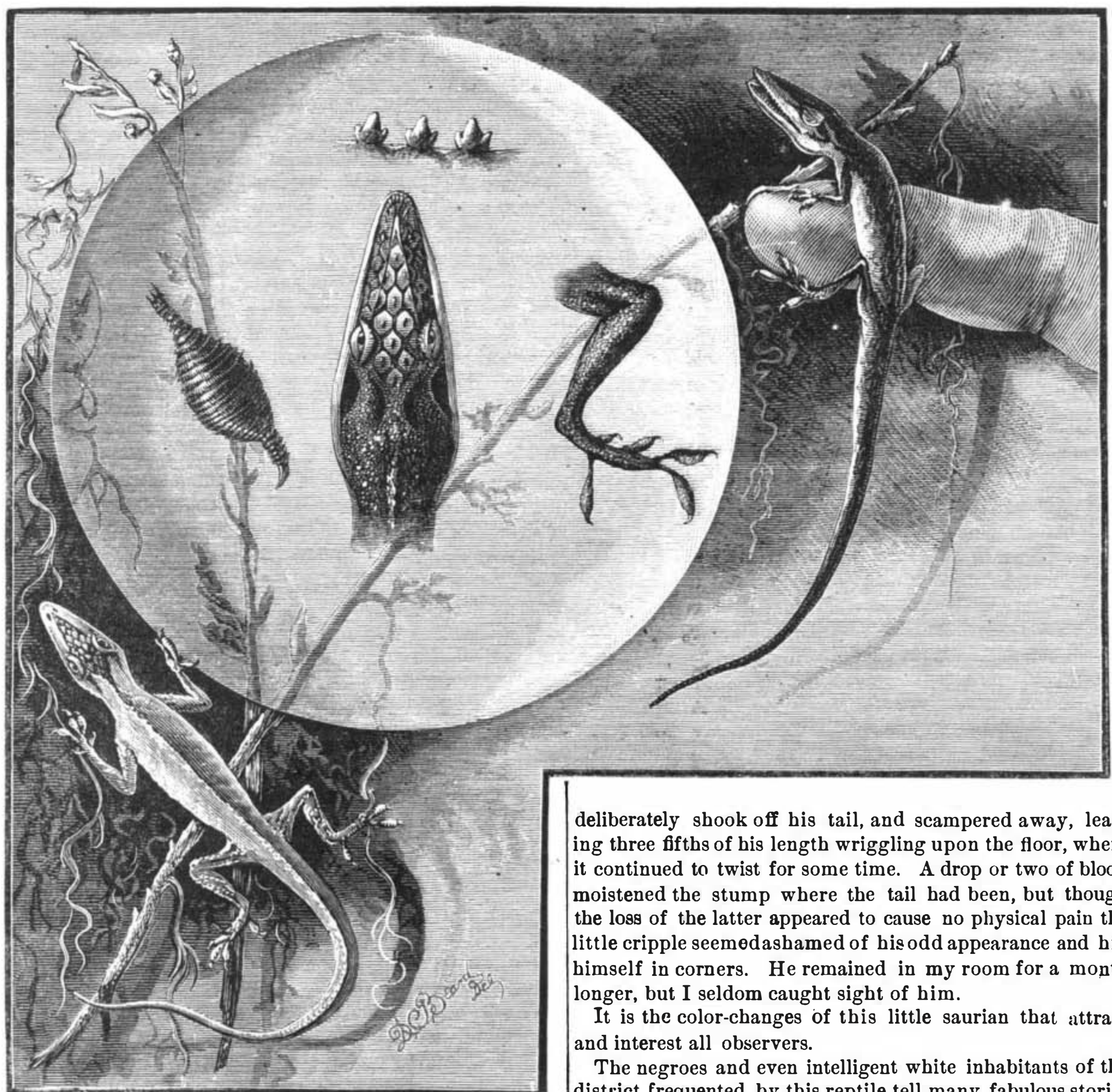


GREEN CAROLINA ANOLIS; OR, THE AMERICAN CHAMELEON.

