

## "WHIFF NUMBERS"

Descriptions of odors are apt to depend on simile and metaphor rather than on definite terminology. As sense-impressions rather than objective entities, they are often difficult to define with precision.

Linnaeus, the great classifier, attempted to discover some order in their multiplicity, and divided odors into nine classes: ethereal, aromatic, balsamic, ambrosial, alliaceous, empyreumatic, repulsive and nauseating. He thus established a classification which, if far from exact, has been widely useful to the present day.

In an article called "Whiff Numbers," reviewed in *Tropical Woods*, E. C. Crocker and L. F. Henderson discuss first the attempts at a simplified classification made by a German experimenter, Henning, who reduced the number of fundamental odors to six: spicy, flowery, fruity, resinous, burnt, and foul. They then explain their own system which, on the basis of only four primary odors and a scale of values for each of these, permits of the definition of perfumes with a high degree of exactness. Their elementary odors, for which they believe, like Henning, that there exist distinct smell-sensation nerves in the human nose, are: fragrant, acid, burnt and caprylic.

"Fragrant is strong in the odor of most flowers, spices, and fruits, and in some animal secretions such as musk, ambergris, and civet.

"Acid is the sharp character notable not only in volatile acids, but in chemically neutral materials such as turpentine and camphor, and in alkalies like ammonia.

"Burnt is a character well-known to cooks—prominently present in creosote, tars, and so on, as well as in skunk, beaver, fox, and many other animal odors, and roasted coffee.

"Caprylic or goaty is the character poignantly present in rare cheeses, illuminating gas, and rancid grease, very evident in many animal odors, including perspiration, and moderately represented in many odors classed as pleasant."

As to the scale of values used by them, these authors write: "We went a step further and represented the amount of each component present in a given odor by a digit such as 1, 4, or 7, based on 8 as the strongest that the particular character ever attains in any known odor. If these digits are arranged in a standard order, it becomes possible to represent any odor as a four digit number, as: 6523 for the odor of the damask rose, where 6 is fragrant, 5 is acid, 2 is burnt, and 3 is caprylic. Similarly derived, the odor of the purest ethyl alcohol is 5301, and oil of wintergreen 8442."

Finding the fragrant values of most odors of interest to be about 6, and the acid value about 4, their burnt and caprylic components become most important for their exact definition, and may be represented on a single chart. With the aid of a set of "standards" the authors "found it possible to get good agreement between operators in assigning odor numbers and in using the number system in practical perfume and flavor experimentation."

The most important odoriferous substances in the vegetable kingdom are represented by the essential oils of which a comprehensive display may be found in Hall 28.

A beautiful painted dome which once hung from the ceiling in a Lama temple in Tibet is on exhibition in Hall 32.

Specimens of many plants important in the preparation of medicinal products are shown in the Hall of Plant Life (Hall 29).

