[BOSTON COMMONWEALTH.]

Latest News From Mars.

Mr. Lowell's four lectures on the planet Mars were heard by crowded audiences of people who filled every seat and all the standing room in Huntington Hall. For once, we got the very latest advices from that planet. The observatory in Flagstaff, as our readers know, was established by Mr. Lowell himself, and the position of Mars in the last summer gave him opportunity to make such observations as have never been made before, and to reveal to us what are marvels indeed. The result, as our readers know, is the firm conviction in his mind that intelligent beings occupy the planet Mars, who know how to work in the common good, who have contrived public works of vastly larger extent than we of the earth have dreamed of, and have carried out their contrivances with a precision and strength wholly unknown in mundane affairs.

It is impossible in print to describe the charm of Mr. Lowell's lectures. His humor, his ready wit, his complete knowledge of the subject with which he deals, are such as one has no right to expect in the same public speaker. The most serious considerations are made interesting by analogies with affairs with which we are familiar and in which we are at ease. Everybody knows how light his pen is when he writes of his travels, and his ease as a public speaker and the readiness with which he takes his audience into his confidence give an additional charm to the lectures as he reads, or rather, as he delivers them.

There are not more than twenty people in this earth who have seen what he has seen. Even some of the great observatories of the world are so situated that they have not noted the marvels which the Flagstaff observatory has revealed to us. But truth is truth, and it matters but little whether at this moment it have twenty apostles or two thousand. It is certain that the revelations which the Flagstaff observatory has made from its signal station to the world are revelations which will be accepted.

It was Mr. Lowell's good fortune to reveal the relations of what he calls so well the "oases" with which the great canals of Mars communicate. These "junctions," shall we say, where two, three, four or even seven canals meet each other, seem to be the fortunate spots on the surface of Mars where one supposes that the inhabitants live in luxury, which they have secured for themselves by the diligent work, perhaps, of ages upon ages in the past. That is to say, an "oasis"—and of the oases one dares not say how many there are; they are to be counted now by hundreds—an oasis is a circular or oval spot, perhaps of a hundred and fifty miles in diameter, of living green. Its green is so dense and dark that when we are forty million miles from it, its rich verdure may still be made out, if we have an air as clear as they have at Flagstaff. The readers of the Commonwealth must not regret that this green fades away in its season. They must remember that Boston Common to-day does not present, even to their own eyes, the same aspect with which they regarded it in July or in August. It cannot be doubted that in the period of vegetation these strong-minded and strong-limbed men have been able to lay up, perhaps, the barrels of flour, perhaps the bales of manioc, perhaps the bananas or oranges, with which in the long winter of Mars they shall make life tolerable and even luxurious.

Mr. Lowell, with great humor but with absolutely accurate mathematics, showed to his hearers how large and tall and strong the Martian people might be. The attraction of gravitation is only one-third what we have here. The mathematical reader will see at once, if he be an anatomist as well, that there is no reason why the men should not be nineteen feet tall and why the Venus of Milo of Mars should not be sixteen or seventeen feet high. The physical power of this man is as great in proportion, his memory of the past may be more accurate, as it would seem that his foresight for the future is more sweeping. So it is that a population quite as dense, we may believe, as the population of this world, a population which has not spent, apparently, most of its history in mutual throat cutting and constant quarreling, has achieved the marvels of irrigation and vegetation which we see upon the planet Mars to-day. EDWARD E. HALE.

RAILWAYS in Holland are carefully managed. Accidental deaths on them average only one a year for the entire country.

CLOUD PHOTOGRAPHY.

The difficulties in obtaining good cloud effects in pictures are very well known to photographers. To the majority a good photo with a fine cloudy sky is an exception, not to say an accident. We think it is not

