Maps:
Aberdeen Harbour Improvements 1867–8
by Keith and Gibb, Aberdeen
Macdonald Collection, Department of Geography,
University of Aberdeen
Doggerland map from
Graeme Warren (2010) Mesolithic Lives in Scotland,
Stroud: The History Press

RAIK

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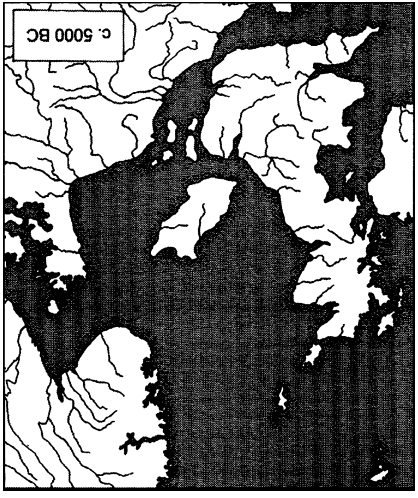
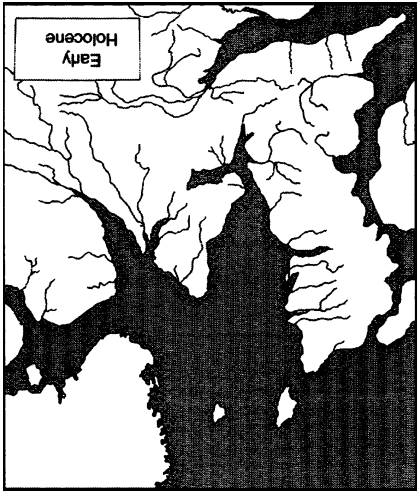
METABOLIC ANIMISM

