

Mr. G. C. Curtis, Assistant in the Physical Geography Laboratory of Harvard University, from his own observations and after sketches made by the writer.

R. DEC. WARD.

HARVARD UNIVERSITY,
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COMPLIMENT OR PLAGIARISM?

OUR attention has been called to a communication from Professor George Bruce Halsted in a recent number of SCIENCE in which he says that we 'took' a whole block of problems and a long note from Halsted's Elements of Geometry.

If Professor Halsted had only printed in parallel columns extracts from Halsted's Elements of Geometry and the corresponding paragraphs in Beman and Smith's Plane and Solid Geometry, his charge of plagiarism would have fallen to the ground. For those, however, who have not the two books at hand, it may be worth while to make a few comments upon his accusation.

The *order* of the problems: To bisect a perigon; to trisect a perigon; to divide a perigon into five equal angles; to divide a perigon into fifteen equal angles, etc., is so natural that for this Professor Halsted will surely claim no originality. The same order may be found in Newcomb's Elements of Geometry, an earlier book than Halsted's.

Does Professor Halsted claim that we 'took' our *solutions* from his book? A comparison will show only such resemblances as are inevitable when two authors are dealing with the same material.

It must then be the *terminology*, and especially the word '*perigon*,' which we have been guilty of appropriating. A modern treatment of the subject of angles requires the use of single terms for the angle formed by a half revolution of the moving arm and the angle formed by a complete revolution. To designate the former the term straight angle is now fully established; for the latter we had a choice among such terms as round angle, circum-angle, perigon, full angle, closed angle. After due consideration we chose '*perigon*,' a word given in both the Century and Standard Dictionaries, and found in several geometries, among them Faifofer's (*perigono*).

Finally Professor Halsted lays especial emphasis upon the long note which we 'took' from his Elements. We quote the two notes in full.

HALSTED.

REMARK.—From the time of Euclid, about 300 B. C., no advance was made in the inscription of regular polygons until Gauss, in 1796, found that a regular polygon of 17 sides was inscribable, and in his abstruse Arithmetic, published in 1801, gave the following:

In order that the geometric division of the circle into n parts may be possible n must be 2, or a higher power of 2, or else a prime number of the form $2m+1$, or a product of two or more different prime numbers of that form, or else the product of a power of 2 by one or more different prime numbers of that form.

In other words, it is necessary that n should contain no odd divisor not of the form $2m+1$, nor contain the same divisor of that form more than once.

Below 300 the following 38 are the only possible values of n : 2, 3, 4, 5, 6, 8, 10, 12, 15, 16, 17, 20, 24, 30, 32, 34, 40, 48, 51, 60, 64, 68, 80, 85, 96, 102, 120, 128, 136, 160, 170, 192, 204, 240, 256, 272.

BEMAN AND SMITH.

NOTE.—That a perigon could be divided into 2^n , $3 \cdot 2^n$, $5 \cdot 2^n$, $15 \cdot 2^n$ equal angles was known as early as Euclid's time. By the use of the compasses and straight edge, no other partitions were deemed possible. In 1796 Gauss found, and published in 1801, that a perigon could be divided into 17 and hence into $17 \cdot 2^n$ equal angles; furthermore, that it could be divided into $2m+1$ equal angles if $2m+1$ was a prime number; and, in general, that it could be divided into a number of equal angles represented by the product of different prime numbers of the form $2m+1$. Hence it follows that a perigon can be divided into a number of equal angles represented by the product of 2^n and one or more different prime numbers of the form $2m+1$. It is shown in the Theory of Numbers that if $2m+1$ is prime m must equal $22p$; hence the general form for the prime numbers mentioned is $2 \cdot 22p+1$. Gauss's proof is only semi-geometric, and is not adapted to elementary geometry.

Of course Professor Halsted is aware that from the days of Young, possibly earlier, in his Elements of Geometry, 1827, up to the present the substance of Halsted's 'long note' has been given in the better geometries, as witness Baltzer, Henrici and Treutlein, Chauvenet, Newcomb.

Professor Halsted's motive in making his charges we leave for others to determine.

