI, No. 16, pp. 812-815. 250 words.) London *Electrical Review*, May 12.

BIOGRAPHICAL.

(See Obituary.)

Arthur Bergtheil. (400 words and portrait.) *Electrical Review*, May 6.

U. N. Bethel. (125 words and portrait.) *Electrical Review*, May 13.

Henry Clark Townsend. (400 words and portrait.) *Electrical Engineer*, May 6.

Henry Goebel. (1,600 words, 2 portraits.) *Electrical World*, May 6.

Captain Charles H. Smith. (600 words and portrait.) *Street Railway Review*, May.

Augustus Lynch Mason. (300 words and portrait.) *Street Railway Review*, May.

A. A. Anderson. (300 words and portrait.) *Street Railway Review*, May.

Charles B. Thurston. (600 words and portrait.) *Street Railway Review*, May.

Edwin J. Houston. (300 words and portrait.) *Electrical Engineer*, May 24.

John Waring. (400 words and portrait.) *Electricity*, May 17.

Frank C. Mason. (300 words and portrait.) *Electrical Age*, May 20.

"A Historical Group." (Brief biography of "the men who established the claims of Henry Goebel and put an end to the monopoly of the Electric Trust," William Clitus Witter, William H. Keynon, Louis D. Brandeis, A. S. Fowler, Elmer B. Adams, Henry S. Kaliske, Jacob Heilborn, J. H. Rhotechamel, Edward E. Cary, Franklin Leonard Pope, Charles R. Cross, Judge Moses Hallett, Henry Goebel. 3,000 words, 13 portraits.) *Electricity*, May 24.

CENTRAL STATIONS.

(See Municipal Engineering, and Gas.)

"Some Economic Points in Connection with Electricity Supply." By Gisbert Kapp. (A paper read at the Society of Arts, April 17, and containing excellent suggestions to be observed in making isolated installations. Subheads: Preliminary; time of lighting; capacity of plant; power and capacity of battery; load factor; use of meters; table showing cost of electric supply in private installations, etc. 5,700 words and table; and editorial, April 21, 550 words.) London *Electrical Engineer*, April 21 and 28.

"Notes on the Cost of Electric Lighting." By F. B. Nicholson. (Paper read before the Civil and Mechanical Engineers' Society, April 6. Presentation of data for estimating cost of lighting for ordinary house-work, in offices and factories; with tables showing cost per yard of mains, and average receipts per lamp obtained by the London companies. 2,000 words.) London *Electrical Engineer*, April 28.

"The Value of Combination Stations." (Editorial comment on a symposium of views discussing the question of combination stations, published in the *Street Railway Gazette* of Chicago, and including contributions from the pens of several well known and influential men in the railway world in the states. "It is difficult to recall one example in England, however, so that we can afford to look at the results and opinions prevalent where such experience has been gained. In the Metropolis it is unlikely that any such putting of eggs in one basket would either be sanctioned or seriously considered, and the magnitude of the work with which we are concerned in London is vastly in excess of such interests as those dealt with by our contemporary." 4,500 words.) London *Electrical Review*, May 19.

CENTRAL STATIONS, DESCRIPTION OF.

"Dundee Corporation Supply." (Contains six Siemens dynamos coupled to Willans engines, and forty-eight cells of accumulators. 6 pages, including 9 illustrations.) London *Electrical Review*, April 21.

"Particulars Relating to Electric Light Installations." (Condensed details of forty stations in Great Britain. Table covering 3 pages.) London *Electrical Engineer*, April 28.

"The Quintin (Cotes Du Nord, France) Central Station." By Julius Maier and A. P. Haslan. (Turbine-driven dynamo and sixty accumulator cells. 1,000 words, 5 illustrations.) London *Electricity*, April 21.

"The Mulhouse Central Station." By Julius Maier and A. P. Haslan. (The installation comprises: Two boilers; two steam engines; two continuous-current dynamos coupled direct to the steam engines; a battery of accumulators; a network of underground cables; apparatus for control and distribution. 2,800 words, 13 illustrations.) London *Electricity*, April 28.

"Hull Corporation Supply." (Includes description of three boilers, four dynamos, four engines, 4,500 yards of mains and 123 accumulators. 700 words, 8 illustrations.) London *Electrical Review*, May 12.

"The Clermont-Ferrand Central Station." (Description of the French station, having three groups of 50,000 watts each, Corliss engines and Ganz alternators. 1,500 words, 4 illustrations.) London *Electricity*, May 12.

"Yorkshire House-to-House Electricity Company." (Description of new station in Leeds. 5,000 words, 7 illustrations.) London *Electrical Review*, May 19.

CHEMISTRY.

(See Batteries, Primary; Electrotyping, Metallurgy, and Tanning.)

"The Production of Artificial Gems." By James Morris. (Refers to article in *Industries*, April 14, gives further details of his experiments, and refers to an article by Doctor Phipson, in the *Chemical News*, of March 24. 1,000 words.) London *Industries*, April 28.

"The Application of Ozone." From a correspondent. (Details regarding production and application of ozone, with illustrations of generators began February 24. Appendix—Villon Ozonizer; Konda, 1892; Andreoli, 1893; Ageing and Refining Wines and Spirits; Purifying Water; Saccharose and Glucose; Oils; Bleaching; Disinfection. 5,000 words, 6 illustrations, 34 illustrations in all.) London *Electrical Review*, April 21 and 28.

"Facts and Figures on Electrolytic Chlorine and Soda." By Emile Andreoli. (Review and discussion of various methods. 6,500 words.) London *Electrical Review*, April 28, May 5 and 12.

"Atomic and Molecular Motions." By A. E. Dolbear. (7,500 words.) *Electricity*, May 10, 17 and 24.

"Some Applications of Electricity to Chemistry." By James Swinburne. (A series of three "Tyndall" lectures before the Royal Institution: Electrolysis; deposition of metals and chemicals. 2,500 words. The Electrolysis of Fused Salts. 1,800 words. The Electrolysis of Gas. 1,600 words.) London *Electrician*, April 21 and 28, and May 5.

"The Migration of the Ions." By George Flowers Stradling. (Abstract of a paper read before the Electrical Section of the Franklin Institute, March 28. 3,000 words.) *Electrical Age*, May 20.

"Electric Production of Aniline." (Reference to the Coblenz method described in the *Revue de Chimie Industrielle*, May 9, of producing aniline from nitro-benzine electrically, with statement that "toluidines and xylydines can be treated in the same way." 300 words.) London *Electrical Engineer*, May 19.

"Electric Production of Baryta." (M. Ch. Taquet, in the *Bulletin de l'Association des Chimistes*, describes his process of producing baryta electrolytically, and also the carbonic acid of the precipitated carbonate, in a method of extracting sugar from molasses. Abstract, with statement that the same reactions take place with strontium instead of baryta. 400 words.) London *Electrical Engineer*, May 19.

"The Rate of Explosions in Gases." By Harold B. Dixon. Received March 7. (31 pages.) *Proceedings of Manchester Literary and Philosophical Society*, Vol. 7, No. 2.

"On the Length of Flame Produced by the Explosion of Gases in Tubes." By B. Lean. Received February 21. (8 pages.) *Proceedings of Manchester Literary and Philosophical Society*, Vol. 7, No. 2.

"CONGRESS OF ELECTRICIANS."

(See World's Fair.)

"Practical Electrical Problems at Chicago." By Prof. Silvanus P. Thompson. (A paper read at the Society of Arts on May 3, commenting on the points of divergence in the practice of English and American engineers in the designing of central stations, the laying of circuits, and in heavy engineering, that will come up for discussion at the Electrical

Congress. 3,800 words. And editorial, 750 words.) London *Electrical Engineer*, May 5 and 12.

"Electric Notation, Abbreviations and Symbols." (Abstract of a paper read by Mr. E. Hospitalier at the International Congress in Frankfort, 1891, giving the system which the committee of the American Institute of Electrical Engineers suggested using as a basis for an international system to be adopted at the next congress. 900 words and table.) *Transactions American Institute Electrical Engineers*, May.

"On the Proposed Practical Magnetic Units—Gilbert, Weber, Oersted and Gauss." By A. E. Kennelly. (Reviewing the history of the present units and outlining the present situation. 3,000 words.) *Electrical World*, May 20.

COOKING, ELECTRIC.

(See Heating, Electric.)

CORPORATIONS.

"Trusts." By "Philosoph." (Outlining obstacles that prevent the General Electric Company from gaining additional support. 2,400 words.) *Electricity*, May 3.

"Annual Report of the Westinghouse Electric and Manufacturing Company." (Statements showing a profit from manufacturing of \$1,491,817.13, and from other sources of \$112,766.60, making a total for the year of \$1,604,583.73. This is after charging to operating expenses the following amounts: \$84,747.31 for alterations and additions to buildings; \$155,484.87 for maintaining the machinery and tools in the highest order, and \$58,188.86 for interest and discount. 2,000 words.) *Electricity*, May 17.

"The Westinghouse Report." (Editorial comment that the report "fails to give all the information concerning the business of the company that shareholders and the public would seem entitled to, in view of the fact that its stock is dealt in on the Boston Stock Exchange. The financial and business statement consists of a balance sheet only, and from it alone no satisfactory knowledge can be deduced in respect to the business and gross earnings of the company." 700 words.) *Electrical Engineer*, May 24.

"Sowing the Wind and Reaping the Whirlwind." (Editorial comment on the methods that resulted in the accumulation of "a vast mass of doubtful securities in the treasury of the General Company." 650 words.) *Electrical Engineer*, May 10.

"Sensational Charges Against the General Electric Company." (Extended reference to the press dispatch announcing the arrest of several officials charged with the theft of blue prints, and substance of interviews with representative officials. 1,800 words.) *Electrical World*, May 13.

CIRCUITS.

(See Wiring.)

"A Cable Rupture." By Harris J. Ryan. (Probably caused by temporary but very high electrical pressure, and detected through the lowering of the insulation resistance from 40,000 megohms to 20,000 megohms.) *Sibley Journal of Engineering*, April.

"Fault-Finding in Conductors." (Extract from discourse delivered by Dr. M. Kallmann, at the meeting of the Electro-Technical Association, on February 28, 1893, and published in the *Elektrotechnische Zeitschrift*, 1893, No. 11, describing a system of alarms or fault detectors in networks of underground conductors. 900 words.) London *Electrical Review*, May 5.

DYNAMO ELECTRIC MACHINERY.

(See Alternating Current Apparatus.)