BY DANIEL C. BEARD.

Perhaps the first creature that attracts the eye of the Northern naturalist upon landing at Florida is a small, slender lizard, which appears omnipresent, to be seen running up and down the walls of the Old Fort at St. Augustine, peering in at the windows of the hotel at Pilatka, scampering over the logs of the swamp at Tocoi, or scrambling along the garden fences at Jacksonville. It may also be seen exhibited for sale along with young alligators, wildcats, black bears, and many other queer objects to be found in the jewelry stores at Jacksonville.

The specimen from which my illustrations are made I captured at Tocoi. When first taken he was of a sooty black; five minutes afterward, when I opened the handkerchief in which I was carrying him to show my prize to a friend, I was amazed to find, in the place of the dark, dingy little creature I had wrapped up, a beautiful emerald green lizard. It was only then that I discovered my specimen to be the so-called American chameleon. I was somewhat ashamed of my ignorance until I met a certain naturalist from Michigan, who had made quite a collection of what he took to be distinct species of saurians, and had carefully preserved them in spirits, only to find upon inspection, that they were all exactly alike in form and color, all having assumed a yellowish-brown tint after immersion in alcohol. Two anoli that I kept in captivity proved very gentle pets, and would run over my hands waiting eagerly for me to catch flies for them. Although quick in their movements, and able by the help of their tail to spring quite a distance, these little animals never could capture the flies for themselves unless I first crippled the insect by removing a wing. They loved the sunshine and fresh air; the latter they would swallow occasionally in great gulps, expanding a sort of pouch under their neck by the process. Though gentle when treated with kindness, when tormented they would show fight, opening their mouths in a ludicrous way. One, after trying in vain to bite a lead pencil, with which I had been stroking his back and otherwise plaguing him, deliberately shook off his tail, and scampered away, leaving three fifths of his length wriggling upon the floor, where it continued to twist for some time. A drop or two of blood moistened the stump where the tail had been, but though the loss of the latter appeared to cause no physical pain the little cripple seemed ashamed of his odd appearance and hid himself in corners. He remained in my room for a month longer, but I seldom caught sight of him.

It is the color-changes of this little saurian that attract and interest all observers.

The negroes and even intelligent white inhabitants of the district frequented by this reptile tell many fabulous stories of its wonderful powers in this respect. Experiments with specimens which were in my possession at different times seemed to demonstrate that emerald green, gray, and sooty black and reddish yellow were the limits of its power. When frightened or pleased it turned green; if agitated for some time in apparent indecision, the color would fade and return in blotches. Under an ordinary magnifying glass it could be seen that the hollow around the eye changed first. Then the hexagonal plates upon the head showed the color, commencing at the edges and gradually spreading over each plate, the centers being the last points to turn. If a number of these animals be placed in alcohol they will be found to assume a dirty yellow or brown tinge. This is probably the natural hue of the skin with the coloring matter removed. The pigments appear to be contained in a network of vessels beneath the skin, and to be somewhat, though not altogether, under control of the animal. One, placed upon a bright crimson cloth, assumed a reddish yellow color, and though it did not approach the brightness of the cloth, a casual observer would hardly have noticed the lizard motionless upon it.

Green is its favorite color, and black I never saw but in one instance. When hiding in the Spanish moss or upon a tree trunk it assimilates the gray, while yellowish red it assumes with apparent effort. When put and left upon a red substance or in a cigar box, the color of the latter it approaches very nearly. From tip of nose to tip of tail measures from five to six inches, the tail being three fifths of its total length. The head is rather large, triangular in shape, apex at the nose, and covered with small hexagonal plates from the nose to just behind the eyes. The rest of the body is covered with small papillous points; the nostrils are near apex of the nose; the animal has no apparent external ears; it has bright, intelligent, almond-shaped eyes; large mouth, ten well defined teeth upon each side of the upper jaw, and four well defined teeth in the lower jaw, the intermediate space being filled with minute points; and four well developed legs, five toes upon each, each toe swelling out into a soft pad, terminating in a hooked claw. The pad or middle of the toe, under the magnifying glass, shows an odd arrangement of folds or flounces in the skin, each flounce, tuck, or fold being armed upon its edge with minute points, one half of them pointing up and the other half down, as shown in the illustration. Thus may we explain the creature's ability to run up or down the side of a house with equal facility.

