mitted to report their work in these meetings. The writer has distinctly in mind the attitude of the undergraduates toward a certain sophomore who had discovered the continuity of protoplasm between cells of a filamentous alga and had been permitted to report this before a State Academy of Science. The effect perhaps was as important on the sophomore as on his associates, for his name is now one of the starred list of botanists in American Men of Science. In itself the discovery may or may not have been important, but the effect was important on that student body. In this day of great stadia and unlimited honor to heroes of beef and bone, it should occur to scientists to devise some method of making scientific honors for undergraduates a thing worth the seeking. In those days of the Indiana Academy, when the influence of Jordan and Coulter was strong, democracy prevailed, and the student of science in the colleges of the state felt that to appear before the academy was almost as important as winning his degree. To the veteran it may be important to be reminded that the borders of the unknown are near at hand by bits contributed from unexpected sources. The best that can prevail for the promotion of research is that spirit which knows only the rank of ability.

Though not of the group of which the study was made, it may interest some to know that the models of the Indiana and the Wisconsin Academies were well in the minds of the organizers of The Northwest Scientific Association when that organization began four years ago. Here the senior or the young graduate meets on equal footing with the doctors and the deans of colleges, chancellor, president or professor, and fine fellowship prevails among all. The groups which were isolated and unknown to each other in the widely scattered colleges now meet and are getting well acquainted and learning to work together. The present membership is nearing three hundred. The program for December 28 and 29 announced seventy-four titles. Nine different sections are now under way and twenty-five sessions of breakfast, luncheon, dinner and general or section meetings convened.

Northwest Science, the official organ of Northwest Scientific Association, has now completed its first year and in a way represents the work accomplished by that organization. It has printed a history of the organization for three years of its existence, abstracts of papers presented at the meetings, some regional news, a few general papers and one issue devoted to the geology of the region on either side of the line between Idaho and Washington in the locality of Spokane.

THOS. LARGE

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CHILDREN WHO RUN ON ALL FOURS

IN the last two numbers of *The American Journal of Physical Anthropology* (Wistar Institute, Philadelphia), the undersigned publishes the account, with illustrations, of eleven children who before walking upright have spontaneously developed the habit of running effectively on all fours. This is a highly interesting phenomenon of nonpathologic nature, and he would be thankful for further reliable reports. The principal points on which information is desired are as follows: 1. Race and nationality; 2. Sex; 3. Health and robustness; 4. What child in numerical order; 5. Has the phenomenon been noticed in any other child of the same parents or among relatives; 6. At what age has the child begun to run on all fours and how long has it continued. To which should be added a description, as detailed as possible, of the performance itself, supplemented when this can be done by a photograph of the child in the act. The position of the hands (whether fully open or partly closed), and of the head, while running on all fours, as well as any other peculiarities of the child's behavior, are matters of interest.

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SCIENTIFIC BOOKS

The Antiquity of Man in East Anglia. By J. REID MOIR. Cambridge University Press, 1927.

THIS invaluable volume is not, like many of the contemporary works on the Old Stone Age, a restatement of current archeological knowledge or of current Continental research in archeology, but is an entirely fresh and convincing presentation of a series of wonderful discoveries in the newest field of prehistoric archeology which were made in the counties of Norfolk and Suffolk, a region collectively known as East Anglia.

The title chosen by the author does not fit the contents of this volume because he has assigned an age of only 500,000 years and the geologic epoch of merely Lower Pleistocene time to discoveries which in the reviewer's opinion belonged to a far more ancient period, namely, 1,250,000 years, and to a more ancient geologic epoch, namely, the close of Pliocene time. This is less surprising when we consider that English geologists for the most part still speak only of two glacial periods and, with the exception of Brooks, there is little serious attempt to connect these two ice invasions of British territory with a fourfold Ice Age of western Europe and of North America. The

author, moreover, is under the very strong influence of Sir Ray Lankester, who insists that Upper Pliocene time in Great Britain corresponds to Lower Pleistocene time in other parts of Europe. Yet Lankester has rendered a courageous service to archeology in his strong support of Mr. Moir's contention for the artificial character, especially of the flints known as rostro-carinates, which are distinctive of what the reviewer would call the Upper Pliocene of Great Britain and thus far have not been found elsewhere, except as degenerate survivors in a subsequent archeological stage. These are the only two exceptions found by the present reviewer in this invaluable collection of most original observations in Norfolk and Suffolk, extending back to the year 1909 when the author made his first discovery and was attracted to this fascinating and absorbing subject. In previous writings, the present reviewer has also stoutly espoused the cause of Mr. Moir against much indifference and incredulity not only among English but among Continental archeologists, and has supported his successive discoveries as far ante-dating in geologic age those made in any other part of the world.