"Electric Light and Power—VII." By Arthur F. Guy. (With diagrams showing compound dynamos connected in parallel and instructions for operating same. A serial on the construction and operation of electrical apparatus. 1,800 words, 1 illustration. Notes on running. 4,000 words.) London *Electrical Engineer*, April 21, and May 5 and 12.

"The New Western Electric Multipolar Generators and Motors." (Description of a 150 horse-power multipolar gramme ring type, compound wound machine. 600 words, 3 illustrations.) *Electrical Engineer*, May 10.

"Theoretical Elements of Electro-Dynamo Machinery—XVIII, XIX." By A. E. Kennelly. (1,300 words, and diagrams 38, 39 and 40.) *Electrical Engineer*, May 10.

"Dynamo Graphics." (Describing set of diagrams for use in calculating the shunt winding of dynamos. 700 words, 3 diagrams.) London *Electrical Review*, May 5.

"An Automatic Printing Speed Counter for Dynamo Shafting." By George S. Moler. (1,500 words, 3 illustrations.) *Transactions American Institute Electrical Engineers*, May.

"Electricity as a Motive Power." By Albion T. Snell. (A series of papers on the general scheme of electrical transmission of power, commenced March 17, and giving the size of armature, the gauge of wire and the number of turns for its winding; the shape of field-magnets and length of the winding space; the bore of polar cavity and the width of the poles; the magnetic flux and the densities in armature, gap, field cores and yokes. 10, Calculation of the field excitation; 11, Special points to be observed in designing motors. 1,800 words and plate showing magnetic induction in iron and air.) London *Electrician*, April 28, May 12.

"Some Notes on the Design of Series Motors for Traction." By J. Douglas Dallas. (Giving details of construction of American street railway motors. 2,500 words, 7 illustrations, continued.) London *Electrical Review*, May 12.

"Impédance." By A. E. Kennelly. (A paper read before the American Institute, April 18. 800 words, 10 plates and tables. And discussion, 7,000 words.) *Transactions American Institute Electrical Engineers*, April and May.

"Dynamo Electric Machinery with Compound Excitation." By Paul Hoho. (Explaining "the possibility of producing currents which, between certain limits, do not vary with the speed of the engine, has been practically realized by means of two separate exciting currents." Abstract from *Comptes Rendus*, April 10. 250 words.) London *Electrical Review*, May 12.

"On the Prevention and Control of Sparking; Continuous-Current Dynamos without Winding on the Field Magnets, and Constant-Pressure Dynamos without Series Winding." By W. B. Sayers. (A paper read before the Institution of Electrical Engineers, May 11, chiefly to lay before the institution certain means for bringing under independent control the commutation of ring and drum armatures for continuous currents. The limits dependent on considerations of sparking at the brushes being thereby done away with, a new field of design is opened up. 4,000 words, 11 diagrams and 6 tables. Editorial comment, heartily congratulating the author on the successful application of his ingenious device to small dynamos, and also on the hearty reception of his paper, "which will apparently make history." 1,000 words.) London *Electrician*, May 19.

"Sparkless Dynamos." (Review of W. B. Sayers' paper, and statement that the arrangement suggested may "play a very important part in the future design of direct-current dynamos, and that existing types will undergo radical changes in the near future." 600 words.) London *Industries*, May 19.

"Magnetic Viscosity." By J. Hopkinson, E. Wilson and F. Lydall. (A paper read before the Royal Society detailing continuance of experiments "showing the relation between the induction and the magnetizing force, for rings of fine wire of soft iron and steel, through complete cycles with varying amplitudes of magnetizing force, both with the ordinary ballistic method and with alternating currents of a frequency up to 125 complete periods per second." See *Electrician*, September 9, 1892. 1,800 words, 6 tables, 12 diagrams.) London *Electrician*, May 19.

"The G. E. 800 Railway Motor." (Describing new motor named as indicating its ability to exert a horizontal effort of 800 pounds through a 33-inch wheel continuously in ordinary street railway service. 500 words, 2 illustrations.) *Electrical Engineer*, May 31.

ELECTRO-CULTURE.

(See Agriculture.)

EDUCATIONAL.

"Mathematics in Place and Out of Place." (Editorial criticism of the "algebraic skeleton" in L. B. Stillwell's paper read at the St. Louis convention: "The pressing of mathematics into places where they are not needed is as foolish as their exclusion from places where they are essential. Undoubtedly, there is an unfortunate tendency nowadays to overburden every branch of electrical work with mathematics, to the detriment of the practice." 1,000 words.) London *Electrician*, April 21.

"The Study of Electrical Engineering." (Editorial review of the editorial in the London *Electrical Engineer*, and correspondence relating thereto, regarding the best course of study to be pursued, and suggesting that: "The best and most suitable training for positions included in the calling of an electrical engineer is that which meets the views of likely firms—possible employers—and therefore renders the embryo electrical engineer favorable in the sight of those who alone can place him in positions of the kind he seeks." Also recommending that the student ultimately become a specialist. 1,800 words.) London *Electrical Review*, April 28.

"The Training of Electrical Engineers." (Editorial comment on the want of breadth in technical schools, with suggestions for practical improvement, and extracts from letters from prominent manufacturers and professors. Commenced April 7. 6,000 words.) London *Electrical Engineer*, April 21, May 5.

"Electrical Engineering Plant at McGill University." (1,000 words, 2 illustrations.) *Electrical Engineer*, May 10.

"What is Technical Education?" (Editorial suggestions for a system of national education that should adequately meet the requirements of all classes of the community, and render it successful in a practical as well as an educational sense. 1,400 words.) London *Industries*, May 5.

"The Independence of Abstract Science and Engineering." (Abstract of the "James Forest" lecture delivered by Dr. James Anderson before the Institution of Civil Engineers, May 4, on the importance of having a practical as well as a scientific knowledge before qualified professional work can begin. "The time has passed when an engineer can acquit himself respectably by the aid of mother-wit alone, or by means of certain constructive instincts which have chiefly guided builders down to quite recent times." 6,000 words.) London *Industries*, May 12, 19.

"Theory and Practice." By Sir Benjamin Baker. (Abstract of Remarks on Graving Docks at the Institution of Civil Engineers, questioning "whether the results of the high technical training of the present day with many young engineers did not lead to a dangerous confidence in theoretical deductions and the use of formulas." 1,200 words.) London *Electrician*, May 12.

"The Pupil System." (Editorial comment on the practice of apprenticesing youths, and suggesting that the best method is to set forth in

plain English that the firm does not intend to teach, but the apprentice can learn by keeping his eyes open. 1,700 words.) *London Electrician*, May 12.

"Technical Education in London." (Editorial review of the very exhaustive report by Mr. Llewellyn Smith to the special committee of the London county council on technical education. "We have more than once urged the necessity for the systematic coördination of London's educational agencies, and we have therefore much pleasure in observing that Mr. Smith presents a comprehensive scheme, very much on the lines which we have suggested, and which will in itself be of great and lasting use to all who are concerned with public education. We have always tried to insist on the special importance of evening schools, which could be taken advantage of by those actually engaged in work, and thus enable them to combine theory and practice; and we regret to notice that the most serious deficiency of London is in the provision for evening instruction, on which at present the son or daughter of the London workman or clerk must so largely rely. About 100,000 children leave the London elementary schools every year, nearly all of whom ought to be found in the various evening institutions for the three or four next years of their lives." 1,700 words.) *London Industries*, May 19.

"The Upward Pressure." By Walter Besant. (An interesting chapter from the History of the Twentieth Century, showing how the masses were enabled to enter the professions. 12 pages.) *Scribner's*, May.

"The Position of Engineering Courses in Colleges." By Prof. D. C. Jackson. (Emphasizing the high value and importance of the engineering studies.) *Egis*, May 5.

"Technical Education in Europe." By Frank C. Perkins. (Describing the laboratories and lecture rooms of several polytechnic schools in Europe, including the course at the University of Berlin and at Berlin-Charlottenburg. 1,500 words, 7 illustrations.) *Electrical World*, June 3.

ELEVATORS.

"The American Passenger Elevator." (Historical reference and description of various types of elevators. 3,000 words, 15 illustrations.) *Engineering Magazine*, June.

ELECTRO-THERAPEUTICS.

"Description of a New Induction Apparatus for Medical Purposes." By Augustin H. Goelet, M.D. (Describing the Goelet Faradic Battery. 1,500 words, 1 illustration.) *Medical Bulletin*, May.

"The Therapeutics of Current Direction and Polar Action in Nervous Diseases." By A. D. Rockwell, M.D. (Read before the New York County Medical Society, March 27. Details interesting experiments that demonstrate the different effects of ascending and descending currents, and manner in which they modify the physiologic action of the

two poles. 3,000 words. Discussion: Doctors Frederick Peterson, W. J. Morton and Mary Putnam-Jacobi disagreed with the author in his view that the direction of the current made a great difference upon living tissue. 800 words.) *Medical Record*, May 6.

"Removal by Electrolysis of an Extensive Hairy Nævus of the Face." (Brief reference by Dr. George Henry Fox to a successful case presented before the Medical Society of the County of New York. 250 words.) *Medical Record*, May 6.

"A Brief Glance at Electricity in Medicine." By Dr. W. J. Morton. (Abstract of lecture given at Columbia College before the New York Electrical Society, May 17, on the Properties and Applications of the Different Currents, and the Changes in Modern Practice of Electrical Treatment. 4,400 words.) *Electricity*, May 24.

"Magnetism and the Human Body." Review of report to the American Electro-Therapeutic Association, of Mr. A. E. Kennelly, of the Edison laboratory, and Dr. Frederick Peterson, of the College of Physicians and Surgeons, of the results of their experiments on the effect of magnets on the human body. 400 words.) *Electrical World*, May 27.

"Currents from Commercial Circuits for Medical Purposes." By H. E. Waite, M.D. (Communication to the editor, stating that as a manufacturer of electro-medical instruments, he has refused to furnish apparatus for use with dynamo currents, for fear of injury or death following the crossing of station circuits, and requests discussion of certain questions. 500 words. Reply from Dr. W. M. Hutchinson, stating that two years' experience with Edison current had been free from danger, and suggesting the placing of a one-ampère fuse in circuit, as a safety factor. 500 words. Editorial comment: "If a cross occurs such that the circuit being employed in medical treatment is subjected to high voltages from the circuits referred to, the fact that a lamp or fuse will almost instantly break the circuit will not prevent a violent shock from being given, that in the case of a sick or delicate person may be fatal, even should the current in itself be too instantaneous to be harmful. * * In conclusion, it may be stated that, while the probability of danger from the medical use of commercial circuits is more or less remote, it nevertheless exists, and the physician who wishes to take no chances should not use a commercial circuit that may directly or through other wires come in contact with a high-tension circuit. 400 words.) *Electrical World*, May 20 and 21.