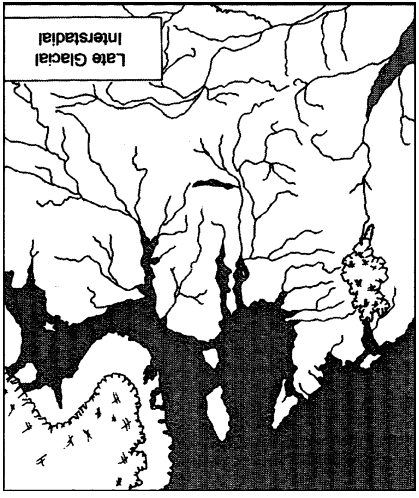
Simon Yuill

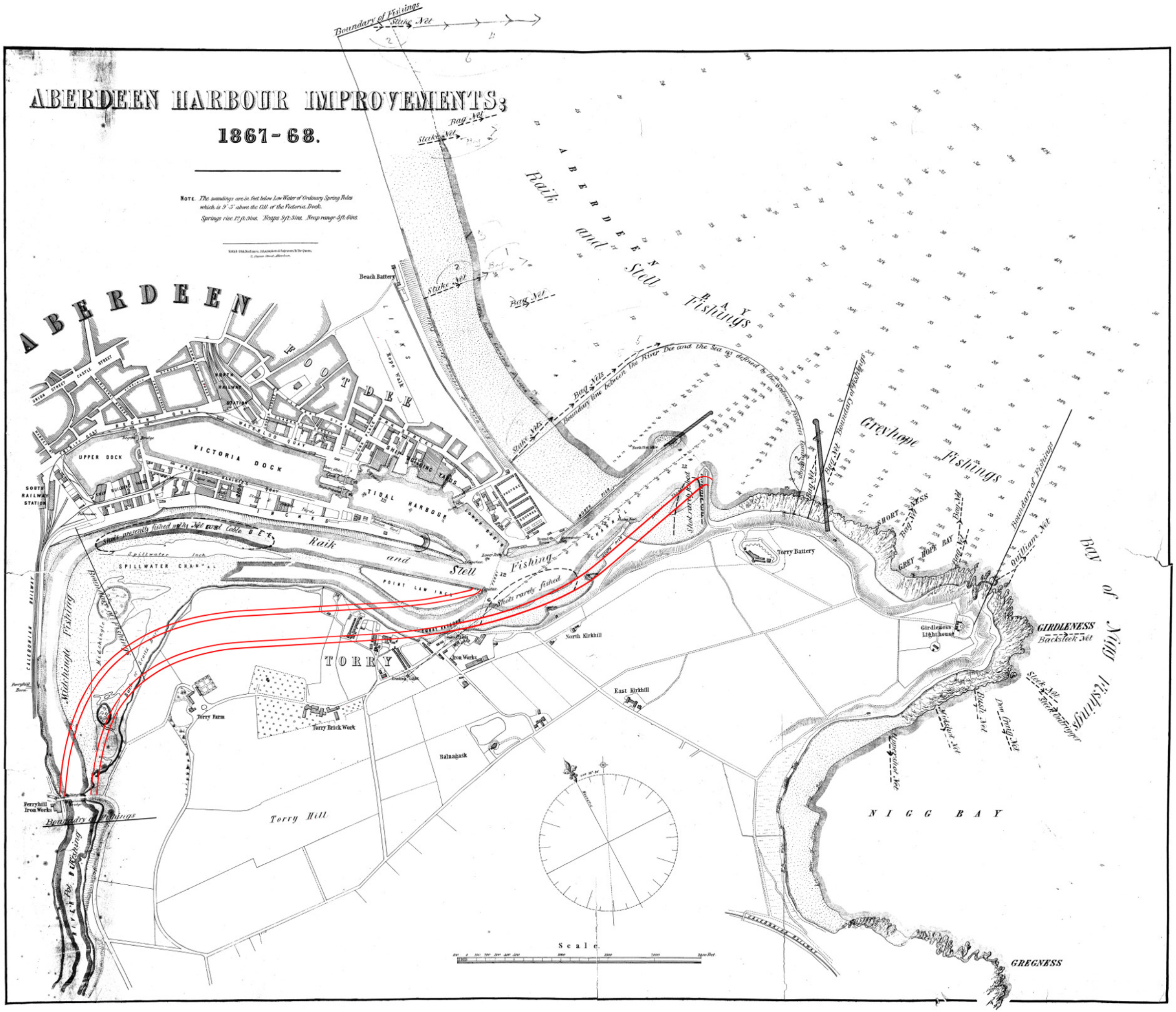
2019

Raik, *v.* to rake; to collect. Cf. Rake.
Raik, *v.* to heed, matter. Cf. Reck.
Raik, *n.* an idle person, a stroller by night; a dog that does not stay at home.—*v.* used of cattle, dogs, persons: to stray, to roam about. Cf. Rake.
Raik, *n.* the extent of a pasturage for sheep or cattle; a swift pace; what a person can cart or carry at a time from one place to another; the extent of a fishing-ground; the direction of clouds driven by the wind. —*v.* to run, fly. Cf. Rake.
Raik, *n.* attainment; width, reach.—*v.* to reach; to hand; to stretch; to strike a blow. Cf. Reach.
Raik, *n.* a weed which grows around a water-spring or in a well.









ABERDEEN HARBOUR IMPROVEMENTS;
1867-68.
NOTE. The soundings are in feet below Low Water of Ordinary Spring Tides which is 9'-5" above the Cill of the Victoria Dock.
Springs rise 12 ft. 9ins. Neaps 9 ft. 3ins. Neap range 5 ft. 6ins.
ABERDEEN
Boundary of Fishings
Stake Net
Bag Net
ABERDEEN BAY
Raik and Stell Fishings
Boundary line between the River Dee and the Sea as defined by the Salmon Fisheries Commission
Bag Nets
Greyhope Fishings
Boundary of Fishings
Quilliam Net
Bay of Nigg Fishings
GIRDLENESS
Backsteek Net
Steek Net
Steek Outrigger
Dow Craig Net
Bush Net
Midshot Net
Hymershot Net
NIGG BAY
GREGNESS
Beach Battery
LINKS
Rope Walk
FOOTDEE
VICTORIA DOCK
UPPER DOCK
TIDAL HARBOUR
SOUTH RAILWAY STATION
Shots rarely fished
Raik and Stell Fishing
SPILLWATER CHANNEL
POINT LAW
Midchingle Fishing
Torry Battery
Girdleness Lighthouse
North Kirkhill
East Kirkhill
Iron Works
TORRY
Torry Farm
Torry Brick Work
Balnagask
Torry Hill
Ferryhill Iron Works
Scale

REINDEER

Cladonia are a family of lichen that grow well in less hospital environments and poor soil conditions. They are at home amongst the acidic floors of pine forest or the hard rock and fragile soils of tundra with their contrasting regions of wet and dry terrain and cycles of extreme weather conditions. Lichens are a symbiotic species, a combination of fungi and algae that extract nutrients from their environment as they digest and metabolise the surfaces on which they reside and the fluids that flow over them. This gradually erodes harder terrains, transforming them from solid mass into the beginnings of a more fertile soil.