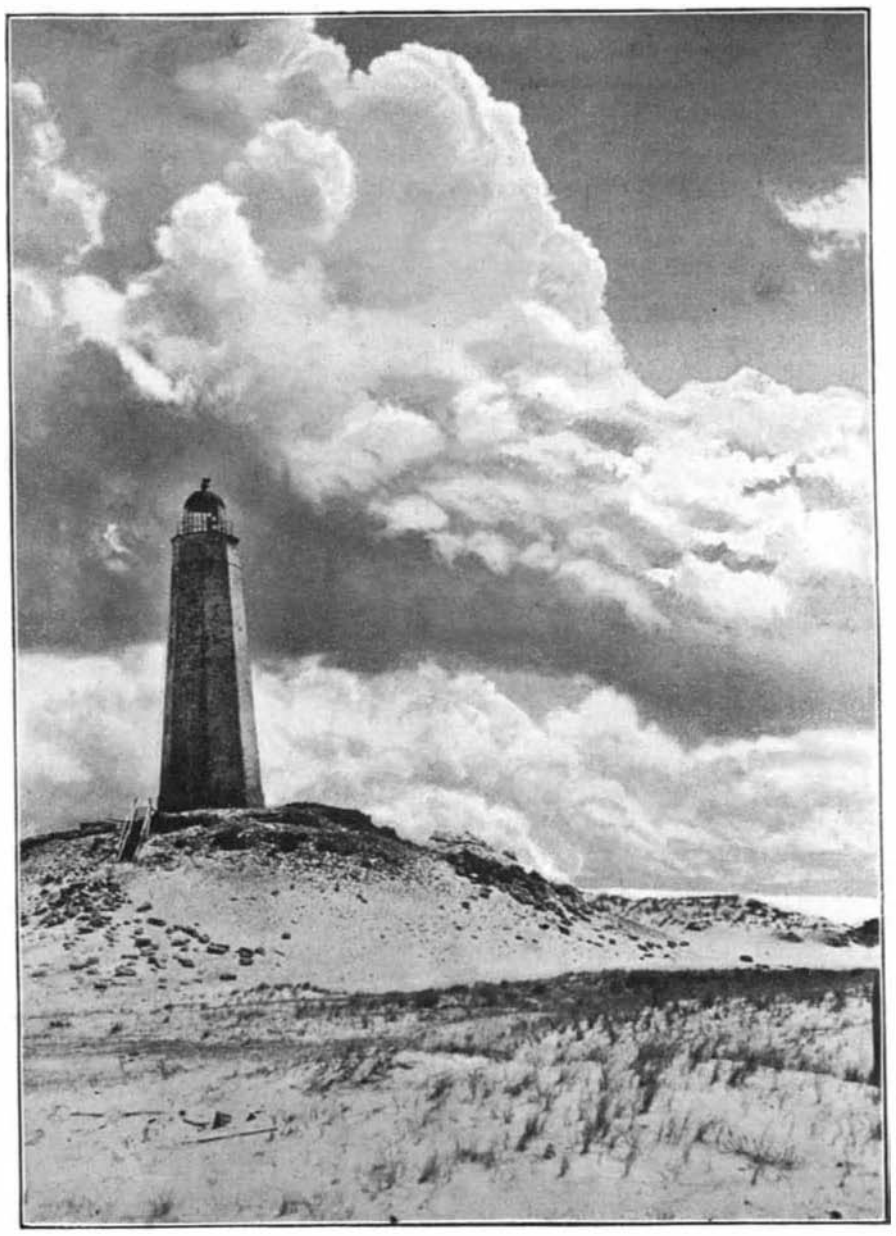
ARRANGEMENT OF THE BICHROMATE CELL.

generally known that the Weather Bureau, at Washington, is constantly engaged in making meteorological photographs, cloud photography having received much attention.

We give a half tone engraving of a cloud photograph taken by Mr. A. J. Henry, of the Weather Bureau. This print was made from a single negative taken with one exposure, and it is through the courtesy of Mr. Henry and Mr. McAdie, of this Bureau, that we are enabled to give our readers the secret of this remarkable effect.

The picture is taken through a monochromatic screen. The one found most effective is that formed of a saturated solution of bichromate of potash inclosed in a plate glass cell having parallel sides. The construction of this cell is shown in the second engraving, in which a a' are squares of plate glass and b is a ring cut from a glass tube and ground to render its edges parallel and smooth. One side of the ring is perforated and furnished with a stopper. The ring is cemented between the two glass plates with balsam of fir or other suitable cement. The saturated solution of bichromate of potash is introduced through the perforation, and the cell thus made is inserted in a piece of cork, c, which fits over the collar of the camera lens. The proper thickness for the cell is shown in the engraving; the diameter will of course vary with the size and the angle of the lens. The exposure for the negative from which our illustration was taken was four seconds.

