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waists, H. Greenberg et al.....	9,008
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a medicine, C. W. Johnson.....	9,013
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Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list. For terms and further particulars address Munn & Co., 361 Broadway, New York.

NEW BOOKS, ETC.

THE MANUFACTURE OF LAKE PIGMENTS FROM ARTIFICIAL COLORS. By Francis Jennison, F.I.C., F.C.S. London: Scott-Greenwood & Co. New York: D. Van Nostrand Company. 1901. 8vo. Pp. 136. Price \$3.

The term "lake color" is used to distinguish pigments made from dye stuffs and coloring matters by precipitating the coloring matter as an insoluble compound which can then be used for pigmental purposes to distinguish them from natural pigments, such as ochre, amber, etc., and from chemical colors manufactured by direct combination or decomposition of distinct salts, e. g., such colors as lead chromates, Chinese blue, emerald green, etc. This is a very valuable treatise and is accompanied by plates containing samples of papers treated with lakes. There are sixteen plates. It is a most successful and valuable contribution to the literature of technology.

MANUFACTURE OF MINERAL AND LAKE PIGMENTS. By Dr. Josef Bersch. London: Scott-Greenwood & Co. New York: D. Van Nostrand Company. 1901. 8vo. Pp. 476. Price \$5.

The present volume contains directions for the manufacture of all artificial artists' and painters' colors, enamel colors, soot and metallic pigments and is a text book for manufacturers, merchants, artists and painters, and is translated from the second revised edition by Arthur C. Wright, M. A. We hardly knew any branch of chemical technology which has made such wonderful advances of late as the manufacture of colors. A large number of pigments have been recently discovered, distinguished by beauty of shade and permanence. The chemists are continually endeavoring to replace handsome and poisonous colors by others equally handsome but non-poisonous. The author has avoided the receipt "fetish" and has endeavored to make clear to the reader the chemical processes to which regard must be had in the manufacture of the different pigments. The treatise is the best we have ever seen upon the subject.

ALASKA. NARRATIVE. GLACIERS, NATIVES, Vols. I. and II. By John Burroughs, John Muir and George Bird Grinnell. New York: Doubleday, Page & Co. 1901. Pp. 383. Price \$15 net.

The present partly volumes are a very choice example of the bookmaker's art. They are beautifully printed and bound and the illustrations are of a high order and are well executed, and the color work being especially fine. It is a book which will appeal to all students of travel and exploration and natural history. The Harriman expedition was one of these happy thoughts which sometimes occur to those whose position enables them to benefit the world at large by the outfitting of such an expedition. The papers are all written either by three authors, or by specialists such as Professors E. E. Fernow, Henry Gannett, C. Hart Merriam and William Healy Dall. The scientific aspect of the expedition is never forgotten for a moment, and the collaboration of these eminent scientific men has resulted

in a unique contribution to scientific literature which will prove of permanent value. The book is withal very readable.

MUNICIPAL ADMINISTRATION. By John A. Fairlie, Ph.D. New York: Macmillan & Co. 1901. 8vo. Pp. 448. Price \$3.

Cities are the mark of civilization advancing beyond the stage of self-sufficing agricultural villages. They bring forward entirely new problems, and how to treat them has been the study of thousands who are called upon to govern our cities. Some of them are wisely governed, and some the reverse, but there is no question that a book like the present, placed in the hands of the mayors of cities, would prove its great worth. The whole organization of the city is taken up, and each phase of the subject is discussed in a broad and rational manner.

RECOVERY WORK AFTER PIT FIRES. By Robert Lamprecht. New York: The D. Van Nostrand Company. 1901. Pp. 171; 7 plates. Price \$4.

The above volume is the result of long experience in various mines in different parts of the world. It is a practical mining work. The author, after an introductory chapter giving the causes of fires in coal mines, devotes the remainder of his book to preventive regulations, methods of extinguishing, appliances for working in irrespirable gases, and means for rescuing imprisoned miners.

THE RISKS AND DANGERS OF VARIOUS OCCUPATIONS AND THEIR PREVENTION. By Leonard A. Parry, M.D., F.R.C.S. New York: The D. Van Nostrand Company. 1901. Pp. 192. Price \$3.

This work sets forth the essential risks and dangers of the most important English industries, the mode of onset of diseases caused by some of them, together with the chief symptoms, and measures which may be taken by employers and employes to prevent such diseases. As most of the industries mentioned are followed in America also, the book is to be commended to our employers of labor and workmen.