Lichens are essential to the sustenance and development of more complex lifeforms, enabling them to establish in previously barren landscapes. They are also a source of nutrition in their own right. One of the most common varieties of the *Cladonia* family is *Cladonia rangiferina* that is named after the species of animal, the *rangifer*, for whom it provides a central part of the diet. In the long polar winters, reindeer and caribou rely upon such lichen when the summer grasses have died off and become buried beneath snow.

The *rangifer* are roaming animals whose range, or *raik* as it would be called in Doric, covers vast areas. In the circumpolar regions of Greenland and Scandinavia, across Siberia and Northern America, various human groups have developed semi-nomadic cultures that follow the *rangifer*, hunting and herding them. Archaeological evidence from the Mesolithic period at the end of the Ice Age shows that similar practices were central to the diet and social structure of the peoples that followed *rangifer* across the European continent. At this time much of the terrain was tundra that stretched across what is now Russia to Denmark, through Germany, France and the Netherlands to the far western shores of the continent on an area of land that is now an island. Known to early inhabitants as Albion, this island was once joined across the North Sea and English Channel as part of a large plain named *Doggerland*. Reindeer crossed this plain as part of their seasonal raik. People followed, bringing their artefacts and culture with them, settling along river banks and coastal areas. Flints found in sites within the city of Aberdeen and up the River Dee match those of the Ahrensburgian sites in north-west Germany where reindeer were hunted. It is from this that Fenton Wyness called these people the *Reindeer Folk*.

How exactly the reindeer were hunted remains unknown. Analogies have been drawn with techniques employed by peoples who in modern times hunt for reindeer and caribou such as the Sámi of Scandinavia, the Nenets of Siberia or Innu in Canada. Echoes of some techniques are reflected in archaeological evidence that may suggest, if not direct lines of continuity, then forms of resonance over time of practices based around similar materials and conditions.

One technique found across several cultures is that of trapping reindeer as they cross a river. The seasonal flood plain of the Inches on the Dee, overlooked by the settlements on the hill of Gilcomston, may have been part of a migratory route between inland forest and the tundra of northern Doggerland into which the Dee once flowed. Reindeer may have been trapped here as they slowed down in crossing. Other techniques involve chasing the deer into large corrals bounded by wicker fencing culminating in trap pits such as those found near Torry that have been dated to the era. More intriguing, and in many ways more culturally significant, are those ways in which the boundaries between human and reindeer, hunter and prey are blurred.

A 19th century engraving from of Sámi hunting reindeer shows the hunters – men and women – draped in reindeer skins, bent over to suggest they are walking on all fours as they draw arrows in their bows. Modern day studies of Siberian Yukaghirs describe the careful preparations that hunters take to remove their human scents using sauna and birch tree whisking and adopt the calls of their prey, losing human language as they do so. The hunter transforms themselves, physically and mentally, into their prey not merely to blend in with the herd but to understand and anticipate their actions. It has been argued that this adopting of the spirit of one's prey is an evolutionary development that is not limited to humans but common to other predatory animals, a form of cognitive mirroring or deep empathy with the very creature that it seeks to devour. One must internalise another animal conceptually or spiritually before one can consume it physically. This empathy with one's prey extends beyond death into various rituals through which the captured prey is honoured. One tradition amongst the Sámi has been to deposit the reindeer antlers into a river in order to return a part of the body to the flow of life from where it came. At the Mesolithic site of Star Carr, a once peaty bogland area in North Yorkshire, large numbers of red deer antlers were found deposited in water. Along with these were pieces of deer skull, still holding their antlers, that had been shaped and drilled with holes so that, it has been suggested, they might be worn as a human headdress. A cave etching from

a related culture in Trois Frères in France shows a human with antlers coming from its head that is echoed in depictions of much later shaman from the Tungusk region in Siberia.

Such traditions have been labelled as *animist*, a term initially expressing a belief in an inherent spiritual force that gives life to all things. More recent understanding has come to describe this as a form of *relational epistemology*, an understanding that our, human, perceptions and knowledge of the world are not uniquely superior to and exclusive of other life, but rather that they depend upon, are shaped by and must pay regard to the perceptions and knowings of other-than-human life. This is not something we should limit to a purely *agential* notion of life, respecting only those whose actions mirror our own way of doing, but also the process of life itself, of participation in a wider set of metabolic processes of which we are merely one part. Not only humans, not only reindeer but lichens and algae and much more beyond.