We have no doubt this simple device will furnish the basis of many experiments for both amateurs and professional photographers.



NEGATIVE TAKEN THROUGH BICHROMATE CELL.

Riding a Wheel.

The proper position for a bicycle rider is, in the first place, an upright one, says a writer in Harper's Young People. He should push nearly straight downward with his legs—not backward, as one must do who leans far forward. His arms should not be rigid and extended to their full length, but a little bent, and the handles can be easily adjusted to bring this about. The reason for the bent or slightly bent arm is evident after a moment's thought. If the arm is stiff, rigid, and extended to its full length, the "pull" which you give the handles on going up hill, or indeed, while running along a level road, is a dead pull. There is no life in it. Each jar to the machine is a jar to your body, your head and neck, and consequently a jar to your whole system. On the other hand, if you ride with your arms a little bent, and acting as a kind of a buffer to all jarring influences, they will save you an injurious, though unnoticeable, shaking up each time you go out. The only way in which you will notice a change will be after you have become accustomed to the bent arm method. Then you will find you can ride longer without becoming tired.

Another feature of this stiff arm is the position into which the shoulders are thrust. Try it; grow a little tired with a long ride, and then see where your shoulders are. You have gradually come to lean on your arms for rest. Both shoulders have been thrown far back; your head and neck are stretched far forward, and your chest has, so to speak, sagged forward out of its natural position. Keep this up long enough, and you will be a fine-looking specimen.

No; the weight of your body should never come on the hands and arms, but on your thighs, and thence be transferred to the seat, with the unconscious, springy action of your legs, which in a measure allows some of your weight to come on the pedals. In this position your hands are free to guide your wheel, your body is erect; you do not then get into the habit of swaying from side to side to put your weight first on one side and then on the other; and your whole muscular movement is regular and normal. Try riding without putting either hand on the handles and sitting erect. If you ride well, you can easily keep your balance, and in an instant you will be in the correct position. Once in this position, place the hands lightly on the handle bars, and you will be in a healthy, a proper situation to gain benefit from your riding.

In riding ten miles, for instance, I should never go the whole distance at one pace. Slow, steady riding has its merits; so has sprinting for short distances. When a good clear road looms up ahead, have a brush for two or three hundred yards with the boy who is with you. These little races are good things. They quicken your movements and they keep you from forming bad habits or letting your body sag into set, immovable positions. They also bring the muscles into a different kind of play.

In fact, in bicycle riding, as in about everything else, you should remember that there is a right and a wrong way; that you need not only endurance, but speed, and that changing from one to another, keeping up variety, is one good way of avoiding bad habits.

THE southwest wind is the most prevalent in England. It blows on twice as many days as any other.

© 1895 SCIENTIFIC AMERICAN, INC.

Natural History Notes.

Origin of Vascular Plants.—According to Prof. Douglas H. Campbell, it is generally admitted that the origin of the vascular plants is to be sought among the less specialized Bryophytes, which were derived from algal ancestors. In the evolution of the sporophyte it gradually passed from a condition in which its entire substance was devoted to spore formation to one in which this function was more and more subordinated to the vegetative life of the sporophyte. The latter, by the development of special organs (roots and leaves), became free from the gametrophyte upon which it had lived as a parasite, the genus Anthoceros being the nearest to realizing this condition among the Bryophytes. From such a condition, several lines of development have probably proceeded, resulting in the different groups of Pteridophytes, which in turn may have independently given rise to seed-bearing plants.

Salmon and Trout.—Mr. C. S. Patterson, in a paper recently read before the Piscatorial Society, put forth the theory that the salmon and the salt and fresh water trout are simply three varieties of one and the same species, which is therefore necessarily very polymorphous. The principal arguments presented by Mr. Patterson in support of his theory were: the facts observed in the fish reared in captivity and the changes that they exhibit; the changes that occur when the surroundings are changed; a study of the individuals that live entirely in fresh water; a comparison of dwarf forms, and a comparison of the variations in the different species.