GAS AND COAL DUST FIRING. By Albert Putsch. Translated from the German by Charles Salter. New York: The D. Van Nostrand Company. 1901. Pp. 122; 103 illustrations. Price \$3.

This work is a complement of the author's two previous treatises on the subject, which dealt with gas-firing and smoke-consuming devices that had been patented up to 1885. It is a critical study of the various patented systems from that time up to the present, reviewing what has been done in this field and closely examining the practical importance of the different patented devices for burning this fuel.

ENGINEERING PRACTICE AND THEORY. By W. H. Wakeman. New Haven, Conn.: Published by the author. 1901. Pp. 170; 28 illustrations.

The author describes the various types of modern compound engines and gives thorough instructions for the engineer as to their handling and care. The book is a valuable one for engineers and others who have the care of steam engines.

MANUAL OF ELEMENTARY SCIENCE. By R. A. Gregory and A. V. Simmonds. London and New York: Macmillan & Co. 1901. Pp. 425; 260 illustrations.

This book was designed with the purpose of providing a repertory of experiments illustrative of the fundamental principles of physical, chemical, and astronomical science. It contains numerous experiments capable of being performed with simple apparatus by students and teachers unfamiliar with laboratory methods. It is divided into numbered sections corresponding to definite ideas, various aspects of which are first illustrated by experiment, and then dealt with descriptively. This method has also been carried out as far as possible in the astronomical part of the book, and is, so far as we know, the first attempt made at teaching astronomy inductively. The book is furnished with suitable exercises and questions, and will be of service to all beginners in science.

TECHNICAL GAS ANALYSIS. By Frank H. Bates. Philadelphia: Philadelphia Book Company. 1901. 16mo. Pp. 98. Leather. Price \$1.

The first of a series to be known as The Industrial Gas Series. The author is an expert of the subject, and the book seems to be an eminently practical discussion of a somewhat difficult subject.

CONDUIT WIRING AND ERECTION. By L. M. Waterhouse. London: S. Rentell & Co. 16mo. Pp. 66.

AN INTRODUCTION TO MODERN SCIENTIFIC CHEMISTRY. By Dr. Lassar-Cohn. Translated by M. N. Pattison Muir, M.A. New York: D. Van Nostrand Company. 1901.

This work is in the form of popular lectures suited for University extension students and general readers. The book can be followed easily by anyone who takes a serious interest in natural science. It gives a succinct and accurate presentation of chemistry on strictly scientific grounds. The illustrations are executable.

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Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(8555) W. S. asks: Is it possible to consume all the oxygen in a confined quantity of air, viz., in a sealed iron pipe? A. Yes; by placing copper scraps in the pipe and heating the air in the pipe. The oxygen combines with the copper, forming a solid substance, and leaving the nitrogen uncombined.

(8556) M. J. M. asks: 1. I have a folding camera 4 x 5, with lens 1 5-16 inches in diameter. Can I use it for a 5 x 7 camera? A. To cover a 5 x 7 plate a lens with a focal length of about 8 inches is used. 2. How can I remedy a ground glass which has become blurred and spotted by water and breathing on it? A. Wash it with soap and water, and afterward do not handle it. 3. Is there any paste made that can be used on squeegee prints that has but little water or moisture in it, for it will spoil the print? A. There are many formulas in the photographic books for pastes or mountants made of gelatine. These do not penetrate the paper very much. 4. Can you give me the formula for flash-light powder? A. Flash-light powder is finely powdered magnesium. You should buy it from photographic dealers. 5. Will you please tell me what is the matter with my intensifying solution. I made it as per directions, but after it had stood several days it became crystallized at the bottom and shaking would not dissolve it. A. The water is saturated with the substances employed in the formula. Filter the solution. It is not injured by the crystals. 6. I have a lot of trouble with my exposure. I cannot always time it just right. Which would be the best for me to do—to get an exposure meter or an exposure book in which I would have to register every exposure? A. Nothing but experience and a careful study of the light can enable you to expose properly. You cannot become a photographer by the use of a meter or a book. It is, however, well to record the conditions of our exposures, so that we may study them and improve by our experience. Keep an exposure book by all means. 7. I wish to become proficient in the art of photography. What book or books would you advise me to procure to advance in that direction? A. We recommend and can supply you with the following books relating to photography: "The Amateur Photographer," by Wallace, price \$1; "A Manual of Photography," by Brothers, price \$6, post free. 8. Is there any way to burnish my prints and keep the card from curling without a burnisher? A. We do not know of any way of burnishing without a burnisher. Most amateurs use paper which has no gloss, such as velox, platinum, bromide, etc. 9. Is it necessary to have a license to sell pictures? A. Some cities may require a license for selling anything. We do not think a license is required to sell a photograph any more than to sell a penny whistle you may have made. 10. Can you give me the address of some firm that has good lenses? A. See our advertising columns for addresses.

