prominent citizens, as Senator Sanford, Johns Hopkins, Clarke, Lick, Cooper, etc., ought also to take the development of bacteriological research in consideration. Should there not exist a second Lick, who will help revealing with microscopes mysteries of just as high interest and still more practical bearings, like the first Lick with his telescope helped to reveal mysteries of the heavens? Thus far Europe is ahead in such studies, but I know that the ambitious Americans want to excel all other nations in every respect. The United States is bound to become in every scientific branch the first country on earth. This is my firm conviction.

SOME RELICS OF PRIMITIVE FASHIONS IN INDIA.

BY MR. KEDARNATH BASU, COR. MEMB. ANTHROP. SOCIETY, BOMBAY.

"THE ideal," says Theophile Gautier, "torments even the rudest natures. The savage who tattoos his body, or plasters it with red or blue paint, who passes a fish-bone through his nostrils, is acting in obedience to a confused sense of beauty. He seeks something beyond what actually is; guided by an obscure notion of art, he endeavors to perfect his type." Coquetry and neoterism are the peculiar characteristics of man. From the dawn of the Stone Age onwards man is known to have adorned himself with feathers, coral, shells, bone, wood, and stone ornaments; but the exact time when he commenced painting and tattooing his body and face is beyond the ken of history.

Tattooing the body and the face is one of the favorite, though painful, methods of adorning the body among savages, more especially among the Polynesian Islanders. This savage ornamentation of the body has permeated many of the so-called civilized and semi-civilized people, such as the modern Hindoos, the Burmese, etc. There is no mention of this savage and rude art, to my knowledge, in any of the ancient Sanscrit works, where other methods of decorating and ornamenting the body in all times and on all occasions are put down in detail. This art, if it may be so called, was not known to the aborigines of India till a recent date, and it may, therefore, be surmised that the Hindoos borrowed the rude and savage art from some race or races outside of India. I strongly incline to believe that this practice came to India from the Malayan Archipelago through Burmah to eastern Bengal, and through southern India upwards to the whole northern part of India.

The rude and savage custom of tattooing is still in vogue among almost all classes of Hindoo females and in almost all parts of India. The face, chest, and the arms are generally tattooed with varied and fantastic designs. The remnant of the savage custom of painting the person is to be seen in the red paint over the forehead, extending to the crown, among the married women of India. Both of these customs are rapidly waning with the refinement of the people. I do not see the same profusion, as I saw ten or twelve years ago, of tattoo-marks and red-ochre or red oxide of lead (*sindur*) over the forehead and crown among the women of Bengal. The rapid stride of female education and the consequent refinement in æsthetic taste are the causes of the decline of this rude and savage adornment; but the people of Behar, the North-Western Provinces, etc., still cling to these remnants of savagery. The up country women, besides tattooing their bodies and painting the head with red paint, bore the lower lobes of their ears, and insert big and heavy wooden cylindrical plugs, which almost sever the lobes from the ears. The plugs are sometimes as big as two inches in length with a diameter of an inch and a half, and as much as two ounces in weight. These heavy plugs pull down the lobes of the ears as far as the shoulders, and give the wearers a hideous look. The Marwaree women, besides tattooing their bodies and faces, ornament their upper incisors by drilling holes and plugging them with gold, and sometimes with carvings or engravings. The latter ornamentation is usually in the form of two or more concentric rings. The women in the North-West Provinces, Behar, Bengal, and elsewhere sometimes, color their teeth black with a kind of astringent tooth-powder, called *misi* or *manjan*. Painting the feet with scarlet paint (*alakta*) is prevalent among the Hindoo women from a remote age. The Mahomedan women, and the Hindoo women after them, paint the tips of their fingers and the palms with *henna* (*Lawsonia alba*) leaves. The Jains, on certain social ceremonies, paint their hands and feet with *henna* leaves. The up-country and Marwaree women wear their *sarees* and petticoats below the navel, and artificially cause the muscles of the belly to hang down loosely in a fold over their wearing apparel, thus causing an ugly appearance to the contour of the trunk. Some of the men also adopt this fashion, and destroy the natural beauty of the abdomen.

The Burmese men tattoo their entire bodies from the legs up to the chest and shoulders with blue and red pigments, with designs of animals and dragons. The lower limbs from the waist down to the ankles are tattooed in blue, while the parts above the waist are ornamented in red. These people tattoo their bodies as a mark of manhood, and ascribe special *charms* to every particular design. A Burmese priest or *phoongie* told me that men only are decked with tattoo-marks, the women do not mar their natural beauty with permanent pigments. The Burmese women look down with contempt upon men who fail to tattoo their persons, and would not marry a man who has not been tattooed. But the *Mugs*, both men and women, tattoo their bodies.