The Sheep Parrot.—Among the remarkable birds of New Zealand, says the Revue Francaise, is the greenish gray nocturnal parrot of the genus Strigops, which lives in burrows and resembles an owl, and a still more singular parrot, the Nestor notabilis, which the English have come to regard as a dangerous nuisance. The English, as well known, introduced sheep farming into New Zealand as well as into Australia. Now, these parrots have acquired the habit of perching upon the back of the sheep and excavating holes therein with their formidable bill in order to extract the kidneys. The fact is so much the more curious in that it cannot be attributed to an innate instinct; since, previous to the arrival of the English, these birds had never seen a sheep nor even any animal of analogous conformation, the fauna of New Zealand including scarcely a single mammal. We know, moreover, that in entire Oceanica there are no other mammals except marsupials. There is here, then, on the part of these birds, an act of intelligence and even of calculation, so much the more curious in that it is certainly complicated with a phenomenon of language or analogous communication. It is true that the birds are parrots, but the fact is none the less worthy of remark.

Amphibious Fish.—In an entire family of fishes, that of the Labyrinthici, inhabiting the warmest parts of the old world, we find in the branchial cavity an accessory organ of aerial respiration that permits several species to lead a partially terrestrial life. In the Anabas scandens, or climbing perch of India, Indo-China, the Malay Archipelago, and the Philippine Islands, the most celebrated fish of the group, the branchial chamber ascends very high upon the sides of the head and is divided into two cavities by a membranous partition. The lower cavity is occupied by the branchiæ, which are but slightly developed, and the upper by a foliaceous mass that has been compared to a Savoy cabbage on a small scale, which is formed of a multitude of osseous plates, variously curved, that depend from the upper pharyngeal bones. These plates are covered with a membrane well supplied with blood vessels, and the cavity that contains them debouches above the branchiæ by a narrow orifice. The complication of this labyrinth continues to increase with age, as has been shown by Gunther.

It was thought for a long time that this apparatus was a sort of sponge designed to keep the branchiæ always in a sufficient state of humidity; but it is now known, from the researches of Semper and Day, that the labyrinth never contains anything but air, and that, physiologically, it must be compared to a true lung.

It will be seen that, provided with such an organ, the Anabas is capable of leading a life as terrestrial as that of many batrachians. Numerous observations prove, in fact, that it leaves the water voluntarily and ascends to terra firma, where it remains for a very long time, crawling along by the successive inflexions of its body. It seems even to make its exit regularly from the aqueous medium every night. It likewise climbs trees by maintaining itself with its serrate opercula and the spines of its fins. From this habit and its resemblance to a perch is due its English name of climbing perch, and its Tamal name of pannei-evi, or "tree mounter." When the marshes dry up, hundreds of these fish undertake long voyages overland in search of new pools of water. Finally, they are capable of living in earth that is thoroughly dry, by taking refuge in holes, and it is by digging into the dry bed of the marshes with picks that the Hindoos unearth them at this period.

The other Labyrinthiforms, the Spirobranchus, Ctenopoma, Osphronemus (gourami), Macropodes, etc., are doubtless capable of resisting asphyxia better than other fish, but they do not seem to be as amphibious as the Anabas. Moreover, their labyrinthiform apparatus is infinitely less perfect than in this type.

Nocturnal Habits of the Bass.—A paper on the habits of the black bass, by Mr. A. N. Cheney, has called forth some interesting and valuable facts from other observers. Dr. Alfred Hinde, of Chicago, gives some information in relation to these fish developed by microscopic observations of the retinæ of the eyes of large-mouthed black bass. He concludes that they are unable to swim about after dark on account of the histological character of the bacillary layer of their retinæ, which consists solely of cones. Dr. Hinde bases his conclusions on the fact that birds of nocturnal habits have only rods in the bacillary layer of their retinæ. Animals of mixed habits, of which man is one, those which see well in high and low degrees of illumination, have a mixture of both rods and cones. On account, therefore, of the absence of rods in the retina of the eye of the large-mouthed variety of black bass, Dr. Hinde thinks that it cannot swim about in the dark. While these deductions are apparently conclusive, it would be interesting to know how under such conditions black bass are enabled to protect their young at night. That the fry have nocturnal enemies cannot be doubted. The catfish, or bullhead, which is generally supposed to be a night feeder, is one of them. A microscopic examination of the retina of the eye of the catfish might reveal some facts, whether its habits are nocturnal or not.

