exaltation of the vegetation, but to the detriment of the quantity of fruit, its size and its earliness. (3) Violet glass gives a larger number of fruits, but small and of inferior quality and somewhat late. (4) Red, blue, or green glass are injurious to the vegetation of plants.

Habits of the New Zealand Kea.—In the last number of the Zoologist Mr. Taylor White gives some interesting information about the kea (Nestor notabilis), the New Zealand parrot that is so often cited as an example of a graminivorous bird that is capable of becoming carnivorous, and that has the reputation of attacking sheep in order to consume the very delicate fat that surrounds their kidneys. Mr. White lives in New Zealand and has been able to make a close observation of the bird under consideration.

According to him, the kea lives mainly upon lichens and not upon fruit and seeds, for it is found only at a distance from and outside of forests, upon rocks and bare ground. Like other animals that have not yet made the acquaintance of the natural perversity of man, the kea did not fear the latter at first, but allowed itself to be approached, captured, and caressed. In captivity it eats bread and meat. Its very powerful bill permits it to gnaw the strongest wooden bars of a cage. As for its carnivorous habits, Mr. White says: Toward 1861, sheep were introduced, and some years afterward it was observed that a certain number of them were dying, and upon the back of these, behind the shoulders, or at the level of the kidneys, a wound was perceived.

At the end of some time it was discovered that the offender was the kea, which always preferred animals with a long fleece, as it could obtain a better hold on these with its claws. It never seems to seek grain or meat, has never been seen around a dead animal, and the probabilities are that it drinks blood. What has been said of the kea, then, is probably true; it attacks sheep. But it is naturally carnivorous, for to the fruit and seed that it may meet with it adds insects. It has not, then, changed its diet in adding the sheep to its bill of fare, but has simply extended its depredations. It has generalized.

BEHRING'S law says that the blood and blood serum of an individual which has been artificially rendered immune against a certain infectious disease may be transferred into another individual with the effect to render the latter also immune, no matter how susceptible this animal is to the disease in question.

Railways as Infringers of Patented Articles.

The announcement that the Siemens-Halske Electric Company, of America, has brought suit against the Metropolitan West Side Elevated Railway Company, of Chicago, to restrain it from infringing their patents covering the third rail and contact system of propelling electric cars, will probably create more or less envy in the breasts of the manufacturers of railway supplies for the steam roads of this country. For it is a fact that as matters now stand these manufacturers do not dare to sue steam railroads, even if the infringement is of the most flagrant character. This is a strong statement, but unfortunately it is true, and it goes without saying that a great injustice is thereby being done to manufacturing interests.

The steam railroads of this country have organized what is known as the Eastern and Western Railway Association, one of whose duties is to furnish to the roads that are members opinions on patents covering articles that are offered to them for purchase. This is an important duty, and was undertaken to protect the railroads from damages incurred from ignorantly or thoughtlessly using patented articles that were infringements. It is a wise provision, and rightly carried out should be satisfactory to all concerned, as it acts to protect alike the rights of the manufacturer and the purchaser. But it soon came to be understood that he who sued a member of one of these associations would incur the displeasure of the other members and might find it difficult to do any business with them. This has been held to be a reasonable restriction to place upon sellers of railway supplies, and it is conceivable that if every one was perfectly fair in such matters, no harm would be done. Unfortunately, the implied rule has operated to make some roads careless, and it is charged that others have deliberately taken advantage of it. They feel, says the Railway Master Mechanic, that they will not be sued in any event, and they therefore are disposed to use any device that meets their fancy, leaving the manufacturers to fight out the matter among themselves. The firm whose patents are infringed thus sees railroads patronizing concerns making articles which expert opinions from the railroad's or association's attorney would pronounce infringements.

And what course can such a firm pursue? It dare not sue the railroad, for if it does, it antagonizes other railroads not already involved, and its business may suffer thereby. If it sues the manufacturer, the railroad goes on buying from the latter under promise of protection from damages, and from the profits of such sales the infringing manufacturer fights his case. The suit may drag for several years, and when decided in his favor, he is unable to collect damages from the irresponsible concern, and can only look back over several years of damaged business and expensive litigation, which represents the expense of wiping out the unfair competition. It is needless to say that when railway officials are interested in the infringing concern, there are further complications.

