THE TRAINING OF ZEBRAS.

Some time ago, there appeared in the Revue des Sciences Naturelles Appliquées a note upon the training of zebras, and which read as follows: "An attempt has several times been made, with more or less success, to tame adult zebras. A merchant of the Transvaal, a short time ago, bought eight of these animals, still young, that had been lassooed two months previously. At the end of a couple of months, two of them had been thoroughly broken in as draught animals. In their gait was combined both strength and sureness." This note was signed "S.," and was immediately followed by these few lines added by the editor: "It is not without interest to recall that the training of the Burchell zebra (Zebra Burchelli) has been accomplished at the Jardin Zoologique d'Acclimatation. These zebras did the hauling work of the zoological establishment of the Bois de Boulogne for several consecutive years, and worked daily in the interior service."

By what means is the zebra trained? It would be interesting to make some researches into this subject, and that is the object of the present article.

We shall say in the first place that there are zebras and zebras. In fact, there are three species of zebras, which are principally distinguished by their coat and which are somewhat different in character. All three belong to Southern Africa.

The zebras, says Brehm, stand midway, by their carriage, between the horse and the ass. They have a thickset body, a strong neck, the head of both the horse and the ass, quite long and wide ears, a straight mane, with hair that is not so coarse and thick as that of the horse and not so soft and flexible as that of the ass. Their tail is tufted at the extremity and their hoofs are oval in front and rectangular behind. The coat of all the species known is in great part striped.

The zebra properly so-called (Hippotigris zebra) has the entire body striped, inclusive of the legs. It lives in the mountains of Southern and Eastern Africa, from the Cape as far as to Abyssinia.

The dauw (H. Burchelli) has a strongly striped head and body, but the legs are uniformly white. It lives upon the plains of Southern Africa and ascends to the steppes comprised between the tenth and twelfth degree of north latitude.

The quagga (H. quaccha) is the species of which the coat is least striped. The rump, thighs, belly and legs are not striped, and it is the species that most nearly approaches the horse. It inhabits the plains of Southern Africa, but does not ascend so far toward the north as the dauw.

The zebra properly so called is the one that possesses the most intractable disposition, and the one that has long been considered as untamable. The museum of Paris, nevertheless, once owned a female of this species that had been captured when young, and that had belonged to the governor of the Cape. It was very gentle and allowed itself to be approached, led and mounted.

According to Brehm, the quagga is the species that allows itself to be tamed most easily. At the Cape, says he, it is often seen in company with draught horses, and in England Sheriff Parkins had a pair that could be harnessed to a small carriage: yet Cuvier speaks of a quagga that was owned by the museum and that remained wild and untamable.

The dauw also is easily tamed, and the young born in captivity can especially be trained without much difficulty.

It is usually a question of this when we speak of trained zebras.

The processes employed for training zebras are the same as those in use for horses, and the experiments made at the Jardin d'Acclimatation have demonstrated that gentle methods succeed better than harsh ones and than the true breaking-in process. This was shown by Mr. Saint-Yves Menard, then sub-superintendent of the Jardin d'Acclimatation, in a communication upon the subject made to the Societe d'Acclimatation in April, 1874.

The effort was first made to familiarize the dauws by treating them as horses, and not as menagerie animals that are fed and then left to themselves. Halters were carefully put upon the animals, and then they were tied in stalls alongside of one another and separated by simple partitions.

The idea afterward occurred to interpose horses between the zebras, and, by putting to profit the instinct of imitation that all the equidæ possess, one succeeded in grooming them, as they had seen the operation performed upon horses without the latter offering any resistance; and it is undeniable, as Mr. Menard says, that an animal scarcely tamed gradually assumes confidence at the approach of man when it sees its neighbor reassured.

The dauws thus showed themselves more familiar every day. They were so calm that no stable accident occurred, and allowed themselves to be groomed regularly, with the brush and currycomb. After these results were obtained they were set at liberty now and then upon a lawn surrounded with a wire fence, and quickly learned to know the way to it and how to return to their stalls.

