

THE ROYAL NATURAL HISTORY.

Edited by Richard Lydekker, B.A., F.R.S. Illustrated with 72 colored plates and 1,600 engravings. (London and New York: Frederick Warne and Company, June, 1895.) Published in 1s. parts. We reproduce two illustrations recently drawn for this work, namely, the Narina trogon and the Brazilian motmot.

Natural History Notes.

Remarkable Eye Structure in a Fish.—Mr. W. Tegetmeier has recently called attention to a fish which is very curious as regards the organization of its eyes, of which, like its congeners, it has two, although it well merits the name (tetraophthalmus) that attributes four to it. This fish has extremely bulging eyes, and when it is swimming upon the surface, as is its custom, half of the eye is above the surface of the water and the other half beneath the latter. Even externally, something abnormal is observed in these eyes. In fact, from the conjunctiva there starts a horizontal band of a dark color that divides the eye into two parts—an upper and a lower. But the division is more profound still. There is a sort of halving of the pupil so as to form two, an upper and a lower, to which correspond a common iris that tends to a division, in the sense that a fold of this membrane separates the upper iris from the lower. But all this would not permit the animal to see in the air as well as in the water were there not added a special arrangement of the crystalline lens. The crystalline of terrestrial animals has the form of a lens, but, in order to see in water, it requires a nearly spherical one. The Anableps possesses both such forms. Mr. Stewart, who has carefully dissected the optical organ of this curious fish, shows that the crystalline lens itself is likewise halved, the upper part being lenticular, while the lower part, beneath the conjunctival band, is nearly spherical. There is, therefore, in this case a very marked adaptation, the upper part of the eye being adapted for vision in the air and the lower part being conformable to the type required by vision in water. It is very probable that the structure of the upper half is acquired, although it would be difficult to prove the fact. Perhaps such adaptation might be made to disappear by causing the fish to live entirely under water.

Staining the Wings of Insects.—In No. 4 of volume I of the Biological Review of Ontario, Dr. H. W. Hill gives the following method, devised at the request of Dr. Brodie, of staining the veins in the wings of certain insects: Place the whole insect in a strong alcoholic solution of fuchsin and allow it to remain there for forty-eight hours. Then transfer the insect to water with a pair of fine forceps and wash it until no more color comes away, changing the water if necessary. While the washed insect floats in clear water slip a microscope slide under it, raise the slide, holding the insect on it with a fine needle, separate the wings from the body with a fine scalpel and remove the body. With a drop or two of clear water on the slide float the wings into any desired position, keeping them flat and unwrinkled, taking care to have no bubbles under them. Remove any excess of water with blotting paper and allow the wings to dry. Then place a drop of thick Canada balsam near them and heat the slide over a spirit or gas flame. Tilt the slide so that the now liquefied balsam flows over the wings; lower a cover glass gently into position, and allow the preparation to cool. On examination the veins will be found red, the depth of the coloring varying with the length of time of staining, the thickness of the veins, etc. The

color is well retained, so far as has been tried, and successful photographs have been made.

Heredity in the Color of the Hair of the Horse.—Mr. Wilckens, of Vienna, has found that two pure blooded English horses transmitted the color of their coat to their progeniture in 586 cases out of 1,000. When the parents are of different colors, the offspring are almost always of the color of the mother.

With Arabian horses, the facts are more striking still. The white color of the coat of the mare was found to be clearly transmitted in 729 cases out of 1,000. In other cases, there was a more or less marked mixture.

A Swimming Insect.—In 1864 Sir John Lubbock published in the Transactions of the Linnean Society, of London, an interesting note upon the Polynema natans. This hymenopterous insect has the habit of making use of its wings after the manner of fins. Since the above named epoch, the Polynema has been but rarely observed. Last month a correspondent of Science Gossip met with it anew and had an opportunity of observing it close by. He finds that the insect swims very well with its wings and moves about in the water at will in all directions.

Laccase in Plants.—Mr. G. Bertrand finds that lac-

of the whole. Besides, where with small seeds four successive crops are obtained, we have six with large seeds, their evolution occurring with greater rapidity.

