

is much more important than chemical modification of it.

The author states that his researches confirm in some measure a fact which seems general among animals, viz. that melanism is a sign of vigour and health; albinism, on the contrary, of the enfeebling of the organism. In melanism we have great abundance of pigment, increase in the size of scales and sometimes in their number, usually greater size, the females generally with voluminous abdomen, full of eggs; among Bombyces a great increase in pilosity. In albinism on the other hand, we have the opposite state of things; the scales also frequently deformed, curled, and atrophied, the wings often failing to develop, the abdomen slender, with few eggs or none; in the Bombyces little pilosity.

The author refers to Standfuss's hypothesis that this enfeebling may begin in the larva, and to his own experiments supporting this. Caterpillars ill-nourished, having been supplied with leaves they could ill bite into, produced imagines struck with albinism, supporting the view that albinism is a sort of anæmia of the organism. These modifications increase in succeeding generations subjected to similar conditions, but at the end of four generations the caterpillars adjust themselves to the leaves they found difficult, and then recover their vigour, size, and habitual colour. There are certain characters which exposure to abnormal conditions does not seem able to modify, such characters as are common to a group or genus, for instance, the discoidal spot of *L. quercus*, and the discoidal V. of *Oconeria dispar*.

Dr. Pictet's valuable researches certainly cannot be considered to exhaust the subject of the cause of variation in the colouring of lepidoptera. In the case of seasonally dimorphic species, for example, experiments seem to have shown that the difference in colouring is dependent more on the differential life habit of the spring and summer emergences than on mere exposure to environment or change of environment. With many lepidoptera long duration in the pupal stage, such as is produced by a low temperature, usually causes darkness, but in *A. levana* cooling the summer pupa for many months results in an imago so much brighter than the nearly black imago which comes from a pupal life in a summer temperature of five or six days that it looks quite a different species.

F. MERRIFIELD.

THE SENSITIVENESS OF SELENIUM TO LIGHT OF DIFFERENT COLOURS.

SOME curious facts about the behaviour of the selenium cell are mentioned in a recent paper by A. H. Pfund.¹ The possibility of using these cells for ordinary photometric processes has often been discussed, but there are certain irregularities in their behaviour which set a limit to their usefulness.

One obvious difficulty lies in the fact that the rays of light to which the eye is most sensitive

¹ *Phys. Review*, xxxiv., No. 5, May, 1912.

are not necessarily those which have the most effect on selenium. Pfund brings this out by reproducing—what has seldom been published before—a curve showing the distribution of sensitiveness of this material throughout the spectrum of a Nernst filament. The energy-maximum in this spectrum lies far out in the infra-red; the maximum luminosity to the eye (at moderate illuminations) is situated in the yellow-green. The maximum sensitiveness of selenium, however, is located in the red, and the shape of the curve is also distinctly different from the luminosity curve for the eye, so that inconsistent results would evidently be obtained if one tried to compare the light from various illuminants (having radically different energy-curves) by means of the selenium cell. But it may be mentioned that, according to a recent number of *The Illuminating Engineer*, such cells have a possible sphere for purely comparative measurements of one and the same illuminant; for example, they have been used for studying the fluctuations in daylight and the variation in illumination in the course of an eclipse.

Perhaps the most curious point brought out in these researches is the dependence of the maximum sensitiveness of the selenium cell on the intensity of the stimulus. With a very bright light the maximum is in the red, near 0.7μ . But as the illumination is weakened, this maximum becomes less definite, and ultimately, in a feeble light, another maximum point, situated about 0.57μ , appears. Ruhmer makes two kinds of selenium cells. The "hard" type is most sensitive to strong light, but relatively insensitive to feeble stimuli, and has its maximum in the red. The "soft" type, on the contrary, is most sensitive to weak light, and has its maximum in the green. This explains the discrepancies between earlier observers, some of whom found selenium to be most sensitive to yellow light, while others thought that red had most effect.

Now the interesting point to observe here is that this behaviour of the selenium cell is curiously similar to that of the eye. It is a well-authenticated fact, demonstrated many years ago by Sir Wm. Abney, that whereas at strong illuminations the maximum luminosity occurs near 0.58μ in the yellow, in weak light it shifts to the green, probably near $0.51-0.53 \mu$. This is known as the Purkinje effect. In very feeble light the eye seems almost insensitive to red, while green and blues appear an uncanny light grey. Formerly this singular effect was ascribed to a struggle for predominance between the minute light-perceptive organs on the retina known as the "rod" and "cones." But, according to a later theory, this is not necessarily so, for the accentuation of the red end of the spectrum with increasing stimuli is characteristic of all photo-chemical processes.

At all events the similarity between the eye and the selenium cell in this respect is very suggestive. At first sight this complicated behaviour of selenium would seem unfavourable to

its extended use in photometry. But in a sense it appears fortunate, since it suggests that one might conceivably prepare selenium in such a way as to follow out almost exactly the behaviour of the eye as regards the perception of luminous energy.