The wings of butterflies and wing-cases of beetles were, and are to some extent, in use as ornaments among the women of India. The wings of butterflies have now given place to artificial ones, made of mica sheets and paints, which, however, bear the name of butterflies or *ticklies*. The wing-cases of gaudy beetles are still in use in Bengal and elsewhere. The wing-cases of the Indian blister-fly (locally known as *Kánch pôká*, or glass insect), are generally used by women of Bengal. These wing-cases and *ticklies* are worn stuck upon the forehead, in the space between the eyebrows, or a little above it.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

On request in advance, one hundred copies of the number containing his communication will be furnished free to any correspondent.

The editor will be glad to publish any queries consonant with the character of the journal.

Notes on a Captive Pocket-Mouse.

IN November, 1889, I found a pocket-mouse (*Perognathus fallax*) in one of my traps, alive and unhurt, though torpid with cold, and took a fancy to keep it a captive to study its habits. It warmed slowly, and was some hours in regaining its usual state of activity. I have found individuals of other species and genera of this family (*Saccomyidæ*) chilled in traps, and it seems probable that, while they can bear considerable cold if free to move about rapidly, if compelled to keep quiet, they speedily succumb to cold. On this November morning the cold was sufficient to produce but a slight rime on the grass. This pocket-mouse was not wild, but allowed handling freely from the first. It would walk up my sleeve, around my neck, and down the other arm, and for a year or more would not try to jump to the floor, but later it seemed to have lost the sense of depth, and now it will jump down after a little walking about, even if the fall is far enough to injure it. It has never tried to bite me, and will quietly bear stroking and carrying about in my hand, though it seems to be getting somewhat wilder. I put it in a wooden box of perhaps a cubic foot in capacity, and put in an inch or so in depth of dry sand. For the first two years its habit was to dig and scratch in this sand each night, often making noise enough that I could hear it through my closed bed-room door, just outside of which the box was placed, but I never heard it scratching in daylight, and for some months I have not heard it in the night. It has not gnawed the wood as true mice would have done, and has not lifted the lid, which was kept closed by but its weight. If taken out of the box after dark and turned loose on the floor of the sitting-room, it moves about actively a few minutes, usually by short, deliberate, rabbit-like jumps, but if frightened it leaps two feet or more, as if shot off by a spring. After it has satisfied its curiosity, it creeps into some dark place behind a piece of furniture. In daytime it hunts a dark place immediately, if al-

lowed to, and is easily caught, while after dark I must corner it to catch it. I have heard it make no vocal sound save a slight squeak if accidentally hurt. It appeared to be fully adult when caught, but I have no other means of knowing how old it then was. It now acts as if feeling the effects of age. At first I tried feeding it grain, seeds, and green food. It would eat no green food that I gave it and would not touch water. For two years I have given it only dry barley or dry wheat and no water. It seems to prefer the wheat. It is a mystery to me how such an animal can live and thrive for years on dry grain without water or moisture in any form. Once or twice a year I empty its box and put in fresh, dry sand, and set the box in an angle in the hall where it is perfectly dry. I put nothing more in the box but dry grain and a little cotton to make a nest of, yet under these conditions it has lived three years. Many birds and animals do not drink water, or but rarely, but most such eat either green food, soft insects, or freshly-killed flesh, from all of which sources some moisture is obtained.

From where does my pocket-mouse get its moisture? Some seems necessary to make blood, replace water evaporated from the lungs and skin and other waste. F. STEPHENS.

Santa Ysabel, Cal., Nov. 22.

Confusion in Weights and Measures.

THE interesting article in *Science* Nov. 25, on "weights and measures in England versus the decimal and metric system," recalls to my mind the difficulties I once experienced in stating the value in grains of a U. S. gallon of water at 60° F. A telegram was handed me one morning, requesting the above information, and I requested the messenger to wait until I had written a reply. Much to my astonishment, there existed the greatest confusion among the authorities upon this simple point, and it took me several months of investigation before I could write a satisfactory answer to the above telegram. Among the values noted were the following:—

U. S. Pharmacopœia, 1870,	58328.8862 grains.
" " 1880,	58329.6 "
Miller's Chemistry,	58317.3 "
Am. Chemist, Vol. I., p. 318,	58319.8 "
U. S. Dispensatory (last edition),	58328.886 "
Oldberg's Weights and Measures,	58335.218 "
U. S. Treasury Department,	8.3312 pounds.