It is in the power of railway officials to remedy this state of affairs. To remove the implied restriction relating to suits against railway companies may not be necessary, but it does appear that unless this is done justice requires the greatest care be exercised in the purchase of supplies that may possibly be infringements.

Mark Twain's Yell.

Mark Twain, who recently started on a tour round the world, told an interviewer at Winnipeg how he often felt a desire to "cut loose" from civilization and to get away by himself where he could run and yell to his heart's content. In this connection there is a story about the humorist and Canon Kingsley. Walking along the streets one day, Mark felt the impulse to yell coming on him with irresistible force, and said to Kingsley, "I want to yell, I must yell." The canon said, "All right, yell away; I don't mind." "And with that," said Mark, "I stepped back a few steps, and, throwing my arms above my head, let out a war whoop that could be heard for miles, and in less time than you could count Canon Kingsley and myself were surrounded by a multitude of anxious citizens who wanted to know what was the matter. I told them nothing was the matter. I just wanted to yell, and had yelled."

Centenarians in France.

A census of centenarians recently taken in France gives 213 persons of one hundred years or over, 147 of them women and 66 men. The oldest was a woman who had just died at one hundred and fifty, in a village of the department of Haute Garonne. Nearly all the centenarians belonged to the lowest ranks in life.

THE British Institution of Civil Engineers, in its instructions for preparing papers to be read at its meetings, requests that the use of the personal pronoun be avoided. This will be sad news to those who are fond of detailing the performances of little "I," and will tend to abbreviate many of the presented documents.

RECENTLY PATENTED INVENTIONS.

Railway Appliances.

TRAIN PIPE COUPLING.—Frank R. Bischoff, New Castle, and John C. Baird, Cheyenne, Wyoming. In clutch couplings adapted for automatic engagement and disengagement, these inventors have devised an improvement whereby, when the cars are uncoupled, the train pipes of the opposing cars will separate readily, the ribs of the male sections leaving the prongs of the female sections. Each end of the pipe has a forked or U-shaped extremity, and the forks are drawn out until collars come in contact with stops, when the couplings part, leaving the forks projecting beyond the ends of the drawheads and in position for re-engagement. The improvement affords a quick, sure, and strong coupling, with a tight and positive interlocking engagement between the opposing sections.

RAISING AND LOWERING CAR WINDOWS.—Horace Holbrook and Thomas S. Beals, Jr., Coupeville, Washington. This is a pneumatic device by means of which the windows may be raised or lowered by air pressure from the air brake pipes. At each window is a piston fitted to slide in a cylinder and having its piston rod connected with the window sash, while pipes from the air brake system connect with the upper and lower ends of the cylinder on opposite sides of the piston, and a valve controls the admission of air to either end of the cylinder to force the window up or down.

Electrical.

TELEGRAPHIC VIBRATOR.—Paul La Cour, Askovshus, Denmark. This invention relates to vibrators producing different electric signals by generating intermittent currents to act upon distant vibrators having only the same speed of vibration. The essential point of the invention is the use of a body, as a pendulum, in its normal position in contact with a vibrator, but when the latter is set in motion the pendulum body is pushed forward and held by a catch, establishing thereby a different electrical condition, and causing a signal to be transmitted until the pendulum body is returned to its normal position.

DISTRICT TELEGRAPH AND TELEPHONE SYSTEM.—Edgar E. Salisbury and Albert E. Dean, Tacoma, Washington. This invention combines with district telegraph call boxes and central office apparatus a telephone system for verifying the signals of the call box and giving orders for messengers, saving the time of the messenger in going to the home of the subscriber. One of the arbors of the call box has a telephone-supporting lever to wind the actuating spring of the call box by the weight of the telephone, but capable of being lifted by the spring when the lever is released by the removal of the telephone. A telephone cut-out is operated by the supporting lever, and there is a key for grounding the line at either side of the call box.

