

In his first article he says: "Without the slightest word of acknowledgment these professors [Beman and Smith] 'took' a whole block of problems and a long note from Halsted's Elements of Geometry;" or, as he puts it more picturesquely in another place: "[They] have paid Dr. Halsted's Elements of Geometry the startling compliment of appropriating bodily Book IV., Section I., Partition of a Perigon (pp. 151-154), in their Geometry, pp. 179-181; Ginn, 1895. Elementary Geometry has been the most stable part of all science. The introduction into it, by Dr. Halsted, of the section entitled Partition of a Perigon was an utter innovation. The section, and even the very phrase 'Partition of a Perigon' had never before appeared in the world. This being the fact, the following 'deadly parallel' shows a psychologically interesting ethical color-blindness on the part of two teachers not otherwise known to have been openly immoral." Then follows a comparison of the two books, omitting the 'long note,' which seems to have disappeared from the controversy.

We have shown that the *order* of these problems is a perfectly natural one and not original with Professor Halsted. We have shown that the *solutions* of the problems in the two books are not the same. We have shown that Professor Halsted took the word 'perigon,' on which so much stress has been laid, from Sandeman's Pelicotetics without acknowledgment, and yet he affirms that "their [our] * researches on this matter turn out highly complimentary to me [him];" and that "our having reason to believe that W. B. Smith, Newcomb and Fairofer all did see the word for the first time in Halsted's books * * * surely * does me [him] great honor." Evidently "honors are easy."

That Professor Halsted furnished the facts given on page 237 of Cajori's Teaching and History of Mathematics in the United States we are not inclined to deny, but we look in vain for the slightest reference to the word 'perigon' or its origin.

That the phrase 'Partition of a Perigon' occurs only in Halsted's book and our own is true—so far as we know—but surely the notion is not so original that Professor Halsted would claim it as his personal property. Compare

Henrici und Treutlein, Lehrbuch der Elementargeometrie, 1881, p. 91: "Denkt man den Vollwinkel [Vollwinkel-perigon] * * in n gleiche Teile geteilt;" and again, "Teilt man den Vollwinkel in n gleiche Teile." If this does not suggest 'Partition of the Perigon,' how would the idea be expressed in German?

In the preparation of our geometry we made considerable use of Henrici und Treutlein and in our preface we mention it first among the helps employed; with respect to the sources of his material it is not the habit of Professor Halsted to take the public into his confidence. How familiar he may have been with this book we do not know.

In answer to his last question we might say that Professor Beman saw Sandeman's Pelicotetics for the first time in the Peabody Institute library at Baltimore in February, 1882, and secured a copy for his private library that same year.

With this summing up of the evidence we cheerfully submit the whole question to the intelligent jury of readers of SCIENCE, feeling absolute confidence as to the verdict that will be rendered.

BEMAN AND SMITH.

[As the charges were first brought by Professor Halsted, it seems best to close the discussion with the reply from Professors Beman and Smith.—ED.]

MEXICAN HIEROGLYPHS.

TO THE EDITOR OF SCIENCE: I have received the following note from Mrs. Zelia Nuttall, an expert in all that pertains to Mexican hieroglyphs, in which she shows that figures 114 and 115 of my paper in United States National Museum Report, 1894, Pp. 623-726, were not, as I supposed they might be, figures of drills. The fire drill in all countries is similar to the drill employed in making holes through hard minerals and wood. Mrs. Nuttall's correction makes it probable that the North American nor the South American either of them know other than the straight shaft.

J. D. McGUIRE.

Fig. 114 is a copy of the hieroglyph of the town Huitzoco taken from the Codex Mendoza, p. 39, fig. 4. (See text of Codex Mendoza,

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.