In the illustration I have shown the lizard upon my finger, with mouth open; the dark color representing its favorite green hue. At the bottom in the moss is the same animal in his gray coat. In the circle appears a magnified view of the teeth, the second toe of the hind foot much enlarged, showing the peculiar arrangement of the folds of the skin upon the under side; and an enlarged view of the hind leg, and the head as it appeared under the glass while changing its color.

A NEW TORPEDO BOAT.

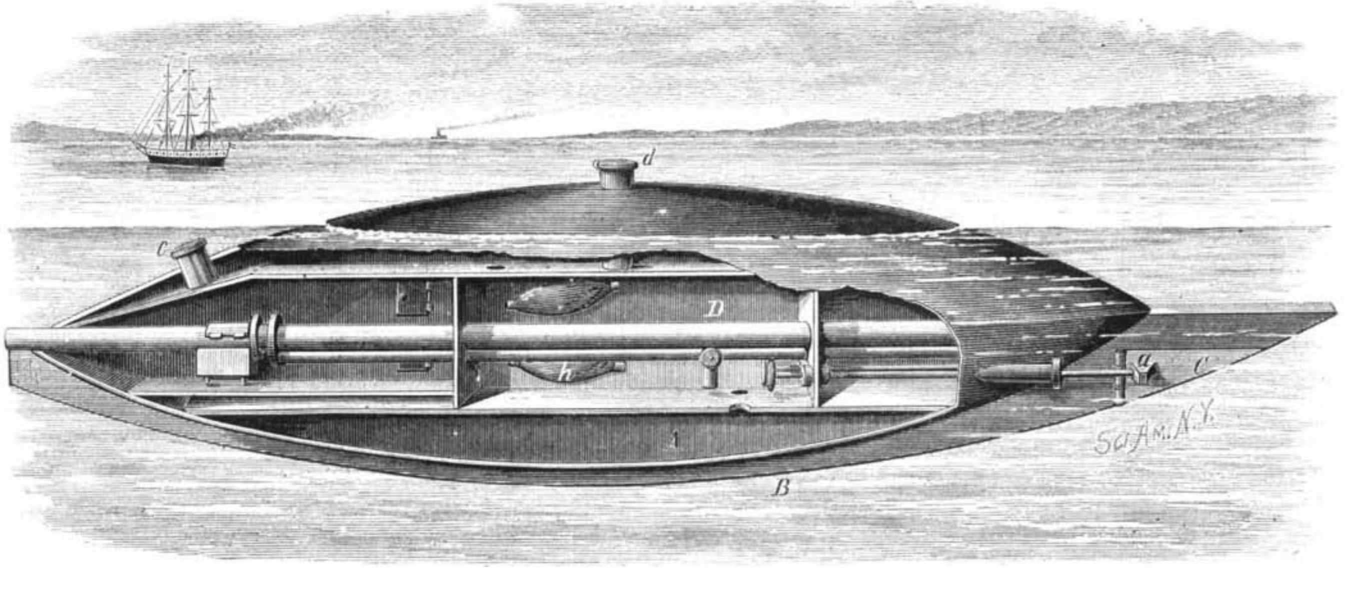
The accompanying engraving represents partly in section a torpedo boat recently patented by Mr. H. Mortensen, of Leadville, Col. The hull A, of the boat, has an arc-shaped keel, B, that runs the entire length, and projects beyond the stern. A portion of the keel is cut away at the stern to receive the rudder, C, which is pivoted in the support thus formed, and is provided with two arms, *a*, one on each side, that project at right angles to the face of the rudder, to receive the thrusts of the screw rods, which project through the stern of the boat, one on each side of the keel. The hull is divided into several compartments, one of which is designed to contain the men that operate the torpedo-projecting mechanism, another contains the men who introduce the torpedo into the projecting apparatus and attach it to the movable rod, and there are compartments for containing either air or water, as occasion may require. In the upper part of the boat there is a chamber which contains compressed air for the supply of the crew and for working the machinery. Under the several compartments already mentioned, there is a compartment for containing water forced in against an air cushion. This chamber acts as an accumulator of power which is expended in working the torpedo projecting apparatus.

