

## A NOTE ON THE APPLICATION OF SCIENTIFIC METHOD TO LITERATURE.

BY C. MICHENER, SAN FRANCISCO, CAL.

PEOPLE have lately begun to study literary products inductively; but that study has been almost entirely systematic. Words, sentences, paragraphs, figures of speech, etc., are counted and classified, and from the results obtained some slight conclusions are drawn as to the development of style. This is undoubtedly good work. But it is easy work and perhaps it is on that account that we so readily see that it is good.

In the present paper I wish to propose something more difficult. I wish to indicate the use of a science as a tool in the study of literary products scientifically. The history of any science is a story of development by stages, each successive stage of advance caused by the application of another department of science to the investigation of the one in question, for example, mathematics to electricity.

Literature is a product of the mind, and its use and purpose are by and for the mind. Is it not then intimately connected with psychology, and should not an investigation and comparison of the facts of each be of benefit in determining the laws of each?

Let us take, for example, that exceedingly important part of most literary products, Plot. As an outline for the study of plot (not to be confounded, of course, with plot content), I would propose the following:—

(A.) *The psychological bases of plot.* Here the main part of the work is to be done. The exceedingly delicate mental phenomena included loosely under such terms as attention and interest are to be investigated by experiments as wide in range as possible; and from all this should result facts enough for the construction of the ideal plot and the determination of its structure. This we might call

*The typical plot*, that is, plot stripped of all accidental factors and limitations. The next step would be to consider the various adaptive modifications which this typical plot would undergo when subjected to the restraints and environment of the various great classes of literary products; and our investigations under the first head, and I think I may say such investigation only, will enable us to understand the differentiation. We should thus be led to consider the plot of the lyric, the epic, the drama, the novel, etc.

B. *The temporal development of plot.* Here we should commence from the other end as it were, and from the existing literary products trace the growth of plot from its beginning to the present; and from these records obtain the history of the development of those mental functions which plot presupposes. This second division is the natural and necessary complement and check of the first and should be as useful to psychology in this department and, in an analogous way, as paleontology is to zoölogy or botany.

That the method here outlined is merely tentative I confess. It would, of course, be severely limited and the conclusions impaired by any limitation in the range of experiments under the first head; and in the present state of scientific psychology to be at all possible, the method would have to be materially modified to produce any result at all. I have, however, in this present note, only attempted to be suggestive, not conclusive.

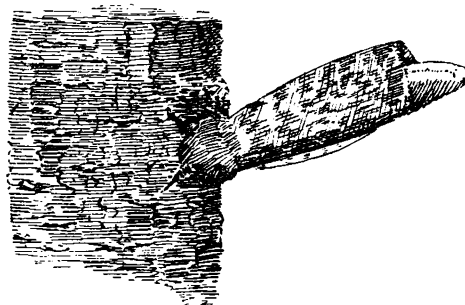
## LETTERS TO THE EDITOR.

## A Case of Protective Mimicry.

THIS morning, as I was passing a small apricot tree standing in my yard, my attention was arrested by what appeared to be a short stub of a branch, about 1½ inches long, projecting from the side of the tree about 20 inches from the ground. Having recently pruned the tree carefully, I wondered how I had happened to leave that stub, and at once applied my pocket-knife to remove it. Much to my surprise, I found that the supposed stub of a branch was a moth attached by its head to the side of the tree. The accompanying sketch represents its appearance.

The grayish-brown mottled color of the closed wings of the moth matched the color of the bark completely, and the angle

made by the axis of its body with the tree was such as a branch would naturally make. It was attached, with its ventral surface uppermost, and the extremity of the abdomen, which projected beyond the closed wings, was nearly white, as seen from above, thus imitating very perfectly the central woody portion of the broken branch. Having turned the moth over in my attempt to remove the supposed branch, it assumed the natural position of such insects on the side of the tree, but upon returning a half-hour later I found it again in the position shown in the figure. Several



other persons who saw it were as completely deceived by its appearance as I had been, and it is easy to believe that the keen eyes of a hungry insect-eating bird might see there only the stub, and thus be cheated out of a breakfast.

GEO. H. COLTON.

Hiram, O., June 11.

## A Maya Month Name.

As every additional find in reference to the Maya manuscripts is of interest to some of the readers of *Science*, I submit the following item.

In the bottom line, Pl. 46, Dresden Codex, is the glyph shown in Fig. 1, which, as all students of these Codices admit, is the symbol for the Maya month *Kayab*. Here it is without the appendage which sometimes accompanies it. In Fig. 2, from the bottom line of the Dresden Codex, Plate 61, the form is more complete, and the appendage is present.