(8557) C. M. writes: 1. I want to use a call bell in kitchen, battery to be in second story, from which run two wires. I want one push button in one room, one in second room, one in parlor, one in room down stairs, also one in dining room—five push buttons; how could I connect all buttons to work properly with only one bell? A. Carry one wire from one post of the battery to the bell, and from the other side of the bell a wire which shall branch through each push button to the other side of the battery. There will then be a complete and separate circuit through battery, bell and a push button. 2. I have one lamp, 8 candle power, 26 volts: could I light it with 14 cells improved standard Fuller battery? If so, how about the amperes it will use with 26 volts? A. You probably can light the lamp when the battery is freshly charged. 3. How old is Mr. Edison? Also, who was the first that invented the electric light? I mean both the arc and incandescent lamp? A. Mr. Edison was born February 11, 1847. The first man who ever saw a spark from artificially excited electricity is said to have been Otto von Guericke in 1660. This was the first electric light. Sir Humphry Davy is credited with first producing an electric arc light in 1801. He had a battery of 3,000 plates, each four inches square, and used charcoal points

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made of wood, which he immersed in a mercury bath to increase the conductivity. With this he melted many refractory substances, lime, platinum, sapphire, diamond. The man who first heated a wire red hot had the first incandescent lamp. We do not know who he was.

(8558) H. E. G. asks: 1. What causes the humming sound heard at the receiver of a 'phone during a long-distance connection (New York to Philadelphia)? A. The running of the dynamo at central by which the system is worked. 2. Would not an alternating current (high tension) circuit parallel to 'phone wire have a tendency to cause such effect? A. Yes. The transposing of the line wires on the poles destroys the induction effect from currents upon parallel lines. 3. What is the object of transposing telegraph circuits? Are they affected by induction? A. The effect of transposing line wire is as given above, in answer to question 2. 4. Why did such a long time elapse between the discovery of electro-magnetic induction (1831) and the invention of the dynamo (1867)? A. The world was not ready for it. 5. Are single-phase alternating current circuits ever operated on the three-wire system of distribution? A. We do not know whether this has ever been tried.

(8559) J. H. L. asks: I have a long-distance telephone in my office. A portion of the day the office is locked and I am engaged in another room about one hundred feet distant, where I cannot hear the bell ring. How can I arrange to hear the signal in the latter room without having a second long-distance 'phone installed? Can I fix up a separate two-battery call telephone that will transmit the sound from one room to the other, thus notifying me that the bell is ringing? A. You can have a second bell put in so that the call shall ring in both places all the time. Or you can switch out the second bell when you do not wish it to ring. Many physicians have such an arrangement for night calls, placing the extension bell in their sleeping room.

(8560) J. T. H. asks: 1. If you rub with flannel a stick of sealing-wax held in the hand, it becomes electrified. If similarly you rub a rod of brass it does not become electrified. Explain the differences. A. The wax is an insulator, the brass is a conductor, and its electricity flows off as fast as it is generated. Insulate the brass and it can then be charged. 2. Is it possible to obtain a magnet with a single pole? A. No. 3. Can you magnetize a steel ball, 3 inches in diameter, and where is the equator? A. Yes. If symmetrically magnetized, the equator will be at the largest place between the two poles and equidistant from them.