A cylinder containing a piston is placed longitudinally in the hull, and provided with a loading chamber which projects through the bow of the boat.

The water required for working the piston may be forced into the accumulator chamber before the boat is started, or it may be forced in by hand or otherwise while the boat is under way.

The rods by which the rudder is operated are threaded, one being provided with a right hand and the other with a left hand thread, and work in fixed nuts, and are provided with driving mechanism operated by a suitable motor or by hand.

The boat has a removable upper portion, which is secured to the hull by means of bolts. The top is comparted in the same manner as the hull, and both top and hull are provided with valves for the admission and escape of air and water. In the top there are two entrances, *c d*, provided with hinged covers that are packed to render them water-tight.



MORTENSEN'S TORPEDO BOAT.

The compartments for containing the crew are provided with windows, which open inwardly, so that they may be repaired or replaced in case of breakage.

In each side of the boat there are recesses inclined in opposite directions; each of these recesses contains a screw propeller, the shaft of which extends into the boat, and is connected with a motor. By means of these screws the boat may be propelled forward or backward, and raised or lowered, as may be required.

The boat is capable of being operated wholly under the water; or the top portion may be removed, when it may be propelled on the surface.

Development of the Lizard.

At a recent meeting of the Royal Society Prof. K. Parker presented a communication embodying part of his work on the structure and development of the skulls in the lizard group. His researches on the embryos of the common British lizards have led him to very unexpected results. Hitherto we have been accustomed to regard the crocodiles and

© 1879 SCIENTIFIC AMERICAN, INC.

turtles as the highest groups of the reptile family, chiefly on the evidence of the structure of the soft and more important vital organs. But the evidence from the skull leads Prof. Parker to regard the lizards not only as the most highly specialized of reptiles, but the group which approaches most closely towards birds. The term "lizard" is, however, at present used so vaguely as to include the hatteria of New Zealand and chameleon, both of which are often regarded as types of distinct orders of reptiles. The chameleon, however, which in many respects approximates toward crocodiles, is regarded as the lowest of the lizards, and even more distant from the higher types than tortoises and turtles. Yet the lizard skull is found to be but slightly modified from that of the snake. On the whole the character of their skulls leads to the conclusion that birds differ less from lizards in structure than does the ordinary perfect insect from its pupa. Of old the strong resemblance which the lizards termed "blind worms" present to serpents led to the conclusion that what we see in them the limbs first coming into existence, but Prof. Parker not only regards the serpent as the more ancient and more generalized animal, but also as one which shows evidence of its degradation by the loss of limbs, which he believes the ancestral forms of the serpent types possessed. Of late years it has been customary to attach great importance in classification to the modification as presented by the ear bones. Judged by this standard the lizard is closely related to the tortoise and crocodile, and all three types are regarded as differing but little from the bird in this respect. The snake, however, is of a lower grade in the structure of the ear, while this feature in the chameleon is even less specialized than in frogs and toads. As concerns the theory of the skeleton and of the skull, Prof. Parker is led by his researches to conclude that the skull was the part of the animal first formed. Subsequently the joints of the backbone came in successive generations into existence, while the limbs and the bones which support them were of more recent origin than the trunk. From the indications furnished by development of the embryo there is reason to believe that some of the lower vertebrates had a long head, including as many as 14 or 15 divisions, which succeeded one another in a line from the front backward, and from this, as well as from the supposed comparatively late origin of the backbone, Prof. Parker is led to describe as absurd the well known "vertebral theory of the skull," originated both by Goethe and by Oken, and elaborated by Owen. Another important conclusion of Prof. Parker's, based chiefly on the researches of Mr. Balfour, is that the neck comes into existence by a long series of evolutions as a result of the subdivisions of the second vertebra, and serves "to bind the shortening head to the retreating body." In conclusion Prof. Parker expresses his opinion that even those who are content to work at the development of the lowlier types, such as the worm and the crayfish, are helping to throw light on the solution of the vertebrates.