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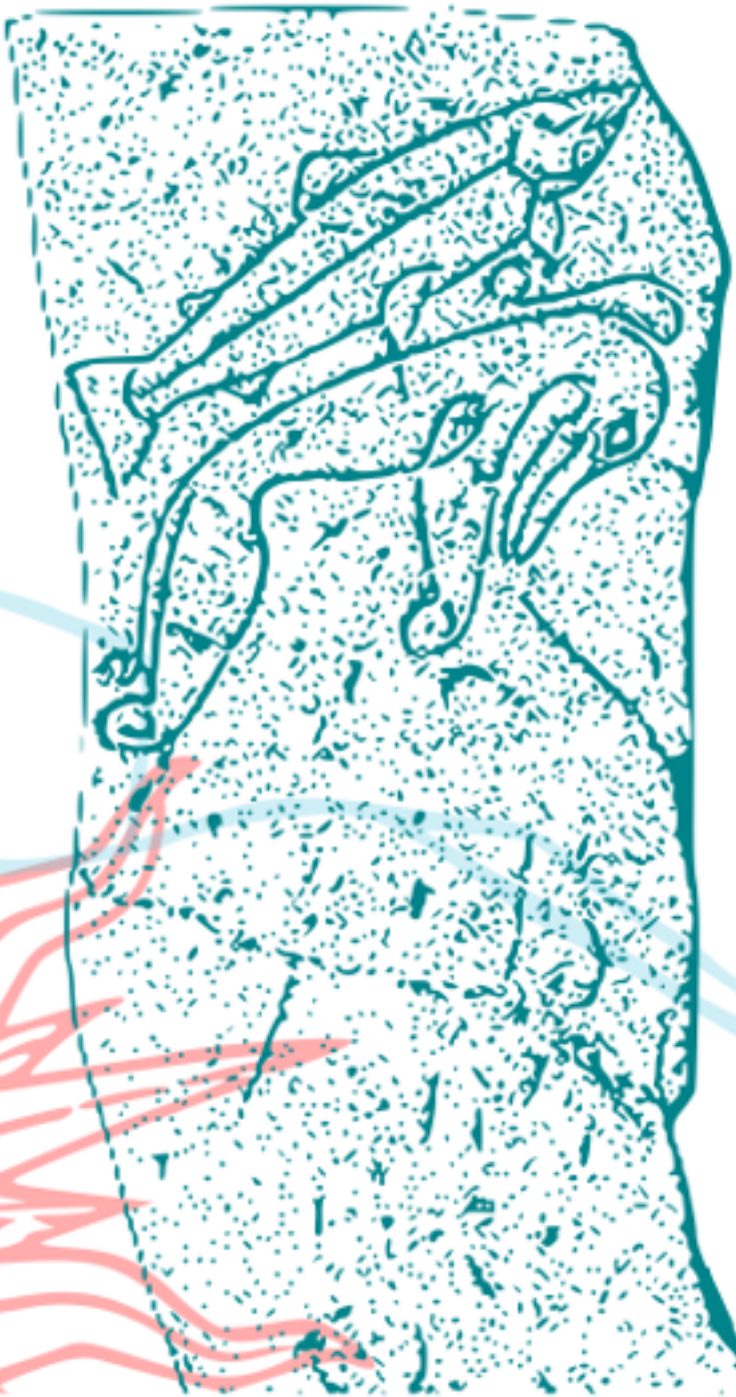

SALMON

The irregular, contrasting stripes of fissured rock that run vertically through the granite give the mountain its Gaelic name: *Am Bràigh Riabhach*. These fissures evoke the forces that extruded the rock many millions of years ago from a molten state below ground to be the highest peak in the Cairngorms, weathered beneath Ice Age glaciers and centuries of extreme weather. It is here on the Braeriach plateau that a spring of water trickles forth and runs down through the mountains, gathering tributaries and rainfall as it flows out into the sea. In winter the river carries blocks of ice down from the higher grounds that, in colder years, would choke the river and jam up against one another within the arches of Victoria Bridge. Like other rivers across the country that share its name, the Dee was a Goddess River for the Brythonic-speaking Celts and Picts who carved its fish upon their stones.