ELECTRIC GENERATOR ATTACHMENT.—George W. Pickett, Denver, Col. According to this improvement, the dynamo has the usual commutator, and an auxiliary commutator has whole and half contact rings, a pair of brushes being oppositely arranged to contact with the half ring, a brush to contact with the whole ring, and mechanism for giving an irregular speed to the auxiliary commutator. The improvement is designed for use in connection with reciprocating plungers working in connection with solenoid or other magnets oppositely arranged and adapted to reciprocate between them a plunger which can be utilized for working a rock drill or other reciprocating mechanism.

LINEMAN'S VISE.—John Ryan, New York City. This is a hand vise in which the jaws present a maximum of bearing surface and have a parallel movement, while they may be readily manipulated either to open or close them. One jaw is fixed and the other movable, an adjusting screw engaged by a nut being connected to the fixed jaw, and there being a spring connection between the nut and the movable jaw. The vise is designed to be particularly useful in running electric or other wires.

Mechanical.

VALVE GEAR.—Millard F. Hill and Clifton W. Easley, Henrietta, Texas. This is an improvement in gears in which but a single eccentric is used, there being devices by which the eccentric may be shifted on the shaft and locked in various positions to effect a reversal or a stoppage of the engine with a full head of steam on, and to run the engine in either direction. The automatic or non-automatic reversals are so arranged as to not interfere with each other.

VALVE.—George W. Graffin, Allentown, Pa. Two valves are movably mounted in a casing and adapted to be seated on the valve seat when moved in different directions, while an abutment movably secured in the casing opposite the valve seat is adapted to be engaged by each valve when moved. The improvement affords a double valve arrangement, either adapted for use in the ordinary way to open or close the valve, and one valve being removable for repairs while the other is kept in use. The valve may be easily taken apart for repairs, and works positively.

PIPE JOINT.—Michael Sexton, New York City. To unite pipes without threads cut on their ends, and without solder, calking, or flanges, this inventor has devised an improvement comprising a sleeve in the ends of which screw exteriorly threaded collars having at their inner ends bevels, while wedge-shaped rings are engaged by the bevels of the collars and pressed upon the pipe periphery at or near the pipe ends.

Agricultural.

SUBSOIL PLOW.—Peter Heintz, Grand Island, Neb. The subsoil attachment, according to this improvement, comprises a share and an adjustable shank, a shoe being connected with the mould board of the share to prevent its springing, while breakers are attached to the mould board to pulverize the soil, and a cutter at the front of the shank extends down to the land side to break the ground as the plow penetrates it. The attachment may be applied to any plow, and the upper section of the shank may be adjusted to accommodate itself to any shape or position of handle, standard, or other support.

SULKY ATTACHMENT FOR PLOWS.—John A. Duttera and Joshua F. Flickinger, Hanover, Pa. This attachment is applicable to any form of plow having a beam, being adjustable to plow beams of different shapes and sizes without cutting or boring into them. Means are also provided for simultaneously adjusting both the running wheels of the sulky, to raise or lower the plow or lift it entirely out of the ground, or for adjusting only one of the wheels to adapt the sulky for use on a hillside.

Miscellaneous.

TREATING ZINC BEARING ORES.—Edgar A. Ashcroft, Broken Hill, New South Wales. This inventor has devised a combined electrolytic and leaching treatment of sulphide ores and products, by which the oxidized ore is first leached with a solution containing ferric salt, to precipitate the iron and dissolve the zinc, then electrolyzing the resulting zinc-bearing solution by first passing it around metallic cathodes to precipitate the zinc and around iron cathodes to impart a ferrous salt to the solution, the ferrous salt being subsequently raised to the ferric state to regenerate the original ferric salt solution. The process is also suitable for the treatment of zinc oxide ores or the admixtures of zinc oxide with any matrix having no objectionable influence on the various operations.

ARROWHEAD SHAPED VESSEL.—Mark Golinsky, St. George, Bermuda. An improved form of hull designed to afford increased speed and steadiness is provided by this invention. The bow or front portion of the hull presents in plan view the form of an arrowhead, and the body of the hull at the rear of the bow is at all points of less width than the widest portion of the bow. The screws or other propelling means are located behind the angles of the arrowheads on each side.