Influence of Food Upon Insect Organs.—Mr. J. T. Cunningham, in Nature for September 27, 1894, referring to Weismann's statement that the bee has the specific property of responding to imperfect nutrition in the larval state by an imperfect development of the ovaries, and that, as proof of this, blowflies from maggots partially starved, but fed exclusively upon meat like those which were not starved, laid eggs in normal abundance, calls attention to the fact that the larva of the worker bee is supplied with a diet low in nitrogen, while that of the queen bee is supplied with one highly nitrogenous. Evidence is required that the larva of the blowfly can fully develop its ovaries when deprived of nitrogenous food. He points out that Weismann himself, in one of his notes, shows that when blowflies were fed upon carrots and sugar they laid no eggs for more than a month, but as soon as meat was supplied them sucked it greedily and laid great numbers of eggs the week afterward. He further shows that in the case of termites, Grassi has found that the fertile individuals are fed during development on the secretion of the salivary glands of other individuals, while sterile forms are supplied only with macerated wood dust.—Insect Life.

The Work of Bees.—A writer in the Revue des Sciences Naturelles makes the following calculations in regard to the work done by the honey bee:

When the weather is fine, a worker can visit from 40 to 80 flowers in six or ten trips and collect a grain of nectar. If it visits 200 or 400 flowers, it will gather 5 grains. Under favorable circumstances, it will take a fortnight to obtain 15 grains. It would therefore take it several years to manufacture a pound of honey, which will fill about 3,000 cells.

A hive contains from 20,000 to 50,000 bees, half of which prepare the honey, the other half attending to the wants of the hive and the family. On a fine day, 16,000 or 20,000 individuals will, in six or ten trips, be able to explore from 300,000 to 1,000,000 flowers, say several hundred thousand plants.

Again, the locality must be favorable for the preparation of the honey, and the plants that produce the most nectar must flourish near the hive. A hive inhabited by 30,000 bees may, therefore, under favorable conditions, receive about two pounds of honey a day.

The Traveler's Tree.—Among the useful plants of Madagascar, mentioned by a writer in Le Genie Civil in an article upon that country and its products, is one belonging to the same order as the banana (Musaceæ) and called by the French Arbre de Voyageurs. The plant, scientifically, is the Urania speciosa. It obtains its common name from its serving to refresh thirsty wayfarers. The rain, in falling upon its leaves, flows in part into the peduncles, which, by reason of being wide and curved upwardly at the base, serve as a sort of trough in which the water is preserved until the end of the dry season. It suffices to slit the trough with a knife blade in order to obtain at once an abundant flow of water.

The Heredity of Acquired Characters.—Mr. Tegetmaier, says the Revue Scientifique, having undertaken to improve the Jerusalem artichoke, endeavored to obtain tubercles that should be perfectly globular and to eliminate such as were irregular or badly formed. He made a careful selection for several years, using as reproducers only such tubercles as were irreproachable as regards shape. He has now attained his object, and his entire planting yields him no tubercles but such as are perfectly round and regular. This is a proof to be added to those that are already so numerous of the influence of selection, and Mr. Tegetmaier observes that "it will require much influence and eloquence on the part of certain scientists to convince practical men that acquired characters are not hereditary."

A Chance for Inventive Minds.

The board convened by Secretary Herbert to consider the subject of dispensing with wood in the construction of the naval ships now building, and also to find some suitable substitute for wood in places where it is impracticable to use metal, and of which board Commander Bradford is senior member, is making fair progress. Since the naval action fought off the mouth of the Yalu River between the Chinese and Japanese fleets, in which several ships were disabled and thrown out of action by serious fires on board, the subject has received much attention at home and abroad.

The German Admiralty has convened a board to find some proper substitute for wood, and in the meantime the use of wood has ceased altogether, even the furniture being made of iron, and cork used where a non-conductor is absolutely necessary. The English are casting about for some substitute for wood, and the French have for a long time used a minimum of wood.

