reason that fossils, the only true criterion of geological age, are absent from the beds, and from all underlying beds; he says, accordingly, only this—older than the Potsdam sandstone and its equivalents. The Cambrian of Great Britain is of great thickness below the equivalents of the Potsdam sandstone; and the question has arisen among those who have considered the subject, whether the Keweenian beds are not the equivalents of the part of the Cambrian below the upper Lingula flags, that is, of the Lower Cambrian and Menevian groups of Great Britain, or of the Lower Cambrian alone. Should either prove to be a fact, the series is true Cambrian; and if the name Cambrian is to be used at all in American geology, this series may claim it better than any beds of later origin.

The colored maps of the Report are of the best style of the art, and the other illustrations are excellent.

2. *Note on the Paramorphic Origin of the Hornblende of the Crystalline Rocks of the Northwest;* by R. D. IRVING.—In my second paper on this subject in this Journal for February, 1884, in which I give an historical review of the matter, there is a quite important omission. In referring to the work of Streng on the Minnesota crystallines I failed to note that, besides the Duluth gabbro, Streng had described other rocks from Minnesota* in a number of which he found associations of augite and diallage with hornblende, of such a nature as to lead him to believe in the secondary origin of the latter. It is evident that Streng was by far the first to note this relation between hornblende and an augitic material in the rocks of the Northwest; not merely in greenstones but in granites and other quartz-bearing rocks. And not only this, for he describes *single* brown hornblende (with cores of diallage), which he evidently regards as altered from *single* diallages, though he speaks cautiously on the subject.† His words in conclusion are worth quoting:

"Das augitische Mineral ist überall als Diallag ausgebildet, dessen deutlichste Spaltfläche die stumpfe Säulenkante der es umhüllenden Hornblende gerade abstumpft. Die Verbindung beider Mineralien ist eine so unregelmässige, die Hornblende dringt in so schmalen Parthien in die Augitsubstanz ein, dass man sich des Gedankens nicht erwehren kann, hier sei die Hornblende aus dem Augit entstanden. Der Beweis für diese Ansicht wird aber erst erbracht sein, wenn es gelingt nachzuweisen, dass die äussere Umhüllung des ganzen Krystalls die Form des Augits an sich trägt. Würde dieser Beweis gelingen, dann würde man annehmen müssen, dass auch andere Hornblenden, welche keinen Augitkern mehr besitzen, aus Augit entstanden sein und dass bei ihnen die Umwandlung schon vollendet sei; d. h. dass die fraglichen Gesteine einstmals noch reicher an augitischem Minerale gewesen sein, als sie jetzt erscheinen." This was in 1876.

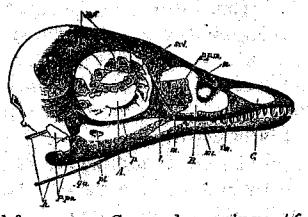
Madison, Wis., Oct. 7, 1884.

* Neues Jahrbuch für Mineralogie etc., 1877, pp. 31–56, 113–138, 225–242.

† Neues Jahrbuch, 1877, p. 240. See also for translation Eleventh Annual Report Geol. Survey Minn., p. 84.

1884 Am S 3rd Ser. Vol. 28

3. *The Berlin Archæopteryx.* — The Geological Magazine for September last contains an abstract of a paper by W. Dames on the Archæopteryx discovered in 1877 in the lithographic stone at Blumenberg in Bavaria (the same rock that afforded the specimen described by Professor Owen), which is illustrated by a plate showing the head with the tooth-bearing jaws, from which the accompanying figure of the head is taken, reduced in size. The



A, orbit; *B*, antorbital foramen; *C*, nasal opening; *pf*, parietal and frontal; *n*, nasal; *im*, intermaxillary; *l*, lachrymal; *m*, maxillary; *p*, palatine; *ppm*, palatine process of maxilla; *pt*, pterygoid; *qu*, quadrate bone; *scl*, sclerotic plates of eye; *mi*, lower jaw; *ppa*, post-articular process of mandible; *h*, hyoid bones.

length of the head is about two inches. When examined by Carl Vogt and Professor Marsh only two of the teeth were visible. By the removal of the rock, 12 teeth in a row are now exposed from the extremity of the beak backward out of the original number 13. The edge of the jaw carrying the teeth is 16^{mm} long; and the teeth, which are very nearly alike in size and shape, measure 1^{mm} in length and 0·5 in width. On the lower jaw, portions of only three teeth are visible, but enough to make it almost certain that the teeth of the jaw corresponded with those in the upper. The length of the jaw is 35^{mm}. The evidence seems to prove that the teeth are implanted in distinct alveoli.

The author states that the skeleton appears to be more closely connected with living birds than with the toothed birds of the Cretaceous period described by Marsh.

4. *The deposition of Ores;* by J. S. NEWBERRY, (School of Mines Quarterly for May, 1884, New York).—Dr. Newberry's extensive knowledge of the ore deposits of western North America gives great weight to his conclusions as to their positions and origin. In this valuable paper he discusses the bearing of the facts he has observed on the theory which attributes the origin of the ores to the leaching of adjacent *igneous* rocks. He shows, by a mention of many examples, that different sets of fissure veins widely diverse in character cut the same country rock; that the same vein often traverses a series of distinct formations without any essential change; that many veins have no connection with any igneous rock; that the most extensive igneous ejections have no associated ore deposits; and favors the view of Richthofen that the filling of many of the veins was the result of "the leaching of deep-seated rocks, perhaps the same that enclose the vein above, by highly heated solutions, which deposited their load near the surface." The region, he observes, is conspicuous for the number of its hot springs, and it is evident that these are the last of the

PDF by Amis + Wedel