The author opens with the chapter entitled "The Pleasures of Flint Hunting." It is this pleasure or, more truly, this fascination guided by real genius that has led him to devote every spare moment of his time to thorough, repeated and well-rewarded research in localities which offered the best promise or prospect of revealing traces of prehistoric man. His outstanding discoveries are those of the Foxhall quarry and fireplace, which he suggests may be of the same age as the Piltdown skull, the rostro-carinate bed lying *beneath* the classic Red Crag of East Anglia and the giant Cromer flints on the foreshore of Norfolk in the most unpromising locality exposed only at low tide. In each case, he has been rewarded with most brilliant achievement and final recognition of the authenticity of his findings by such acute European archeologists as Breuil and Capitan. He is himself a master of the art of flint-making and has worked out many of the stages of early manufacture and adaptation, even of the long-disputed types of flints known as Eoliths. His firm opinion on this subject, as evidenced in the following quotations, is, therefore, entitled to a most serious consideration.

> The human origin of the Eolithic, Kentian, flint implement has been in dispute for a great number of years, but the weight of opinion is now in favor of the view that they were artificially flaked, especially as they are seen to conform to the criteria of man's work upon flints. The primitive appearance and profound antiquity of these specimens make them of the greatest interest to students of prehistoric man.
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> Though, as has been shown above, there is very good reason to believe that the Eoliths of the Kent Plateau are of a very great antiquity, yet the gravel in which they are found is not covered by any other deposit such as would enable us to say, with certainty, that this gravel is of a particular geological age. It is fortunate, therefore, that examples of Eoliths, quite comparable with those discovered in Kent, have been found in Suffolk, in the detritus, or bone bed, below the Red Crag, thus showing that the very ancient people who made these implements inhabited East Anglia.
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> The Eoliths are thus, evidently, of an extreme antiquity, and represent the most ancient works of man yet brought to light. In my opinion also these specimens show us the basic forms from which all later flint implements were derived, and I have been able to trace the manner in which the Eoliths developed into the later sub-Red Crag forms, and these, in their turn, to the still more advanced Palaeolithic specimens. It can not be too strongly urged that the evidence now to hand demonstrates the orderly development of flint implements from the very primitive Eoliths to the latest, symmetrical forms in use at the end of the Stone Age, and that this development, indicating as it must the slow, though sure, advance of man himself from a rudimentary pre-human state, provides further support, if such were needed, to Darwin's great theory of evolution.

In these passages, he not only commits himself to the theory of human origin of the Kentian Eoliths but goes still further back to those of Darmsden and Puy Courny. As to the latter, he says:

> . . . It is, therefore, of great interest to realize that at Puy Courny, in Central France, there is present a bed of gravel of Upper Miocene Age (the epoch immediately preceding the Pliocene) containing a large series of examples of cherty flint that assume very definite Eolithic forms. . . . There can not, fortunately, be any doubt as to the age of this deposit because in it have been found the remains of the following Upper Miocene animals, *Dinotherium giganteum, Mastodon longirostris, Rhinoceros Schleiermacheri,* and *Hipparion gracile.* The specimens in the Westlake collection impressed me strongly with their very primitive appearance, and I think it probable that they are comparable with the oldest series recovered by me from below the Red Crag of Suffolk. If this view is correct, then we can at last form some idea of the age of these earliest human implements, and realize that they must be referred to the end of the very remote Miocene epoch. . . . Henri Breuil, who has also seen this collection, regards the specimens it contains as of natural, rather than as of human, origin.

