

ian. In fact, it is not infrequently mistaken for black obsidian or volcanic glass, which also occurs in great quantity in this Territory. Uintahite is also very brittle. When heated it melts readily, but will not burn. This substance is hauled in wagons from the mines near Fort Duchesne, in Uintah County, to Pleasant Valley Junction, on the Rio Grand Western Railway, a distance of more than a hundred miles, to be shipped East for the manufacture of varnish.

Wurtzillite bears a remarkably close resemblance to uintahite. It has a similar color, lustre, fracture and specific gravity, and it is about equally brittle. But wurtzillite readily burns, yielding a bright light from the combustion of illuminating gases. Again, its streak is black, and it is slightly sectile, being capable of being cut or pared by a knife much as rubber or horn may be pared. Wurtzillite has been reported from Wasatch County, as well as from Emery and Uintah Counties, in considerable amount. Asphaltum occurs in Emery and San Pete Counties. It is somewhat mixed with sand and other impurities, but it is already being mined in considerable quantity for paving the streets of various Western cities.

In addition to wurtzillite, uintahite, asphaltum and ozocerite, other hydro-carbons are found in Utah; for example—albertite, petroleum and natural gas. But, as yet, none of the latter have been made productive.

HENRY MONTGOMERY.

University of Utah, Salt Lake City, July 29.

ANIMAL VOCABULARIES.

A GOOD deal has been said about the probable existence of definite vocabularies in the language of the lower animals, and I believe one has gone to Africa to study Simian speech. This is all well enough, but there is no need of going beyond the barn yard to hear a definite animal vocabulary of a considerable number of words. Hear the rooster's warning cry when he sees or hears indications of danger. It is a definite sound, and perfectly understood by every hen and chick. Drop food to the mother hen. She quickly inspects it, and if approved, tells the little ones to eat, by uttering her well known "Coot, coot, coot!" If she decides that it is not fit to eat, she as plainly tells them to let alone. The other day a green worm fell from a tree near a brood of chickens. Every chick ran to seize the morsel. The mother gave one quick glance at the insect and said, "*Skr-r-r-p!*" Every chick stopped instantly. But one wilful child, loth to believe his mother's assurance that it wasn't fit to eat, would make him sick, etc., started a second time to pick up the worm. "*Skr-r-r-p!*" commanded the hen sharply. Even the wilful child obeyed this time, and the whole brood walked off contentedly. Discuss as we will the particular reason for the hen's cackle before and after laying, the fact remains that it is a definite utterance, as plainly understood by both gallinæ and homines as any expression in human speech.

My horse has a low whinny which means "water," and a higher-keyed, more emphatic neigh means food. When I hear these sounds I know as definitely what she means as if she spoke in English. This morning, passing along the street, I heard that same low whinny and, looking up, saw a strange horse regarding me with a pleading look. I knew he was suffering from thirst, and no language could make it plainer.

The language of the lower animals is not all articulate. It is largely a sign language. The horse does a deal of talking by motions of the head and by his wonderfully expressive looks. He also, upon occasion, talks with the other extremity. A peculiar switch of the tail and a gesture, as if threatening to kick, are equine forms of speech. The darkey was not far wrong who said of the kicking mule, "It's just his way of talking!"

The dog can not only "look volumes," but can express whole sentences by wags of the tail more readily than can the waving flags of the signal corps. All that is necessary is to learn his code. We expect our domestic animals to learn our language, and punish them cruelly if they fail to both understand and obey our commands; yet, notwithstanding our higher intelligence, we fail to learn their language, by means of which we might better understand their wants and dispositions, and thus control them by kindness and sympathy, instead of by harsh and arbitrary treatment. I see horses passing along the street, which are saying by every look and motion that they are suffering acute torture from a too short check rein. Their drivers are often people who would be shocked if they could comprehend their own cruelty. But they do not understand horse language, and some of them do not seem to have horse sense.

The language of animals is a neglected subject. The facilities for its study are within the reach of all, and no previous preparation is required. The study can be pursued without interfering with other occupations, and even a little systematic observation will bring large returns in both pleasure and profit.

CHARLES B. PALMER.

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A MAYA MONTH-NAME—KHMERS.

In *Science*, Aug 4, Professor Thomas gives a new name to the 17th month of the Maya calendar on the basis of a phonetic rendering of its symbol.

I do not intend to dispute the correctness of his rendering; I think it quite possible he is right; but I seriously question his inference, that, because the symbol reads *ak-yab*, that therefore was the month-name.

The work *kayab* is from the verbal stem *kay*, to sing or warble. As this concept cannot be objectively represented, the Mayas had recourse to a method very familiar with them, that of the rebus, to convey or keep in memory its approximate sounds. They chose to indicate the guttural initial *k* by a turtle, called in their tongue *ak*; prefixing it to the syllable *yab*.

This method of writing is what I have called "ikonomatic," and I have shown abundant instances of it in Mexico and Central America. (See my "Essays of an Americanist," pp. 213-229). Through neglecting to regard its principles, both Prof. Thomas and Dr. Seler have made several obvious errors in translating the Mexican and Maya codices, as I expect to show in a work I am preparing on the calendar system of those nations.

With regard to the origin of the Khmers and their ethnic affiliation, I do not think that Professor Keane's claim is relevant to that put forward by Dr. Maurel. The latter maintains that the Khmers belong to the "Aryan," in the sense of the "Sanskritic" peoples; and that they are in Cambodia an intrusive stock, arriving practically within historic times. I understand Professor Keane to differ with both these opinions.

D. G. BRINTON.

Media, Aug. 7.

THEORY OF COLOR SENSATION.

An objection to my theory of color-sensation (an abstract of which has lately appeared in *Science*) has been more than once made to me, which needs to be met, but which can be met very easily. It is that I suppose the three primary color-sensations to be conveyed to the brain by one and the same nerve, and hence that the theory is not consistent with the widely accepted doctrine of the specific energy of nerves,—the doctrine, namely, as applied to the eye, that we recognize two reds to be like sensations, not by any specific quality in the sensation, but by the fact that they affect the same set of nerves, and that if a pure blue light could by any possibility be