The Pictish salmon carvings are found paired with other symbols: another animal such as an eagle or wild boar or an object such as the Pictish comb or Z-Rod. It is thought that these may be a form of family crest similar to a coat of arms or Japanese *mon* signs. Whilst the significance of each animal is unknown, the alignment of a person or a family with a specific animal may parallel that of Gaelic names. Many first names are taken from animals such as Calum (dove), Rònan (little-seal) and Oisean (little-deer) and Clan Chattan, whose name may refer to the 'people of the cats', have the cat as their emblem.

Salmon were important for the Reindeer Folk too and may have provided a more regular source of food than the deer. The two may have intertwined in significance, as suggested in a engraving of this era found in Lortet in the Pyrenees, depicting reindeer crossing a river with salmon swimming between and around their legs. The fish were caught individually with harpoons and in larger quantities by wicker meshes pegged across the river. Variants of these techniques continued in use over the centuries. *Stell-nets*, similar to those depicted on 15th century engravings of the Dee, were still stretched out from boats and embankments up into the 1970s. Rights to fish these waters had been entrusted to the town of Aberdeen as part of the Great Charter of Robert the Bruce in 1319 and revenue from the licenses contributed to the city's Common Good Fund. When the river was narrowed and re-routed as part of the 19th century harbour developments, the fishing grounds were bought out by the Aberdeen Harbour Commissioners and £30,000 paid in compensation to the Fund.

The harbour constructions concentrated the river into a single channel along its deepest course which was straightened out as it ran towards the sea. In doing this, the old fishing village of Torry was destroyed and lost beneath the water, whilst on the northern shores, the broad area of tidal islands was 'claimed' and new land raised upon it. This is the area that now sits between the river and the train station, running from the corner of the river where the shore porters were once based, the *Poynernook*, out to Market Street. The street names here refer back to the names of fishing grounds that are marked on older maps. *Raik* may refer to the area of the fishing grounds themselves but also to the process of catching fish as they swam over the shallow shingle beds that lay between the Inches. *Stell* can refer both to a pool of deeper water and to the nets that were stretched and staid across the water.

Those salmon that escape capture die upstream after breeding and spawning. Their bodies decomposing into the water in which they grew, returning themselves as nutrients. One of the most important of these is phosphorus, essential to the growth of plants and animals. It originates in rocks from where it is released through weathering and the actions of lichen. Much of the phosphorus released into the soil is lost, washed away by rains and carried out to sea in the rivers where it is absorbed by the algae and plankton that the fish feed upon. Were this to cease the oceans would grow over with algae, saturate with phosphorus and become increasingly toxic. Fish and sea birds that feed upon the oceans balance this flow, returning phosphorus inland and upstream. Humans too played a part in this, using our own excrement as fertiliser to return the phosphorus we have consumed. The development of modern sewage systems diverted these flows and we have increasingly turned to other methods: through the mining of guano and rock and chemical synthesis. These do not replace but exceed and accelerate the flow of phosphorus into our agricultural soils increasing the run-off into the oceans and disrupting the cycles on which the salmon grew.

The fishing of salmon through *raik* and *stell* has ended upon the Dee, but the stocks of salmon have continued to decline due to the impact of other factors. Now, we must be guardians, match-makers and midwives to the salmon, compensating for other human intervention and managing the breeding cycle, whilst elsewhere the once-wild salmon are corralled into floating farms, their own ability to *raik* and wander curtailed.

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Making Red-herrings.

HERRING

During my childhood, our family would come on holiday to the North East, sometimes staying in a caravan park on the banks of the Dee where Robert Gordon campus now sits. The harbour market stretched right along Commercial Quay and the whole area would be packed out with crates of fish. Once we came when my brother had a broken leg and the merchants plastered his stookie with the paper labels they laid out on the crates they bought. Now, the market is closed and fish are no longer landed for sale in Aberdeen.

The association of Aberdeen and the North East with fishing is a modern construction created through large investments and acts of Parliament such as that of 1871 from which the modern harbour had been built. The area around Raik Road had been created as the heart of the on-shore operations for that industry. Here were the factories of local merchants who gutted, processed and packed the fish, staffed by teams of women, the Herring Lassies, many of whom were Gaelic-speaking seasonal workers from the Western Isles. Here were the smoke houses with their tall and narrow roofs and, at the centre, the ice factory, a grand building with ornate entablature.