Owing to the conducting properties of iron and steel, the living quarters, if not sheathed with some non-conductor, become intensely cold in winter and very hot in summer. Where heat is applied, owing to the difference of temperature on the opposite sides of the metal plating, much condensation of moisture occurs. These difficulties cause rheumatism and pulmonary diseases. Clothing kept in metal drawers and lockers becomes ruined from moisture, and the drawers must be lined with something in the nature of wool or thick felt.

Briefly, a substitute for wood should have the following properties: It should be light, or no heavier than wood, non-conducting and non-combustible, and when struck by shot should not fly into splinters. In wooden ships frequently as many persons are wounded by splinters as by shot.

A solution of the problem, in the opinion of the board, seems to be in the following direction: Take something in the nature of cheap wood or vegetable fiber and fine sawdust, treat them chemically with some insoluble fireproof substance, not too heavy, then press and roll into boards, more or less dense, according to the use for which the material is desired. Such a material will be non-inflammable all through, will not splinter, will not be heavy, and will be a non-conductor. Possibly this artificial board can be strengthened by inclosing within it a tough, fine wire netting.

If sawdust or other fine cellulose material, after being rendered non-inflammable, can, by mixing with other materials not too heavy, or, if heavy, in small quantities, be applied to metal in a plastic state so as to harden into a compact mass impervious to water, then it will be of great value. In other words, if a light, non-conducting, non-inflammable, insoluble cement can be discovered, it may be of great use in ship construction.

The Steam Shovel.

The primary object of the steam shovel is to supersede hand labor in shoveling; but with the advent of the steam shovel came increased and multiplied opportunities for its use, and it is now doing work which by hand labor would have been impossible. Inasmuch as in nearly all cases the material to be shoveled or excavated has to be hauled away, the chief function of the steam shovel is to dig the material and load it on cars. At first wagons drawn by horses were used, and are still used in certain cases, but the wholesale manner in which the shovel digs makes it necessary to take away its product by train loads in rapid succession rather than by wagon loads. It is in this capacity and in its tirelessness in maintaining it that the economy of the machine over manual labor is manifest. The average laborer can shovel from a bank of fairly loose earth into a car or wagon five feet high not over four cubic yards or six tons per ten hours, and where the material is at all hard or compact much less than this is accomplished.

Assuming a laborer's wages to be $1.50 per day, the cost of loading the cars will be 37½ cents per cubic yard, or 25 cents per ton. If plowing, picking, or blasting is necessary, the cost of placing the material on the cars may be $1 per cubic yard or over. The steam shovel, on the other hand, will dig and load as much as 1,500 or 2,000 cubic yards, equal to from 2,250 to 3,000 tons, in the same time, and this with the labor of six men, three on the machine and three to lay its track as it progresses. To do 2,000 cubic yards in the same time, at four yards per day per man, would require 500 men, so that with a single powerful steam shovel six men can do the work of 500.

These figures are startling facts, and, although they will necessarily vary greatly with different conditions and in material of different degrees of hardness, they exhibit strikingly the marvelous superiority of this form of steam labor over hand labor.—A. W. Robinson, in Cassier's Magazine.

© 1895 SCIENTIFIC AMERICAN, INC.

Different Kinds of Money Recognized by the Government as Legal Tender.

Although people talk glibly and wisely about the national currency, the vast majority of them have but a superficial knowledge of the functions of the various issues. On account of the present general discussion on the subject, a few facts are briefly given that may afford a clearer understanding of the present condition of the national finances.

The official definition of the term "legal tenders" is "money of a character which by law a debtor may require his creditor to receive in payment, in the absence of any agreement in the contract or obligation itself." In government transactions the gold coins of the United States are a legal tender in all payments, at their nominal value, when not below the standard weight and limit of tolerance provided by law for the single piece, and when reduced in weight below such standard and tolerance are a legal tender at valuation in proportion to their actual weight.

Standard silver dollars are a legal tender at their nominal value for all debts and dues, public and private, except where otherwise expressly stipulated in the contract. The silver coins of the United States of smaller denominations than $1 are a legal tender in all sums not exceeding $10 in full payment for all dues, public and private.

Minor coins, whether of copper, bronze or copper-nickel, are a legal tender at their nominal value for any amount not exceeding twenty-five cents in any one payment.

