

Footprints in the Sand: the Hugh Miller Writing Competition II 2017-2018

Prose Winner

Thomas Halliday: Landward

Footprints in the Sand: The Hugh Miller Writing Competition II carries the name of one of Scotland's most endearing geologists, Hugh Miller (1802-1856), and aimed to honour his legacy by inspiring new, original prose and poetry on the theme of Scotland's rich fossil heritage. The competition was organised by the Scottish Geodiversity Forum, The Friends of Hugh Miller and other partners.

Further details of the competition, and all the winning entries, are available at www.scottishgeology.com/hughmiller/

Copyright of this competition entry rest with the author. Requests for reproduction can be forwarded to the author: email competition@scottishgeodiversityforum.org

Copyright © 2018 Thomas Halliday

LANDWARD

The sun reluctantly skents beneath the clouds to cast long afternoon shadows along the strandline at Yellowcraig. A stiletto of an east wind blows in from the Bass, scattering the sand. I turn my back to the blast, away from the dog walkers and families, and down the narrow path between the buckthorn, the bents and the strand. The basalt isle of Fidra with its lighthouse sulks in the mist as I skirt the black rocks. Over my shoulder are towering volcanic plugs and the remains of bulging underground lakes of magma, silent reminders of a turbulent geological past. Berwick Law. The Lamb. Craigleith. The Bass. They disappear as I round the corner, this next bay sheltered by a stand of pines. It is quiet save for the distant thwack of golf balls to the laughter of fieldfare, as I see the dark Forth laid out before me.

Against the yellow sands, the shales and cementstones are exposed. I crouch down to peer at the revealed rock pools. Crabs and brown shrimp flee from view, while thrawn limpets hold fast. A pebble of shale, recently detached and fractured, reveals the perfect white memory of a different shrimp, and a different coast.

Here, in this small bay, was once a freshwater lake or lagoon, some three hundred and thirty million years ago – a time best known for its intense heat and congested mires of plant matter, congealing and transforming into peat and coal. The middle of the Viséan period, during which these rocks were laid down, was one of strong, monsoon-like seasons mixed with unpredictable periods of drought. The surface of the lake rose and fell, fed by tropical rains flowing through a vast, meandering river delta from northern hills now lost to time. The volcanoes that once overtopped the Law and Bass Rock were active and explosive, hot lava steaming in the mudflats. In those days the sun climbed higher in the sky, and the sheer heat of its direct, equatorial gaze was enough to separate the surface water from the drowning cold depths that, unable to muster enough energy to break the surface, became suffocated of oxygen. But for the rumbling of the earth from the young and petulant volcanoes, and the occasional intrusion of salt water from the nearby sea, the lake was calm and still – and was teeming with shrimp.

These fossil shrimp, beautiful though they are, are not why I am here. This is something of a pilgrimage, as one might make to the grave of a distinguished ancestor, even long after all who knew them are gone. For, among the crustaceans and plants, if one is lucky enough to find them, the hills and coastlines of southern Scotland hide ancient pioneers who lived alongside these ancient lakes. The oldest – and smallest – of them, *Casineria*, lived here at Yellowcraig. The fossil itself is unassuming; ribs, feet, and vertebrae scattered like a tangle of broom, headless, tailless, and small, but with a tale to tell.

With periodic droughts, the pools dotting the river delta would, from time to time, run dry. For the amphibious four-legged beasts that populated the freshwater pools and swamps, this was a problem. In the long heat of an extended drought, and without water to lie in, the soft, wet eggs would desiccate and die. One evolutionary innovation changed all that, and allowed a single small-bodied group of organisms to escape the confines of the water. A series of almost impossibly thin membranes within the egg: the allantois across which oxygen passes, and the protective chorion and amnion, providing a private pond allowing the embryo to grow, all surrounded by the armour of a shell. The eggs of the relatives of *Casineria* – my ancestors – would become strong enough to remove the need to reproduce in water. The whole of the terrestrial realm, from the lakeshores and riverbanks up to the highest mountain and into the driest desert, was suddenly habitable. That world had already been colonised twice, by plants and arthropods – insects, millipedes, arachnids – and was a landscape rich with food and opportunity. If I look around, there is nothing that

is not as it is because of the tiny developmental shift from water-bound tetrapod to amniote. The reach of *Casineria* and its kin has extended around and beyond the earth, shaping environments throughout that long 'yesterday of the globe' and into human history. All around this flattened landscape, settlements have sprung up around black-stained shafts driven down through time into the Carboniferous swamps, still influencing the global environment hundreds of millions of years later.

The name of this land, it is said, derives from Lot, the king of Arthurian legend who reigned atop another Carboniferous volcanic plug at Traprain Law. He, in turn, takes his name from Lleu, a legendary Brythonic demigod, who was said to be vulnerable to death neither during the day nor at night, neither clothed nor naked. He could not be killed indoors, or outside. Only when existing on the borderline, partially clad on a threshold at dusk, neither in one state nor another, was his mortality revealed. Here, in Lot's kingdom, between sea and shore, *Casineria* has cheated destruction. A single individual, whose life began within membranes within membranes and ended sinking into the unbreathing depths of an ancient lake. Compacted in layers of mud, avoiding volcanic fires, the easterly scraping of kilometre-thick ice, the tectonic yawns of the earth, and erosion by the tireless wind, *Casineria* has crossed a third of a billion years to show us the nature of its own liminal existence. A new kind of life, leaving the water behind. Neither amphibian, nor quite amniote, and yet a living whole.

The tired winter sun droops in the sky. The waves are returning, burying once more the ancient lake. The far-stretching stones thin and submerge. A single scoter distantly bobs in the current, still hopeful of shrimp. I turn, and climb the marram-knitted dune. My place is on the land.