MUSIC LEAF TURNER.—William E. Somers, Sag Harbor, N. Y. By means of this apparatus the leaves of a book or sheet music may be readily turned from right to left or left to right. At each side of the center of a shaft are adjustable spurs engaging by means of a trip a swinging arm which engages the sheet, while a spring-controlled rack is operated by a pinion, there being a connection between the rack and a key. By this improvement the leaves are quickly and conveniently turned, the pages being sure to be presented as desired.

BINDER FOR NEWSPAPERS, ETC.—Joseph W. Wood, Baraboo, Wis. A cord secured to the binder frame, according to this improvement, forms longitudinal rims, and strips are pasted down on the cover over the outer rims of the cord at opposite sides of the frame, whereby the cover is secured to the frame, the whole device forming a simple, durable and inexpensive binder for loose papers, pamphlets, etc.

BATH.—Fernando Ponce, Tulancingo, Mexico. This inventor provides a bath which will permit of applying a shower or jet with a constant pressure for a few seconds or any length of time desired, the pressure under which the water issues being readily regulated. A water barrel in which moves a piston is surrounded by a tubular standard, perforations in the upper part of the barrel leading into the space between the barrel and its tubular casing, while a weight connected to the piston has guided movement on the standard, and discharge pipes are adapted to receive the water forced out of the barrel by the weighted piston.

CAMP STOOL.—Henry Leovy, New Orleans, La. This is a stool which may be readily folded up for conveniently carrying about in the form of a cane. It has a center piece adapted to receive the ends of two sets of rods, the lower set forming the legs and the upper set supporting a canvas seat.

HAIR CURLER.—Herman Neumann, New York City. Short or long hair may, by the use of this device, be clamped and wound around a support in a manner to produce a curl, a retaining member of the device being at the same time manipulated to maintain the hair in its curled position around the support.

SHOE BLACKING.—John B. Bernard, St. Paul, Minn. This blacking is designed to produce a lustrous shine with but a few strokes of the brush, while it does not soil any article coming in contact with the shoes, and will keep the leather pliable. Among its constituents are boneblack, muriatic acid, linseed oil, sugar, gelatine and borax.

CUSPIDOR CLEANER.—Alfrid Larson, Wausau, Wis. This is a device arranged to be opened and rotated after insertion into the cuspidor, to clean the inside. It consists of a two-part spherical brush carried by a shaft and handle in such a way that the brush head may be conveniently spread out or opened.

Designs.

RECEPTACLE FOR COINS.—George and William Benze, New York City. In a suitable base is a circular figure having a concave, disk-like appearance, in the center of which is a representation of a coin, medallion, or the like.

SASH LOCK.—Adolphus A. Shields, Huntsville, Ala. The leading feature of this design is a novel and ornamental form of head, with parts convenient for engagement by the thumb or fingers.

GLASS VESSEL.—Harry T. Broden, Brooklyn, N. Y. Two design patents have been issued to this inventor for somewhat similar glass dishes of a highly ornamental character, in which prisms cross one another at different angles, in connection with conical panels, cross panels and checkering, affording prismatic star figures, etc.

HEATER.—John T. Cullen and Leslie P. Grimes, Clinton, Iowa. The lower or tank portion

of this heater is oval in plan, and a transverse arch rises centrally in the tank from its bottom, extending between the front and rear walls.

DISPLAY STAND. — Jefferson D. Goddard, Kaneas City, Mo. This stand comprises a base and vertical standard carrying at its top a pennant, while midway is an irregular, box-like figure with open sides and vertical partitions, the central portions of the top and bottom of the box-like figure being higher than the side portions.

TRIMMING. — Friedrich Hassenpflug, New York City. According to this design, loop-like wings extend at angles one to the other, in groups, radiating from a common center.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

THE METALLURGY OF IRON AND STEEL. By Thomas Turner, Associate of the Royal School of Mines. Vol. I. The Metallurgy of Iron. London: Charles Griffin & Company, Limited. Philadelphia: J. B. Lippincott Company. 1895. Pp. 367. 8vo. 80 illustrations. Price $5.