"Electricity in Medicine." (Editorial reference to Dr. Wendell C. Phillips' electric head illuminator, and of a method for the local application of the current in stomach trouble. 250 words.) *Electrical Review*, June 3.

ETHICS.

"Are Consulting Engineers Required." (Editorial comment on Mr. Kapp's paper: "On Some Economic Points in Connection with Electricity Supply." "It is certain that we have consulting electrical engineers,

possessing the widest experience, quite capable of designing each plant upon the merits of the case with a due consideration, not only to initial cost, but to cost of maintenance." An indorsement of the value of the services of the consulting engineer. 550 words.) London *Electrical Engineer*, April 21.

"Consultants in the Electrical Profession." (Editorial comment on the course pursued by *Lightning* in placing on record the estimates, terms and bids of firms and individuals, and stating that "as individuals go into trade or professional work for the sake of the income accruing therefrom, the province of journalism should be to respect the privacy without which no transactions are possible, and to deal very superficially and lightly indeed with such features as are usually accorded secrecy by unanimity of professional etiquette. The information is, no doubt, of great interest to beginners in the rôle of consultant, but the actual value can only be in enabling them to under-cut what they know to be the price set upon their services by men of established position." 1,500 words.) London *Electrical Review*, May 19.

ELECTROTYPING AND ENGRAVING.

"An Unpublished Letter of Thomas Spencer." (Describing his invention of etching or engraving by electricity, under date of March 28, 1841, to Doctor Mohr, of Coblenz. 1,400 words, 1 illustration.) London *Electrical Review*, April 28.

EXHIBITIONS.

(See World's Fair.)

"Exhibitions, Industrial, National, International and Electrical." By W. J. Hammer. (An extended historical reference to previous exhibitions. 4,000 words, and portrait.) *Western Electrician*, May 6.

ENGINES.

(See Steam Engineering.)

FOUNTAINS, ELECTRIC.

(See World's Fair.)

"Trouvé's Luminous Fountains." (Abstract of a description of small fountain in the *Bulletin de la Société d'Encouragement*. Instead of illuminating the water jets by lateral mirrors, M. Trouvé lights up with an incandescent lamp at the focus of a parabolic mirror a sort of inverted glass with apertures for the liquid. 100 words.) *Electrical Engineer*, May 24.

FUSE METALS.

"The Action of Continuous and Alternating Currents on Fuse Metals." By C. P. Matthews. (A paper presented to the American Institute, May 17, and forming an abstract of two theses, namely: "Safety-Fuses for Electric Circuits," by J. S. Peck and C. P. Matthews; and "The Action of Alternating Currents on Fuses," by W. S. Rugg and

C. R. Sturdevant, based on experiments in the physical laboratories at Cornell University, and which are divided into: "Part I.—On the behavior of various alloys under the action of direct currents, with special reference to their use in thermal cut-outs. Part II.—On the *disintegrating* effect of the alternate current on fuse metals." 15 pages.) *Transactions American Institute of Electrical Engineers*, May.

GAS.

"Gas Versus Electricity for Illuminating Purposes." By S. A'Court. (Paper read before the Civil and Mechanical Engineers' Society, and intended as a fairer consideration of the subject than was presented by the *Journal of Gas Lighting*. 2,000 words.) *London Electrical Engineer*, April 28.

"Prime Movers for Small Power Generating Plants." (Extended reference to the availability of the gas and the hot-air engine for driving dynamos. 2,000 words.) *London Electrical Review*, May 5.

"An Expert English Opinion on Certain Oil Gas Processes." (An abstract of a report returned to the Edinburgh and Leith Gas Commission by their engineer, Mr. F. T. C. Linton, who had been instructed to inquire into the subject of the "Manufacture of Gas from Oil," giving details and cost of various processes, and recommending the erection of a plant for the manufacture of oil gas. 5,500 words.) *American Gas Light Journal*, May 22.

"Gas-Engine Dynamos." (Illustrated description of the Koerting single cylinder gas-engine driving dynamos.) *Revue Technique des Inventions Modernes*.

"Comparative Cost." (Abstract of article by R. W. Smith-Saville, in the Burton *Observer and Times*, on the comparative cost of gas and electricity, and letter from Mr. Preece. "There can be no question whatever about the correctness of your contention. Electrical energy at 6d. per unit is equivalent in price to gas at 3s. per 1,000. The average over the whole country shows this most conclusively. An ordinary gas-burner consumes an average of 3,000 cubic feet of gas per annum, an ordinary electric lamp absorbs 18 units of electrical energy per annum; as both give the same light it is quite clear that 18 units of electrical energy give the same light as 3,000 cubic feet gas." 500 words.) *London Electrical Engineer*, May 19.

"Sixteenth Annual Meeting of the Western Gas Association, held at Kinsley's, Chicago, May, 17, 18 and 19, 1893." (Official report—revised by the secretary. 8,000 words, and continued.) *American Gas Light Journal*, May 29.

"Modern Gas and Oil Engines." By Albert Spies. (First Paper—March; Second paper, April. Third paper: Describing the White, Middleton, Nash and Backus engines. 2,000 words, illustrations Nos. 36 to 41.) *Cassier's Magazine*, May.

HEATING, ELECTRIC.

(See Cooking, Electric.)

"Cost of Cooking by Electricity." By H. J. Dowsing. (Reply to criticism on Mr. Crompton's lecture: "The electric griller will grill four chops or six cutlets in 10 or 12 minutes, using six ampères. Add to the time taken in actual cooking three minutes to heat up the plate in the first instance, and we find that current will be required for about 15 minutes at six ampères. The cost of this would be about 1½d. It is convenient to remember that at 5d. a unit we are paying ½d. per ampère per hour. To boil a quart of water requires about 3½ ampères for 10 minutes, but if we allow a quarter of an hour for this operation the cost is about ½d. It is quite a question whether the usual spirit stove would be as cheap. If we add to the above the many great advantages and savings due to the absence of waste heat, smell, smoke and dirt, the cost of electric heating for cooking purposes is certainly very little, if at all, in excess of coal. I doubt very much, when all the by-savings are taken into consideration, whether it is dearer at all." 1,100 words. And editorial comment, that while "the whole of the energy is turned into heat, but it does not follow that the apparatus utilizes the whole of it. Careful lagging with asbestos, and the production of the heat at the exact point at which it is required, are necessary, and a reduction in the thermal capacity of the hot plate seems advisable, for though this acts as a kind of fly-wheel, checking the sudden rise of temperature of the resistance wire and afterward giving out a steady delivery of heat, it is evident from Mr. Dowsing's figures that the cost of warming up greatly exceeds the expenditure during the process of cooking." 500 words.) London *Electrician*, May 19.

"Electric Heating and Cooking." (Abstract of lecture delivered by S. B. Jenkins before the Chicago Electric Club. "In an oven 10 pounds of beef have been roasted, 2 loaves of bread baked, and 12 plates heated for serving, all in ninety minutes, 'from the cold,' with an expenditure of energy amounting to 1.5 horse-power hours, or 1,119 watt-hours; this at 5 cents per horse-power hour is 7½ cents; or at 10 cents per horse-power hour is 15 cents. At the five-cent rate this oven costs about 2½ cents per hour, the first expense of 'heating up' being gradually eliminated with each hour of continued service. Chops are cooked for one cent, an oyster stew made for one-half cent, tea and coffee for four-tenths of a cent, all in sufficient quantities for the ordinary table, the energy rate being five cents per horse-power hour. For cooking, electricity at five cents per horse-power hour will compete directly with coal at \$5.50 per ton of 2,000 pounds." 1,000 words.) *Electrical World*, June 3.

"Electric Heating." By Carl K. McFadden. (A paper read before the Chicago Electric Club, May 15, giving a general review of the subject and concluding "that the field for electric heating seems to be on the eve of development in a sense that will be a surprise to even those laboring in this branch of work. The general public cannot remain long

in ignorance of advantages of this method of heating, and although there will be many places where electric heating is an impossibility from a practical standpoint, there will still remain an immense field in which the electric heater will take a firm and permanent hold." 2,800 words.)
Western Electrician, June 3.

HISTORICAL.

(See Biography, Exhibitions and Telephones.)

INDUCTION.

(See Telephone.)

INSTRUMENTS.

(See Meters and Measurements, and Standards and Units.)

INSULATION.

(See Wiring.)

INSURANCE.

(See Wiring.)

"Relations Between Electrical and Insurance Interests." By James A. Waterworth. (Abstract of a paper read before the Electric Club, of St. Louis, April 15, by the president of the St. Louis Board of Fire Underwriters. Detailing the early experiences in St. Louis, and present methods of inspection. 2,700 words.) *Western Electrician*, May 13.

"Fire Risks in Electric Insulation." By Frederic A. C. Perrine, D.Sc. (Suggestions for the more careful installing of electric circuits within buildings. 3,000 words.) *Engineering Magazine*, May.

LAMPS, INCANDESCENT.

(See Central Stations.)

"The Blackening of Lamp Bulbs." By Dr. L. K. Böhm. (The blackening not due to a trace of oxygen contained in the last trace of atmosphere remaining in the bulb, but to the volatilization of an overworked carbon. 250 words.) *Electrical Review*, May 13.

"Note on Life of Incandescent Lamps." By C. H. Yeaman. (Data showing duration of filament in 200 lamps used in private plant. 700 words.) *London Electrical Review*, May 12.

"Development of The Incandescent Lamp." (Editorial review of remarks by Edward Weston, at the St. Louis convention. "Mr. Weston's name is deservedly famous throughout the world as one who has materially aided in the advancement of both arc and incandescent lighting, and he is, therefore, qualified to speak with not a little authority on the subject. And each remark he makes * * has a very sound and genuine ring about it. 1,200 words.) *London Electrical Review*, April 21.

"The Lamp Situation in America." (Review of the tenor of correspondence following the publication of Mr. F. S. Terry's letter in *Electrical*

World, and editorial statement that the General Electric Company may have *legal* right on its side in the present case; but the sooner some law is passed in all countries where patent rights exist, compelling a patentee to grant licenses to outside manufacturers under reasonable royalty in case his patent is not asserted within a given period from the date of issue, the sooner, in our opinion, will another step be taken toward equity and justice." 900 words.) *London Electrical Review*, April 28.