Nothing further was done for five months. It was but little in appearance, says Mr. Menard, but it was much for us who could appreciate the daily progress of familiarization, and who know all the importance of it. A few premature experiments in harnessing taught us, moreover, that training ought not to be begun before their complete taming. On the contrary, the sequel demonstrated to us that, this first result obtained, each dauw in turn very readily submitted to training. Gentleness and patience were powerful means, while force and brutality could only retard us.

Six months after the arrival of the dauws, it was considered possible to begin experiments in harnessing, and for this purpose two females that seemed to be the most gentle were selected. They had already been prepared for it by being harnessed up in the stable. They had been habituated to wearing a small saddle, a collar and then a bridle, and afterward to receiving a complete double draught harness. They made a resistance at first by leaps and sudden motions, and tried to bite when the bridle was put upon them, but thanks to the vicinage of the horses, they were triumphed over.

Once accustomed to the wearing of harness, they were led out into the garden one by one with the harness upon their back. What was curious was that it was difficult even for two men to hold them by the lunge. They had not yet complete confidence, while their ordinary keeper could easily, by himself alone, hold them in check in making them walk before him. He soon walked them in this way in pairs, and accustomed them to walk side by side as in double harness, to feel the bit and to allow themselves to be driven.

Nothing was simpler afterward than to complete the harnessing. A light break was wheeled up behind the animals, and by directing the pole with caution it was possible to fix the traces, etc. This was not very well done in the first place, but the thing became easy after the animals had got accustomed to the two or three assistants employed. It necessitated flat straps to prevent plunging, but nothing more, for plunging was the sole opposition offered by the animals, which were neither restive nor timorous, and which pulled quite regularly.

One turn of the garden was made at first, and afterward two, three and more circuits. Then one went into the alleys of the Bois de Boulogne, into the Avenue Neuilly crowded with carriages, and finally into the streets of Paris. After several exercises in walking, the zebras were put to the trot. Finally, at the end of three months' training, they made a trip from the garden to Place de la Concorde on a trot.

A few months later on, and always by the same means, one succeeded promptly in getting useful work out of the three subjects, which finally took rank with the best animals of service in the Jardin d'Acclimatation. They were harnessed to the dirt cart and were employed regularly every day in hauling earth and manure into the interior of the garden, and they even drew heavy loads from the Batignolles Station, provided they were always harnessed and driven by the same gentle and patient men.

It became likewise easy to shoe them by means of the trave, a well-known apparatus of farriers and veterinary surgeons, and very useful in the shoeing of or operating upon vicious horses.

Thus, it may be said that it is quite easy to train the zebra through gentleness. It is possible to succeed in harnessing them two and three abreast (see figure), but no other means gives the same results, and this fact was proved at the time that the dauws under consideration were trained at the Jardin d'Acclimatation.

A very skillful horse trainer, Mr. C., proposed to Mr. Geoffroy Saint Hilaire to take three of the zebras in question and put them in harness and train them. His services were accepted without the directors of the garden giving up their own experiments; and three animals were confided to him in January, 1873. He was to receive a fixed amount upon the day that he should drive two dauws harnessed to a break, on a sustained trot, without a stop or gallop, from the Jardin d'Acclimatation to Place de la Concorde, and then, after a rest, from Place de la Concorde to the Jardin.

It never became necessary to pay him the award, but the experiment was none the less interesting and permitted of comparing the means employed at the garden with opposite ones. Mr. C. had received the dauws in good condition, well fed, vigorous and incompletely tamed. In order to submit them to training immediately, he had to fight them. Instead of inspiring confidence, he made himself feared. Acting by means of contention, he had recourse to weakening by diet or insufficient food.

With a two-wheeled cart he made prisoners two dauws in three shafts and then three dauws in four shafts, so that one of the animals desiring to struggle or free himself was held by the others. Moreover, he drove them brutally, in speaking to them in a severe tone and whipping them vigorously.

Briefly, at the end of four months and a half he had obtained but a mediocre result. After attempting to harness two of the animals to the break, he gave up the idea of obtaining his award, and returned to the garden three fatigued, impoverished animals, less familiar perhaps, and not in a state to be utilized. It took one of them more than eight months to regain its normal plumpness.

However, Mr. C. had shown to what point man can submit dauws to his influence He had conquered the animals rather than tamed them, but it is none the less true that at the end of four days he had been able to present one of them led by the bridle. He had even submitted these animals to exercises at liberty in a riding school.

