

show that there might be a westward motion, by the following reasoning. If the Krakatoa outburst had occurred at a time of year when the temperature was uniform on either side of the equator, say in March and September, then the motion must have been toward the east, but, after March 21 and until June 21, the sun gradually heats up, relatively more and more, portions of the earth to the north of the equator. In consequence of this the bulging of the upper atmosphere does not occur at the equator so much as at circles of latitude farther north. As a result the motion of air particles becomes reversed, that is, toward the equator and not away from it. This would give the particles a tendency to move toward the west,—Q. E. D. This certainly seems like vicious reasoning. In the first place the phenomena of the sky-glow continued until the second week in September, or within ten days of the time when, according to Professor Ferrel, the heat of the sun would have been uniform on either side of the equator, and the motion of the higher strata must have been toward the east if at all. This consideration alone shows how untenable this reasoning is.

In the second place, let us inquire what the utmost effect can possibly be when the sun is at his farthest north. It should be noted that this heating effect is not directly upon the atmosphere, but the sun first heats the earth's surface, and that in turn the air above it, and so on. If we can find the air temperature at the earth at various latitudes we can reason from that as to the probable heating of the air at some height above the earth. It is quite difficult to determine the heat upon a complete circle of the equator, but, if we take the islands of the sea, we may make an approximation to the true value. The following table gives the temperature of the air at various points:—

Place.	Latitude.	Temperature (Fahrenheit).		
		March.	July.	August.
St. Thome,	0° 20' N.	78°	76°	76°
Batavia,	6 S.	79	78	79
Singapore,	1 17 N.	84	82	80
Mean,	Equator.	80	79	78
St. Beneto,	12 37 N.	80	72	72
Cape Verde Islands,	14 54 N.	82	85	86
Jamaica,	18 3 N.	70	75	74
Porto Rico,	18 18 N.	77	82	82
Kanai,	22 15 N.	70	76	77
Canary Islands,	28 4 N.	63	69	70

It will be noticed at once that the high temperature of the Cape Verde Islands is due to the proximity of the African coast. It is also true that the exposure of the thermometer is not uniform at these localities. Making due allowance for all irregularities, however, we still find the most remarkable fact, that the air at the earth's surface in July and August is actually at a higher temperature on the equator than at a latitude of 23° where the sun may be supposed to be the hottest. This shows conclusively that this seeming heaping up of the air, to the north of the equator, owing to an increased heat from the sun's apparent motion northward in July, is entirely mythical; and the only effect that can possibly supervene upon the higher atmosphere must be a motion to the eastward, in all parts of the year, and in the equatorial regions as well as to the northward.

The question will arise, How can these remarkable sky-glow be accounted for? This question does not properly come into this discussion, but a partial answer may be given. The sky-glow were a marked intensification of ordinary sunset phenomena, which it is well known are due to moisture particles. In order that these glows might be seen at their best the following circumstances were necessary. (1) An abundance of moisture particles at great heights. (2) A clear sky. (3) An abundance of electricity in the air, which would cause the moisture particles to be repelled. We know that the occurrence of such an eruption as

that at Krakatoa does set free an enormous amount of electricity. If any one of these were lacking the glow would diminish or disappear. It is known that the glows were of an intermittent character. That the action should have taken place at great velocity from east to west is not at all incredible. Whatever may have been the cause of these glows, we may be absolutely certain that they were not the effect of sun-light upon ashes or products of combustion mechanically distributed by a rapid current from east to west.

H. A. HAZEN.

Washington, D.C., Aug. 8.

BOOK-REVIEWS.

The Ethical Problem. By Dr. PAUL CARUS. Chicago, Open Court Pub. Co. 12°. 50 cents.

THIS pamphlet contains three lectures recently delivered before the Chicago Society for Ethical Culture, together with some preliminary matter on the same theme. Dr. Carus is deeply impressed with the importance of a new basis for ethics, the old traditional foundations having proved insufficient. He maintains, in opposition to many leaders of the ethical societies, that a correct theoretical basis of moral action is indispensable, a view with which we cordially agree; and he tells those societies plainly that, unless they supply such a basis, their movement will come to naught. "How can we," he asks, "have a common aim in the 'elevation of the moral life,' if we are not agreed upon what a moral life is, if our philosophical opinions about good and bad differ?" Accordingly he has prepared these lectures with the apparent purpose of furnishing a basis of ethics, but, we are sorry to say, without success. Indeed, he hardly makes a serious attempt to solve the problem; but contents himself with talking around it and about it, without ever coming to the point. He rejects all the theories of other men, theological, intuitional, utilitarian, and otherwise, and maintains that ethics must be based on "facts"; but what the true basis is he nowhere informs us. Indeed, we have seldom met with a more unsatisfactory treatment of the question at issue, and we cannot see that Dr. Carus has made any real advance from the position of the ethical societies.