BEMAN AND SMITH.

VOLCANIC DUST IN SOUTHWESTERN NEBRASKA AND IN SOUTH DAKOTA.

APROPOS of Prof. Salisbury's note on the subject in SCIENCE of December 4th, I would call attention to the fact that the occurrence of volcanic ashes in southwestern Nebraska has long been known. At the same time, notices of present exposures are of value. The deposit was at first called 'geyserite' by Prof. S. Aughey before 1880. References to the subject will be found as follows: 'Sketches of Physical Geography and Geology of Nebraska,' 1880, by S. Aughey: American Geologist, Vol. I., p. 877, and Vol. II., pp. 64 and 437; Proceedings

U. S. National Museum, Vol. VII., p. 99; *Am. Journal of Science*, Sept., 1886. These refer to the region in question. Closely similar deposits have been found as far east as Omaha, and as far north as the Missouri River in Knox Co., Neb.

An interesting and important question which should be kept in mind by those observing these deposits is whether there is more than one horizon shown at any one locality. Thus far I think no one has reported more than one, and it may be that all are to be referred to one eruption. If so the deposit becomes a most important reference horizon.

As a related item of intelligence I may add that this last summer I discovered a deposit of somewhat similar character extending a dozen miles or so along the South Fork of White River, in Lugenbeel Co., S. D., showing a thickness in places of more than 10 feet. This deposit is, however, of a light green color, coarser than that of Nebraska and more consolidated than I have seen there. Moreover it seems to mark the transition from the White River epoch to the Loup Fork.

J. E. TODD.

STATE UNIVERSITY,
VERMILION, S. D.

SCIENTIFIC LITERATURE.

GRASSES OF NORTH AMERICA.*

THE botanists of this country have been looking forward with interest for several years to the publication of the second volume of Dr. Beal's 'Grasses of North America.' Single-handed and alone, away from the larger libraries and collections, Dr. Beal has patiently and persistently carried forward the work which he has finally brought to completion and presented to the public in the volume before us. Much interest attaches to the work, for we have here presented, for the first time, in a single volume, descriptions of all the grasses of the United States and northward, which the writer

**Grasses of North America*, by W. J. Beal, M. A., M. S., Ph.D., Professor of Botany in the Michigan Agricultural College, Vol. II. The grasses classified, described, and each genus illustrated, with chapters on their geographical distribution and their bibliography. Henry Holt & Company, New York.

was able to obtain, together with those which have in recent years been collected in Mexico by Mr. C. G. Pringle and Dr. E. Palmer. No work of similar character has before been published, and those wishing to find descriptions of our grasses, excepting for limited areas, have been obliged to consult numerous publications through which the descriptions were scattered. The total number of species described in the work, including introduced species and those cultivated for use or ornament, is 912, covering 659 pages. With few exceptions, these descriptions, which are very full, have been originally drawn up by the author. The nomenclature adopted is that of the so-called 'Rochester code,' and in every case full citations of authorities are given, considerable space being devoted to synonymy.

The author states in his preface that "it has required some courage and persistence to adhere to the work so long, realizing fully that it must contain many defects, and that perhaps its chief use would be to serve as a basis for others to enlarge in the future, correct and otherwise improve." This is very often the fate of scientific publications, and no one can hope to produce a work of any considerable extent which shall be beyond criticism or entirely free from errors. The work before us is no exception to this statement, and the criticisms or corrections here given are made in the kindest spirit, with the intent of calling attention to some of the more important mistakes, hoping thereby to enhance the usefulness of the work, rather than discredit its value.

Collectors in preparing their labels occasionally overlook the importance of carefully noting the locality and station of the specimens gathered, and more often still they fail to note the date of collection or altitude. It is almost discouraging, and even annoying sometimes, to look over a dozen or more sheets of specimens and find nothing more definite in regard to these particulars than the name of the State—it may be 'Texas,' or again, the 'Rocky Mountains.' The author meets here a condition of things which places him at a disadvantage—by rendering his work incomplete—with the reader or student of biology, a position which might have been avoided by a trifling effort on the