

fin rays corresponds almost exactly, and the difficulty of counting the rays in the Whitebait is considerable, as they are more and more rudimentary at the commencement and terminations of the fin. I wish to direct your attention to this drawing of a Whitebait, which has been in the Acclimatization Society's ponds a short time. I think anyone would say it was a young Smelt, it has lost its Eel-like appearance, and is assuming the colour and markings of the adult Smelt.

In concluding this contribution to the natural history of the fresh-water fishes of the River Avon, I may say that I am quite satisfied that the Whitebait is the young of the Galaxia, commonly known as the Smelt, but if any of the members doubt it, let me urge on them the propriety of setting the question at rest in one of two ways; either by developing Smelts from their ova, and observing whether they pass through the Whitebait stage; or, secondly, by preserving the Whitebait themselves and watching their development, care being taken to exclude all sources of error, such as the access of the ova of other fish. Such an experiment is easily tried, and would be decisive.

ART. XIII.—*On the NEW ZEALAND FROG (Leiopelma Hochstetteri), with an account of a remarkable feature in the history of some species of Australian Frogs.* By A. WANDER AITKEN.

[Read before the Auckland Institute, November 15, 1869.]

WHILE engaged in making an examination of the Thames Gold-field, I was rather surprised to find that frogs existed in situations that no imported animals can possibly have reached. I have always been led to believe that no animals of the frog kind existed in New Zealand, and a long experience in the inhabited and uninhabited portions of the islands, had almost confirmed that belief. That the frogs, referred to by me, are indigenous to New Zealand, I have no doubt, as they are quite different from any species I have hitherto seen or read of. I have much pleasure in forwarding one herewith, which I took from one of the range-creeks in the neighbourhood of Puriri. The portion of the creek from which it was taken is about 500 feet above the level of the Thames river, and below that point the creek is a succession of water-falls, and very steep. In forwarding this specimen, I should like to bring under the notice of the Institute a feature in the natural history of the frog, at present (I believe) unknown to the scientific world, but which must be of the deepest interest, not only to the student of natural history, but also to the student of geology.

There are districts, often exceeding 5000 square miles in extent, in the interior of the Australian continent, in which there is no surface-water for many months, and, in some instances, for years; yet as soon as rain falls in sufficient quantities to fill the water-holes, they are swarming with young frogs. Before the rain fell, one might dig for ten or twelve feet without finding the slightest moisture, much less water; the whole of the ground is baked hard and perfectly dry, and no sign of animal life apparently exists in it, or on it.

Even vegetable life has almost ceased to exist, and the only remnant left is a withered and half-dead Salt-bush, here and there. Yet rain on such country had the effect of changing, as if by magic, the whole aspect of affairs,—comparatively speaking, a desert, was, in a day, transformed into an Eden. Plants sprung up everywhere, ducks and water-hens appeared in vast numbers, and swarms of tadpoles peopled the water-holes. I could easily account for the vegetable life, and for the wild-fowl; but the tadpoles puzzled me, till a native boy, not more than ten years old, opened my eyes, and satisfactorily solved a

problem in geology, which had never been, to my mind, satisfactorily solved by the greatest geologists who have written on the subject. Mr. A. W. Howitt, and I, with a black boy of the age above-mentioned, had made a two days' journey on horseback, from the last known water, without finding any more, and had we gone on further our horses would probably have been unable to return. We were much in want of water, and had camped for the night in the midst of a great many dried-up water-holes, with a few Salt-bushes growing on their margins, intending to turn next morning.

I noticed the boy examining the dry surface of the water-holes, and went to see what he was doing. He pointed out an indistinct and crooked mark, on what had once been the mud, and following it to where it apparently ceased, in the shade of a small Salt-bush, he began to dig with a sharp stick, and in a short time turned out a ball of clay about eight inches in diameter, and quite dry outside, which, when broken, disclosed a frog shut up in a beautifully puddled cell, with more than half-a-pint of fine, clear, cold water. We afterwards dug out many others, drinking the water, and eating the frogs. A sudden or gradual deposition of matter over such ground, would have shut up those frogs for ever, and if they live through months and even years, in such a situation, within range of the effects of a scorching sun, we can understand how they have lived for ages in the cool and moist recesses of the rocks in which they are sometimes found. The theory of living frogs getting *accidentally* buried in accumulating mud or sand, if examined, will not stand good, for the compression to which such rocks are sometimes afterwards subjected, would certainly kill them; while the cells, in which I have seen them, would stand compression to half their original bulk, without materially affecting the animal.

II.—BOTANY.

ART. XIV.—*On some new species of NEW ZEALAND PLANTS.* By JOHN BUCHANAN, of the Geological Survey Department.

[Read before the Wellington Philosophical Society, November 13, 1869.]

Ozothamnus lanceolatus, Buchanan. n. sp.

A small shrub, 2–4 feet high; branches slender, tomentose at the tips, grooved. Leaves, $1\frac{1}{2}$ inches long, narrow, alternate, lanceolate, slightly waved on the margins, entire or obscurely crenate, white and cottony beneath, finely reticulated on the upper surface, spathulate or contracted into a winged petiole $\frac{1}{4}$ inch long. Heads in small, lateral, peduncled corymbs, involueral scales, scariosus, woolly at the base, pappus hairs thickened at the tip. Achene glabrous.

Allied to *Ozothamnus glomeratus*, but easily distinguished by the lanceolate leaves and glabrous achene. Habitat, mountains of Hokianga 2000–3000 feet alt. Collected by Mr. J. Buchanan.

Geum uniflorum, Buchanan. n. sp.

A small herb, 6–8 inches high; rhizome, prostrate, stout, woody. Leaves $1\frac{1}{2}$ –2 inches long, pinnate; leaflets, one pair, very small, crenate; terminal leaflet, reniform, 1 inch broad, obtusely crenate, nearly glabrous on both surfaces, but with a marginal row of pencils of stiff orange hairs on the edges of the crenatures. Flower, large, $1-1\frac{1}{4}$ inches dia., white, terminal on a