

The fact that the exact age of each horizon referred to is clearly established in the geological column should make these beds of particular interest to the paleobotanist and should contribute materially to our facilities in correlating the much-discussed Interior Tertiaries. DANIEL W. LANGDON, JR., F.G.S.A.  
Cincinnati, Ohio.

#### Bowser's Mathematical Text-Books.

I HAVE just read a note on "Bowser's Trigonometry" by Professor Hodgkins in *Science* of Jan. 20. Permit me to add a few words on Bowser's series, both in the way of praise and criticism, and, therefore, favoring both sides of the question. I used his analytical geometry and calculus for two years with good results. They are well adapted to the average student in arrangement, examples, and general plan, and they are more modern than most text-books of the same class. But the subject is sometimes unnecessarily complicated, as in solid analytics, where the beauty of the method of direction-cosines is seriously marred. Also, in respect to the details of accuracy of statement and logical demonstration, I am sorry to class the series among the free and easy kind of which we have so many, although among the best of that kind. The public is as much at fault for accepting and even demanding books in that style as are the authors for writing them.

Let me illustrate by his treatment and use of the method of infinitesimals. That method is at best a dangerous one, even in the hands of the masters, let alone the average student. This is sufficiently well illustrated by the errors into which Professor Bowser himself has fallen; and he should read the scoring that Clausius gave his mathematical critics on their use of infinitesimals. He will find that he is in good company. Most anything can be proved to the satisfaction of the average student, just as Professor Bowser establishes the differentials of the trigonometric functions. Thus, by trigonometry,

$$\begin{aligned} \sin(x+dx) + \cos(x+dx) &= \sin x \sqrt{2} \cos\left(\frac{\pi}{4} + dx\right) \\ &+ \cos x \cos dx + \cos x \sin dx \\ &= \sin x + \cos x + \cos x dx, \end{aligned}$$

since  $\sqrt{2} \cos\left(\frac{\pi}{4} + dx\right) = 1$ ,  $\cos dx = 1$ ,  $\sin dx = dx$ .

Hence  $d(\sin x + \cos x) = \cos x dx$ , a false result.

Professor Bowser is more fortunate than the critics of Clausius, since he happens upon a final result that is correct; but, farther along, this good luck deserts him, in the case of a carefully-worked example (Calc., ex. 3, p. 325). Another case is ex. 8, p. 338. In view of these facts, I hope Professor Bowser will revise his demonstrations and eulogy on infinitesimals, to the decided improvement of his valuable book. A. S. HATHAWAY,

Professor of Mathematics, Rose Polytechnic Institute.

Terre Haute, Ind., Jan. 28.

#### Some Additional Remarks on Maya Hieroglyphic Writing.

IN a former communication, replying to some objection brought forward by Professor Thomas, I noticed that in the numerals, composed of straight lines and dots, which are seen accompanying the hieroglyphs of the Maya inscriptions, the one dot of the numbers 1, 6, 11, 16 always is supported and framed by two ornamental signs filling up the space, while no ornamental sign is seen between the two dots of the numbers 2, 7, 12, 17. I noticed this for a Copan Stela published by Alfred Maudsley (see the Figs. 1-16 in my former paper). I may add that the same applies to the inscriptions of the Palenque tablets, only that here the two dots of the number 2, like the one dot of the number 1, are framed by two ornamental signs, while the two dots of the numbers 7, 12, and 17, as a rule, are standing alone. I wish to state that although prevailing in most cases, this rule may allow some exceptions. Alfred Maudsley, page 39 of the text, gives drawings of the numerals, where an ornamental sign, similar to the two ornamental signs of the numbers 1 and 6, is seen between the two dots of the numbers 2 and 7. Maudsley does not mention where he has taken these figures. But, for instance, on the cross-tablet 1, of Palenque, in the hieroglyph V. 17, designating

the twelfth day of the month Kayab, a somewhat peculiar ornamental sign, composed of two nooks, is seen between the two dots of the number.