United States notes, otherwise known as "legal tender notes" and "greenbacks," are a legal tender in payment of all debts, public or private, within the United States, except duties on imports and interest on the public debt.

Treasury notes, issued in payment of purchases of silver bullion under the Sherman act of 1890, are a legal tender in payment of all debts, public or private, except where otherwise expressly stipulated in the contract, and are receivable for customs, taxes and all public dues.

Columbian half dollars are a legal tender to the same extent as subsidiary silver coin—that is, $10 in any one payment. Columbian quarters are also a legal tender to the same extent as subsidiary silver coin.

Gold certificates are not a legal tender. They are, however, receivable for customs, taxes and all public dues. Silver certificates have precisely the same standing as gold certificates.

National bank notes are not a legal tender. They are, however, receivable at par in all parts of the United States in payment of taxes, excises, public lands and all other dues to the United States, except duties on imports; and also for all salaries and other debts and demands owing by the United States to individuals, corporations and associations within the United States, except interest on the public debt and in redemption of the national currency.

Trade dollars are not a legal tender. By the act of February 12, 1873, they were a legal tender at their nominal value for any amount not exceeding $5 in any one payment, but under date of July 22, 1876, it was enacted that they should not thereafter be a legal tender.

By the act of March 3, 1863, fractional currency was receivable for postage and revenue stamps, and also in payment of any dues to the United States, less than $5, except duties on imports; but they are no longer a legal tender to any extent whatever.

The Treasury Department has also decided that foreign gold and silver coins are not a legal tender in payment of debts. The question has been raised and disputed as to whether what was called the "Continental currency," issued during the war of the rebellion by the old government, was or was not a legal tender. The facts appear to be that while the Continental Congress did not by any ordinance attempt to give it that character, they asked the States to do so, and all seem to have complied, except Rhode Island. The Continental Congress only enacted that the man who refused to take the money should be an enemy of his country. This currency, as now classified at the Treasury Department, is not a legal tender.

By law, Treasury notes are redeemable in coin. The kind of coin employed is optional with the Secretary of the Treasury. Secretary Carlisle has directed their redemption in gold whenever that coin is demanded. In case the holder has no preference, he will receive silver in exchange, but such cases are extremely rare. United States notes are also redeemable in gold.

There is no standard in the matter of government bonds. Each loan stands on its own bottom. During the war legal tender notes were accepted in payment for bonds, but since then all government loans have been negotiated in gold or its equivalent—gold certificates. The recent issues of bonds were for the purpose of replenishing the dwindling gold reserve, in order to enable the government to maintain the parity of the two metallic standards of value. Consequently, no other currency was receivable in payment of the bonds. Bonds are redeemable in coin, either gold or silver, at the option of the government.—Evening Telegram.

FENNECS IN THE BERLIN ZOOLOGICAL GARDEN.

We publish herewith an engraving—for which we are indebted to the Illustrirte Zeitung—of some little fennecs (Canis zerda) reared in the Berlin Zoological Garden. The parents were brought from the Sahara in Tunis, and they are the first of these delicate children of the desert that have lived for a length of time in captivity. Great surprise has been expressed that the young ones have been successfuly raised.

At first the little things, with their snub noses and rather short, limp ears, looked like pug pups. They were covered with thick light gray wool. When they were five weeks old they began to try to crawl about, as shown in the round picture in the upper part of the engraving, but did not begin to develop their fox-like shape until they were eight weeks old, when their noses began to become pointed and their ears to grow longer, and soon the little creatures tried to hold their ears stiff. Then they left their mother's side to play together, and soon learned to chase a live mouse when one was given to them, playing with it as kittens would. They grew very fast, and in ten weeks were almost as large as the old fennecs, but their tails had not yet the long, bushy hair like that on the tails of their parents. Our illustrations show clearly the changes in the shapes of the young fennecs that occurred as they developed.

YOUNG FENNECS IN THE ZOOLOGICAL GARDEN AT BERLIN.

Drawn from life by Anna Held.

London Prices of Silver, Tin, Copper and Lead.