(8561) W. F. R. writes: Is it not a fact that wireless telegraphy was known and practiced (experimentally) as much as fifteen to twenty-five years ago? I remember reading (I think in SCIENTIFIC AMERICAN) of some one who succeeded in sending a message a distance of eleven miles between mountain peaks in Virginia. A. Wireless telegraphy has been known much more than twenty-five years. Between 1840 and 1850, Prof. Joseph Henry made this record in a published paper: "A single spark from the prime conductor of a machine of about an inch long, thrown onto the end of a circuit of wire in an upper room, produced an induction sufficiently powerful to magnetize needles in a parallel circuit of iron placed in a cellar beneath, at a perpendicular distance of 30 feet, with two floors and ceilings, each 14 inches thick, intervening." This was not the sending of a message, but the man who did this was not far from sending messages in the same way. He also placed a coil 5 1/2 feet in diameter against a door and at a distance of 7 feet from another coil of 4 feet diameter. Shocks were felt in the tongue from the terminals of the second coil when the circuit of a battery of eight cells was broken in the first coil. This was sending signals with the tongue as a receiver. In 1885 Mr. L. J. Phelps installed a system of telegraphing to trains on the railway between Mott Haven and New Rochelle, N. Y. The message was sent along a wire between the rails and received in the baggage car of the moving train, wherever it happened to be along the line. This was soon replaced by the Edison system, and this was employed by the Lehigh Valley Railroad in running its trains. A man who was connected with this system has recently stated in print that he had received messages by it at a distance of 10 miles from the line, using a wire fence to receive with. In subsequent experiments the same writer states: "A large induction coil similar to that used by Marconi was used, and 10 to 20-mile messages were of common occurrence."

(8562) T. W. B. asks: Can you inform me what length secondary spark it would be necessary to have in order to transmit wireless messages to a distance of 2 1/2 miles overland, using other apparatus described in SUPPLEMENT 1363? I have about 45 feet elevation for radiators. Can you refer me to a SUPPLEMENT giving directions for constructing such an induction coil? A. We do not know the exact length, nor do we advise anyone to build a coil which would only give the exact length for the distance he supposes at present he will send a message. It is better to have a reserve of power at hand. We should not

(Continued on page 215)

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(8566) K. S. A. asks: Is there any method known by which a picture or outline can be thrown on a screen in daylight, on the principle of the magic lantern, without making the room dark? For instance, could the outline be thrown on as a shadow? A. A lantern slide can be thrown upon a screen in a room by daylight if an electric arc lamp is used for an illuminant. It will not be as distinct as if the room were darkened, but still it can be distinctly seen.

(8567) W. E. F. asks: What would be the apparatus necessary to charge a storage battery from a trolley wire of an electric railway, and what size battery for 5 horse power motor to run say 10 hours; and about what would the outfit cost, and how long would it take to charge it? A. You will require half as many storage cells to run your motor as the volts taken by the motor, since each cell will give 2 volts. To obtain the number of amperes you will need, divide 746 by the voltage of the motor. This gives the amperes for one horse power hour. Multiply this by 5 and by 10, and you will have the ampere hours required for 5 horse power for 10 hours. Now go to the electric railway company and ask them to fit you out to charge the battery. We do not know the cost, nor do we know exactly what you will need. But the engineer of the company will know.

(8568) L. E. A. K. asks: 1. Is the current that leaves a telephone in talking the battery or an induced current? A. An induced current. The induction coil is to be seen in the box of the transmitter in many forms of apparatus. 2. Are telephone generators alternating or direct current? A. The magneto generator by which the call bell is rung is an alternating current machine. 3. Can a direct current be transformed from a higher to lower or lower to higher without going through a rotary transformer? A. Yes; by an induction coil it is transformed to a pulsatory current in one direction.

(8569) C. C. McC. asks: Do you publish a work on the construction of voltmeters and ammeters that would enable one to construct one for use on an isolated plant? A. SUPPLEMENT No. 1215, price ten cents, will give information for the construction of a voltmeter and ammeter which may answer your purpose.

(8570) S. C. asks: 1. A party of us visited an electric plant. The electrician attached to the end of the poles of the dynamo two large pieces of iron, then inserted them into a saline solution, saying he would boil water, but I thought what he called boiled was only the decomposition of the water to H₂ + O. Am I correct? A. Both decomposition and heating of water takes place, and the water is soon heated to boiling. 2. The electrician said if the two pieces of iron at the end of the poles were to touch one another, it would blow up the dynamo. In that case what would cause it to blow up? A. If the plates were brought to touch each other, the resistance would be brought so low that an enormous flow of current would take place (Ohm's law), and this would heat the dynamo so that the wire would soon melt, unless there were a fuse which would blow and cut off the current. It would not be an explosion in any ordinary sense of the term, but a burn-out. We cannot change your dates unless you send full address.

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