just as much by omitting *brevicauda* in the instance quoted as by inserting *carolinensis*?

Moreover the adoption of such a practice will necessitate the rearrangement of most of our existing trinomial nomenclature, and in such cases as the Song Sparrows or Horned Larks among our birds it will be no small matter to decide which of the numerous subspecies shall be relegated to 'sub-subspecies' and in which instances the species name shall be omitted.

Furthermore, is not an author who uses quadrinomials, expressed or implied, placing himself in the same category with Brisson and other post-Linnean authors who were more or less polynomial? And when we ignore their works entirely, what right have we to recognize more recent writers who are not consistently binomial?

In conclusion it seems to me a matter of serious regret, when the A. O. U. Code of Nomenclature has practically become the standard for American zoologists and botanists, to see a member of the A. O. U. Committee on Nomenclature breaking away from the Code and proposing such innovations as the above. Is not such individual action directly opposed to the ultimate stability of our nomenclature?

WITMER STONE.

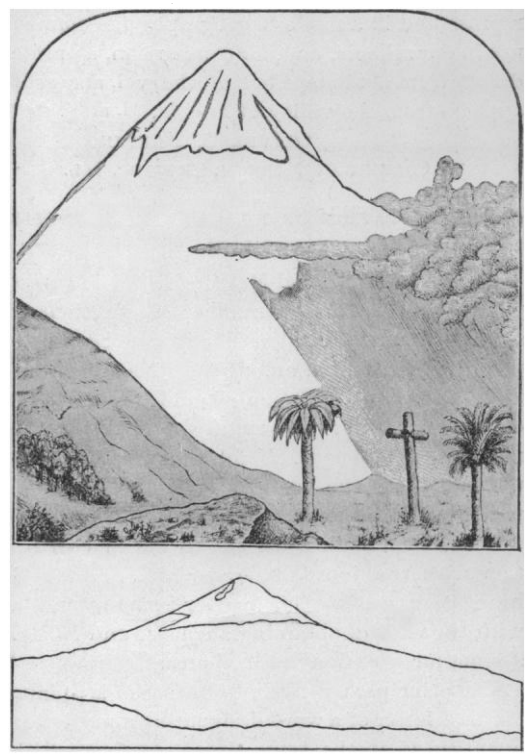
ACADEMY OF NATURAL SCIENCES,
PHILADELPHIA, August 3, 1896.

IMPOSSIBLE VOLCANOES.

TO THE EDITOR OF SCIENCE: I wish to echo the protest expressed by J. Paul Goode in a recent issue of SCIENCE, against the illustrations of impossible icebergs, with which our text-books are filled, and ask that impossible volcanoes be put in the same category.

The picture which has done service in geographies for many years as a representation of Popocatapetl is about as severe a libel on a respectable volcano as one could well imagine. A tall cross, such as no traveller in Mexico ever saw, and luxuriant palms such as never grow at the altitude from which Popocatapetl can be seen, make up a tropical foreground beyond which a symmetrical, snow-capped cone with a slope of from 40° to 50° rises to an impossible height and extends to an impossible magnitude.

All this is untrue, and it would seem, considering the number of excellent photographs of the volcano extant, unnecessary. Besides, it tends to perpetuate a common misconception as to the slopes and heights of mountains which it is time to correct. Many of the pictures of mountains appear rather to record the feelings of the artist after he has climbed to their summit than to represent their actual profile.



It ought to be generally understood that the average slope of a mountain of any kind can rarely be more than 35° and is usually much less. During a recent visit to Popocatapetl, I measured its slope from several points of view, and found it never more than 30°. In making a sketch of the volcano, however, I found that I labored under the optical delusion which leads one to exaggerate the steepness of mountain slopes, and which probably accounts for their usual faulty representation. The slope as I represented it on the paper, with what I thought to be a fair degree of accuracy, proved on holding the paper between my eyes and the volcano to be far too steep. It was only after several trials that I could give it the requisite flatness.

On relief maps vertical exaggeration is excusable and without doubt necessary, but it can hardly be said to be in text-book illustrations. Natural scenery is sufficiently imposing not to need to be made attractive by exaggeration, while correct illustrations strengthen the pupil's confidence in the truth of what he is taught.

I append a view of Popocatapetl as it is represented in a modern geography in common use in our schools, and, for comparison, a profile drawn from a photograph of the volcano as it appears from the valley of Puebla.

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On the Notation of Terrestrial Magnetic Quantities.

At the International Meteorological Congress to be held in Paris, a number of questions of special interest to magneticians have been proposed for discussion, among which is the following: The same notation should generally be employed, H for horizontal force, X for the northern component, Y for the western component, Z for the vertical force, and V for the potential. As the need of some uniform notation has been made apparent to me in connec tion with the journal *Terrestrial Magnetism*, I have been paying this matter some attention with the view of obtaining a concise and logical system for adoption in this journal.

The principle upon which I proceed is to take the first letter of a word designating a particular quantity, if at the same time it conforms with typographic requirements, such, for example, as declination, which is common to several languages. In this way I have thus far obtained the following: D for declination, I for inclination, H for horizontal component of force, V for vertical component, F for total force.

Upon examination it will be found that these letters stand for words derived in almost all cases originally from the Greek and Latin languages and, with but insignificant variations in spelling, common to several of the main modern languages. The Germans will be asked to yield a point with regard to F,* but this, as will be seen below, will be made up to them in the adoption of G for magnetic potential. V, taken from the Latin *vis* or I from *intensitas*, or D from the Greek word $\delta\acute{\upsilon}\nu\alpha\mu\iota\varsigma$, would not do for force, as they are already taken. Nor would T from *totus* or P from $\pi\tilde{\alpha}\varsigma$ answer, since the former is frequently used for time of vibration, and so in fact is the letter P, which stands besides for the first deflection coefficient. As I hope to be able to find satisfactory notation for all the principal magnetic quantities, I am keeping this matter constantly in mind in adopting any particular letter. The English and French have *force*, and I have, therefore, adopted F for total force. As it is frequently the custom to designate angular quantities by Greek letters, I should have preferred, had it been possible, to adopt δ and ι instead of D and I, but the Greek ι is a very unsatisfactory letter from a typographical standpoint. Moreover, if found desirable later on, the small letters d and i or δ and ι can be reserved for the variations on the mean of day and on the mean of year respectively.

I think it very much to be deplored if Z, as above proposed, be universally adopted to designate the vertical force. It should not be forgotten that the Gaussian mode of resolving the magnetic force into northerly component (X), westerly component (Y) and vertical component (Z) applies to a *local* system of coordinates, not to a fixed system, as the layman might naturally suppose, a fact which is even apparently forgotten at times by magneticians. The mean values of these components for a complete circuit of the earth along a parallel of latitude can, in consequence, no more be *physically* interpreted than the mean H, for example. I am therefore opposed to adopting a letter for the vertical force which in no way gives evidence of the exact quantity for which it stands. V, on the other hand, is logically connected with H and at the same time implies that the direction of the quantity that it symbolizes is *local*, the direction of the vertical or plumb line varying from point to point.

For the same reasons I am not in favor of adopting X for northerly component and Y for westerly component. Let authors choose this method of notation if they prefer it, but in a

*The initial letter of the German word *Kraft* is frequently used to designate the moment of inertia and hence will not answer for force.