Within little more than century the North Sea fishing trade has come and, almost entirely, gone from Aberdeen. It was the closure of the ice factory that precipitated the decline. Unable to buy on shore, the trawlers were diverted to Peterhead and Fraserburgh for ice where, as a consequence, it became simpler and cheaper to land their catch. The majority of fish factories have now closed, knocked down and replaced by large offices for the oil sector. A small number of merchants still survive however. As in the past, these depend upon migrant labour but their workforces are much smaller and come from further afield. A number of smoke houses still stand but none are active. Those that continued working after the oil industry moved in were forced to close following complaints against the smells and smoke drifting in through the windows of the high rise offices.

The herring breed and spawn in different regions of the sea that moves southwards from the Arctic down towards Dogger Bank as the seasons move from Spring to Autumn. The locations of spawning grounds are passed on from one generation to another, they are a learned cultural adaptation of the herring to their environment. As the fish move they cross different boundaries that define national fishing rights: Norwegian, Icelandic, Irish, British. Before the harbour constructions it was the Dutch that caught

the herring here, whose boats fished offshore from Aberdeen long before Scottish steam trawlers set forth from the harbour. The herring trade made Aberdeen a central node in a network that transported prime fish by land to London and edible fish waste by sea to Russia, the Baltic, and to the plantations in the Americas.

As the herring moved, as living shoals and dead cargoes, people and other animals moved with them. The Herring Lassies followed the catches through the seasons as they moved south from Scrabster to Yarmouth and between the *Ghàidhealtachd* and the land of Saxon-speakers (*Sassanach*). The herring gulls moved in Arctic circuits around the pole and followed the fish inland as the processing industry grew on shore. Aberdeen connected with other, wider circumpolar navigations, partly as a consequence of its involvement in the whale trade, entering Arctic waters and hiring Inuit families as crews. These relations, like those of Scots fur-trappers with First Peoples in Canada, were mostly of an Imperialist, colonial nature. Yet there were those who made more reciprocal relations, such as David Cardno of Peterhead who lived with the Inuit of *Qikiqtaaluk* (Baffin Island). The Inuit also made their own discoveries of Scotland. Oral sources and personal histories suggest a much closer relation with circumpolar peoples than we assume in accounts of a partly mythic and partly historical group known as the *Finn Folk*. These included visitations on kayaks up the Dee and Den and evidence of settlement or more frequent interactions from the Inuit with Orkney and the northern mainland.

The modern fish trade has made the sea a space of conflicts and boundaries but it has also been a connecting force that drew disparate cultures together. With the growing dominance of land-based political connections and the consuming power of modern capital, the Celtic-Pictish world became lost into an Empire that pulled it away from the orbit of circumpolar cultures it was once orientated towards. What the Empire called 'North-Britain' was once the Souther-land of a sea-bearing mix of cultures incorporating the Gael, the Fjord-people (*Lochlannach*), the Sàmi and the Inuit. This suggests a different history. Not the congealing and coercing of peoples in nations, Empires and Reichs, but of a scattering of different possible worlds within a common orbit. One reflected in recurrent themes of folk-culture, of peoples from the sea and spirits within mountains and creatures of the Aurora.

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FISHING FOR FUEL
AN EAGLE cutaway DRAWING
BP
KEY

OIL

Many of the North Sea oil fields lie along what was once the northern-most edge of Doggerland. They extract raw petroleum that has gathered in pockets of sedimentary rock, clay and shales. Petroleum derives from the residue of once-living organisms, mostly the zooplankton and algae that once swam and floated in the seas or grew upon the coastlines. These pre-date the reindeer of Doggerland by several million years from the Permian and Triassic eras, at the time of the very earliest dinosaurs and mammals. The pockets in which they remain were created in the process of large-scale land movements, as the earth shifts and folds and older surfaces and sea beds are covered over. Over time the residue of decaying matter is trapped and subject to enormous pressures compressing it into liquid and gas. The bodies of these zooplankton and algae have become the fuel within your car, the gas within your stove, the plastics within your home or food within your body. As the hunter becomes the deer so do we become the oil.

Humanity has made use of petroleum since, at least, Mesopotamian times. Modern drilling for oil began in the 19th century and as demand increased with the growth of the car and chemical industries, extraction spread from land-based sources out into the seas. In 1969 the first modern commercial oil field in the North Sea was opened at *Ekofisk* off Norway and expansion of the area soon followed, spurred on by the oil crisis of 1973. The exploitation of such resources requires substantial infrastructure both off-shore and on for extraction, transport and processing. Across Aberdeenshire, at St. Fergus, Bodum and Crimond, camps were set up for the large numbers of temporary workers brought in to construct platforms and processing plants. Some were makeshift such as the caravans parked upon a disused airfield at Longside, others more substantial, becoming temporary townships. The Keyhead chalets in Peterhead remained after the construction boom to became a notorious ‘sink estate’ within the council housing roster. Investment in the camps normalised the use of temporary, migrant workers and, as with the on-off shifts of platform crews, the flow of labour mirrors and mingles with the flow of oil.