In connection with these facts, I wish to mention that there really exists an instance of a cross between the two dots of a number in Dresden Codex 46, already mentioned by Professor Förstemann in *Zeitschrift für Ethnologie*, 23 (1891), p. 149, that, unfortunately, I had overlooked. DR. SELER.

Steglitz, Germany, Jan., 1893.

#### Languages of the Gran Chaco.

I WAS very much gratified to see that Dr. Brinton thinks well of my intention to publish all the material I can get hold of connected with the languages of the Gran Chaco. The following facts may be of interest to him and other Americanists on your side of our continent.

1. Dr. Brinton is quite right in giving the name of "Guaycurú" to the Abipone and other cognate dialects. The root word is *ary*, which simply means "a fierce savage." *Gu* and *curú* are simply particles.

2. The linguistic library of the La Plata Museum will comprise two series: First, the Guaycurú; second, the non-Guaycurú group.

#### The Guaycuru Group

a. MOCOBI. Father Tavolini's MS. faithfully reproduced; a grammar founded on same, with a preliminary discourse and other papers. An English version of the grammar.

b. TOBA. Father Barcena's MS. complete, with supplementary vocabularies by Carranza, Pelleschi, the editor, and others. A preliminary discourse on the language. An English translation of F. Barcenas Quires.

c. ABIPON. Father Dobrizhoffer's chapters on this dialect, supplemented from MSS. supposed to be Father Brigniel's, with a preliminary discourse, and most important vocabulary.

d. LENGUA. Cerviño's MS. vocabulary. Evidently a cognate dialect, with Mansfield's Payaguá. Preliminary discourse on the same subject.

e. GUAYCURÚ. An essay on Castelnan and Gibú's vocabularies.

#### Non-Guaycuru Group.

a. A reproduction of Father Machoni's work on the Lule language, with an essay on the suffixing dialects of the Chaco.

b. An essay on the Vilela and Chulupí dialects, to accompany Pelleschi's vocabulary.

c. MATACO. Pelleschi's grammar and vocabularies, with notes and preliminary discourse by the editor.

d. Possible numbers in Mataguays, Nocten (Mataco dialects), and Chiriguano (a Guarani dialect).

Dr. Moreno, director of the La Plata Museum, is doing his best to push this work forward. SAMUEL A. LUFONE QUEVEDO.

Pilelao, Catamarca, Argentine Republic, Dec. 18.

#### Controversies in Science.

IT might be well for scientific controversialists to bear in mind that undue heat is an indication — as in mechanics — of want of that balance that should constitute a judicial mind. The world generally views with amusement the frothy utterances of the man on the wrong side who finds himself hard pressed by reiterated facts, and judges him to be in the wrong, frequently, by his language, when he may be correct entirely. One without any knowledge of the facts of the present controversy between a few persons connected with the U. S. Geol. Survey — a survey at present under a cloud from the disbelief of Congress as to its needs and usefulness — and the upholders of "palæolithic man," would naturally incline to the side taken by Professor Wright, merely from the perfect courtesy and evenness of temper which he has preserved under exceptional circumstances. It is seldom in the course of controversy that a clergyman of good character has been so bespattered with epithets, innuendoes, and charges that would render him — if true — worthy of abrupt expulsion from any position of trust, or from any decent religious body.

It is probably because Professor Wright is so secure in his position that he can afford to pass by in silence the statements that any sane man can see are unwarranted, and the attention of the world at large may have been directed to him by these very attacks, as well as arranged on his side by their baselessness. The writer does not wholly agree with the professor; but he can thank him for a good example of a disputant. The time has passed when the progress of knowledge can be dammed by the straws of a few determined opponents, and the examples of the primordial and cretaceous controversies cannot be safely repeated. It has been the shame of America that it has been so taken up in petty fights over side issues that it has left to others abroad the building of the science of geology.

In the future the combatants in the arena had better take as their type, the old-fashioned town pump. It always works best in the cold and deliberation of winter, and the quality of its product is beyond question. When the heats of spring come it begins to diminish its flow, and during the controversial dog-days it dries up.