This is a volume of Griffin's Metallurgical Series, which is edited by Professor W. C. Roberts-Austen. C.B., F.R.S. The present work is one of a series of treatises on metallurgy written by associates of the Royal School of Mines. The history of the manufacture of iron and steel is treated more fully than is usual in metallurgical treatises, as is also the section dealing with foundry practice and with the reactions of the puddling furnace. The author has paid particular attention to these branches of the subject. A special chapter has been devoted to the corrosion of iron and steel, as this is a subject of great importance in connection with the permanence of modern structures. The special bibliographies are of great value, giving references not only to books, but to periodical literature as well. The work abounds with tables and other data, some of it heretofore unpublished, which cannot but prove of value to all who are engaged in manufacturing iron, and to the student of metallurgy as well.

TEXT BOOK OF THE PRINCIPLES OF PHYSICS. By Alfred Daniell. M.A., LL.B., etc. New York and London: Macmillan & Company. 1895. Pp. 782. 8vo. 257 illustrations. Price $4

This is the third edition of Daniell's Physics, a work which, since the publication of the first edition in 1884, has achieved a most enviable reputation. The work is a recognized standard wherever the English language is understood. It is withal one of the most readable works on physics among those not intended for popular use. The plan of the work is that of a gradual progression from the simpler to the more complex subjects. No preliminary knowledge of principles is assumed, and every effort is made to attain lucidity of expression. The aim of the author has not been to build up a mere compendium of physical facts, but rather to put the reader in possession of such principles as will enable him with small difficulty to apprehend and appreciate these facts. The present edition includes the sixth thousand, which speaks very well for a scientific book which does not appeal to a popular reader. The arrangement is admirable, and many of the facts printed in small type are of the greatest value. An excellent bibliography is provided.

IRRIGATION FARMING: A HANDBOOK FOR THE PRACTICAL APPLICATION OF WATER IN THE PRODUCTION OF CROPS. By Lute Wilcox. New York: Orange Judd Company. 1895. Pp. 312. 12mo. 95 illustrations. Price $2.

Irrigation has become an important factor in modern agricultural pursuits, and it is becoming more or less essential in all parts of the country, so that the need of more specific knowledge regarding it has led the author to write the present book. By means of this work any one can set about constructing an irrigating plant of any given capacity and can proceed to irrigate his land intelligently and correctly. The book is primarily written for and adapted to the use of our Western farmers, but it will prove equally valuable to the farmers of the South and other sections of the country. The text is clear and concise and cannot but be of value to the farmer. The concluding portions of the book give an admirable review of the common law of irrigation and a glossary of irrigation terms.

A GUIDE TO SYSTEMATIC READINGS IN THE ENCYCLOPEDIA BRITANNICA. By James Baldwin, Ph.D. Chicago and New York: The Werner Company. 1895. Pp. 316. 8vo. Price $2.

Although the Britannica has long been recognized as one of the greatest of reference books, and although its possessors may never have consulted it without complete satisfaction, its full value has seldom been recognized. It is usually regarded simply as a repository of general information to be kept at hand for consultation as occasion may demand. While this is the ordinary use of the Britannica, it may be utilized in such manner as to perform the office of a great educational agent. The present work shows how this may be done. The plan has been to direct each individual how to draw from this great storehouse of knowledge that which will cover with all desirable completeness the line of work in which he is most interested. This is done by an elaborate series of references which have been arranged according to the subject. The work is an admirable one and is worthy of great success.

PRIMER OF PHILOSOPHY. By Dr. Paul Carus. Chicago: The Open Court Publishing Company. 1895. Pp. 232. 12mo. Price 25 cents.

It is not expressly designed to give instructions to beginners in philosophy, but it is nevertheless available for that purpose. The uninitiated student will not be bewildered or mystified, in perusing its pages, by unintelligible phrases. The subject is presented with great simplicity, so that the leading idea may be gathered by a glance at its contents. The most essential technical terms are explained, and the high practical importance of philosophy is never lost sight of. The point of view adopted by the author is new to the extent that it cannot be classified among the schools of recent thought. It represents rather a critical reconciliation of rival philosophies of the type of Kantian apriorism and John Stuart Mill's empiricism.

