

The Snout

I have long been an admirer of the octopus. The cephalopods are very old, and they have slipped, protean, through many shapes. They are the wisest of the mollusks, and I have always felt it to be just as well for us that they never came ashore, but – there are other things that have.

There is no need to be frightened. It is true some of the creatures are odd, but I find the situation rather heartening than otherwise. It gives one a feeling of confidence to see nature still busy with experiments, still dynamic, and not through nor satisfied because a Devonian fish managed to end as a two-legged character with a straw hat. There are other things brewing and growing in the oceanic vat. It pays to know this. It pays to know there is just as much future as there is past. The only thing that doesn't pay is to be sure of man's own part in it.

There are things down there still coming ashore. Never make the mistake of thinking life is now adjusted for eternity. It gets into your head – the certainty, I mean – the human certainty, and then you miss it all: the things on the tide flats and what they mean, and why, as my wife says, “they ought to be watched.”

The trouble is we don't know what to watch for. I have a friend, one of these Explorers Club people, who drops in now and then between trips to tell me about the size of crocodile jaws in Uganda, or what happened on some back beach in Arnhem Land.

“They fell out of the trees,” he said. “Like rain. And into the boat.”

“Uh?” I said, noncommittally.

“They did so,” he protested, “and they were hard to catch.”

“Really –” I said.

“We were pushing a dugout up one of the tidal creeks in northern Australia and going fast when *smacko* we jam this mangrove bush and the things come tumbling down.

“What were they doing sitting up there in bunches? I ask you. It's no place for a fish. Besides that they had a way of sidling off with those popeyes trained on you. I never liked it. Somebody ought to keep an eye on them.”

“Why?” I asked.

“I don't know why,” he said impatiently, running a rough, square hand through his hair and wrinkling his forehead. “I just mean they make you feel that way, is all. A fish belongs in the water. It ought to stay there – just as we live on land in houses. Things ought to know their place and stay in it, but those fish have got a way of sidling off. As though they had mental reservations and weren't keeping any contracts. See what I mean? “

"I see what you mean," I said gravely. "They ought to be watched. My wife thinks so too. About a lot of things."

"She does?" He brightened. "Then that's two of us. I don't know why, but they give you that feeling."

He didn't know why, but I thought that I did.

It began as such things always begin—in the ooze of unnoticed swamps, in the darkness of eclipsed moons. It began with a strangled gasping for air.

The pond was a place of reek and corruption, (of fetid smells and of oxygen-starved fish breathing through laboring gills. At times the slowly contracting circle of the water left little windrows of minnows who skittered desperately to escape the sun, but who died, nevertheless, in the fat, warm mud. It was a place of low life. In it the human brain began.

There were strange snouts in those waters, strange barbels nuzzling the bottom ooze, and there was time—three hundred million years of it—but mostly, I think was the ooze. By day the temperature in the world outside the pond rose to a frightful intensity; at night the sun went down in smoking red. Dust storms marched in incessant progression across a wilderness whose plants were the plants of long ago. Leafless and weird and stiff they lingered by the water, while over vast areas of grassless uplands the winds blew until red stones took on the polish of reflecting mirrors. There was nothing to hold the land in place. Winds howled, dust clouds rolled, and brief erratic torrents choked with silt ran down to the sea. It was a time of dizzying contrasts, a time of change.

On the oily surface of the pond, from time to time a snout thrust upward, took in air with a queer grunting inspiration, and swirled back to the bottom. The pond was doomed, the water was foul; and the oxygen almost gone, but the creature would not die. It could breathe air direct through a little accessory lung, and it could walk. In all that weird and lifeless landscape, it was the only thing that could. It walked rarely and under protest, but that was not surprising. The creature was a fish.

In the passage of days the pond became a puddle, but the Snout survived. There was dew one dark night and a coolness in the empty stream bed. When the sun rose next morning the pond was an empty place of cracked mud, but the Snout did not lie there. He had gone. Down stream there were other ponds. He breathed air for a few hours and hobbled slowly along on the stumps of heavy fins.

It was an uncanny business if there had been anyone there to see. It was a journey best not observed in daylight, it was something that needed swamps and shadows and the touch of the night dew. It was a monstrous penetration of a forbidden element, and the Snout kept his face from the light. It was just as well, though the face should not be mocked. In three hundred million years it would be our own.