An Instance of Intelligence in Ants.—The January number of Revista Brasileira, a monthly magazine just started at Rio Janeiro, contains an interesting note upon the intelligence displayed by the so-called sauba ant (probably Ecodoma cephalotes). It seems to be the general opinion that these ants spare the coffee trees that grow about the ant hills. They enjoy the shade afforded by these evergreen trees, whose roots penetrate their galleries, and hence endeavor to preserve them, despoiling only those which furnish them no protection. The writer of the note referred to witnessed near Rio an interesting exhibition of the intelligence of these insects. A "Rosinante" lodged in a stable built of boards was being daily defrauded of a portion of his rations by the saubas. We quote, says Insect Life, from a translation from the Portuguese kindly sent us by Mr. J. C. Branner:

No sooner was the corn put in the feed trough than the scouting ants announced the fact, and a line of workers was immediately established, and, penetrating by the cracks between the boards, they came out, each one loaded with a grain of corn, with which it descended on the outside. In this descent there was a reëntrant angle, difficult to cross; a single worker stationed itself there and undertook to help the others over. It did this by taking part of the weight of the grain of corn and backing across ahead of its companion until it had got it in a safe place. After helping one it returned to meet another, and continued this apparently voluntary task as long as this systematic robbery lasted.

Animal Life in Thermal Springs.—In the Lincoln (Neb.) Evening Call of April 6, 1895, Professor Lawrence Bruner records under the above heading the receipt from Hon. John C. Hamm of living lar-

væ captured by Mr. Hamm in a hot spring in Uinta County, Wyo. The larvæ were found in a cup-shaped depression in the top of a small cone about twenty inches high, situated a few feet from a large sulphur mound or "dune," under which the boiling water could be heard rumbling. Through small apertures in the bottom of the cup hot water rose and overflowed the edges, and it was in this cup filled with hot water that the larvæ were found. The temperature of the water, Mr. Hamm states, was so hot he could not hold his hand in it, and he estimates that it was not more than twenty or thirty degrees below the boiling point. The larvæ belonged to the dipterous family Stratiomyiidae.

It is to be regretted that the temperature in this case was not taken with a thermometer for comparison with previously recorded cases of this kind. Mr. Bruner cites the statement of a Mrs. Partz (Rept. U. S. Geol. Surv. for 1878, Pt. II, p. 358) who saw "in springs in Owens Valley, Cal., a spider-like animal and small red worms in water having a temperature of 124° F."

To this may be added Mr. H. G. Hubbard's statement in a letter published in the Canadian Entomologist of 1891 (p. 226), that in the Yellowstone National Park he saw a little Salda running about the edges of springs which were actually boiling. He also observed two species of Nebria living under pieces of geyserite "even on the sides of the cones of the largest spouting geysers, where they were liable to be washed away in a flood of boiling water." Professor A. S. Packard (American Naturalist, 1882, p. 599) also records such a case, he having received from a Mr. Griffith the larva of a Stratiomyia found in a hot spring in Gunnison County, Col. In this case the temperature of the water is stated to have been 157° F.—Insect Life.

Growth of Plants Under Colored Glass.—It is well known, from experiments, that certain luminous rays exert a favorable influence upon vegetation, while others have an injurious action. It has been asserted that the orange colored light corresponding to the absorption spectrum of chlorophyll has a peculiarly marked action. Professor Zacharewicz, of Vancluse, has experimented with glass of various colors in the forced culture of strawberry plants, and reaches the following conclusions:

- (1) The finest and earliest fruit is obtained under ordinary glass.
- (2) Orange colored glass produces an



BRAZILIAN MOTMOT.



NARINA TROGON.

case, the ferment originally found by him in the latex of the Tonquin lacquer tree, exists in a number of other plants. Thus, it occurs in the roots of beets, carrots, turnips, and dahlias, potato tubers, young asparagus stems, lucerne, clover and rye grass, the leaves of artichokes and beets, the fruits of apple, pear, quince, and chestnut trees, etc.

Longevity of the Pike.—According to the Eleveur, one of the pike of the aquarium of St. Petersburg is considered by a competent zoologist to have been hatched toward the end of the fifteenth century. Despite its 400 years of captivity and its age, it seems to be in excellent health.

Seeds and Germination.—The question of the influence of the size of seeds upon germination and upon the size of the plant that springs therefrom has been recently studied anew by Mr. B. R. Galloway, a summary of whose conclusions is given by the Gardeners' Chronicle. The weight and size of the seed are of great importance. A large seed germinates better and more quickly, and, with it, one can count upon having at the same moment from 85 to 90 per cent of the total crop, while with small seeds the crop reaches maturity only in successive periods of time, so that at no moment, in gathering the crop in toto could we have the same proportion

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 ribs, 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 weight of the 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.—Herma 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 them 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