

own district to some other portion of the empire, the Incas made it a point never to oblige people accustomed to a high altitude to live at sea-level, nor to make those who were used to living at a low altitude live far above sea-level. In every case the transfers were made to districts where the climatic conditions were as nearly as possible the same as those to which the conquered people had become accustomed. One of the most interesting contrasts in the climates of Peru is seen in the difference between the desert costal strip of the provinces bordering on the Pacific and the forested Amazonian provinces in the northeast. In the former the dry climate prevents vegetable growth, except where man has provided irrigation, and there must be a constant struggle against Nature in order that anything green may grow. In the well-watered Amazonian provinces, on the other hand, vegetation is altogether too abundant, and man must here struggle to keep down what Nature produces too freely. In fact, the exuberance of the vegetation is such as to interfere with the habitability of the region, for almost as soon as a clearing is made in the forests it is again overgrown. In the rainy provinces, therefore, habitability is almost precluded by the superabundance of vegetation, while in the barren desert strip man can only live where his own labor has provided a water supply sufficient for the needs of vegetation. The contrast is a striking one.

R. DEC. WARD.

LIMA, PERU, December 27, 1897.

AN INTERESTING MONSTROSITY.

My attention was recently called to the monstrosity pictured in the enclosed photograph. It is a cock, of no pure breed, though carrying some Plymouth Rock blood, having no signs of spurs upon the tarsi, but with well developed ones upon the head, on either side of the comb, just above the eyes. These spurs, neither of which is quite normal in shape, are symmetrically placed, and have every appearance of horns. The right spur, which is less malformed than its mate, is fifteen-sixteenths of an inch in length from its perforation of the skin, and about three-sixteenths of an inch at

that point, tapering somewhat unequally to a blunted point, the whole curved so as to somewhat resemble the horn of a Texas steer.

The left spur, which in diameter and length would be nearly identical with the right, is bent forward so as to form a nearly complete circle, approximately one-half inch in diameter, the point of the spur being in contact with the base of the comb. Both of the spurs are entirely disconnected with the bony structure of the skull, being attached only to the skin and easily movable in all directions.

I could not ascertain from the owner of the cock, in whose possession it had been but a short time, whether this looseness of attachment was congenital or had been brought about by contact with the coop or by fighting.

What makes this specimen extremely interesting is the fact that it is neither a case of dichotomy nor of supernumerary parts nor of atavism, but one in which the normal part is found in an abnormal position without any vestige of representation in its usual place.

In the limited amount of material at my command, I have been unable to find any accounts of cases in many respects similar to this, although Sutton, in his 'Evolution and Disease' (Contemporary Science Series), mentions the successful transplanting (artificially) of the spurs of cocks to the excised comb. I am awaiting with interest the result of interbreeding this specimen, in the hope that more of its peculiar kind may be secured, from which a fertile variety of monstrosities may be obtained.

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CORRECTION.

OBJECTION having been made to my use of the term 'respiration' in the article 'Some Considerations upon the Functions of Stomata' in SCIENCE, January 7, 1898, page 15, second column, line 12, I wish to substitute for it the expression 'the passage of gases.' Plant physiologists, for very good reasons, wish to restrict 'respiration' to the gaseous exchange which has to do with the catabolic activities of living cells, excluding that exchange taking place in those anabolic activities (known as photosyntax)

by which the plant makes use of carbon dioxide in building up carbohydrates.

CHARLES E. BESSEY.

SCIENTIFIC LITERATURE.

U. S. Geological Survey. Monograph XVIII.

The Marquette Iron-bearing District of Michigan, with Atlas. By CHARLES RICHARD VAN HISE and WILLIAM SHIRLEY BAYLEY. Including a chapter on the Republic Trough by HENRY LLOYD SMYTH. 4to. Pp. xxi + 608. Pl. I.-XXXV. Figs. 1-27. Atlas sheets I.-XXXIX. Price, \$5.75.

The issue of the above monograph marks the completion of another chapter in the investigation of the ancient crystalline rocks of America. The book presents the fullest solution yet attained of one of the most puzzling and elusive of the many problems confronting geologists. The great economic importance of the region early drew attention to it. First the copper excitement and then the development of the iron interests brought settlers in increasing numbers. The pioneer work of Foster and Whitney established the claims of the rocks upon the attention of geologists, and the long and honorable line of investigators who have devoted time and effort to the understanding of them embraces the names of many of the best workers in this branch of science.

The monograph opens with a preliminary abstract of its contents, in which a reader who cannot well peruse all its pages will find a succinct exposition of what follows. A brief introduction then outlines the larger official reports previously issued, the area to be described, the chief geological classification, the distribution of the principal formations and the broad structural features. In Chapter I., W. S. Bayley presents a thorough bibliography of all previous literature in the shape of abstracts of each paper or reports chronologically arranged. This has been a heavy task, for the literature is extensive (the chapter occupying 148 pages), and the cited articles are difficult ones to sum up concisely. Dr. Bayley has, however, done so not only concisely, but with great clearness and thoroughness. In Chapter II. the same writer discusses the Basement Complex. Much light is thrown on this tangle of metamorphosed

eruptives, but no unwarranted hopes of unravelling their stratigraphical relations are encouraged. The Northern Complex is treated under the following subdivisions: The Mona schists, the Kitchi schists, the gneissoid granites, the hornblende-syenite and the intrusives. The Southern Complex is subdivided into the schists, both micaceous and hornblendic, the gneissoid granites, the Palmer gneisses and the intrusives. A few isolated areas are cited within the boundaries of the Algonkian.

In Chapter III., C. R. Van Hise takes up the description of the Lower Marquette series in detail. The Algonkian rocks form a compressed syncline on the whole, with many minor foldings along axes both parallel to the main axis and at right angles with it. The whole series pitch downward to the west, so that as one goes in this direction later and later strata are encountered. The basal formation is the Mesnard quartzite, marking the advance of the sea from the eastward. It also appears to some extent around the northern and southern sides on the east. It is succeeded by the Kona dolomite, the Wewe slate, the Ajibik quartzite; the Siamo slate and the Negaunee formation of sideritic cherts, ferruginous slates, ferruginous cherts, jaspilite and iron ores. The last named is the stratum of the greatest economic interest, as it contains the chief deposits of ores. The derivation of the latter from the cherty carbonates in troughs of some impervious rock, by the replacement of the chert, is well established and is a further application of views already presented for the simpler Penokee-Gogebic district. A stratigraphical break occurs between the Lower and Upper Marquette series.

In Chapter VI., Professor Van Hise treats of the Upper Marquette series. The Upper Marquette begins with the Ishpeming formation, which is subdivided into the Goodrich quartzite and the Bijiki schists. Considerable ore bodies are in the base of the Goodrich quartzite, produced by the erosion of those in the Negaunee formation below, but they are treated under the Negaunee formation, as they are closely associated with it. Above the Ishpeming lies the Michigamme of slates and graywackes, mica-schists and mica-gneisses. Next follows the Clarksburg of effusive basic lavas