The report on "Weights and Measures," by the Secretary of the Treasury (Senate Doc., 1857), says: "The gallon is a vessel containing 58372.2 grains (8.3389 pounds avoirdupois) of the standard pound of distilled water, at the temperature of maximum density of water, the vessel being weighed in air in which the barometer is 30 inches, at 62° F."

In view of all this confusion I thought it best to calculate a value for myself, basing my work upon the weight of a cubic inch of water as given in Barnard's "Metric System." My result was: "The U. S. gallon of distilled water at 60° F., weighed in air at 60° F., with barometer at 30 inches, weighs

58334.94640743 grains.

Referring to this result, Dr. Rice, Chairman of the Committee of Revision of the U. S. Pharmacopœia, was good enough to say: "Until further information is supplied, the value reported deserves preference before all others. It seems, however, highly desirable that this whole question of standards and relation of weight to measure, be finally settled by law, and preliminary to this, by a new scientific investigation which might be most suitably conducted under the auspices of the National Academy of Sciences or some other representative scientific body."

This U. S. gallon, of which we have been speaking, is, as is generally known, a survival of the old English wine gallon of 231 cubic inches, which has become disused in England since the Imperial gallon was introduced in 1826. It is not generally known, however, that although dignified by an apparently "standard" title, the U. S. gallon has no statutory existence whatever. In this lack of formal recognition the gallon does not stand alone, for not one of our common weights and measures, with the single exception of the "Troy" pound has any place upon the national statute books. In 1873 an act was passed providing that "For the purpose of securing a due conformity in weight of the coins of the United States, the brass troy-pound weight procured by the Minister of the United States at London in the year 1827, for the use of the mint and now in the custody of the mint at Philadelphia, shall be the standard troy pound of the mint of the United States, conformably to which the coinage thereof shall be regulated." Thus even the troy pound is seen to have no official recognition for general use, but only for the special purposes of the mint.

It is curious in this connection to note that the metric system, as a whole, was legalized in this country by act of Congress of July 28, 1866. The act reads: "It shall be lawful throughout the United States of America to employ the weights and measures of the metric system; and no contract, or dealing, or pleading in any court shall be deemed invalid or liable to objection because the weights or measures expressed or referred to therein are weights or measures of the metric system." By act of Congress the Secretary of the Treasury was directed to furnish each State with "one set of the standard weights and measures of the metric system." It is true that an act passed June 14, 1836, directed a distribution to be made to the several States of complete sets of "all the weights and measures adopted as standards," reference being made to the weights and measures then and now in common use, but it will be found upon inquiry that the expression "adopted as standards" refers to an action of the Treasury department made on the recommendation of Mr. Hassler in 1832, and not to any action on the part of Congress.

To quote from the report of the Secretary of the Treasury for 1857:—

"The actual standard of length of the United States is a brass scale of eighty-two inches in length, prepared by Troughton of London, and deposited in the Office of Weights and Measures. The temperature at which this scale is standard is 62° F., and the yard-measure is between the 27th and 63d inches of the scale."

"The gallon is a vesssel containing 58372.2 grains of the standard pound of distilled water, at the temperature of maximum density of water, the vessel being weighed in air in which the barometer is 30 inches at 62° F."

"The standard of weight is the troy pound, copied by Captain Kater in 1827 from the imperial troy pound. The avoirdupois pound is derived from this; its weight being greater than that of the troy pound, in the proportion of 7,000 to 5,760."

This troy pound was, as has been said, afterwards recognized by act of Congress, thus becoming distinguished from the other so-called "standards." WILLIAM P. MASON.

Rensselaer Polytechnic Institute, Troy, N.Y., Dec. 13.

Is There a Sense of Direction?

ON the first of May last, my camping outfit started from Austin, Texas, bound for the northwestern part of the State. They went through the country, taking with them our camp dog, "Old Rock," a common cur.

Professor Cope of Philadelphia and myself joined the party at Big Springs, two hundred and fifty miles from Austin. Our destination was the upper Red River and the Staked Plains. We travelled northward along the foot of the plains, sometimes without a road, for about one hundred and fifty miles. Thence we went west one hundred miles, and thence south across the high plateau of the Staked Plains one hundred miles. Thence we turned east, crossing our former route at Clarendon, continuing southeastward to Archer County, a distance of one hundred miles. We then went southwestward seventy-five miles, and then back eastward to Archer and Montague Counties. From there we turned southward to near Dallas, where I disbanded my party, and started my outfit back to Austin, the last of October. We had been in the field six months. "Old Rock" had faithfully followed the wagon except at one time, when, his feet getting sore from travelling in the hot sand, he had been hauled for a few days.

After the outfit started for Austin and when at Hillsboro, one