Altogether this is the most original and welcome contribution which has ever been made to Tertiary archeology as distinguished from Quaternary archeology which began with the great discoveries of the Chellean culture on the River Somme by M. Boucher de Perthes. Whether we accept Mr. Moir's interpre-

tation of the Miocene Eoliths or not, we must give him first rank and accord to him the full priority of the discovery of indisputable flint work of man in Tertiary time. It is too early to draw all the theoretic conclusions regarding the antiquity and ancestry of man which may be deduced from these discoveries, but in the present reviewer's opinion, they vastly extend our conception of a truly human and pre-human type of Dawn Man rather than of an ape-man ancestry of our race.

H. F. O.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A PHOTOGRAPHIC PLATE THAT PENETRATES DESERT HAZE

GEOLOGISTS and others who have occasion to take photographs of distant mountains in the arid regions have often been afflicted by the presence of the blue haze that obscures the details of features more than a few miles away. This is presumably caused by the fine dust which the desert winds keep more or less continuously suspended in the atmosphere.

Ordinary photographic plates and films give but poor results under such conditions. The photograph generally shows much less of detail than the eye itself can see, and hence one is apt to be disappointed. By the use of ray filters or color screens, some improvement may be effected, but at best it falls far short of satisfaction.

By using panchromatic films and orange or red ray filters, very much better pictures can be obtained. Cut films or plates of this type are now rather generally used by the more experienced and painstaking photographers of mountain scenery. Unfortunately they are not yet available in the form of roll-films.

Further steps were taken some years ago by Messrs. Burns, Shane and Wright at the Lick Observatory (Mt. Hamilton, California), who, for the purpose of photographing distant landscapes, used plates treated with Krypto-cyanine, a dye which confers sensitivity to a narrow range of color near the red end of the spectrum. The plates have, of course, the usual sensitivity to blue and violet light, but, with the aid of a ray filter which excludes those colors, one may photograph a scene entirely by deep red light. In this way the blue rays, scattered by the dust particles, are eliminated, and a sharp clear picture may be obtained even at a distance of 25 miles and more. Even minor details stand out with a distinctiveness that is remarkable; and it is just such details that are generally the concern of the geologist.

With the addition of a suitable ray-filter (deep yellow or red) the red sensitive plates generally require, under normal conditions, an exposure of about one second, with stop f. 8 to 11.

It must be admitted that there are some objectionable features about the photographs thus obtained. The sky appears black; but if there are clouds present their whiteness relieves that appearance. Again, dry grass, and certain kinds of trees and shrubbery take on a whiteness that suggests a new fall of snow. However, these drawbacks may be considered of secondary importance, provided the chief need is for clear pictures through a hazy atmosphere. By means of these plates it is possible to obtain photographs that show details which the eye itself can not see at the time.

It was the sight of a remarkable photograph of the Sierra Nevada, taken by Mr. Wright from Mount Hamilton, that first drew the writer's attention to the red sensitive plates. The fact that Half Dome and other details of the Yosemite gorge could be clearly recognized although 115 miles away showed clearly that the ever-present blue haze had been definitely neutralized.

ELIOT BLACKWELDER

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MODIFIED WATER REGULATOR FOR SMALL TANKS

IN the annual report of the department of oceanography of the University of Liverpool (London, 1925), H. C. Chadwick describes a new device for regulating the outflow of water from small aquaria. Since this device is quite practical and since its description is found in a publication (*Transactions* of the Liverpool Biological Society) of relatively small circulation in the United States, it may not be out of place to reprint Mr. Chadwick's original account in this journal.

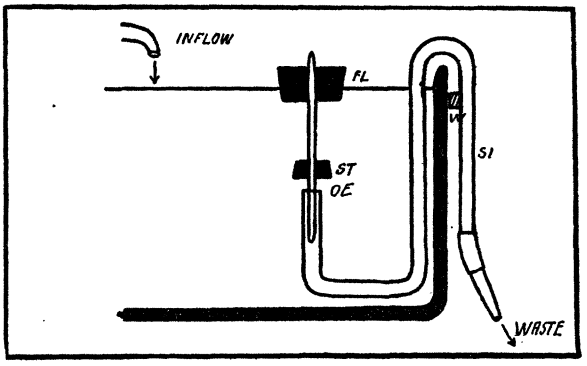

FIG. 1. Chadwick's Tank Water Regulator

The apparatus (Fig. 1) consists of a length of glass tubing 6 mm. in internal diameter, bent as shown in