LAMPS, ARC.

"The Manufacture of Arc-Lamp Carbons." (Editorial comment on improvement effected by Messrs. Mahla & Braun, of Nuremburg, consisting of introducing the cores of the carbons, in a finished condition, into a mass of carbon paste which ultimately forms the carbon rod proper. Under the old process the hollow carbon rod was first finished, and the material, which ultimately formed the core, was, in a state of paste, introduced into the rod. 650 words.) *Electrical Plant*, April 1.

"Bombe & Suchhard's Combined Arc Lamp and Incandescent Lamp System." (Reprint of description by E. Dieudonne in *L'Électricien*. 1,400 words, 2 illustrations.) *Electrical Review*, June 3.

LEGAL DECISIONS.

"Supreme Court of the United States." Opinion filed April 24, in *Telegraph Co. vs. Telegraph Co.*, 7 Biss. 367. Judge Drummond decided that proceedings in the state court on the part of one of the parties to condemn a right of way of the other, in the exercise of the power of eminent domain, was invalid, because the property was in the possession of the Circuit Court of the United States, through receivers, "and that, being so, no action could take place in the state court affecting it without the consent first obtained of this court." *Chicago Legal News*, May 6.

"Liability of Corporation for Fraudulent Issue of Stock Certificate by Secretary." ("A corporation is liable to the bona fide holder of a stock certificate which is signed and countersigned by its secretary and transfer agent, and which appears to be genuine, although the secretary has forged thereon the name of the president." 1,000 words.) *Street Railway Review*, May.

"Edison Fixture Patents.—Recovery for Infringement by Users Denied." (United States Circuit Court, southern district of New York. *Edison Electric Light Company, et al. vs. The Equitable Life Assurance Society of the United States*. *In Equity*. On bill and plea alleging laches and acquiescence in defendant's alleged infringement for eleven years. Eugene H. Lewis, for complainants. Leonard E. Curtis, for defendant. "The suit was one brought by the owners of the patents against a private user, to recover damages for the infringement and use of certain electric light fixtures. Judge Coxe, however, now decides that by the plaintiffs' acquiescence in the alleged infringement for eleven years they have forfeited their rights to recover. The bearing which

this decision will have on the suits to recover from private users of incandescent lamps is not difficult to foresee." 1,300 words.) *Electrical Engineer*, May 17.

LEGISLATION.

(See Municipal Engineering.)

LAUNCHES, ELECTRIC.

(See World's Fair.)

LIGHTING, DECORATIVE AND SPECIAL.

(See Lighting, Ship.)

"The Columbian Ball." (Illustrated description of the electrically decorated grove at Madison Square Garden, April 27. 300 words.) *Electricity*, May 3.

"The Fifth Avenue Theater." By Henry M. Stevens. (Description of the electrical apparatus. 450 words, 1 illustration.) *Architects and Builders' Edition Scientific American*, May.

"The Jacobs and Moore Electric Display System." By D. M. Moore. (A system of illuminated signs and bulletins. 700 words, 1 illustration.) *Electrical Engineer*, May 10.

"Electricity as an Intrinsically Economical Illuminant." By W. J. Rivington. (Showing the comparative cost of gas, oil, candles and incandescent lights in a fifteen-room house in London, with a saving of one-fifth in favor of electricity. Also suggestions for further economy in usual methods of utilizing current in household affairs. 1,100 words.) *London Queen*, April 22.

"Steam and Electric Plant at the Virginia Hotel, Chicago." (1,600 words, 3 illustrations.) *Stationary Engineer*, May 6.

"Electrical Installations in Explosives Factories and Magazines." (Editorial review of the annual report of Her Majesty's inspectors of explosives. 1,200 words.) *London Electrical Review*, May 19.

LIGHTING AND POWER FOR SHIPS.

"Electricity in the Naval Review." (Description of the electrical appliances on the British cruiser Blake, and reference to some features on the United States cruisers, and to the night display on the Hudson, with illustrations of the Blake, Philadelphia, Navarra, Nina, Pinta and search-light display. 3 pages.) *Electricity*, May 3.

"The Construction and Uses of Projectors." By F. Nerz. (Abstract of paper presented to the Verein Deutscher Ingenieure. Reviewing work of Fresnel, Mangin, Tschikolew, Schurkert, Munker and others, and comparing the parabolic form with the mangin mirror. 4,000 words, 8 illustrations.) *London Electrician*, April 21 and 28.

"Ship Lighting." (Reference to ten ships equipped with electrical apparatus, including the "Leopold II" and the "Gibraltar." 1,200 words.) *London Electricity*, April 21.

"Electrical Transmission and Indicators for the Movements of the Tiller." (Abstract of a paper in the *Rivista Maritima*, by Vittorio Moreno, a translation of which is given in the *Journal of the Royal United Service Institution* for March. 500 words.) London *Electrical Review*, May 19.

"Government Premiums." (Editorial, suggesting the policy of awarding premiums for exceeding contract requirements in naval lighting plants. 350 words.) *Electrical World*, May 20.

LIGHTNING, THEATER.

"Imitating Lightning." (Abstract of M. Trouve's method of imitating lightning at one of the Paris theaters. Instead of flashing lycopodium powder behind a broken line cut in the scenery (the old plan), a long bamboo or other flexible rod is used, having a small incandescent lamp of great brilliancy at the end, with a foot commutator, enabling one to make or break the circuit at will. The rod is moved quickly down in a zigzag direction at the proper moment. The sound of the wind in a storm is imitated by means of a double-action pump and two sirens; and that of hail by throwing coarse sand against an osier screen. 150 words.) *Electrical Engineer*, May 24.

LIGHTNING.

"Reynolds' Instructions for Erecting and Testing Lightning Conductors." (Reprint from *Indian Engineering*. 3,300 words.) *Scientific American Supplement*, May 13.

"On Lightning Rods." (Review of pamphlet by Major Pescetto, giving a summary of the present position of protection from lightning. 2,600 words.) London *Electrical Review*, April 14 and May 12.

"The Effect of Lightning on Trees." (Abstract and discussion of paper by Dr. Ferdinand Cohn, read before the Breslau Kaiserlichen Leopoldinisch-Carolinischen Akademie der Naturforscher on November 15, 1856, and published in Part I, Vol. XXVI of the *Verhandlungen*, describing the effects of lightning strokes on pine trees; and of Mr. Tonesco's recent paper on "The Damage by Lightning to Trees," published in the *Jahresheft des Vereins für vaterländisch Naturkunde* in Würtemburg, 1893. Allusion was also made to communications on the subject "made to the society in 1873 by the late Mr. Baxandell, and to experiments performed at that time by Professor Reynolds to test the explosive force of small quantities of moisture volatilized by the electric spark, the results of which were communicated to the society in the same year." 1,000 words.) *Proceedings of Manchester Literary and Philosophical Society*, Vol. 7, No. 1.

LIGHTHOUSE.

"Lighthouse Illuminants." By W. P. Anderson. (Criticism of the Wigham gas system, and reference to D. A. Stevenson's report on the

electric light often "being visible in fog that totally obscured the oil lamp. * * * Being very rich in the most refrangible rays of the spectrum, that is, very white, it suffers a greater percentage of diminution in passing through fog than oil or gas light, which is redder, but nevertheless, owing to its enormously greater initial power, the electric light is always a better penetrator of fog than the others." 1,400 words.) *Science*, May 12..

MANUFACTURING ESTABLISHMENTS.

"National Electric Manufacturing Company." (Description of the factory at Eau Claire, Wisconsin, with brief biographical notices of Walter M. Lenhart, Maurice E. Bates, C. G. Crocker and W. E. Smith. 1,200 words and 6 illustrations.) *Electrical Industries*, May.

"Western Electric Company." (Description of the Chicago factory, and of the electric lighting apparatus. 1,200 words, 6 illustrations.) *Electrical Age*, May 6.

"The Crocker-Wheeler Model Factory Operated Without Shafting." (Description of factory at Ampere, New Jersey. 1,000 words, 3 illustrations.) *Electrical Engineer*, May 17.

MAGNETISM.

"Electro-Magnetic Theory." By Oliver Heaviside—XLVIII. (Pars. 195, 196, 197. The influence of conductivity on electro-magnetic waves. 3,700 words. Pars. 198, 199. 2,700 words.) *London Electrician*, April 21, May 5.

MACHINERY, TOOLS, ETC.

"Traveling Cranes." By H. M. Lane. (Describing the compressed air crane built by Lane & Bodley, for their works. 1,000 words, 3 illustrations.) *Cassier's Magazine*, May.

MAGNETS, ELECTRO.

"Non-sticking Armature for Electro-Magnets." (Description of S. H. Stupakoff's invention, wherein a thin strip of iron supported by a resilient tongue is supported between the armature and the magnet. 400 words, 2 illustrations.) *Electrical Engineer*, May 3.

METEOROLOGY.

"Balloon Meteorology." By Prof. Carl E. Myers. (Interesting experiments in various localities. 1,600 words.) *Scientific American Supplement*, May 6.

"Meteorology as the Physics of the Atmosphere." By Prof. Wilhelm Von Bezold. (Translated by Prof. Cleveland Abbe, from Himmel u. Erde, October, 1892, Vol. V, pp. 1-19. Serial. 9 pages.) *American Meteorological Journal*, May.

"Some Meteorological Problems." By Shelford Bidwell. (Abstract of a lecture delivered on March 15, before the Royal Meteorological Society, of London. The unsolved origin of atmospheric electricity ;

the typical flashes of lightning and their duration; and the probable cause of sunset colors, which were attributed to the presence of minute articles of dust in the air, were referred to. 500 words.) *American Meteorological Journal*, May.

"A Collector of Atmospheric Electricity." By L. Palmieri. (Description of "apparatus based on the principle that as conductor is raised in the open air it collects positive electricity, and that then after discharge it collects negative electricity as it descends." 300 words, 2 illustrations.) London *Electrician*, April 21.

METERS AND MEASUREMENTS.

(See Standards and Units.)

"Terminals." By J. Rennie. (Paper read before the Physical Society of Glasgow University, March 10, detailing the importance of having perfect terminals on electrical measuring instruments, and stating that ideal terminals must fulfill these conditions : (a) They must not alter the character or amount of the electrical activity which passes through them. (b) They must be convenient in use, and not liable to become undone through vibration. (c) The contact surfaces must not be liable to become oxidized in places not easy of access for cleaning. 1,400 words.) London *Electrical Engineer*, April 28.