## TRAGEDY OF CALIFORNIA "TAR BEDS" RE-ENACTED IN GROUP

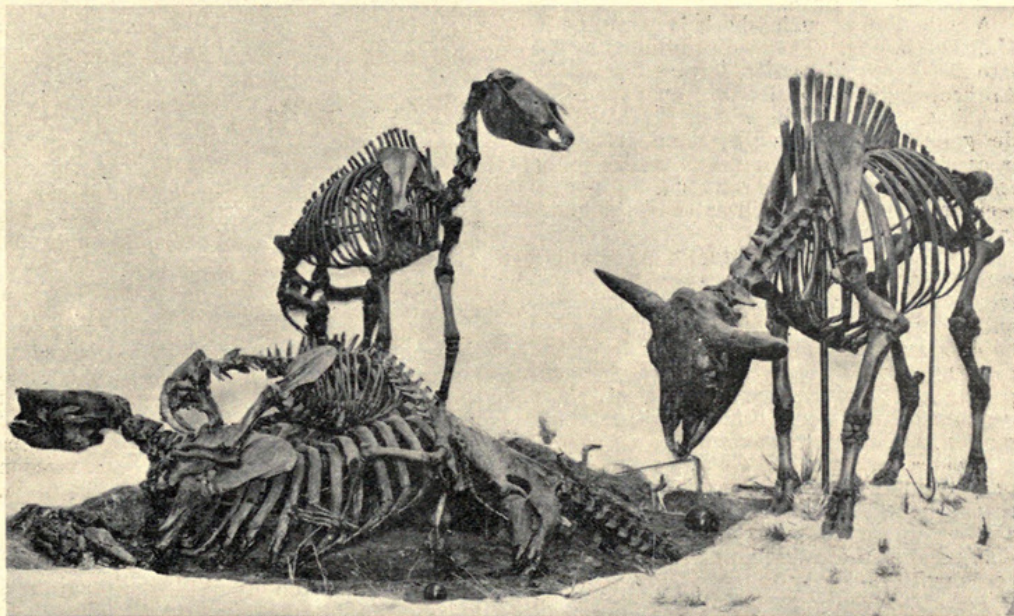
BY ELMER S. RIGGS

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A tragic scene enacted many thousand years ago at the "tar pools" of Rancho La Brea, Los Angeles, is reproduced in a group of skeletons from that place which recently have been installed in Ernest R. Graham Hall (Hall 38). The group includes skeletons of the saber-tooth tiger (*Smilodon*), of the great ground sloth (*Mylodon*), of an extinct species of bison, and of one of the species of prehistoric American horse. These specimens have been mounted and are grouped in a tar-pool scene to indicate the way in which the animals were caught in a natural death-trap. Above them a mural painting by Mr. Charles R. Knight further illustrates the gathering of preying animals

the pools; the tarry mass below served to catch and hold the unwary feet. Often the half-submerged carcass remained as a bait to lure other preying animals to it. Many of the latter were caught in turn, and so the process went on. The bones, settling into the tar, were saturated and preserved by it and accumulated as a heterogeneous mass at the bottom of the pool. There they remained as mute evidence of a system of animal life of a past age.

The specimens, though darkly discolored by the tar, are splendidly preserved. In most cases parts are separated and intermingled with those of other animals of many kinds. Included are such great birds as eagles, vultures and condors, together with many smaller and more common



Death Trap in Asphaltum Pools of Rancho La Brea

New fossil group in Hall 38 showing how preyed-upon and preying animals both met their doom thousands of years ago. At left is a helpless sloth being attacked by a saber-toothed tiger; in the rear at left is an early type of horse, and on the right an extinct species of bison.

and of carrion-feeders to feast upon the remains of the unfortunate victims.

These tar pools were known to the earlier Spanish settlers about Rancho La Brea, and were marked by them as danger-spots on the range. Riders were constantly on the alert for unwary cows and horses which had been caught in them. These they dragged out by means of horse and lasso. Many domestic animal victims no doubt failed to be thus rescued.

Some thirty years ago an attempt was made to use the asphaltum of the La Brea pits for paving roads. The mass was found to be so filled with bones that it could not be used. A professor from the University of California observed that some of the bones embedded in the asphaltum were not those of modern animals but of animals now entirely extinct. Enthusiastic investigation followed, and pits dug to a depth of twenty-five feet yielded masses of fossil bones. More than eighty species of extinct birds and mammals have been discovered in this locality.

The asphaltum pools, now commonly known as the "tar pools," are formed, like springs of water, from asphaltum in the liquid state seeping up from the earth through crevices in the rock and collecting in pools at the surface. Often the "tar" was covered by water which collected in the same pools and served to conceal it. The water acted as a bait to attract animals to

species. Common preying animals such as the coyote, the wolf and the saber-tooth tiger are most abundant. Mastodons and elephants are found there less frequently, and lions and camels of Asiatic type are among the number. Even great ground sloths of South American origin found their way to the tar pools. Bones of men of Indian type have also been found there. The remains so preserved have been a great boon to natural history. At no other place in the world have fossils of an entire system of life been so well preserved in a limited locality. Large collections of these fossils have been stored in the museums of California, and many specimens have been distributed by them to museums throughout the world.

The skeleton of the ground sloth in the Field Museum group shows how the animal had ventured into the pool to drink and had become mired in the sticky asphaltum. A lurking saber-tooth tiger, realizing the helpless condition of the sloth, has attacked him and in turn has found his hind foot sinking into the mire. A bison sniffs doubtfully at the tarry pool while the horse is wheeling away to escape. The group was assembled by Preparator Phil C. Orr.

Exhibits representing the every-day life of the present Indian inhabitants of Central America are on view in Hall 8.





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