It must be remarked, says Mr. Menard, after the account of the training that has just been read, that in such a case influence ceases with the man who has exercised it and is not transmitted. When the Jardin d'Acclimatation took back the animals that had been intrusted to Mr. C. it required some time to familiarize them anew with their guardian.

On the contrary, these same animals, treated with gentleness, readily allow of the substitution of one driver for another, as those trained at the garden with kindness have proved.

Thus, then, upon the whole, the basis of the training of wild animals, as well as of domestic ones, is gentleness combined with patience and, of course, firmness.—La Nature.

ZEBRAS HARNESSED THREE ABREAST.

A Curious Potato.

A correspondent from Somerset, Pa., Mr. W. M. Schrock, sends us a specimen of a last year's garnet potato, which, having sprouted, potatoes grew on the parent potato. On each side of the original potato are slits, from which protrude the new growths. On removing one of these other potatoes, others are seen in the heart of the original.

Photographing the Moon at Lick Observatory.

The great telescope of the Lick Observatory is not only a powerful instrument for seeing the heavenly bodies, but it is also a powerful camera for photographing them. The object-glass is three feet in aperture, and it was, until very recently, the largest in existence. A supplementary lens, thirty-three inches in diameter, is provided, which can be attached to the telescope just in front of the thirty-six inch lens. When it is so attached, the combination becomes a great photographic camera—the largest in the world—which is especially suited to do certain classes of work. One of the things which it is particularly well fitted to do is to photograph the moon, and for the past few years considerable time has been devoted to making negatives of the moon during the course of a lunation—from new to full moon. As the shadows on the moon change materially during a few hours, it has been necessary to make a set of such pictures every hour or so, and the whole series gives a very perfect representation of the lunar topography as it is now. By comparing these photographs with others previously made (Rutherfurd, Draper, De la Rue), and more especially with photographs which will be made in the future, it will be easy to detect any important changes which occur in the lunar surface. It is certain such changes must occur, since gravity is constantly working on the moon, as on the earth, to pull down existing structures; and it is to the study of changes that we have to look for a more intimate knowledge of lunar conditions. An accurate plastic representation of the moon's surface is a prerequisite for such a study, and it will be seen that the photographs of the Lick Observatory, when properly examined, afford every desired datum. Most of the photographs made by previous astronomers were on too small a scale and were not precise enough in definition to afford the necessary accuracy. The enlargements from our negatives meet every want, and enable us to construct a satisfactory map of the moon on a scale of ten feet to the moon's diameter. One inch on such a map corresponds to about seventeen miles, or one seventeenth of an inch to one mile. A map of California on this scale would be about forty-one inches long.

The original negatives made in the focus of the large telescope are a little over five inches in diameter. They are extremely beautiful as mere pictures, especially when copied as transparencies on glass. Everything that the telescope will show is contained in these originals, but the scale is still so small that minor features cannot be distinguished. A mile on the moon is only a few thousandths of an inch on the negative, for example. Hence they must be enlarged to be of use. Without enlargement they are of small scientific value. —Dr. Edward S. Holden, in McClure's Magazine for October.

A New System of Medical Treatment.

We all know what homeopathy and allopathy and hydropathy are, but probably few know what the new "pathy," isopathy, is. The word is applied to the medical treatment of diseases of the several organs of the body by the corresponding organs, or preferably extracts of them, of animals. Thus diseases of the brain would be treated by an extract of the healthy brain of an animal, such as an ox; diseases of the spinal cord by an extract of the spinal cord of some animal, and diseases of the heart by an extract of the heart of an animal. While the system is comparatively new to modern scientists, it actually is "as old as the hills." Two thousand years ago it was hinted at by Hippocrates, was mentioned by medical writers in the middle ages and was described at length fifty years ago by a German physician named Hermann. The system died out and attracted little or no notice until about two years since, when it was revived by Dr. William A. Hammond, a celebrated physician of Washington, D. C., Surgeon-General of the United States Army. By a long-continued maceration of the brain, the heart, the spinal cord, etc., for a year or more, by processes that have been fully described in medical journals, principles contained in these organs, but in an inert form, are extracted and modified in a manner similar to that effected within the human body.