"A New Departure in Electric and Magnetic Instruments." (Brief reference to G. Quincke's description in the *Annalen der Physik und Chemie*, No. 1, 1893, of some simple apparatus that may be used either as a tangent galvanometer or as a magnetometer. 200 words.) London *Electrical Review*, April 28.

"The Reckenzaun-Binswanger Meter." (A description of the "General" meter. 2,800 words, 5 illustrations.) London *Electrical Review*, May 5.

"The Bismuth Magnetic Field Explorer." By Dr. Th. Bruger. (Description of the Hartmann & Braun instrument, the action of which depends on the property of bismuth of varying its resistance in magnetic fields. 700 words, 3 illustrations.) London *Industries*, May 12.

"The Oulton-Edmondson Electricity Meter." (Consists of two pendulums, each driven (without the intervention of clockwork) by a small impulse arm, acting on the pendulum by the force of gravity, and lifted at each double vibration by an electro-magnet. 1,000 words, 1 illustration.) London *Electrical Engineer*, May 12.

"Crompton's Potentiometer Method of Obtaining Accurate Electrical Measurements." (Description of a potentiometer suitable for verifying voltmeters to one-tenth of a volt, for testing meters to one part in 1,000, and for measuring from one milliampère to 5,000 ampères or more, and including: 1, A set of standard Clark cells; 2, The comparing instrument which is called the potentiometer; 3, A set of fractional resistances which can be used to reduce the pressures to be measured to

that which can be conveniently compared by the potentiometer. 2,200 words, 4 illustrations.) London *Electrician*, May 12.

"Riehle Automatic Electric Screw Beam Testing Machine." ("As the beam rises it makes contact and completes the circuit, throwing in action the magnets on one side of a bell-crank lever, this operating a friction clutch, a train of gears and small spline shaft which cause the poise to revolve and travel outward. When the beam falls to the bottom of the gate, it throws in action the magnet on the opposite side of the lever and a reverse gear, thus bringing the poise toward zero." 700 words, 1 illustration.) *American Manufacturer*, May 19.

"A Modified Deprez-D'Arsonval Galvanometer." By Lieut. Charles D. Parkhurst. (A paper read at the meeting of the American Institute, describing an instrument made to his order. 17 pages, 17 illustrations.) *Transactions American Institute Electrical Engineers*, May.

"The Accuracy of the Copper Voltmeter." By Bertram Blount. (Appreciative comment on Doctor Oetell's experiments, published in the *Chemiker Zeitung*, showing the method by which certain changes due to the irregular electro-deposition of copper may be overcome. 2,000 words; and editorial, 300 words.) London *Electrician*, May 19.

"The Hummel-Schuckert Meter." (Abstract of M. E. Meylan's description in *L'Électricien*, and briefly designated as a German adaptation of the Elihu Thomson motor meter. 400 words.) London *Electrician*, May 19.

"The Pentz-Reckenzaun Electric Meter." By James A. Pentz and Anthony Reckenzaun. (1,300 words.) *Electrical Engineer*, May 24.

"The Ideal Electric Meter." By W. G. Stratton. (Dealing in a general way with the requirements of an ideal electric meter and the errors that may arise in the operation of the different forms of meters. 1,300 words.) *Electrical Engineer*, May 24.

"Differential Meter Clock." (Description of apparatus designed by Gisbert Kapp and tested on circuits in London. 1,300 words, 4 illustrations.) *Electrical World*, May 27.

"Edward Weston and His Electrical Work." (Describing the steps taken in producing a perfect instrument, and the details of manufacture of the Weston instruments. 6,000 words, 17 illustrations.) *Western Electrician*, April 29.

"An Accurate Meter for Alternating Currents." (Description of the Fort Wayne meter. 200 words, 1 illustration.) *Electrical Review*, March 18.

METALLURGY, ELECTRO.

"Electrolyzing the Rare Earths." (Editorial comment on recent researches by Dr. Gerhard Krüss. "It appears that a suitable method for working up the metals of the rare earths is afforded by the electrolysis of solutions of these earths" * * * and "from the results obtained with yttria, there seems every reason for believing that

an electrolytic method of some commercial importance will soon be elaborated." (250 words.) London *Electrical Review*, April 21.

"Electrolytic Separation of Gold, Etc." (In potassium cyanide solutions gold is readily separated from arsenic, molybdenum, or osmium; also from wolfram, if WO_3 is dissolved up in potassium cyanide. If, however, this oxide is dissolved in potash, and potassium cyanide is added, the separation is unsatisfactory. Cadmium, silver and mercury are readily separated from osmium in a potassium cyanide solution, and cadmium can be separated from nickel in this solution if potash is present.—Smith and Wallace *Journ. and App. Chem.*, Vol. VI, p. 87.)

"Electrolytic Separation of Various Metals." (Rudorff has been revising some of Classeus' well-known reactions, and finds that those with oxalates are not so convenient as is claimed in some cases. Methods are given for the separation of gold in potassium cyanide, platinum in sulphuric acid solution, silver from copper, mercury from copper, cadmium from copper and copper from nickel.—*Zeits. Angewandte Chem.*, 1892, p. 695.)

"Separation of Lead from Galena." (L. Medicus has recently proposed a method of separating lead from galena, which seems likely to develop considerable technical utility, on account of its being both accurate and rapid. The lead is obtained from galena as chloride by means of hydrochloric acid. This is then dissolved in potash, and precipitated as carbonate by means of carbon dioxide. The carbonate is next dissolved in nitric acid and electrolyzed, whereby the metal is obtained in the state of peroxide.—*Vide Berichte der deutsche Chemische Gesellschaft*.)

"Electrolytic Separation of Palladium and Platinum from Iridium." (Smith states that iridium is not precipitated by the electric current from solutions containing an excess of an alkaline phosphate and free phosphoric acid, whereas palladium and platinum separate readily.—*American Chemical Journal*, Vol. XIV, p. 435.)

"Electrolytic Separation of Copper." (Drossbach finds that on electrolyzing an ammoniacal solution of copper, the metal is deposited without contamination, even though traces of silver, bismuth, antimony, arsenic or tin may be present; mercury and cadmium, however, may interfere with the disposition under these circumstances. If the action of the current is much prolonged, after the copper has been thrown down, then nickel, cobalt or tin, if present, will also be partially deposited.—*Chemiker Zeitung*, Vol. XVI, p. 818.)

(The foregoing five paragraphs are clipped from the London *Electrical Review*, April 28.)

"Alloys." (Abstract of Prof. W. C. Roberts-Austin second report to the Alloys Research Committee, at the meeting of the Institution of Mechanical Engineers, in London, April 20. "The object of the investigation was to extend a research previously made by the writer upon the application of the 'periodic law' of Newlands and Mendeleef to the

mechanical properties of metals." * * * "The profound change which is produced in the properties of metals by alloying them is well shown by some recent experiments by Professors Dewar and Fleming. They have examined the effect of very low temperatures on the electrical resistance of pure metals and alloys, and the results tend to prove that if pure metals could be reduced to the absolute zero of temperature, they would offer no resistance to the passage of an electric current. This is true of soft, pliable metals like gold, and rigid ones, such as nickel." 2,600 words.) *Engineering News*, May 11.

MINING.

"An Electric Mining Plant at Bodie, California." (Abstract from report of the Standard Consolidated Mining Company. Power-house twelve and one-half miles from mill; four 21-inch Pelton wheels are coupled to the armature shaft of four 120-kilowatt 3,530-volt generators; circuit of No. 1 B.-s wire; 120 horse-power motor will be placed later. The cost of this plant is given as follows: Water-power, including ditch, pipe, water-wheels, etc., \$8,915; wire line, 12.46 miles, \$10,474, or \$840.63 per mile; motor-room, countershafts and pulleys at mill, \$1,791; telephone line, fourteen miles, \$1,099, or \$78.52 per mile; sundry expenses, \$305; total, \$22,584. This does not include the dynamos and motors, which had not been put in at date of the report. Cost somewhat reduced by the use of material from the old mill, as stated. Fuel for mill power cost \$10 a cord delivered. 800 words, 2 illustrations.) *Engineering and Mining Journal*, May 13.

"Electricity in Phosphate Mining." (Suggestions for the installation of an electric plant in a mine operating three pits. 1,800 words, 6 illustrations.) *Dixie*, May.

MUNICIPAL ENGINEERING.

"The Thiele Bill and Socialism." By Allen R. Foote. (Commenting on editorial in issue of April 29, and inviting attention to Frank B. Tracy's article in the May *Forum*, "Menacing Socialism in the Western States," and J. W. Mason's article in the *American Journal of Politics*, "Governmental Ownership of Railroads." 1,600 words.) *Western Electrician*, May 13.

"Some Problems of Municipal Engineering." By Charles D. Marx. (A paper read before the Technical Society of the Pacific coast, April 7. Detailing the practice and the improvements in supplying water, removing refuse, etc., since 11 B. C., and discussion. 20 pages.) *Transactions Technical Society*, April.

"Considerations for Town Councillors." By N. Scott Russell. (Suggesting methods of procedure for obtaining authority for establishing municipal plants, with extracts from Bower & Webb's "Law of Electric Lighting." 5,600 words.) *London Electrical Engineer*, April 28. (Criticism of the inaccuracy of certain terms and definitions in same. 2,000 words.) *London Electrical Review*, May 19.

"Tiverton." (Report by the borough surveyor, Mr. J. Siddalls, to the Town Council on the cost of erection and maintenance of an electric lighting plant. 4,000 words.) London *Electrical Engineer*, April 21.

"The Supervision and Regulation of Corporations. The Way Not to Do It." By Allen R. Foote. (Comment on a bill before the Pennsylvania Legislature, for the supervision and regulation of lighting companies. 2,200 words.) *Electrical Age*, April 29.

"Electric Lighting of Belfast." (Abstract of a report of Professor Kennedy to the Town Council, recommending the use of gas engines and storage batteries. 1,700 words.) London *Electricity*, April 21.

"Municipal Electrical Engineers." (Editorial statement that "the future of electrical engineering will be largely in the hands of those who serve municipalities," and advising municipal engineers to organize and strengthen their positions both with municipalities and with the industry in general. 700 words.) London *Electrical Engineer*, May 5.

PATENTS.

"Review of Noteworthy Electrical Patents." *World's Fair Electrical Engineering*, January, February, March, May, June.