Photography on Wood.

BY PROFESSOR J. HUSNIK.

I adopted the method of exposing gelatinized paper alone under a negative, and when the chromium salt had been washed out, placing it on a plate of glass and laying on the ink with a very small glue roller. With this I succeeded completely; I obtained beautiful pictures, perfect in the half tones, which could be at once laid on the wood block, and be printed off at one impression. Gelatine paper can be easily prepared, and kept in stock, according to the process described in my book *Das Gesammtgebiet des Lichtdrucks*, by placing sheets of paper in a perfectly horizontal position, and coating them with a dilute solution of gelatine, and they need only be sensitized at the moment of use with a one per cent solution of chromate; by this means the above described method is rendered thoroughly simple and practical, as well as being certain in its results. The wood block itself requires a very simple preparation; it must be rubbed down with whiting to which some adhesive substance has been added. This rubbing can be best effected by the ball of the hand. Gelatine paper can also be purchased from the dealers, and even my own photo-lithographic transfer paper will answer the purpose very well, provided that, before immersing it in the chromate solution, it be wiped over a few times with a damp sponge, and then rinsed well in clean water. This is done to remove any soluble matter from the surface. Afterwards the paper is dipped for some minutes in a one per cent solution of chromate, then drained, and hung up to dry at an ordinary temperature. Sensitized in this way it remains good for the above named purpose for from three to five days.

The Manufacture of Glass in Pittsburg.

Pittsburg, Pa., produces more than half the glass made in the United States. Its factories number 73, with 690 pots, and give employment to 5,248 hands, whose wages approach $3,000,000 a year. The materials employed in the manufacture were, the past year, 12,110 tons soda ash, 48,340 tons of sand, 152,000 bushels of lime, 1,218 tons nitrate soda, 793,500 bushels of coke, 4,525,760 bushels of coal, 4,025 cords wood, 6,055 tons of straw, 2,760 barrels of salt, 250 tons pearl ash, 330 tons of lead, 150,000 fire brick, 2,955 tons of German clay. The packing boxes cost $484,250, and required 2,109 kegs of nails. 96 wagons and 130 horses were employed in hauling. The space occupied by the buildings is equal to 208 acres, and the capital in buildings, machinery, and grounds is, in round numbers, $3,500,000. The business produces about $7,000,000 a year.

Memoranda for Garment Dyers.—Substances and Reagents Suitable for Removing Spots.

Steam has the property of softening fatty matters, and thus facilitating their removal by reagents.

Sulphuric acid may be employed in certain cases, especially to brighten and raise greens, reds, and yellows; but it must be diluted with at least 100 times its weight of water and more, according to the delicacy of the shades.

Muriatic acid is used with success for removing spots of ink and iron mould upon a great number of colors which it does not sensibly affect.

Sulphurous acid is only used for bleaching undyed goods, straw hats, etc., and for removing fruit stains upon white woolen and silk tissues. The fumes of burning sulphur are also employed for this object, but the liquid acid (or a solution of the bisulphite—not bisulphate—of soda or magnesia) is safer.

