

Vol. V., Kingsborough.) The fact that it was employed in pictography to express the sound *Huitzoco* proves that the object depicted is a 'Huitzoctli,' described in Nahuatl dictionaries as 'a staff of oak, used as a lever to upturn sod or earth—a digging pole.' The figure placed across the staff is the emblem of the pulque (octli) gods and expresses here the *octli*. It offers another interesting illustration of the employment by Mexican scribes of complementary signs, in order to render the meaning of a hieroglyph unmistakable; a usage I had detected and published about 1886 (see *Standard on Headdress*? Peabody Museum, Papers, Appendix).

From the foregoing it is evident that, instead of a possible drill, the hieroglyph represents the digging staff, employed for its phonetic sound with a complementary sign determining it, thus: huitzoctli word expressing name *Huitzoco* (octli), complementary.

Fig. 115 is the hieroglyph of the town, Tlachmalacac (see, also, text of Codex Mendoza). This word explains to us that the signs are representations of 1, the *tlachtli*, not 'a possible frame,' but the groundplan of the court employed for the national game of ball, or *tlachtli*. This sign is well known, and frequent examples of its employment to express the sound *tlach* are to be seen in the same Codex Mendoza; see, for instance, plate 33, fig. 2, and plate 38, fig. 1, where the name of the town of *Tlachco* is expressed in picture writing.

See also plate 22, fig. 4 (town *Tlachyahualco*), and plate 47, fig. 3, *Tlachquianhco*, expressed by the sign *tlachtli*, within which are raindrops—*quiachuitl*. The affix *co* means *inside of* and is expressed by the rain being represented *inside* of the *tlachtli*. The object represented on the *tlachtli* sign is a spinning-wheel, a *malacatl*; it has nothing to do with the *tlachtli* and is only employed to express its own sound.

Figs. 100 and 116 are *both* representations of priests kindling the New Fire at the beginning of a new cycle, a ceremonial observance.

Fig. 116 shows how the *themaill*, or fire drill of wood, was employed to kindle fire in a log or large piece of prostrate wood; a fact that does not at all contradict Mr. McGuire's interesting observation that, doubtless, the Mexi-

cans employed the same kind of drill for boring wood.

ZELIA NUTTALL.

THE PLAY OF ANIMALS; THE FUR SEAL.

It was with some little pleasure that I read the review of Professor Gross' *Die Spiele der Thiere* in *SCIENCE* for February 26th, and found that he holds play in animals 'to be an instinct developed by natural selection, * * and to be on a level exactly with the other instincts which are developed for their utility.' The pleasure lay in the fact that having ventured into the (to me) foreign domain of psychology, I had written as follows: "The great redeeming feature of the fur-seal's character is its playfulness when young, for few animals seem to enjoy life so well as the rollicking pups and young bachelors. But here again it is necessary to curb our imagination and to remember that while the young seals undoubtedly do derive a certain amount of enjoyment from their sports very much of what strikes us as mere play is in reality dawning instinct. The sporting of seal pups foreshadows the time when their very lives will depend on the ability to capture food for themselves, and the playful wrestling contests in which they perpetually engage are mere hints of future fierce battles among bulls. Yearlings do not 'round up' harems of pups with the reasoning care that a child bestows on her dolls, but because centuries of heredity have caused this instinct to be developed long before it serves any practical purpose." As the young seals do not associate with the old, their play would seem to be purely instinctive. The conclusion derived from this study of the mental traits of the fur seal and its direct bearing on the questions at issue is that "this acting by instinct is the keynote of the seal's character; the mind, like the body, has been molded by natural selection acting on the mass, so that one seal behaves like another and knows just as much as another, and no more. It is a creature of instincts and not guided to any great extent by reason; as it has done in the past so it will do in the future; its habits being formed by the slow process of natural selection can change but slowly; hence the fur seal is not likely to alter its habits nor to adapt itself to changes in surrounding conditions."

F. A. LUCAS.