These flows form pathways within what is perhaps the most extensive metabolic assembly created by our species, transforming bodies into energy and energy into bodies. The total durational range stretches from the lifespan of plankton floating on ancient oceans, the movement and subsidence of major land masses to the accelerations of industrial technology and to

the journey of a rig worker heading home on the late-night Friday train from Aberdeen. Whereas the hunters-become-deer acknowledge their place within a metabolic cycle, returning antlers to the water in acts of honour and renewal, the modern hunters and fishers of oil have lost such knowledge. The extraction of oil creates a metabolic rift as dramatic and transformative as the geological rifts and tectonic movements that created the oil fields many millennia ago. We know all too well, that the plastics and chemical wastes we feed into our waters neither honour nor renew but degrade the environments and disrupt the metabolic cycles of plankton, algae and all who live upon them.

Yet this rift did not begin with oil, nor with science nor the advent of modernity. When we first began to separate our bodies from the food chain, to bury ourselves in stone and deny our bodies as food for other animals a subtle rift between ourselves and other-nature began to open up. When we began to divert resources from life itself towards religious, political and economic dominion we began a process of seeking to separate ourselves from and to define and control our relation to the metabolic processes within which we survive. The oil rigs are merely one further monument along this trail, remnants whose obsolescence may offer up a story for future archaeology to unravel.

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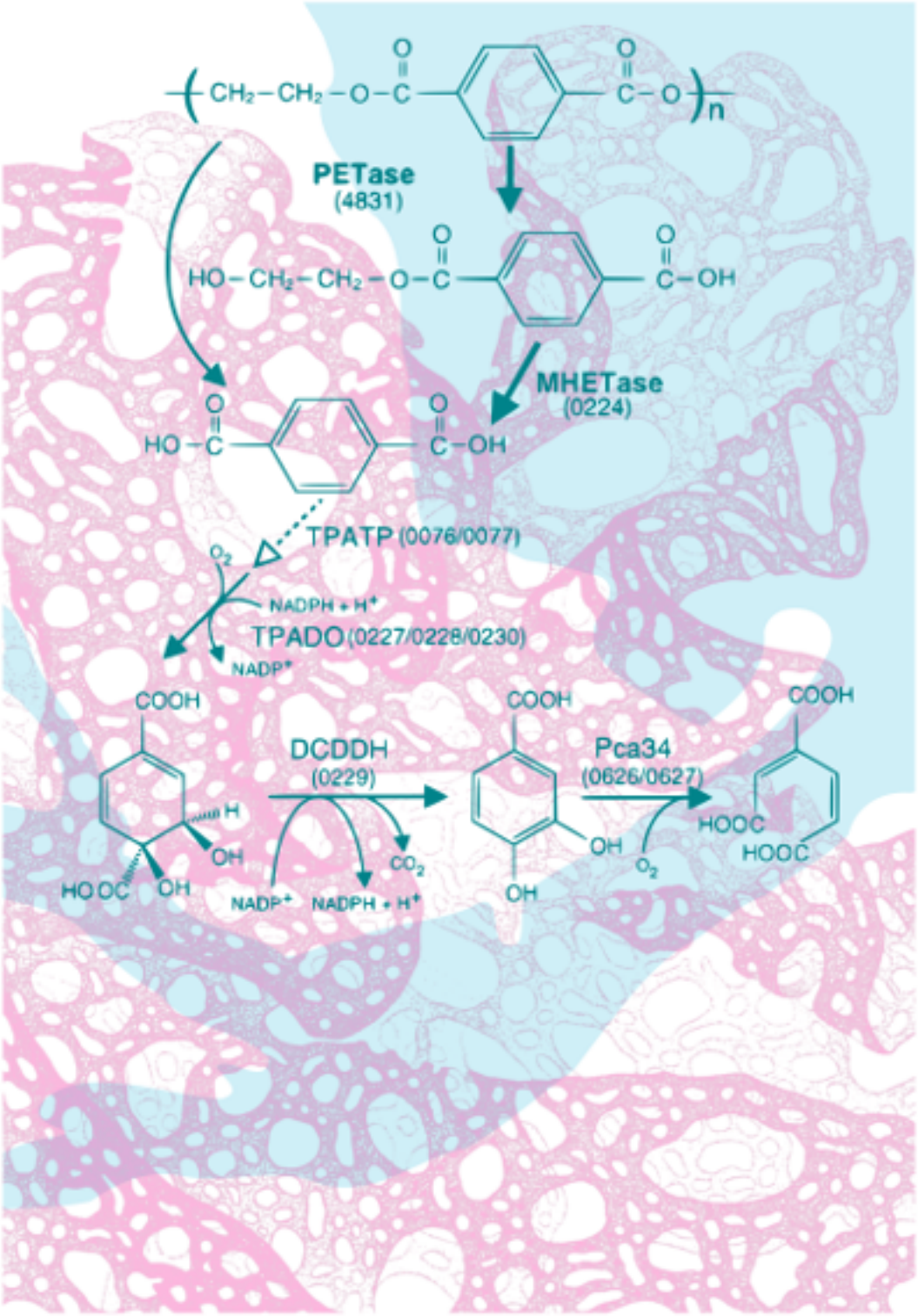
PETase
(4831)
MHETase
(0224)
TPATP (0076/0077)
TPADO (0227/0228/0230)
NADPH + H+
NADP+
DCDDH
(0229)
Pca34
(0626/0627)
CO2
O2