"Origin of the Patent Specification." (Editorial, contending that the statement that the first patent in which this proviso is known to exist is that of Nasmyth's, dated 1711, is incorrect, and that the earliest known instance of the requirement of a specification is to be found in the "Treatise of Metallica" of Simon Sturtevant, printed by George Eld in 1612, which forms the first of the supplementary series published by the Patent Office. 1,200 words.) London *Industries*, May 19.

"The Charges Against Ex-Commissioner Simonds." By G. C. M. (Details of and comment on charges that Foster & Freeman, with the connivance of Commissioner Simonds and Chief Clerk Bennett, who is implicated in the alleged irregularity, procured copies of Drawbaugh applications and other papers which were in the confidential archives of the office, and which the commissioner had no right to give out, and which were used to the benefit of the American Bell Telephone Company. 1,600 words.) *Electrical Review*, June 3.

PHYSICS, ELECTRO.

"Luminous Discharges in Electrodeless Vacuum Tubes." By E. C. Rimington. (Abstract of a paper read before the Physical Society, on April 28, describing several experiments leading to the conclusion that varying magnetic induction is the chief cause of luminous rings, and not the electrostatic action of the surrounding wire. 700 words, 5 illustrations.) London *Electrician*, May 5.

"Hall's Phenomenon." (Abstract of Professor Kundt's account of some researches undertaken as an introduction to the study of Hall's phenomenon, at a recent meeting of the Berlin Physical Society. 200 words.) London *Electrical Engineer*, May 17.

"Electrical Theory." By Albert L. Arner. (Commenting on the absence of clear and simply extended statements in explanation of

electrical phenomena. 1,600 words, 2 illustrations.) *Electrical Engineer*, May 24.

"Mr. Tesla's Latest Work." (Editorial review of Tesla's lecture before the Franklin Institute and the National Electric Light Association. 1,400 words.) *Electrical Engineer*, May 31.

"On Light and Other High Frequency Phenomena." By Nikola Tesla. (A lecture delivered before the Franklin Institute, at Philadelphia, February 24, 1893, and before the National Electric Light Association, at St. Louis, Missouri, March 1, 1893. Introductory; Some thoughts on the eye; On the apparatus and method of conversion; On phenomena produced by electrostatic force; On current or dynamic electricity phenomena; On electrical resonance; On the light phenomena produced by high-frequency currents of high potential, and general remarks relating to the subject. 33,000 words, 35 illustrations.) *Electrical World*, June 3.

"Reflection of Electrical Waves." (Abstract of an interesting note by M. Birkeland in the *Comptes Rendus* for April 17, on the reflection of electrical waves at the extremity of a linear conductor. By an application of Professor Poynting's theorem concerning the movement of the energy in an electro-magnetic field to the case of a Hertzian oscillator, he has shown how the damping of the oscillations depends on the nature and position of the conductors in the neighborhood. 150 words.) *Electrical Engineer*, May 24.

POWER TRANSMISSION.

"Recent Developments in the Electrical Transmission of Power." By C. J. H. Woodbury. (A paper read before the New England Cotton Manufacturers' Association, April 26, 1893. Outlining the general principles involved and referring to new methods of application. 3,000 words.) *Electrical Review*, May 6.

"The Distribution of Power by Alternate-Current Motors." By Albion T. Snell. (A paper read before the Institution of Electrical Engineers, April 13. Subheads: 1, Single-phase Synchronous Alternate Current Motors; 2, Use of Condensers; 3, Split-Current Rotary-Field Motors; 4, Multiphase Alternate Motors; 5, Triphase or Drehstrom Circuits; 6, Practical Application of the Drehstrom; 7, Drehstrom Motors with Stationary Armatures; 8, Combined Rotary and Synchronous Motors; 9, Single-phase Non-Synchronous Motors—self-exciting and self-starting. 11,000 words, 18 diagrams; and discussion, 1,200 words.) London *Electrical Engineer*, April 14, 21 and 28.

PUBLICATIONS, SPECIAL.

"Titles of Recent Publications." (German, French, English and American.) *World's Fair Electrical Engineering*, May, June.

"Review of New Publications." *World's Fair Electrical Engineering*, May, June.

"List of Publications Indexed." *World's Fair Electrical Engineering*, May, June.

RAILWAY PLANTS, ELECTRIC.

"Portland, Tacoma, Seattle, Everett, Astoria." By C. B. Fairchild. (An editor's description of the street railway systems in Pacific coast cities; a chapter in the round-the-world series. Well written and instructive articles on the systems in operations, cost of operation, methods adopted and forms used. 21 pages, 26 illustrations.) *Street Railway Journal*, May.

"North Hudson County Railway." (Description of elevated electric road in Hoboken, New Jersey. 800 words, 3 illustrations.) *Street Railway Journal*, May.

"The Union Railway and Chester & Media Electric Railway, Chester, Pennsylvania." (Description of plant. 1,000 words, 1 illustration.) *Electrical Engineer*, May 17.

"The Put-In-Bay and Southwestern Electric Railroad Company." (Details of an inter-urban line in Ohio. 600 words and map.) *Electrical Engineer*, May 31.

"The St. Louis and Suburban Railway." (2,600 words, 3 illustrations.) *Street Railway Gazette*, May 13.

"Brightwood and Takoma Park Electric Railway, Washington, D. C." (Description of plant. 500 words, 2 illustrations.) *Electrical World*, May 27.

"Ohio Inter-urban Electric Railways." (Details of thirty-seven projected lines in Ohio, covering 775 miles. 600 words and map.) *Street Railway Gazette*, May 20.

"Bellefontaine Railway, St. Louis." (Description of plant. 1,800 words, 3 illustrations.) *Street Railway Gazette*, May 27.

"Florida's First Electric." (Brief description of the main street railway lines in Jacksonville, with portrait of S. B. Hubbard and Henry S. Ely. 800 words, 4 illustrations.) *Street Railway Review*, May.

"Terre Haute Electric Railway Power Plant." By Frederick L. Ray. (600 words.) *Stationary Engineer*, May 6.

RAILWAY CONSTRUCTION.

"Electric Railways." (Editorial comment on the number of inter-urban lines projected, that indicates "a rapidly growing appreciation of the advantages of the system as a means of affording rapid and convenient transit to country districts, and in most cases they will serve as feeders to steam railways running through the sections thus improved, and tend to increase general traffic." 500 words.) *Engineering News*, May 25.

"Studies in Track and Roadway Construction." (Estimates prepared by John A. Beeler, Denver. 3 pages, 8 illustrations.) *Street Railway Journal*, May.

"A Chapter on Paving." (Detailing cost of brick and other forms of pavement. 1,600 words, 9 illustrations.) *Street Railway Review*, May.

"The Under-Running Trolley." Reproduction of illustration, and brief description, of such a device, taken from *La Lumière Électrique* of March 14, 1885, and included in a series of articles by Deprez and Leblanc. 200 words.) *Electricity*, May 24.

"Rail Bonding." By C. W. Wason. (A paper read before the Cleveland Electric Club, giving the results of practical work, referring to the letters sent in answer to the inquiries in the *Street Railway Review*, and describing the various styles of rail bonds used, and discussion. 5,000 words and portrait.) *Street Railway Review*, May.

"The One Great Mistake." (Editorial comment on the employment of too light rails. "A light track construction not only fails itself, but is a direct cause of failure in the rolling stock. Axles break from the excessive pounding, and, because of faulty curve construction wire connections break, wheels fail, the trucks go to pieces, the motors are injured, the car bodies are so wrenched that all the framing joints become loosened, and premature failure results. * * * Any company that employs a girder rail of less than eighty pounds to the yard, or a T rail less than sixty pounds, for new construction, is, as it were, flying in the face of Providence, and will have reason to regret its action." 500 words.) *Street Railway Journal*, May.

RAILWAY SYSTEMS AND APPARATUS, ELECTRIC.

"The Munsie-Coles Surface Contact Electric Railway System." By A. C. Shaw. (800 words, 3 illustrations.) *Electrical Engineer*, May 17.

"The Heilmann Electric Locomotive." (Brief description. 450 words, 1 illustration. Also, editorial comment, 300 words.) *Electrical Engineer*, May 17.

"The Elliott Car Brake." (800 words, 1 illustration.) *Electrical World*, May 27.

"Love's Electric Tramway Culvert." (Details of the Love conduit system in service in Washington and Chicago. 800 words, 4 illustrations.) *London Industries*, April 28.

"The Wheless Conduit Railway System." (Describing section in service on the Washington & Arlington Railway. 1,600 words, 7 illustrations.) *Electrical Engineer*, May 10.

RAILWAYS, MAINTENANCE OF ELECTRIC.

"The Cleaning of Tramway and Other Rails." By H. Conradi. (Abstract of paper read before the Society of Engineers, describing a device to be fitted to each car affording a continually clear track, and effecting a saving in tractive power. 5,000 words.) *London Railway World*, April.

"Street Railway Franchises." By R. D. Fisher. (Detailing the advantages that accrue to cities dealing liberally with responsible street railway companies. 2,500 words.) *Street Railway Gazette*, May.

"Accident and Claim Blanks." (Copies of seven forms in use by the Denver Tramway Company. 3 pages.) *Street Railway Journal*, May.

"A Complete Classification of Accounts." (Details of system used by the Chicago City Railway. 4 pages.) *Street Railway Review*, May.

"Fast Trains of England and America." By G'r Lodian. (Data includes speeds, dimensions of locomotives, etc. 13 pages, including 11 illustrations.) *Cassier's Magazine*, May.

SIGNALS, ELECTRIC.

"Mozier Three-Position Semaphore and Safety Signal." "The distinctive features of Mr. Mozier's system are the use of a three-position semaphore, the electric interlocking of the semaphore with the telegraph key of the operator at the block station to insure the keeping of the semaphore in the danger position, and the control of all trains by the train dispatcher." 2,000 words, 1 illustration.) *Engineering News*, May 11.

"Important Practical Necessities in Military Signaling." By Lieut. John P. Finley, U. S. A. (Dealing with visual rather than electric signals. 20 pages.) *United Service*, June.

"The Wattson and Stewart Block Signal System." (Description of a new block signal system placed in the New York, West Shore and Buffalo Railway Tunnel at Weehawken, New Jersey, the joint invention of Mr. W. G. Wattson, division superintendent, and Mr. Joseph B. Stewart, superintendent of telegraph and signals of the road. 600 words.) *Electrical Engineer*, May 31.

SUBWAYS.