These principles are rendered practically indestructible by time. Dr. Hammond says that organic beings possess the power of assimilating from the nutritious matters which they absorb the peculiar pabulum which each organ demands for its development and sustenance. The human body, as well as the body of any animal, makes no mistake in such selection. The brain absorbs such principles as are necessary to sustain its strength; so do the heart, the liver, the muscles, etc. In certain diseased conditions these organs lose the power of selecting the principles which they need, and sickness and sometimes death ensues. The object of the administering of all medicines is to hold disease in check while nature effects a cure. Medicines in themselves cannot cure. Nature alone can do this. The principle of isopathy, therefore, differs from that of other "schools" essentially in the manner in which the remedies are to be introduced into the physical tissues requiring them. The established schools introduce the medicines generally through the stomach, thus requiring more or less time for their active principles to be assimilated with the organs affected. In isopathy the remedies are brought into immediate contact and assimilation with the organ, without being required to pass through the digestive system. This is the main difference, though there also is a difference in the character of the materia medica. It is by the direct injection into the blood of the peculiar matter that an organ requires that isopathists hope to do away with the performance of many vital processes which now are accomplished only by the expenditure of a greater or less amount of vital force.

As an illustration, suppose a person to be suffering from an exhausted brain brought on by overwork. No matter how judiciously the patient attempts to live up to the rules of health, the condition continues. If the concentrated extract of the brain of a healthy animal be injected into the blood of the patient, the pabulum which the organ requires is at once supplied. This rule is applicable to every other organ. Just what success will attend the workings of the new system is conjectural. It is claimed that as far as it has been tried it has been followed by a surprising amount of success. The new system, if it eventually prove to be as great a success as at present indicated, will not interfere with the established schools of medicine. It will be an aid to all and may be adopted by the homeopath and the allopath alike without the abandonment of any of the fundamental principles so dear to the adherents of the different schools.—Troy (N. Y.) Press.

Penny-in-the-Slot Gas Meter.

This is a gas meter in which automatic vending mechanism is used, so that a user of gas may purchase a certain amount of gas by simply placing a coin in a receiver, which is so connected to the meter as to allow a certain number of feet of gas to be used for a given amount. For instance, the apparatus is arranged to receive silver quarter dollars, and is so connected to the meter mechanism that, if the gas is selling at $1.25 a thousand cubic feet, the mechanism would be so timed that upon the insertion of the quarter dollar, 200 feet of gas could be used before the mechanism of the meter would be stopped; five quarters can be fed into the apparatus, so that $1.25 worth of gas, or 1,000 feet, can be paid for at one time. By this means a person can pay for gas in small installments, rather than wait until the sum accumulates.

RECENTLY PATENTED INVENTIONS.

Railway Appliances.

REFRIGERATOR CAR.—Charles S. Hardy, San Diego, Cal. This invention provides means for supporting ice, the devices being adapted to fold out of the way in the car when not in use. The ice box is formed of folding hinged members, a drain guard below the box swinging into and out of position for use. The parts fold and unfold in a simple and secure manner, and provision is made to prevent the drippings from soiling the contents of the car, and to avoid the clogging of the drain pipe, while the whole apparatus is designed to promote economy in the use of ice.

SWITCH.—Charles L. Lincoln, Brooklyn, N. Y. To hold the switch point or rail steadily in position without actually locking it, and in a convenient and easy manner, is the object of this invention. The switch rail is also so arranged, in reference to the car track, that it will lie normally in closed position, and when opened by mechanism on the car will be automatically shifted back by contact with the car wheels. The switch rail has a rearwardly extending ribbed tail piece, and a contact block is held to slide at right angles to one of the siding rails, there being a lever connection between the contact block and the tail piece whereby the pressing out of the block actuates the tail piece and moves the switch rail.

SWITCH WORKING MECHANISM.—This is a further patent of the same inventor, for a mechanism carried by and operated from the car, whereby the switch may be opened or closed at will by turning a crank and operating a treadle on a moving car. Beneath the car platform are vertically swinging levers carrying shifting devices, pivoted hangers supporting the levers and a cross bar connecting the hangers, while on the car is mounted a crank shaft having operative connection with the cross bar.