EDWARD P. WILLIAMS, JR.

Bethlehem, Pa., Feb. 6

#### BOOK-REVIEWS.

*The Hemiptera Heteroptera of the British Islands.* A descriptive account of the families, genera, and species indigenous to Great Britain and Ireland, with notes as to localities, habits, etc. By EDWARD SAUNDERS, F.L.S. London, L. Reeve & Co., 1892. With 32 plates. Price, £4, 8s.

THE late well-known naturalist, the Rev. J. G. Wood, used to deliver a popular and entertaining lecture on "unappreciated insects." Among these he included the one which is familiarly termed the black beetle. To this he endeavored to reconcile feminine taste and intelligence by representing that its approach infallibly scares from our chambers the more dreaded and more vicious bed-bug. But this latter is itself one of the unappreciated, for which even a very skilful advocate will not easily

conciliate our esteem. The best perhaps that can be said for it is that the barest suspicion of its presence is an incentive to cleanliness. The modern feeling about this special nocturnal terror is happily, however unintentionally, expressed in that old version of the Psalms, which brought home to the reader a deep sense of comfort and security by the wording, "so that thou shalt not need to be afraid for any bugges by night." It is singular that collectors of insects should have adopted for themselves as a kind of pet name the title of bug-hunters. Perhaps they have wished to wrest a weapon out of the hands of the scornful, with the feeling that it is more agreeable to call oneself names than to be called names by other people.

The students of bugs in particular, as distinguished from those who study insects in general, are comparatively few. It is probable that, for the sins of a single and not very characteristic species, a prejudice has been evoked in the public mind against the whole order to which the objectionable species happens to belong. There has been plenty of time for prejudice to gather strength, since the genus *Cimex* is said to have made its first ascertained appearance in the far-distant Liassic period. There is something wonderfully romantic in the thought of this blood-thirsty genus biding its time, waiting, craftily waiting through so many ages till man should appear upon the mundane scene with lodgings to let! But as it must be confessed that its habits, however venerable for their antiquity, have placed all its kindred more or less under a cloud, there is the more reason to acknowledge the spirited enterprise of Messrs. Reeve in publishing an expensive work on this rather neglected department of zoology. There is, however, good reason to think that the volume, being such as it is, will largely help to cure the neglect of the subject. The beginner learns at the outset that most of the species are vegetable-feeders, and that, from the few that are less temperate, the collector runs practically little or no risk of harm. From the beautifully colored plates it is obvious that many of the species must be in nature highly attractive. The clear descriptions of all the species at present known in Great Britain and Ireland

#### CALENDAR OF SOCIETIES.

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Feb. 7. — O. T. Mason, Co-operation in Anthropological Work; Clifford Howard, The Philosophy of Sin; W. H. Holmes, Early Man on the Upper Mississippi.

##### Biological Society, Washington.

Feb. 11. — M. B. Waite, The Destruction of Lichens on Pear Trees; C. H. Townsend, The Propagation of the Atlantic Coast Oyster on the Pacific Coast; Charles Hallock, The Geographical Distribution of the Musk-Ox; C. Hart Merriam, The Four-Toed Kangaroo Rats (with exhibition of specimens); F. A. Lucas, The Food of Humming-Birds.

##### Society of Natural History, Boston.

Feb. 15. — Henry W. Haynes, More Evidence of Cannibalism among the Indians of New England; R. T. Jackson, Notes on the Development of Palms; S. J. Mixter, A Massachusetts Beaver Dam.

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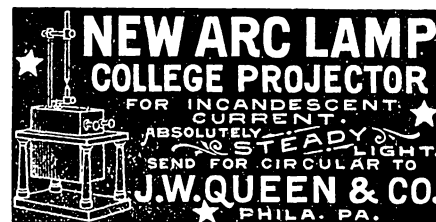
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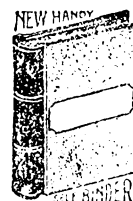
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