NOTES.

THE typhoon which recently visited Japan, isolated Tokyo telegraphically from September 22 to 24, and carried widespread devastation, is said to have been the severest experienced in half a century. Accounts so far are meagre, but according to reports already received the loss of life and damage to property afloat and on shore are appalling. The storm appears to have been most violent in the middle of the south coast. Typhoons are revolving storms of tropical origin that may occur in Far Eastern seas—the North Pacific or the China Seas—during any month of the year. In Japan and its neighbourhood they are, as a rule, confined to the months of June to September inclusive, and are most frequent in September. In general, all tropical revolving storms follow a parabolic track. The typhoons that visit Japan in September usually originate in the Pacific south-eastward of Formosa, move N.W. by W., recurve when abreast of that island, and then take the direction of the Japan Sea. Algue divides the tracks of typhoons in the Far East into two classes—those of the Pacific, which do not cross the meridian of 124 E., and those of the China Sea. A typhoon is said to travel rapidly when its rate of motion exceeds twelve nautical miles an hour; if its rate of motion be less than six miles an hour it is said to travel slowly. The September typhoons come under the former category.

DURING the recent meeting at Geneva of the fourteenth International Congress of Prehistoric Anthropology and Archæology, an important piece of work was carried out by the Committee for the Unification of Anthropometric Measurements. The committee (or commission) included representatives of most of the European countries, as well as of the United States of America, and the number amounted to about thirty. Dr. Duckworth (of the Cambridge Anthropological Laboratory) was one of the three secretaries appointed to prepare a report of the proceedings. The secretaries made out a report, which was adopted at the final meeting of the commission, and was confirmed at the concluding meeting of the congress. The official report will be published in French, but it is intended to issue translations in English and in German simultaneously, if possible, with the official version. The illustrations are to be uniform in all three publications. Dr. Duckworth is at present engaged (for the third year in succession) upon excavations at Gibraltar, but he will be pleased to give further information as to the above-mentioned report after his return to England early this month. Communications should be addressed to the Anthropological Laboratory, New Museums, Cambridge

A CONFERENCE of members of the Museums Association and of others interested in similar work will be held on the afternoon of Thursday, November 7,

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at the Manchester Museum, for the purpose of discussing subjects of common interest to those concerned in the work of museums, art galleries, and kindred institutions.

THE Huxley lecture will be delivered at Charing Cross Hospital Medical College on Thursday, October 31, by Prof. Simon Flexner, of the New York Rockefeller Institute, on "Recent Advances in Science in relation to Practical Medicine." On the same day the extensive new laboratories of public health and bacteriology, recently formed by the school and taken over by the University of London as the public health and bacteriological departments of King's College, will be formally opened and handed over to the University.

ON the suggestion of Mr. Mark Sykes, M.P., Sir Tatton Sykes has kindly sent for exhibition in the Hull Museum the objects of prehistoric date in his possession. These include the contents of the famous Duggleby Howe burial mound, which contained flint and bone weapons and implements of exceptional interest; a prehistoric jet necklace containing several hundred beads; a fine series of prehistoric implements in flint, sandstone, bronze, &c., and some earthenware vases taken from British burials on the Yorkshire Wolds.

THE extensive collection of east Yorkshire and north Lincolnshire diatoms, made by the late R. H. Philip, of Hull, also the specimens which have been figured and described in the well-known work by Mills and Philip, together with his microscope, a fine collection of microscopical slides (including several made by Robt. Harrison, a former Hull microscopist), and his scientific books, have been presented by Mrs. Philip and family to the Hull Museum. The collection of slides contains more than 3000 specimens, and among the books are such important works as "Diatomées Marines de France," by MM. H. et M. Peragallo; "A Treatise on the Diatomaceæ," by Van Heurck; "Diatomaceæ Germaniæ," by H. von Schonfeldt; "British Desmidiaceæ," by W. West, and numerous other volumes dealing with microscopy.

THE British Fire Prevention Committee opened its autumn session on September 25 with two important series of official fire tests, namely, (1) a series of twenty tests with ordinary celluloid kinematograph films *versus* a non-inflammable celluloid film; and (2) an extensive series of some twenty-five fire tests as to the possibility of extinguishing petrol fires, celluloid fires, and similar outbreaks by the application of chemical foam. Reports upon the tests, which were witnessed by representatives of about thirty Government departments and other institutions, will be published by the committee later.

THE next meeting of the Australasian Association for the Advancement of Science is to be held at Melbourne in the University, from January 7 to 14, 1913, under the presidency of Prof. T. W. E. David, C.M.G., F.R.S., Sydney. The presidents of the various sections are as follows:—A, Astronomy, Mathematics, and Physics, Prof. H. S. Carslaw, Sydney; B, Chemistry,