CAR FENDER.—William L. Shockley, Colorado Springs, Col. This fender is held beneath the forward end of the car and the car platform, and is normally supported so as to pass freely over any ordinary obstruction on the track, but it may be instantly released and caused to spring downward into close contact with the track, even though the car is running very fast. The fender itself is a sort of flat, skeleton scoop, having side straps, and the mechanism by means of which it is held up or thrown down on the track is of a simple and inexpensive character, readily operated from the car platform.

CAR BRAKE.—John C. Miner, Smyrna, Neb. This invention dispenses with the use of brake beams, and provides a simple mechanism for setting the brakes quickly and firmly against the wheels, while at the same time track brakes are forced down upon the rails to slightly lift the truck and prevent the wheels from sliding. Vertically movable racks, operated by a lever and gear mechanism, are carried by the car truck, and brake shoes carried by a portion of the racks engage the car wheels, while a second set of brake shoes carried by the other racks are adapted to engage the track rails.

Electrical.

TELEGRAPH KEY AND SOUNDER.—Philip D. Cox, Jasper, Fla. This invention provides an extremely simple and efficient instrument in which the key is pivoted on a threaded stud whose lower end screws into the base to which are attached the sounder and magnet, the stud extending through a hole in the key, above and below which are nuts, a spring resting on the lower nut and pressing the under surface of the key.

FRICTION BRAKE.—Bergen Davis, Newark, N. J. This device consists of a magnetized drum with a periphery composed of pole pieces separated from one another by a diamagnetic material, electromagnets connected with the pole pieces having consecutive pole pieces of opposite polarity, while a metallic strap or shoe is held for attraction to and frictional engagement with the drum. The amount of braking effect, from a gentle friction up to locking the wheels, is controlled by a rheostat on the platform of the car.

CONDUIT FOR ELECTRIC RAILWAYS.—Michelangelo Cattori, Rome, Italy. Combined with corresponding adjacent sections of each of the conductors is a rotatable circuit closer having a surface partly of insulating and partly of conducting material, with stationary contact pieces adapted for continuous sliding contact with the surface of the circuit closer, the contact pieces and the insulating and conducting portions of the circuit closer being so arranged that the adjacent sections of one conductor are connected when the corresponding sections of the other conductor are disconnected. A high degree of safety is thus assured and sparking is avoided, while one or both rails of an existing track may be utilized as conductors.

Agricultural.

DISK CULTIVATOR.—Andrew L. Brock, Lockhart, Tex. This machine may be used with or without supporting wheels, and in operation cuts stalks or trash while cultivating the ground. The disks are substantially cup-shaped, and turn in brackets or hangers, each disk frame carrying a disk cultivator at each end, the disks being adjustably connected with their frames and also with the main frame of the machine. The disks may be set in any desired position to throw the dirt to or from the rows, and may be carried close together or farther apart to regulate the width of the strip to be cultivated.

Miscellaneous.

RAISING SUNKEN VESSELS.—Edward M. Arnold, Pawtucket, R. I. According to this invention a vessel employing the improvement has a short chain cable firmly attached to it about amidship, there being a strong button on the end of the chain, and attached to the button is a coil of rope at the end of which is a float or buoy, the latter rising to the surface when the vessel sinks and indicating the locality. A specially devised grapple is employed to send down the rope to which the buoy is attached, the grapple sliding over and engaging the button, when the hawser, to which the grapple is attached, may be drawn upon and a firm connection established with the sunken vessel, to be afterward raised by the ordinary means.

CREVASSE CLOSER.—Mathias A. Laska, New Orleans, La. For closing breaks in dams, etc., this invention provides for the pivotal connection of an arm with one of the posts already driven into the ground, and for its detachable connection with one of the posts to be driven, the arm being adapted to carry the post down into the water and hold and guide it into position, permitting of properly driving the post from above. A skeleton frame is also provided to pass between adjacent posts, cross bars projecting at the ends to rest on the front faces of the posts to hold the frame in place.

