

SCIENCE:

A WEEKLY RECORD OF SCIENTIFIC
PROGRESS.

JOHN MICHELS, Editor.

TERMS:

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6 MONTHS,	-	-	-	-	TWO "
3 "	-	-	-	-	ONE "
SINGLE COPIES,	-	-	-	-	TEN CENTS.

PUBLISHED AT

TRIBUNE BUILDING, NEW YORK.

P. O. Box 3838

SATURDAY, JULY 23, 1881.

PROFESSOR LEWIS SWIFT informs us that he has been receiving letters claiming the Warner Prize, at the rate of seventy per day for some time past; it may be convenient, therefore, if we state the conditions on which Mr. Warner offers the reward for the discovery of comets during the year 1881.

In the first place the comet must be telescopic, which is a bar to all naked eye observers, and the comet must be unexpected. An exception is made to this condition in favor of the comet of 1812, the re-appearance of which is expected.

The first discovery of the comet must be made in the United States or Canada. To secure the prize immediate notification must be made by telegraph to Professor Lewis Swift, of Rochester, Director of the Warner Observatory. This telegram must give the time of the discovery, the position, direction and daily rate of motion with sufficient exactness to enable at least one astronomer to find it.

A study of these conditions will prevent useless applications and many disappointments. The first condition, however, which appears to limit claimants to the class who possess telescopes, should, in our opinion, be construed to object to naked eye observations only. A good opera or field binocular glass could be used with good effect in a search for comets. Caroline Herschell used a very simple instrument, and, in the course of her life, discovered no less than eight comets. With a tube with two glasses, such as was commonly used "as a finder," she used to "sweep" for comets, writing down and describing all remarkable appearances.

We direct attention to a series of interesting drawings of comet B, 1881, made by Professor Edward S.

Holden at the Washburn Observatory, with the 15-inch telescope, constructed for the late Professor Watson, which will be found on pages 346 and 347 of this issue.

Professor Holden has attempted to delineate the appearance of the comet on six consecutive nights, commencing on the 24th of June, and also on the 8th and 11th of July.

Messrs. S. E. Cassino & Co., of 299 Washington street, Boston, are about to publish an international directory of the names and addresses of all those who are engaged in any of the departments of Science. Such a work can only be arranged in a satisfactory manner with the co-operation of scientific men. We therefore cordially respond to a request from Messrs. Cassino to make known their intentions in this direction, and we call upon all scientists at once to forward their names and addresses to the publisher.

This notice is not only intended for professional scientists, but for the large class of amateurs, who may be collecting, or giving their attention to any scientific specialty.

As the directory is partly prepared, prompt attention is essential to those who would have their names included.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

WE remind our readers that the annual meeting of the American Association for the advancement of Science will be held this year at Cincinnati, commencing on the 17th of August next. The executive committee announce that the sessions of the Association will be held in the Music Hall and Exposition Buildings, on Elm street. All the meetings, general and sectional, will be under one roof. Each section will have a room regularly assigned to it, and every necessary facility in the way of tables, blackboards, etc., will be provided. The offices of the Permanent and Local Secretaries, Reporters' Room, Post Office and Reception Rooms will all be on the first floor. Between the morning and afternoon sessions a daily lunch will be served in the wing of the Exposition Buildings known as Horticultural Hall.

On the first day of the meeting, besides the general session for organization, some of the official addresses will be delivered. In the evening there will be a citizens' reception.

On the following days the usual routine business will be transacted, papers will be read, and so on. A variety of social entertainments will be provided, and an afternoon is to be devoted to visiting the Zoological Garden.

Members of the Sub-Section of Anthropology, and others who are interested, will have an opportunity to examine the excavations at Madisonville, and to visit other localities of antiquarian interest near Cincinnati. After the adjournment of the Association, excursions will be organized on the Cincinnati Southern Railroad, and also, it is hoped, to the Mammoth Cave.

Beginning on the evening of August 16, and continuing through the meetings of the Association, there will be an exhibition of scientific apparatus, appliances, and collections. This exhibition is to be in charge of the Department of Science and Arts of the Ohio Mechanics' Institute, and a large amount of valuable material will be shown. Some of the leading dealers in chemicals, ap-

paratus, microscopes, minerals and zoological specimens have already notified the Special Committee of their intention to exhibit. The goods here displayed are to be kept over for the Ninth Cincinnati Industrial Exposition, opening September 7, the Managers of which have offered special premiums for this class of exhibits.

The local executive committee comprises the following names: A. T. Goshorn, Chairman; F. W. Clarke, Ormond Stone, Secretaries; Julius Dexter, Treasurer; J. D. Cox, William McAlpin, Herbert Jenney, George W. Jones, Archer Brown, C. W. Wendte, Robert Brown, Jr.

CONTRIBUTIONS TO COMPARATIVE PSYCHOLOGY.

BY S. V. CLEVINGER, M. D.