AMONG THE PUBLISHERS.

D. C. HEATH & Co., Boston, have in press, to be published about Aug. 15, a new number in the series of Guides for Science Teaching, published under the auspices of the Boston Society of Natural History. The book is entitled "Insecta," and is written by Professor Hyatt, curator of the Natural History Society. It will be extensively illustrated with engravings from drawings made specially for the work.

—Scribner & Welford have the exclusive agency for America of the library edition of Moncure D. Conway's "Life of Hawthorne," published in England in the Great Writers series. This is printed on larger paper, and, in general, is gotten up more sumptuously than the twelvemo edition.

—Frank Vincent, the well-known traveller and author, "in recognition of his distinguished services to the literature of travel," has received from the Emperor of Austria the great gold medal for art, literature, and science. This is the second honor Mr. Vincent has received from Vienna, having, a few years ago, been elected a corresponding member of the Austria Geographical Society.

—Messrs. Longmans, Green & Co. have published a volume of short pieces by the late Richard Jefferies, entitled "Field and Hedgerow." It contains more than twenty essays, mostly on topics suggested by rural scenes and events; but for what purpose such works are written and read we do not know. There is nothing in the book but trifling descriptions of natural objects, written in a disagreeable style, with occasionally some brief remark on moral or artistic themes. We look in vain for any contribution to our knowledge of nature, either in its scientific or its esthetic aspect; while the author's remarks on higher themes are singularly vapid and profitless. It may be that somebody will derive either

amusement or instruction from the pages of this book, but we don't admire the mental equipment of the man who can do so.

—A readable account of the building up and washing away of the narrow sandy islands near Sandy Hook, Long Branch, and Cape May, illustrating similar action that is going on all along our eastern shores, will appear in the *Popular Science Monthly* for September. The article is by F. J. H. Merrill, and is entitled "Barrier Beaches of the Atlantic Coast."

—The Open Court Publishing Company have published "Three Lectures on the Science of Language," by F. Max Müller. They were originally delivered at the Oxford University extension meeting in 1889, and are, of course, of a somewhat elementary character. They give a brief summary of the leading facts about the nature of language, with remarks on the importance of studying it; and are specially designed to awaken an interest in the subject on the part of inquiring minds. The most interesting part of the book to scientific readers will be the passage in which the author discusses the relative merits of the two methods of classifying the races of men, by language and by physiological characteristics. He maintains that physiological classification has proved a failure, and that classification by language must be adopted, though with some reservations. Professor Müller reaffirms his theory of the origin of the Aryans in Central Asia, but without presenting anything new. The concluding paper in the book is a brief account of the earlier thinkers who have held Professor Müller's views as to the identity of language and thought. We may note in conclusion that the book is printed throughout in blue ink.

—D. C. Heath & Co., Boston, will publish in September a "Brief Course in the Elements of Chemistry," by James H. Shepard, professor of chemistry, South Dakota Agricultural College, and chemist to the United States Experiment Station. This book will be on the same plan as the author's "Elements of Inorganic Chemistry." It is not a fragmentary compilation, but gives the

student a concise and comprehensive view of the main formulas of chemical science. The experiments are easily performed and bear directly upon the subjects under consideration, while the apparatus and chemicals required are as inexpensive as thorough work will permit. The book is well adapted to the needs of schools where the time is limited and where the teacher aims to do most of the work, but it will find a warm welcome in schools possessing working laboratories. The carbon compounds are tersely treated, thus giving the student an insight into the fundamentals of organic chemistry.

—The yield of gold in New South Wales in 1889, as shown by the "Annual Report of the Department of Mines," was larger than that for any year since 1883, amounting to over 182 million dollars.

—The United States Steamer "Thetis," Lieut Commander Stockton commanding, was detailed by the Navy Department to cruise, during the summer and autumn of 1889, in Behring Sea and the Arctic Ocean. During this cruise, in order to make its results as useful as possible, several of the officers on board the "Thetis" were directed to prepare reports upon subjects connected with the waters and regions visited by the ship, from their observation and from other reliable sources. One of these reports, by John W. Kelly, is on the ethnography of the Eskimos; and another, by Ensign Roger Wells, jr., is an Eskimo vocabulary, prepared almost entirely from information and material furnished by John W. Kelly, who spent three winters among the north-western Eskimos, and who has been engaged for seven years, at various times, in acquiring a knowledge of their language. The manuscripts of these two reports were presented to the Bureau of Education at Washington by Commander Stockton, to whose intelligent foresight the preparation of the reports was due. The Bureau, being charged with the supervision of education in Alaska, and the Commissioner of Education, W. T. Harris, appreciating the

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