JUSTUS VON LIEBIG: HIS LIFE AND WORK, 1803–1873. By W. A. Shenstone, F.I.C. New York: Macmillan & Company. 1895. Pp. 219. 16mo. Portrait. Price $1.25.

The name of Liebig is familiar to all who are in any way acquainted with the science of chemistry, but many will doubtless like to have had a clear idea of why chemists admire and esteem him. The author has found that the prevailing impression concerning Liebig was that he was a man who gained a large fortune by making extract of beef. He has, therefore, made it his object in writing this little book, not so much to dwell upon Liebig's private life as to tell what he was, what he did and why all chemists and those who are versed in the history of science admire and esteem him so greatly. The work is written in admirable style and gives details of his great discoveries in pure chemistry, fermentation and agricultural and physiological chemistry.

WASHINGTON; OR, THE REVOLUTION. A drama founded upon historic events of the war for American independence. Part I. By Ethan Allen. Chicago: F. T. Neely. 1895. Pp. 212. 12mo. Illustrated. Price 50 cents.

This drama is divided into two parts; each part consists of five acts. The chief aim of the author has been to secure to the reader a personal intimacy with the actor in the great struggle which made the United States of America.

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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.

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Minerals sent for examination should be distinctly marked or labeled.

(6629) J. R. says: Will you kindly tell me through your valuable columns how to make a hair stain from walnuts? A. The simplest form is the expressed juice of the bark or shell of green walnuts. To preserve the juice, a little alcohol is commonly added to it with a few bruised cloves, and the whole digested together, with occasional agitation, for a week or fortnight, when the clear portion is decanted, and, if necessary, filtered. Sometimes a little common salt is added with the same intention. It should be kept in a cool place. The most convenient way of application is by means of a sponge.

(6630) G. W. H. says: Will you kindly publish the process of making beef, iron and wine? A. Liebig's extract of beef ½ ounce avoirdupois, ammoniocitrate of iron 256 grains, spirit of orange ½ fluid ounce, distilled water 1½ fluid ounce, sherry wine sufficient to make 16 fluid ounces. Dissolve the ammonio-citrate of iron in the water, dissolve the extract of beef in the sherry wine, add the spirit of orange and mix the solutions.

(6631) J. E. S. asks: Does a wheel go around the axle? Does the outside of a wheel go around the hub? A. There is much misapprehension in the numerous phases of this class of questions. A wheel as a whole does not go around the axle, although all of its parts revolve around the axle when it is running. The hub turns with the rim, and although there is no change of relative position of parts of rim and hub, yet it may be truly said the rim goes around the hub, for every part of the rim is consecutively on every side of the hub.

(6632) H. E. H. asks how to estimate the force of a blow made by a steam hammer, when the end of piston serves as the hammer; also would there be much diminution of the force of the blow, if transmitted through another piece of metal held tightly against the object to be hammered? Is there any way by which the force of a blow from a hammer actuated by a spring can be determined? A. The force of a blow in a steam hammer, and other forces, are explained and the method of computation carried out with examples in SCIENTIFIC AMERICAN SUPPLEMENT, No. 862. There will be a considerable diminution of the force in transmitting a blow through another body, depending upon its weight and rigidity. Cast steel, when hardened, being the most rigid of the metals for transmitting a blow. The force of a blow from a hammer actuated by a spring may be known by the method of computation for a steam hammer; the weight and the actual pressure of the spring, with the acquired velocity, being the elements for computation, as shown in the article on "Impact or the Force of Percussion," in the SCIENTIFIC AMERICAN SUPPLEMENT as above named.

(6633) G. M. asks for a rule used for calculating the contents of a barrel. A. To find the volume of a cask of any form. Add together 39 times the square of the bung diameter, 25 times the square of the head diameter, and 26 times the product of the diameters. Multiply the sum by the length, and divide by 26,470 for United States gallons.

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