Messrs. Vivian, Younger & Bond, London, have issued a diagram showing the prices of various metals at the beginning of each month for 19 years. The diagram is most instructive, and the fluctuations can be seen at a glance. Taking first the case of silver, the price in 1875 is shown to have been 57½d. per oz.; in 18 months it dropped 18d., recovering in six months. Since 1877 the tendency has been downward, with the exception of a sharp recovery and subsequent drop in the autumn of 1890; and now the price is 27¼d., a drop in 19 years of 2s. 6d. per oz. The influence of the Societe des Metaux is seen in the line representing copper, but the cornering was of short duration, the rise from £40 to £87 per ton lasting only 16 months—sufficient, however, for fortunes to be made and lost. The price now, £42, is only half what it was in 1875. Foreign tin has fluctuated more than the others, but still the price now, £61, compares with £95 in 1885. Tinplates have dropped 20 per cent.

A Forest 3,000 Miles Long by 1,700 Miles Wide.

"Where is the greatest forest in the world?"

The question was asked in the Forestry section of the American Association for the Advancement of Science, at its recent annual meeting. The importance of forests for equalizing the climate and the rainfall of the globe was under discussion, and the purpose of the question was to show where the great forest tracts of the world are situated.

One member, replying offhand, was inclined to maintain that the greatest continuous tract of forest lies north of the St. Lawrence River, in the provinces of Quebec and Ontario, extending northward to Hudson Bay and Labrador; a region measuring about 1,700 miles in length from east to west, and 1,000 miles in width north and south.

A professor from the Smithsonian Institution rejoined that a much larger continuous area of timber lands was to be found, reckoning from those in the State of Washington northward through British Columbia and Alaska. But he limited his statement to North America, for he added that, in his opinion, the largest forest in the world occupied the valley of the Amazon, embracing much of northern Brazil, eastern Peru, Bolivia, Ecuador, Colombia, and Guiana; a region at least 2,100 miles in length by 1,300 in length.

Exception was immediately taken to this statement by several members who, in the light of recent explorations, have computed the forest area of Central Africa in the valley of the Congo, including the head waters of the Nile to the northeast, and those of Zambesi on the south. According to their estimates, Central Africa contains a forest region not less than 3,000 miles in length from north to south, and of vast although not fully known width from east to west. Discussion, in which the evidence afforded by travels and surveys was freely cited, seemed favorable to the defender of the Amazonian forests.

Later in the day the entire question was placed in another light by a member who was so fortunate as to be able to speak from some knowledge of still another great forest region of the globe. This gentleman gave a vivid picture of the vast, solemn taigas and urmans, the pine, larch, and cedar forests of Siberia.

It appears that Siberia, from the plain of the Obi River on the west to the valley of the Indighirka on the east, embracing the great plains, or river valleys, of the Yenisei, Olenek, Lena, and Yana rivers, is one great timber belt, averaging more than 1,000 miles in breadth from north to south—being fully 1,700 miles wide in the Yenisei district—and having a length from east to west of not less than 4,600 versts, about 3,000 miles. Unlike equatorial forests, the trees of the Siberian tiagas are mainly conifers, comprising pines of several varieties, firs and larches. In the Yenisei, Lena, and Olenek regions there are thousands of square miles where no human being has ever been. The long-stemmed conifers rise to a height of 150 feet or more and stand so closely together that walking among them is difficult.

The dense, lofty tops exclude the pale Arctic sunshine, and the straight, pale trunks, all looking exactly alike, so bewilder the eye in the obscurity that all sense of direction is lost. Even the most experienced trappers of sable dare not venture into the dense taigas without taking the precaution of "blazing" the trees constantly with hatchets as they walk forward. If lost there the hunter rarely finds his way out, but perishes miserably from starvation or cold. The natives avoid the taigas, and have a name for them which signifies "places where the mind is lost."

The discussion was closed very appropriately by Prof. Fernow, of Washington, with an illustrated lecture, which showed how, in the earlier ages, forests had covered all the continental areas, and had rendered the climate equable to a degree now unknown.

At first human beings battled with the forest in a fitful manner, making small clearings for themselves; but gradually, by the aid of fire and of their own increasing numbers, they have so far prevailed in the struggle for supremacy that the forests are hopelessly conquered. But grave evils follow their extermination; and now the question is, how to foster, protect, and preserve them.—Youth's Companion.

© 1895 SCIENTIFIC AMERICAN, INC.