"Single and Combination Couplers." By W. Howard Tasker. (Describing his coupler, designed to act as a switch to divide the system of mains into sections, wherever it was necessary to cut off the current for several hours. 700 words, 3 illustrations.) *London Electrical Review*, April 28.

STANDARDS AND UNITS.

(See Meters and Measurements, and Congress, Electrical.)

"A Necessary Modification of Ohm's Law." By Fernando Sandford. (Reply to criticism in *Electrician* of January 13, attributing the reported discrepancies in the resistance of a copper wire to a change in the heat emissivity in the different media. 1,000 words. Editorial comment: "We still think that the method used for measuring the temperature of the wire was a very crude one. The common method is to deduce the temperature from the observed resistance of the wire, and until our esteemed correspondent can devise an independent sensitive method of measuring the temperature of the wire, we fear he will be unable to establish his point.") *London Electrician*, April 21.

"Energy as a Dimensional Unit." (Abstract of Ostwald's communication to the Munich Academy, in which the extension of the energy idea over the entire province of physics and chemistry is formulated as

follows: "In order that any system whatever, containing forms of energy, shall be in equilibrium, the necessary and sufficient condition is that for every displacement of the system, consistent with the conditions of its existence, the sum of the quantities of energy which appear and disappear shall be equal to zero." 250 words.) London *Electrical Review*, April 28.

"The Proposed New Units." By J. R. Rosebrugh. (Indorsing the selection of the weber and the gauss, but questioning the wisdom of adopting the value proposed for the gilbert. 1,600 words.) *Electrical World*, May 16.

"Electrical Nomenclature." (Editorial comment on M. E. Hospitalier's article in *L'Industrie Electrique*, suggesting certain rules to be adopted for discussion at the coming congress in Chicago. 2,000 words.) London *Electrical Review*, May 5.

"The Coefficients of Fundamental Laws." By E. Mercadier. (Dealing with the general relations which exist between the coefficients of the fundamental laws of electricity and magnetism.) *Comptes Rendus*, No. 16, April 17.

"Proposals for Establishing Electrical Units on a Legal Basis." (Details of the legal definitions of electrical units drawn up by the German Physico-Technical Institute. 1,200 words.) London *Electricity*, May 12.

"Electrical Standard Units." By F. M. F. Cazin. (Criticism of the international proposals, especially of the official report of the Kuratorium der Physikalisch-Technischen Reichsaustalt, published in the issue of May 5, 1893, of the *Electrotechnische Zeitschrift*. 1,600 words.) *Electrical Age*, May 27.

"An American Gauntlet Thrown to the British Board of Trade." By F. M. F. Cazin. (Contending that mechanical power is the only true standard to measure electric energy by. 3,200 words.) *Electrical Age*, May 20.

STEAM ENGINEERING.

(See Word's Fair.)

"Boiler Tubes." (Editorial comment and review of the agitation in England of the difficulty of keeping marine boiler tubes from leaking. "It has never been satisfactorily explained why this difficulty is so much more serious in marine boilers than it is in locomotives." 4,500 words, 6 illustrations.) *American Engineer*, May.

"La Cour's 'Kratostate.'" (Details of the engine governor invented by Paul la Cour, of Denmark. 600 words, 2 illustrations.) London *Industries*.

"Proper Area of Supply Pipes for Engines." (Table showing sizes of pipes used by a number of builders for different sizes of engines, with examples for making comparisons. 2,000 words and table.) *Power*, May.

"Losses in Transmission of Heat." By Prof. R. C. Carpenter. (Details of tests of the heating plant at Cornell University and at the Lehigh Coal Storage Plant, South Plainfield, New Jersey, with statement that the loss in transmitting 100 horse-power in steam 1,000 feet in pipe covered with solid wood and earth is 11.2 per cent; and only 4.2 per cent when the pipe is encased in Wyckoff's covering. 5,000 words, 7 illustrations.) *Power*, May.

"Steam Engine Indicator." (Instructions on the proper application to various engines. 1,200 words, 10 illustrations.) *Power*, May.

"Power Catechism." (Questions and answers for practical engineers, Nos. 130 to 156. 2,500 words, 5 illustrations.) *Power*, May.

"Steam Pipes." (Abstract from a work by Messrs. Geifel and Kilgour, giving data in regard to the flow of steam in pipes. 600 words, 2 curves.) London *Electrician*, May 5.

"The Genesis and Exodus of Steam." By George H. Babcock. (Detailing the process of economically making steam, and giving data regarding quantity generated. Including manufacturing interests, locomotives and steamboats, having an estimated average of 120,000,000 hourly horse-power each day, not less than fifty million tons of steam is condensed each year to do work, "while at least eleven times as much more is compelled to keep it company and pass out of existence, mostly without further use." 5,000 words.) *Sibley Journal of Engineering*, May.

"The Variation in Economy of the Steam Engine Due to Variation in Load." By Prof. R. C. Carpenter. (A paper presented to the American Institute, May 17. 23 pages.) *Transactions American Institute Electrical Engineers*, May.

"The Loss of Fuel by Smoke." (Editorial statement that smoke prevention of itself is no great source of economy, for carbon may be sufficiently oxidized to produce a colorless gas and yet the heat-making property is not wholly utilized. * * Careful experiments, however, have shown that even the most dense black smoke carries away no more than two per cent of the fuel used and in the majority of cases one and a half per cent will cover the loss of uncombined carbon. * * Carbonic oxide, a colorless gas may be continually escaping from the chimney without being noticed, yet it is carrying away a heat value that may amount to more than fifty per cent of that of the fuel consumed. 500 words.) *Stationary Engineer*, May 20.

SUPPLY HOUSES.

"The Central Electric Company." (Brief reference to formation and growth. 1,400 words, 6 illustrations.) *Electrical Age*, May 6.

SUPPLY INTERESTS.

"Commercial Advancement of Electrical Interests." By W. H. McKinlock. (A résumé of the important part taken by the supply man in the rapid growth of the electrical industry, with statement that

while in 1880 the approximate capital of the supply interests might aggregate \$1,000,000, it now exceeds \$40,000,000, not including manufacturers of wire and patented articles. 1,200 words and portrait.) *Western Electrician*, May 6.

"Cutting Down Prices." (Comment on low price at which a contract for lighting was accepted. "In how much the leading firms of electric light contractors are injured by the cutting down of prices below actual cost, is a matter which is best known to themselves. If confined to small installations of infrequent occurrence, perhaps the injury sustained is scarcely felt, but if the same thing obtains generally, it becomes then a subject for serious consideration." 500 words.) *London Electrical Review*, April 28.

TANNING, ELECTRO.

"Electro-Tanning." By L. A. Groth. (Commenting on Dr. Rideal's criticism of Mr. Falkenstein's paper on Electro-Tanning, characterizing the paper as incomplete and inaccurate, and stating that "the electric current must be regulated according to the nature of the hides and composition of the tanning liquor used in order to obtain satisfactory results." 1,500 words.) *London Industries*, April 28.

TOWING.

"Towing by Electricity." (Reference to trial of the de Boret method on board the "Ampere," at Saint-Denis, on the Seine, showing "that an absolute speed of 9½ miles an hour could be obtained." 700 words.) *London Electrical Engineer*, May 19.

TELEGRAPH.

"The Telecroscope." By Leon De Pontois. (A paper read before the Pittsburgh Electric Club, describing an apparatus for the transmission of pictures or views of moving or stationary objects. The transmitting apparatus consists of a special form of camera holding selenium cells. 2,800 words, 3 illustrations.) *Electricity*, May 10.

"A Revolution in Means of Communication." By Elisha Gray. (The inventor's description of the evolution of the telautograph. 6 pages, including 7 illustrations.) *Cosmopolitan*, May.

"Telegraphic Communication in the West Indies." By Dr. R. B. Anderson. (Communication complaining of the lack of telegraphic facilities, "showing how trade and intercourse may most successfully be restricted within the narrowest limits," with copies of official letters on the subject. 8,500 words.) *London Electrical Review*, May 5 and 12.

"Earth Currents." By J. Kennedy Gibson. (Describing series of observations taken on one of the Java-Australian cables, shown in plotted curves at Port Darwin, South Australia. 450 words, 1 diagram. And editorial comment.) *Electrical World*, May 20.

TELEPHONE.

(See Accumulators and Patents.)

"Is Self-Induction Played Out?" By T. B. Herold. (Review of the opinions expressed in ten articles on the subject, and concluding with Mr. Oliver Heaviside, that "self-induction is not played out; what is played out is what may be called the British engineer's self-induction which stands still and won't go." 1,600 words.) *Electrical Review*, May 6.

"Telephone Apparatus for Divers." (Description of the Hayes system supplied by the American Bell Telephone Company. 300 words, 2 illustrations.) *Electrical Review*, May 13.

"Tramways Versus Telephones." By S. Sellon. (Paper read at a meeting of the Tramways Institute, Liverpool, April 13, advising "a strong combination to fight the grasping demands of the telephone company." 2,200 words. And editorial indorsement, 900 words.) London *Electrical Engineer*, April 21.

"A Telephonic Meter." (Description of a device that registers the length of time that the receiver remains unhooked, built by Mix & Genest from suggestion by Doctor Strecker, chief inspector of the German Government Telephone Department. 400 words, 2 illustrations.) London *Electrician*, May 5.

"Modern Equipment of Telephone Stations." By W. H. Hyde. (A paper read before the Wisconsin Electric Club, describing McLeod's desk transmitter and an automatic exchange system installed by the Central Union Telephone Company, for forty-eight subscribers or less. 1,600 words, 5 illustrations.) *Western Electrician*, May 20.

"The Telephone in Sweden." By G. Emil Hesse. (Statistics showing the rapid growth of telephone lines in Sweden, and suggesting that it is not always wise for Americans to neglect securing Swedish patents. 600 words.) *Electricity*, May 17.

"Telephone Progress in St. Louis." (Reprint from *Globe-Democrat*, giving details of new code of signals operated with current from storage cells. 800 words.) *Electrical Review*, May 20.

"The Military Telephone." By Ch. Haubtmann. (A paper read before the Paris Société des Ingénieurs Civils, May 19.)

"Traction Versus Telephony." (Editorial comment on communications from R. E. Crompton and others. "We have no reluctance in once more discussing the relation between electric traction and telephony. The latter has done its level best to render the former impossible. It may be that bad telephony is of more importance to the community than electric traction, but with this view we must differ." "Municipalities must take one side or the other if they do their duty, and we ask them to support the efforts of those who contend that it is against public interest to give telephony the power to prevent the due development of electric traction." 900 words.) London *Electrical Engineer*, May 19.

