of agates is taken practical advantage of by German manufacturers in the preparation of agates for the market, beautiful internal dendritic markings, which add so much to their market value, being produced by soaking the agates in a succession of liquids. In my Belfast address, however, I did not consider the case of the permeability of cold crystals by cold solutions. On the contrary, my main object was to impress upon my hearers the fact "that heat increased the porosity of minerals, facilitated the passage of liquids laden with mineral matter through their pores, and increased the potency of chemical action."

In the course of my remarks I referred to numerous instances in which there was good evidence to show that crystals and rocks had been permeated by chemical reagents, and I need not go into these cases again. I do not see how the schillerisation of minerals or the formation of a pseudomorph of one mineral in the form of another can be accounted for if you do not believe in the permeability of heated rocks and crystals by heated chemical reagents. I foresaw that the idea of cracks and their subsequent obliteration would suggest itself to some minds, and in my Belfast address I said all that I considered necessary in reply to this suggestion.

V.—ON A NEW STEGOCEPHALIAN (BATRACHOSUCHUS BROWN) FROM THE KARROO BEDS OF ARIWAL NORTH, SOUTH AFRICA.

By R. BROOM, M.D., B.Sc., C.M.Z.S.

IN the collection of Mr. Alfred Brown, of Ariwal North, there is a fairly complete skull of a moderate-sized Stegocephalian which differs very considerably from that of any form hitherto The specimen is in a sandstone matrix. Owing to described. a crack produced by weathering practically all the cranial bones adhered to the counter slab when an endeavour was made to display the remains. The sculpturing of the bones is thus hidden, but the sutures are for the most part distinctly seen. Fig. 1 represents a slightly restored view of the upper side of the skull. The most striking features are the great breadth of the skull and the relatively advanced position of the orbits. In these respects it makes a slight approach to the condition found in the American genus Diplocaulus. There is no distinct notch in the post-temporal region, as in most Stegocephalians, and there are no 'epiotic' cornua. There are two rudimentary cornua on the posterior cranial border, but they are formed by the so-called 'supra-occipital' bones. In the middle line between the frontals and nasals is a median bone, probably an ethmoid. I fail to detect a supra-temporal element as distinct from the quadrato-jugal, which is of large size.

The under surface of the skull has only been partly cleared of matrix. The occipital region is well ossified and extends far backwards. The condyles are well developed. The most noteworthy feature of the palatal surface is the large size of the pterygoids. These, with the 'parasphenoid,' form more than a third of the under surface of the skull. The pterygoids also form two large descending plates, which lie close to the inner sides of the mandibles. The borders of the maxillaries and premaxillaries are unfortunately lost, but large teeth or the remains of them are seen, as indicated in Fig. 2. The position of the internal nares is also shown. The quadrate, which is apparently lost, has been small and possibly cartilaginous.



FIG. 1, UPPER, AND FIG. 2, LOWER VIEWS OF SKULL OF Batrachosuchus Browni, sp. nov. $\times \frac{1}{4}$.

E. ethmoid; Fr. frontal; I.N. internal nares; Ju. jugal; L. lachrymal; Mx. maxilla; Na. masal; Pa. parietal; Pmz. premaxilla; Po.F. postfrontal; Po.O. postorbital; Po.Pa. post-parietal ('supra-occipital'); Po.T. post-temporal ('epiotic'); Pr.F. prefrontal; Pt. pterygoid; Q.J. quadrato-jugal; Sq. squamosal; Vo. vomer ('parasphenoid' of most authors).

In the absence of vertebræ it is impossible to be quite certain to which group of Stegocephalians the new form belongs. In the same beds, however, Mr. Brown has collected vertebral hypocentra of a size sufficiently large to have belonged to the form under consideration, and if, as is probable, the vertebral remains belong to the same form as the skull, its affinities will most probably be with those other forms which have rhachitomous vertebræ.

The extreme length of the skull from the occipital condyles has probably been about 250 mm. From the back of the ethmoid to the back of the 'supra-occipital' is 135 mm.; and the distance between the orbits 82 mm.

For the new form I propose the name Batrachosuchus Browni, in honour of the discoverer.

VI.—ON A PREGLACIAL OR EARLY GLACIAL RAISED BEACH IN COUNTY CORK.1

By H. B. MUFF, B.A., F.G.S., and W. B. WRIGHT, B.A.

[Communicated with the permission of the Director of the Geological Survey.]

THE existence of a raised beach formed, and probably elevated, before the deposition of the Boulder-clay has already been demonstrated in South Wales² and Yorkshire.³ During the progress of the Drift Survey of the country surrounding Queenstown Harbour, a beach of similar age was observed along the shores of the harbour, and was subsequently traced at intervals along the adjoining coast of Waterford and Cork from Dungarvon to Clonakilty, a distance from east to west of about sixty miles.

The relation of this beach to the well-known submerged river valleys of the south of Ireland is a point of considerable interest. The finding of glacial drift and striæ within the valleys led at once to the recognition of their preglacial excavation, but the subsequent tracing of the raised beach beneath the Boulder-clay along their banks showed that their submergence was also preglacial.

The most persistent relic of the raised beach is a water-worn rock platform, of varying width, sloping gently seaward and terminated at its landward side by a rocky cliff against which the deposits overlying the beach are banked. The higher portions of this platform, just at the foot of the cliff, are from five to ten feet above high-water mark-that is, perhaps, seven to twelve feet above the higher portions of the corresponding plane of erosion in process of formation at the present day.

¹ This paper was read in abstract before the British Association, Southport,

September, 1903, in Section C (Geology). ² R. H. Tiddeman, "On the Age of the Raised Beach of Southern Britain as seen in Gower": Rep. Brit. Assoc., 1900, p. 760. See also Summary of Progress of the Geological Survey of the United Kingdom for 1899, pp. 154, 155.

³ G. W. Lamplugh, "Report of the Committee appointed for the Purpose of investigating an Ancient Sea-beach near Bridlington Quay": Rep. Brit. Assoc., 1890, p. 375. See also Proc. Yorkshire Geol. and Polytechnic Society, 1887, p. 381; and "The Drifts of Flamborough Head," Quart. Journ. Geol. Soc., vol. xlvii, p. 384.