There was something fermenting in the brain of the Snout. He was no longer entirely a fish. The ooze had marked him. It takes a swamp-and-tide-flat zoologist to tell you about life; it is in this domain that the living suffer great extremes, it is here that the water-failures, driven to desperation, make starts in a new element. It is here that strange compromises are made and new senses are born. The Snout was no exception. Though he breathed and walked primarily in order to stay in the water, he was coming ashore.

He was not really a successful fish except that he was managing to stay alive in a noisome, uncomfortable, oxygen-starved environment. In fact the time was coming when the last of his kind, harried by more ferocious and speedier fishes, would slip off the edge of the continental shelf, to seek safety in the sunless abysses of the deep sea. But the Snout was a fresh-water Crossopterygian, to give him his true name and cumbersome and plodding though he was – something had happened back of his eyes. The ooze had gotten in its work.

It is interesting to consider what sort of creatures we, the remote descendants of the Snout, might be, except for that green quagmire out of which he came. Mammalian insects perhaps we should have been – solid-brained, our neurons wired for mechanical responses, our lives running out with the perfection of beautiful, intricate, and mindless clocks. More likely we should never have existed at all. It was the Snout and the ooze that did it. Perhaps there also, among rotting fish heads and blue, night-burning bog lights, moved the eternal mystery, the careful finger of God. The increase was not much. It was two bubbles, two thin-walled little balloons at the end of the Snout's small brain. The cerebral hemispheres had appeared.

Among all the experiments in that dripping, ooze-filled world, one was vital: the brain had to be fed. The nerve tissues are insatiable devourers of oxygen. If they do not get it, life is gone. In stagnant swamp waters, only the development of a highly efficient blood supply to the brain can prevent disaster. And among those gasping, dying creatures, whose small brains winked out forever in the long Silurian drought, the Snout and his brethren survived.

Over the exterior surface of the Snout's tiny brain ran the myriad blood vessels that served it; through the greatly enlarged choroid plexuses, other vessels pumped oxygen into the spinal fluid. The brain was a thin-walled tube fed from both surfaces. It could only exist as a thing of thin walls permeated with oxygen. To thicken, to lay down solid masses of nervous tissue such as exist among the fishes in oxygenated waters was to invite disaster. The Snout lived on a bubble, two bubbles in his brain.

It was not that his thinking was deep; it was only that it had to be thin. The little bubbles of the hemispheres helped to spread the area upon which higher correlation centers could be built, and yet preserve those areas from the disastrous thickenings which meant oxygen death to the swamp dweller. There is a mystery about those thickenings which culminate in the so-called solid brain. It is the brain of insects, of the modern fishes, of some reptiles and all birds. Always it marks the appearance of

elaborate patterns of instinct and the end of thought. A road has been taken which, anatomically, is well-nigh irretraceable; it does not lead in the direction of a high order of consciousness.

Wherever, instead, the thin sheets of gray matter expand upward into the enormous hemispheres of the human brain, laughter, or it may be sorrow, enters in. Out of the choked Devonian waters emerged sight and sound and the music that rolls invisible through the composer's brain. They are there still in the ooze along the tideline, though no one notices. The world is fixed, we say: fish in the sea, birds in the air. But in the mangrove swamps by the Niger, fish climb trees and ogle uneasy naturalists who try unsuccessfully to chase them back to the water. There are things still coming ashore.

The door to the past is a strange door. It swings open and things paw through it, but they pass in one direction only. No man can return across that threshold, though he can look down still and see the green light waver in the water weeds.

There are two ways to seek the doorway: in the swamps of the inland waterways and along the tide flats of the estuaries where rivers come to the sea. By those two pathways life came ashore. It was not the magnificent march through the breakers and up the cliffs that we fondly imagine. It was a stealthy advance made in suffocation and terror, amidst the leaching bite of chemical discomfort. It was made by the failures of the sea.

Some creatures have slipped through the invisible chemical barrier between salt and fresh water into tidal rivers, and later come ashore; some have crept upward from the salt. In all cases, however, the first adventure into the dreaded atmosphere seems to have been largely determined by the inexorable crowding of enemies and by the retreat further and further into marginal situations where the oxygen supply was depleted. Finally, in the ruthless selection of the swamp margins, or in the scramble for food on the tide flats; the land becomes home.