Oxalic acid serves for removing spots of ink and iron and the residues of mud spots, which do not yield to other cleansing agents. It may also be employed for destroying the stains of fruits and of astringent juices, and stains of urine which have become old upon any tissue. Nevertheless, it is best confined to undyed goods, as it attacks not merely fugitive colors, but certain of the lighter fast colors. The best method of applying it is to dissolve it in cold or lukewarm water, and to let a little of the solution remain upon the spot before rubbing it with the hands.

Citric acid serves to revive and raise certain colors, especially greens and yellows; it destroys the effect of alkalies and any bluish or crimson spots which appear upon scarlets. In its stead acetic acid may be employed.

Liquid ammonia, formerly called volatile alkali, is the most energetic and useful agent employed for cleaning tissues and silk hats, and for quickly neutralizing the effects of acids. In the latter case it is often sufficient to expose the goods to the fumes of this alkali in order to remove such spots entirely. Ammonia gives a violet cast to all shades produced with cochineal, lac, the redwoods or logwood, and all colors topped with cochineal. It does not deteriorate silks, but at elevated temperatures it perceptibly attacks woolens. It serves to restore the black upon silks damaged by damp.

The carbonate of soda (soda crystals) serves equally in most of the cases where ammonia is employed. It is good for hats affected by sweat.

Soda and potash only serve for white goods, of linen, hemp, or cotton; for these alkalies attack colors and injure the tenacity and suppleness of woolen and silk. For the same reason white soap is only to be recommended for cleaning white woolen tissues.

Mottled soaps serve for cleaning heavy stuffs of woolen or cotton, such as quilts; for such articles which do not require great suppleness or softness of feel the action of the soap may be enhanced by the addition of a small quantity of potash.

Soft potash soaps may be usefully employed in solution, along with gum arabic or other mucilaginous matters, for cleaning dyed goods, and especially self colored silks. This composition is preferable to white or marbled soaps, as it removes the spots better, and attacks the colors much less.

Ox-gall, which can be obtained from the butchers in a sort of membranous bag (the so-called gall bladder), has the property of dissolving the majority of fatty bodies without injuring either the color or the fiber. It may be used preferably to soap for cleaning woolens; but it should not be employed for cleaning stuffs of light and delicate colors, which it may spoil by giving them a greenish yellow, or even a deep green tint. It is mixed also with other matters, such as oil of turpentine, alcohol, honey, yolk of egg, clay, (fuller's earth), etc., and in this state it is used for cleaning silks.

To obtain a satisfactory result gall ought to be very fresh. To preserve it a simple method is to tie the neck of the gall bladder well with a string, and hold the bladder in boiling water for some time. This being done it is taken out and let dry in the shade.

Yolk of egg possesses nearly the same properties as ox gall, but is much more costly. It must be used as quickly as possible, for it loses its efficacy with keeping. It is sometimes mixed with an equal bulk of oil of turpentine.—*Moniteur de la Teinture.*

Whooping Cough and Fungus.

Some years ago M. Svetzerich made the assertion that whooping cough was caused by a certain fungus. This assertion seems lately to have been confirmed by the researches of M. Yschamer, who says he has found certain lower organisms in the spittle of whooping cough patients—organisms not met with in any other disease accompanied by cough and expectoration. Examining the spittle after it has been a short time suspended in water, there are found corpuscles about the size of a pin's head, of white or slightly yellowish hue, and these show, besides apathetical cells, a network frame of polygonal meshes, with rounded greenish sporules; at a more advanced stage, colorless hyphæ are seen, and large sporules, yellowish or brownish red, sometimes even ramified. It is interesting to learn that the champignons in question are quite identical with those which, by their agglomeration, form the black points on the skins of oranges and the parings of certain fruits, especially apples. Thus, M. Yschamer, by inoculating rabbits with this dark matter, or even causing it to be inhaled by men, produced fits of coughing several days in duration, and presenting all the characters of the convulsive whooping cough.

The Geological Relations of the Atmosphere.