"Static Charges on Metallic Telephone Lines." By F. J. F. Schwartz. (Describing disturbances noticed in Montreal during last three winters. 450 words.) *Electrical Engineer*, May 17.

"Reminiscences of Early Telephone Days. By F. E. Kinsman. (An interesting résumé of efforts to introduce the telephone in various localities. 3,300 words.) *Electrical Engineer*, May 17 and 24.

TRAIN LIGHTING.

"The Lighting of Railway Trains." By Oswald Haes. (Abstract of a paper read before the Electric Club of New South Wales, February 3, giving a summary of the various methods employed and detailed description of some of the systems. 4,000 words, 4 illustrations.) London *Electrical Engineer*, May 12.

"Train Lighting." MM. E. Sartiaux and E. Jacquin have issued a pamphlet on the use of oil lamps and electricity on the Great Northern Railway of France, which is published by Veuve Ch. Dunod, at Paris.

VELOCITY.

"Some Extreme Speeds." (Table prepared by Mr. James Jackson, showing speeds from growth of finger nail to the velocity of electricity which is given in feet per second, as follows: Electricity on the submarine cable, 3,120,000; electricity on telegraph, wire, 118,080,000; lightning in a solar spot, 656,000,000; light in water, 738,000,000; light in air, 984,000,000; electric current carrying the discharge of a Leyden jar over a copper wire $\frac{7}{16}$ of an inch in diameter, 1,520,280,000. Abstract from *Revue Scientifique*.) *American Engineer* May.

UNITS.

(See Standards and Units.)

WAR.

(See Ship Lighting.)

"Electricity and the Art of War." By C. D. Parkhurst, First Lieutenant, 4th U. S. Artillery. Discussion of the paper printed in the October *Journal*, advocating the immediate installation of electrical power and lighting plants in our sea-coast forts. 26 pages.) *Journal United States Artillery*, January.

WIRING.

"Concentric Wiring." By Sam Mavor. (Reply to criticisms by Sydney Walker. 1,100 words.) London *Electrician*, April 21.

"Strip, the Electrician." (Sketch of a clever fox terrier employed by the Crompton's to carry wires through ducts. 100 words, 1 illustration.) *Scientific American*, May 13.

"Overhead Wiring for Small Towns." By E. H. T. (Suggestions for improvements in present methods of erecting pole line circuits, more in Spanish towns. 800 words.) London *Electrical Engineer*, May 12.

"The So-Called Neutral Wire in Lighting Systems." (Review of remarks at the Elektrotechnische Society of Berlin. 800 words.) *Electrical Review*, May 27.

"Rules for Safe Wiring." (Reprint of rules adopted by the National Electric Light Association. 5,000 words.) *American Architect*, May 13.

"The Wiring of Houses for the Electric Light." (Commenting on article in *Lightning*, of April 20, that the greatest danger to the future of electric lighting lies in the imperfect work of the transient contractor. 1,600 words.) *London Electrical Review*, May 19.

"The Wiring of Buildings for Electric Lights." By George P. Low. (To lay down a general law even for a given class of building is impossible, and each building must receive specific consideration both in the matter of proper loss in potential as well as in the load basis upon which to figure the circuits. It is evident then that the drafting of electric wiring specifications is a matter worthy of most serious consideration and concerning which the architectural profession is deeply interested.) *Electrical Engineer*, May 17.

"New Underwriters' Rules." (Editorial comment on the proposed new rules, and on the formation of the Underwriters' Electric Association. 450 words.) *Electrical World*, May 20.

WORLD'S FAIR.

(See Congress, World's Electrical and Supply Interests.)

"Hints for Seeing the World's Fair." By Moses P. Handy, Chief of the Bureau of Publicity and Promotion. (A general statement regarding exterior sights. 3,000 words, 5 illustrations.) *Youth's Companion*, Extra, May 4.

"Foreigners at the Fair." By Richard Lee Fearn, Secretary of the Department of Foreign Affairs. (A general description of foreign exhibits. 3,000 words, 5 illustrations.) *Youth's Companion*, Extra, May 4.

"How to Spend a Week at the Fair." By C. A. Stephens. (Commencing with a tour of the grounds and ending in the Midway Plaisance. 3,300 words.) *Youth's Companion*, Extra, May 4.

"An Electrical Wonderland." (A general description of the electrical exhibits. 1,200 words, 2 illustrations.) *Youth's Companion*, Extra, May 4.

"Department of Electricity, World's Columbian Exposition." By J. Allen Hornsby, Assistant Chief of the Department. (A general review of the assignment of space, arrangement of exhibits, method of lighting, etc. 3,500 words, portrait and 2 diagrams.) *Western Electrician*, May 6.

"The Service Plant." By R. H. Pierce. (A general description of the service obtained from the arc lighting plant at the World's Fair. 2,000 words, portrait and 2 illustrations.) *Western Electrician*, May 6.

"Model Incandescent Lighting Plant." By E. E. Keller. (Description of the Westinghouse installation at the World's Fair. 3,700 words, portrait and four illustrations.) *Western Electrician*, May 6.

"World's Electrical Congress." By Prof. H. S. Carhart. (Review of work done at previous congresses and proposed plans for the coming meeting. 1,400 words and portrait.) *Western Electrician*, May 6.

"World's Fair Telephone Exchange." By A. S. Hibbard. (Brief outline of proposed plans. 500 words.) *Western Electrician*, May 6.

"Western Union Telegraph Service." By William J. Lloyd. (Outlining proposed service and display. 900 words.) *Western Electrician*, May 6.

"Postal Telegraph-Cable Company." By E. J. Nally. (Brief outline of service and exhibit. 500 words.) *Western Electrician*, May 6.

"Columbian Intramural Electric Railway." By C. H. Macloskie, (General description. 1,500 words.) *Western Electrician*, May 6.

"Varied Applications of Electricity." By E. J. Spencer. (Outlining what the General Electric Company are doing at the World's Fair. 2,000 words, portrait and 2 illustrations.) *Western Electrician*, May 6.

"The World's Congresses of 1893." By C. C. Bonney, president. (A general outline of the purpose of the different congresses. 1,200 words and portrait.) *Illustrated World's Fair*, May.

"How President Cleveland Opened the World's Fair by Electricity." By Locke Etheridge. (Giving details of the electrical system employed to start the machinery. 1,000 words, 2 illustrations.) *Western Electrician*, May 13.

"World's Columbian Exposition—X." (Electricity building and electrical exhibits. 2,400 words, 1 inset.) *Engineering News*, May 11.

"A Complete History of the Fairs of All Nations from Their Origin to the Present Day." (6 pages, 45 illustrations.) *New York World*, April 30.

"The Electric Fountains at the World's Fair." By T. C. Martin. (Complete description, with plans and diagrams. 3,600 words, 13 illustrations. Reply of G. B. M., 1,200 words.) *Electrical Engineer*, May 3 and 24.

"Electric Launches at the Exposition." (Complete description and plan showing the wiring of the launch. 1,000 words, 1 illustration.) *Electrical Engineer*, May 3.

"Electricity and Electrical Appliances." By Professor W. E. Ayrton. ("The introductory monograph to the electrical section of the British catalogue at the Chicago Exhibition." An excellent summary of the progress accomplished in the various applications of electricity. 4,500 words.) *London Electrical Engineer*.

"The Great Switch Board of the Westinghouse Exhibit." (Complete description of the switch board and exciter board in Machinery hall. 5,000 words, 13 illustrations.) *Electrical World*, May 20.

"Kerite at the Fair." (Description of the Kerite exhibit in the Electricity building. 700 words, 1 illustration.) *Electrical Engineer*, May 31.

"Foreign Nations at the World's Fair." (I—Persia. By Clarence Andrews, Assistant Commissioner for Persia. 1,100 words. II—Canada. By George Stewart. 1,900 words.) *North American Review*, May.

"Great Britain at the World's Fair." By James Dredge, British Royal Commissioner. (3,000 words.) *Engineering Magazine*, June.

"Steam Engines at the World's Fair—I." By George L. Clark. (Describing the Allis, Lane & Bodley, Wolf, Watertown, Dick & Church, Harrisburg Ideal and other engines. 17 pages, including 16 illustrations.) *Cassier's Magazine*, May.

"Telegraphy at the Exposition." By Robert H. Rogers. (2,000 words.) *Chicago Sunday Herald*, May 20.

"The Electrical Fountains at the World's Fair." (7,000 words and 20 illustrations. See also correspondence relating thereto, page 402, June 3.) *Electrical World*, May 13.

"The Department of Machinery at the Fair." By L. W. Robinson, chief of the department. (2,000 words.) *Illustrated World's Fair*, June.

"Art at the Columbian Exposition." By Ernest Knaufft. (14 pages, 29 illustrations.) *Review of Reviews*, June.

"Transit Facilities in Chicago and on the Fair Grounds." By Henry Haven Windsor, editor of the *Street Railway Review*. (3 pages, 4 illustrations.) *Review of Reviews*, June.

"The Forthcoming Conventions and Great Gatherings of 1893, at Chicago and Elsewhere." (9 pages, 11 illustrations.) *Review of Reviews*, June.

OBITUARY NOTICES.

James Bowstead Williams. (Died in New York, April 1. 350 words.) *Electrical Engineer*, May 10.

Walter T. Glover. (Died in London, April 27. 360 words.) *London Electrical Engineer*, May 5.

James Ford Lumsden. (Drowned near Salina Cruz, Mexico, May 1. 150 words.) *London Electrical Review*, May 12.

Dr. Mathaus Hipp. (Died at Zurich, May 3. 60 words.) *London Electrician*, May 12.

M. Frank Gerald. (200 words.) *London Electrical Review*, May 12.

Sir James Anderson. (Died in London, May 7. 1,300 words, steel engraved portrait; also remarks by President Preece, at the meeting of the Institution of Electrical Engineers. 400 words.)

Moses Gerrish Farmer. (Died in Chicago, May 25. 2,700 words and portrait.) *Electrical Engineer*, May 31. (See, also, Obituary. 1,000 words.) *Religio-Philosophical Journal*, June 3.

Edward Alfred Cowper. (Died in London, May 9. 700 words.) London *Electrical Engineer*, May 19.

E. J. Burt. (Died in Sao Thome, May 11. 100 words.) London *Electrician*, May 19.

A. W. Meston. (Died in St. Louis, May 12. 400 words.) *Western Electrician*, May 20.