Not the least interesting feature of some of the tide-flat emergents is their definite antipathy for the full tide. It obstructs their food-collecting on the mud banks and brings their enemies. Only extremes of fright will drive them into the water for any period.

I think it was the great nineteenth-century paleontologist Cope who first clearly enunciated what he called the "law of the unspecialized", the contention that it was not from the most highly organized and dominant forms of a given geological era that the master type of a succeeding period evolved, but that instead the dominant forms tended to arise from more lowly and generalized animals which were capable of making new adaptations, and which were not narrowly restricted to a given environment

There is considerable truth to this observation, but, for all that, the idea is not simple. Who is to say without foreknowledge of the future which animal is specialized and which is not? We have only to consider our remote ancestor, the Snout, to see the intricacies into which the law of the unspecialized may lead us.

If we had been making zoological observations in the Paleozoic Age, with no knowledge of the strange realms life was to penetrate in the future, we would probably have regarded the Snout as specialized. We would have seen his air-bladder lung, his stubby, sluggish fins, and his odd ability to wriggle overland as specialized adaptations to a peculiarly restricted environmental niche in stagnant continental waters. We would have thought in water terms and we would have dismissed the Snout as an interesting failure off the main line of progressive evolution, escaping from his enemies and surviving successfully only in the dreary and marginal surroundings scorned by the swift-finned teleost fishes who were destined to dominate the seas and all quick waters.

Yet it was this poor specialization – this bog-trapped failure – whose descendants, in three great movements were to dominate the earth. It is only now, looking backward, that we dare to regard him as “generalized”. The Snout was the first vertebrate to pop completely through the water membrane into a new dimension. His very specializations and failures, in a water sense, had preadapted him for a world he scarcely knew existed.

The day of the Snout was over three hundred million years ago. Not long since I read a book in which a prominent scientist spoke cheerfully of some ten billion years of future time remaining to us. He pointed out happily the things that man might do throughout that period. Fish in the sea, I thought again, birds in the air. The climb all far behind us, the species fixed and sure. No wonder my explorer friend had had a momentary qualm when he met the mudskippers with their mental reservations and lack of promises. There is something wrong with our world view. It is still Ptolemaic, though the sun is no longer believed to revolve around the earth.

We teach the past, we see farther backward into time than any race before us, but we stop at the present or, at best, we project far into the future idealized versions of ourselves. All that long way behind us we see, perhaps inevitably, through human eyes alone. We see ourselves as the culmination and the end, and if we do indeed consider our passing, we think that sunlight will go with us and the earth be dark. We are the end. For us continents rose and fell, for us the waters and the air were mastered, for us the great living web has pulsed and grown more intricate.

To deny this, a man once told me, is to deny God. This puzzled me. I went back along the pathway to the marsh. I went, not in the past, not by the bones of dead things, not down the lost roadway of the Snout. I went instead in daylight, in the Now, to see if the door was still there, and to see what things passed through.

I found that the same experiments were brewing, that up out of that ancient well, fins were still scrambling toward the sunlight. They were small things and which of them presaged the future I could not say. I saw only that they were many and that they had solved the oxygen death in many marvelous ways, not always ours.

I found that there were modern fishes who breathed air, not through a lung but through their stomachs or through strange chambers where their gills should be, or breathing as the Snout once breathed. I found that some crawled in the fields at nightfall pursuing

insects, or slept on the grass by pond sides and who drowned, if kept under water, as men themselves might drown.

Of all these fishes the mudskipper *Periophthalmus* is perhaps the strangest. He climbs trees with his fins and pursues insects; he snaps worms like a robin on the tide flats; he sees as land things see, and above all he dodges and evades with a curious popeyed insolence more suggestive of the land than of the sea. Of a different tribe and a different time he is nevertheless, oddly reminiscent of the Snout.

But not the same. There lies the hope of life. The old ways are exploited and remain, but new things come, new senses try the unfamiliar air. There are small scuttlings and splashings in the dark and out of it come the first croaking, illiterate voices of the things to be, just as man once croaked and dreamed darkly in that tiny vesicular forebrain.

Perpetually, now, we search and bicker and disagree The eternal form eludes us – the shape we conceive as ours. Perhaps the old road through the marsh should tell us. We are one of many appearances of the thing called Life; we are not its perfect image, for it has no image except Life, and life is multitudinous and emergent in the stream of time.