At one of the recent sessions of the French Academy of Sciences a communication, with the title which heads these notes, was read from Professor Henry Hunt. This paper, of which we make a brief abstract from the text contained in one of our French exchanges, puts forth a curious theory. Taking into account the enormous quantity of carbonic acid stored up in the vegetation forming the coal deposit, and the much greater quantity of the same gas which is met with in the calcareous formations, Professor Hunt believes that it must be admitted that this gas has an extra-terrestrial origin. He believes that our atmosphere should be considered as a universal cosmic medium, condensed around the centers of attraction by reason of its mass and temperature, and occupying all the interstellar spaces in a state of extreme rarefaction.

By considering the question from this standpoint he deduces the conclusion that the atmospheres of the different celestial bodies should be in equilibrium, and so much so that every change that supervenes, be it either by condensation of aqueous vapor or carbonic acid, or by the setting free of oxygen or any gas whatever, would make itself felt in all the rest of the planets through the effect of diffusion. So, then, during those periods in which a great absorption took place on the face of our globe, our atmosphere would have been constantly fed by new portions of gas coming from the universal medium, and consequently from the gases surrounding the other planets.

From this it is understood that the proportion of carbonic acid in the atmosphere of the other planets must have experienced an equal diminution, at the moment that the excess of oxygen spread over the surface of our globe was equally diffused through their atmospheres.

Professor Henry Hunt sees in this theory the explanation of the origin of the cosmic dust.

A Quicksilver Motor.

A street car motor to be run by quicksilver is being manufactured at Aurora, Ill. About 800 pounds of quicksilver is to be placed in a reservoir at the top of the car and to pour down over a cast iron over-shot wheel, producing an equivalent of three horse power. The quicksilver is to be returned to the reservoir by pumps placed underneath the car, to be operated by a brakeman by means of a crank on the front platform.—*St. Louis Miller.*

There must be some mistake here in the calculations. Allowing a distance of 10 feet from the quicksilver reservoir to the point where it strikes the wheel, then the utmost force yielded by the fall of the 800 pounds of liquid metal will be a little less than one quarter of one horse power. To pump up the liquid again would keep the brakeman constantly at work. He could propel the car faster and to better advantage by simply walking behind the vehicle and pushing it forward with his hands, thus dispensing with the weight, and cost of 800 pounds of quicksilver, reservoirs, pipes, wheels, etc. In order to realize three horse power from a wheel arranged as above, 10,000 pounds, or five tons, of quicksilver would be required; and to pump it back the labor of fifteen men would be necessary. We fear that the new motor is destined to stand still.

The Metric or Decimal System.

The following simple table gives all that there is in the metric or decimal system of weights and measures:

MONEY.

10 mills make a cent.
10 cents make a dime.
10 dimes make a dollar.
10 dollars make an eagle.

LENGTH.

10 milli-meters make a centimeter.
10 centi-meters make a decimeter.
10 deci-meters make a meter.
10 * meters make a decameter.
10 deca-meters make a hectometer.
10 hecto-meters make a kilometer.
10 kilo-meters make a myriameter.

WEIGHT.

10 milli-grammes make a centigramme.
10 centi-grammes make a decigramme.
10 deci-grammes make a gramme.
10 † grammes make a decagramme.
10 deca-grammes make a hectogramme.
10 hecto-grammes make a kilogramme.
10 kilo-grammes make a myriagramme.

CAPACITY.

10 milli-liters make a centiliter.
10 centi-liters make a deciliter.
10 deci-liters make a liter.
10 ‡ liters make a decaliter.
10 deca-liters make a hectoliter.

The square and cubic measures are nothing more than the squares and cubes of the measures of length. (Thus, a square and a cubic millimeter are the square and the cube of which one side is a millimeter in length.) The are and stere are other names for the square dekameter and the cubic meter.—*Boston Transcript.*

* A meter is equal to 39·368 American inches.
† A gramme is equal to 15·433 grains troy or avoirdupois.
‡ A liter is equal to 2.113 American pints.

© 1879 SCIENTIFIC AMERICAN, INC.