II. LANGUAGE.

Excepting in Kussmaul's (1) elaborate essay, speech has had but little consideration anatomically and physiologically. The philologists and ethnologists have been trying to interpret phenomena while ignoring the mechanism directly concerned therein. As readily might the operations of a locomotive be explained by a person who had never seen one. Herbert Spencer, on the origin of language, is discursive and inconclusive. Darwin passes hastily over the subject in his "Descent of Man," but later (2) lays the foundation for a proper study. Bastian may be taken as the representative of the majority expressing opinions on language (3). He says: "Language was started by some hidden and unknown process of natural development or as a still more occult God-sent gift to man." If inquiries are to terminate in such assumptions, why not extend our conceptions of occult God-sent gifts, to the explanation of the Universe? Bastian's words mean, "I cannot fathom it, therefore, no one should try to do so."

Mivart (4) adopts the usually accepted divisions of language:

I. Sounds which are neither articulate nor rational, such as cries of pain, or the murmur of a mother to her infant.

II. Sounds which are articulate, but not rational, such as the talk of parrots, or of certain idiots, who will repeat, without comprehending, every phrase they hear.

III. Sounds which are rational, but not articulate, such as the inarticulate ejaculations by which we sometimes express assent or dissent from given propositions.

IV. Sounds which are both rational and articulate, constituting true speech.

V. Gestures which do not answer to rational conceptions, but are merely the manifestations of emotions and feelings.

VI. Gestures which do answer to rational conceptions and are, therefore, external, but not oral manifestations of the *mental* word. Such are many of the gestures of deaf mutes, who, being incapable of articulating words, have invented or acquired a language of gesture.

Analyzing these divisions, we find therein the prevailing idea to be that:

I. Language consists of speech and gesture (This essay will be directed toward proving that speech is also gesture; hence *Language is gesture accompanied, or not accompanied with sounds*).*

* No attempt at a perfect definition is made here. In fact the impossibility of absolute definiteness, in a world where everything is relative, seems, in this instance, not to have occurred to the metaphysicians. Language, owing to its blending of voluntary and involuntary, and consisting of gestures, used thoughtlessly, as well as those for expressing thought, is inseparable from other animal activities. One definition of Life is that it consists of Motion, but everything moves, hence everything lives, and there is no such thing as Death. Even the mathematical definition of a point is absurd and unthinkable. Who can define Health or Disease satisfactorily?

II. Language is voluntary or involuntary.

An impassable gulf exists between the voluntary and the involuntary in the minds of those who are disposed to reverence authority more than logic. The history of human thought proves Agnosticism to be a far better friend to man than Vaticanism or its disguises. Huxley (5) concludes that "We are conscious automata endowed with free will in the only intelligible sense of that much-abused term—inasmuch as in many respects we are able to do as we like—but none the less parts of the great series of causes and effects, which in unbroken continuity, composes that which is, and has been, and shall be—the sum of existence. As to the logical consequences of this conviction of mine, I may be permitted to remark that logical consequences are the scarecrows of fools, and the beacons of wise men. The only question which any wise man can ask himself, and which any honest man will ask himself, is whether a doctrine is true or false?" Kussmaul (6) feels justified in claiming that "each act of the will is always also the realization of a movement image previously sketched out in the recollection, or an entire chain of such movement images." * * * "*What we call the will is not only a motor, but always a sensory process.*" That which is involuntary in our actions appears, neurologically speaking, to be most evidently reflex, and those who know most about the mechanism of the will, know also that it is none the less reflex for being complex, or for having evaded the analysis of dualists and those ecclesiastically biased. It is from this automatic basis that I seek an explanation for the hitherto inexplicable. Brown-Sequard insists that speech is a reflex phenomenon (21). We find certain muscles, tendons, bones and cartilages concerned in mastication, and deglutition of food common to many vertebrates. Many of these same parts, separately or conjointly, prove useful to these animals in noise production: A woodpecker (7) finds by drumming rapidly upon a sonorous piece of wood, that he excites the admiration of his kind, and attracts attention to himself. When he repeats the operation for the distinct purpose of exciting admiration and attracting attention, he uses as much and precisely the same kind of reason, as the serenader, who pours out his rhyme to the jingle of a guitar. Wilder (8) speaks of the inharmonious feline nocturnes, and *Lieder ohne Worte*, but cats to whom that sort of music is addressed, find it quite as rational and expressive as the seranaded biped, and the greater part of both sorts of caterwauling, may be interpreted to mean the same thing, inharmonious only to those not interested.

Thus the brays, snorts, shrieks, grunts, etc., of the myriad kinds of animals are only methods for expressing their satisfaction or displeasure. Many such sounds being made use of after their accidental origination. The North American Indian uses the hoggish grunt in affirmation, and a perusal of Darwin's "Expression of the Emotions in Man and Animals" would be profitable to philologists who are not too strongly permeated by a metaphysical bias. At the outset any animal having observed that its noises, of whatever origin, attract attention of other animals would be led to the use of such noises as are serviceable. All that follows is simply an improvement upon these conceptions, and the animal that uses one noise or gesture, or a thousand, to bring itself into relation with other animals, expresses, in so doing, an idea, conveys a thought and hence speaks.

But this matter of reason and language possessed by animals has been ably worked out by observers and thinkers (9).

When water in an engine boiler is low and the alarm whistles through a simple float device; or when portions of machinery jar and scrape, the necessity for more water or oil is conveyed to the engineer's mind, and by a means comparable to the mechanism of crying. Just so the colony of beavers dive out of sight when they hear the warning slap of the sentinel's tail.