The signification given by Perez to the name of this month is "singing," from the Maya word *Kay*, "to sing, to warble," but a study of the symbol leads to quite a different interpretation. According to the interpretation heretofore given by me (*American Anthropologist*, July, 1893, p. 246) the character in the upper right-hand corner of the glyph has *b* as its chief phonetic element,



which is also one of the consonant sounds of the word *Kayab*, and the appendage is the month determinative. But I was unable at the time the article referred to was written to indicate the portion of the symbol denoting the *k'* element. A more thorough examination, as given in Fig. 2, has called my attention to the fact that in the left portion and general form we have precisely the symbol for *Aac* (*Ac*, *Ak*), the "turtle," as given in the upper division of Plate 17, Cortesian Codex. Following this interpretation, the true name of the month is *Acyab* or *Akyab*, which, for the sake of euphony, has been changed to *Kayab*. The derivation, according to this interpretation, will be from *Ac* or *Ak*, "turtle," and *Yab* or *Yaab*, "many, abundant, plentiful." Adding the month determinative, we obtain as the full signification, "The month when turtles abound." Whether or not turtles are most abundant on the coast of Yucatan during the month of June I am unable to say. The only evidence I have at hand relating to the subject is found in Mrs. LePlongeon's charming little work, "Here and There in Yucatan." In this she describes a trip along the coast in June, at which time turtle catching was in progress and attended with great success, the fishermen's pens being full. Dr. Schellhas (*Zeitschrift für Ethnologie*, 1892) notices the resemblance of this character to the turtle symbol.

This apparently furnishes, at least, a straw pointing in the direction I have been moving in my study of the Maya hieroglyphs.

Washington, D.C., July 15.

CYRUS THOMAS.

#### Historical Statements in Century Dictionary Contradicted by Other Authorities.

Napier's rods (or bones), a contrivance commonly attributed to John Napier (1550-1617), but in fact described in the Arithmetic of Oronce Finée (1532).—*Century Dictionary* under *rod*.

Die erste Beschreibung gab Nefer in seiner Rabbologia (Edinburg, 1617).—*Vorlesungen über Geschichte der Mathematik*, von Moritz Cantor, zweiter Band, Seite 660.

The earliest known writers on the subject (magic squares) were Arabians, among whom these squares were used as amulets.—*Century Dictionary*, under *magic*.

The earliest known writer on the subject was Emanuel Moscopulus, a Greek, who lived in the fourth or fifth century, and whose manuscript is preserved in the National Library at Paris.—*Encyclopædia Britannica*, under *magic squares*.

These seem to me to be contradictions. I should be glad to see the truth in regard to these historical facts plainly set forth by a reader of *Science*.

GEO. A. MILLER.

Eureka College, Eureka, Ill., July 24.

#### The Cambodian Khmers.

OWING to some irregularity in the postal delivery I have only just received *Science* for June 9, else I should have sooner asked leave to put in a claim of priority in connection with Dr. Maurel's new views regarding the "Aryan" origin of the Khmers, referred to by Dr. Brinton in that issue. Personally I avoid the expression "Aryan" or Indo-European stock" as confusing and applicable far more to linguistic than to ethnical groups. But if "Caucasian," used in Blumenbach's sense, be substituted for

"Aryan" Dr. Brinton will find, by consulting the Transactions of the British Association for 1879, that fourteen years ago I conclusively showed that the Khmers should be grouped not with the surrounding Mongolic, but with the Caucasian division of mankind. In the "Monograph on the Relations of the Indo-Chinese and Inter-Oceanic Races and Languages," read before the association, and again before the Anthropological Institute and printed in the journal of that society for February, 1880, and issued separately by Trübner at same date, I argued *generally* that "both of the great Asiatic types conventionally known as Caucasian and Mongolian, have from prehistoric times occupied the Indo-Chinese peninsula," and *particularly* that here the Caucasian stock is represented by the widespread Khmer group, that is to say, the Cambodians proper, the Kuys or Khmerdom ("original Khmers"), as the Cambodians call them, the Stiengs, Charays, Chams and many others, some still in the tribal state, some long civilized or semi-civilized. It is the civilized that mainly engage Dr. Maurel's attention, and that he rightly regards as Aryans (read Caucasians), but wrongly supposes to have migrated in comparatively recent times from India to Indo-China, "bringing with them the Aryan culture of that country as proved by the stately ruins of Ang-Kok (read Ongkor-Vaht)." There was no such migration "probably about the third or fourth century of the Christian era," for the Khmers are not recent arrivals, but the true aborigines, as shown by the presence of the Khmerdom and the kindred wild tribes, and also by their untuned polysyllabic speech, radically distinct both from the Indo-Chinese toned monosyllabic group and from the Indic (Sanskritic) branch of the Aryan, but closely allied to the untuned polysyllabic Malayo-Polynesian linguistic family.

This point, which I think I have established to the satisfaction of most ethnologists and philologists (Professor Sayce amongst others), is of far-reaching consequence. It affords the solution of the extremely difficult problem connected with the presence of Logan's "Indonesians," my Caucasians, side by side or intermin-

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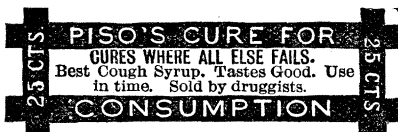
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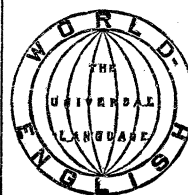
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