MICROBES

Plastic as a material is something we regard as lifeless and inert, man-made and artificial. It is at odds with all that we consider organic, an assault on life that we have unleashed across the planet and its oceans. Micro-plastics consumed by plankton re-enter the food chain as they are consumed by larger animals. We too are dining upon the plastics we have discarded into our seas. We may believe that we have mastered metabolism and diverted its cycle towards our benefit, yet the flow of matter completes itself in other ways.

Bacteria and fungi that have evolved to break down the external cell-walls of plants have also been found to act on certain kinds of plastics. *Ideonella sakaiensis 201-F6* is a strain found to occur naturally in plastic recycling centres where it appears to have evolved so as to break down plastics and feed upon their carbon content. It is speculated that similar bacteria are evolving in the oceans as part of a natural response to the increasing presence of plastics there. Such bacteria force us to rethink our place in the metabolic cycle. The products of human hyper-separation may become the food of new evolving species. Just as lichen transform the tundra, might these microbial creatures transform our waste into the fertile soil of other life? Whether such bacteria are capable of significantly reducing the negative impacts of human waste plastics remains unknown. In some ways they may actually accelerate the absorption of micro-plastics elsewhere in the food chain. Such bacteria may even enter uncontrolled into our environments and undermine the very stability upon which our use of plastic depends.

In many Mesolithic graves people are buried alongside animals. Adults resting on reindeer antlers. A child lain upon a swan's wing. Not all bodies were buried however. Archaeological evidence from Scottish sites suggest that bodies may have been laid to rest on middens. These large piles, mostly consisting of limpet shells and animal remains, are amongst the most significant physical markers of human habitation surviving from this time. In one midden found at Cnoc Coig on Oronsay a human hand lies juxtaposed almost exactly against the bones of a seal flipper. It is thought that these middens were not merely refuse dumps but rather a more considered form of habitation, often being maintained and added to over many generations. If this is so, they represent a very different relation between what we now think of as a distinction between culture and waste. Notably, such middens are important concentrations of phosphorous and nitrogen, released from decaying bodies of land and sea life back into the soil. If these are an expression of cultural

form as a much as material subsistence then they propose a participation of the human body as a material that contributes to metabolic process rather than solely consuming from it.

In rethinking the relation between culture and waste this also proposes that we develop an animism beyond totemic figures such as deer and salmon. A relational epistemology that integrates with, regards and responds to microbial life. One that rethinks our knowledge of life and death and the boundaries between them, one that rethinks ourselves as food and feeders. If we seek out animism now it is not as a return to the past but rather as a new mode of consciousness that looks to a future that confronts us with our own failure. This is our *raik*, our reach, our passing.

The Mesolithic was experienced as a time of enormous climactic instability. Settlements and coastlines could vanish beneath rising seas within the life of a generation. Elsewhere lands rose upwards and tundra turned to forest in the wake of retreating ice. If the Mesolithic walks the banks of the Dee once more it does so to remind us that every mundane moment, every space into which we step, was once so very different and may be so very different again.

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