PUMP.—Charles Rumley, Helena, Mont. This is an improvement on a formerly patented invention of the same inventor, providing a powerful pump of simple construction, but with a valve of less surface motion, and a spurcut-off, which, in connection with the valve, absolutely prevents leakage. There is no intricate mechanism in the pump to become clogged, so that it may be used to pump water filled with mud, sand, etc., and it may be worked in either direction, its ports being used alternately as suction or discharge ports, according to the movement of the pump piston.

PUMP VALVE.—Truckson S. La France, Elmira, N. Y. To prevent the valve packing from being forced into the throat of the port is the main object of this invention, which provides a simple form of construction especially designed for the valves of steam fire engine pumps. The valve seat has an outer bearing and a central bearing on which is a pad or cushion, and fitted to the outer bearing is the valve proper, under which is a supporting plate arranged to abut against the cushion of the central bearing when the valve is closed, the supporting plate being formed to nearly fill the port or valve space when the valve is closed. The packing or valve proper is thus relieved of pressure, and a thinner or weaker rubber may be employed without danger of its breaking down.

LATCH AND LOCK.—John MacLachlan, West Hoboken, N. J. A tubular case, consisting of two semi-cylindrical sections, receives and supports in working condition the improved latching and locking devices designed by this inventor, in very compact, simple, and cheap form, quickly applicable to any door of moderate thickness, the improvement affording an excellent knob latch and lock combined, or a latching device alone, if this is preferred. A lock of this kind may be conveniently adapted for the use of different keys.

GRATE.—Lee R. Andrews, Bath Beach, N. Y. This grate consists of a series of revoluble cylindrical grate bars, strips forming bearings for the shafts of the bars, which are connected by gear wheels with each other. A perforated hood is removably held on one of the strips to cover the gear wheels, the hood having dovetail parts engaging grooves in the bearings of the shafts to lock the latter in place on the strips. The improvement gives the operator complete control of the burning fuel, permitting of conveniently raking it and removing clinkers.

WIRE SUPPORT FOR BEDS OR SEATS.—Gustav Dominick, Cologne, Germany. This invention provides, within a suitable frame, two series of springs running crosswise of each other and essentially parallel to the sides of the frame, the springs of one series being fastened to the frame at both ends, while the springs of the other series are secured at one end only, the other ends being guided in eyes formed preferably by twisting the springs of the first series into coils. The springs of the two series supplement each other in their action, each series yielding to a certain extent, and a mattress made of springs so arranged yielding to the slightest pressure.

CLEANING MACHINE.—William Hebb, Cambridge, Vt. This is a machine especially designed for cleaning pails, tubs and similar vessels. It has a platform with standards in which vertically moves a slide adapted to be raised and lowered to move the brushes into and out of the pail or other vessel to be cleaned, a shaft journaled in the slide carrying a crank arm, by which, through a bevel gear connection, the heads carrying the brushes are revolved. The vessel to be cleaned is locked in position by a clamping and centering device.

CHOCOLATE DIPPER. — Cyprien Gousset, New York City. This is a device to be used for dipping cream drops into a chocolate solution to give them the desired exterior coating. It consists of an open frame crossed by parallel wires, a series of cups formed of serpentine or zigzag wires crossing the frame and resting at their upward bends upon the cross wires, while a second series of serpentine zigzag wires at right angles to the first series have their downward bends crossing the downward bends of the first series. It is adapted to carry a large quantity of cream drops and hold them so they cannot be displaced until perfectly coated.

FOOD SCREEN.—John H. Rhoads and Gustave H. Spannagel, Nokomis, Ill. This is a cheap and simple screen to be placed upon a table to cover the food and all else on the table. The screen frame which holds up the screen may be easily knocked down and snugly packed. It consists of a horizontal base frame, open at one end, arched bars pivotally connected therewith, and a longitudinal rod connecting the arched bars at the top of the arch, locking bars securing the frame in position to hold up the screen.

TEETHING RING.—Martin L. Metzger, New York City. This invention provides for the connection of an unbroken ring with a rubber nipple in a simple and inexpensive manner, whereby the ring will be very durable. The stem is bent upon itself to form two opposing members, a transverse aperture in the lower bent portion receiving the ring, to insert which the opposing members are sprung apart and the ring forced down to its socket.

CIGAR PACKAGE. — Samuel Roman, Montreal, Canada. This package is preferably triangu-