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Published Version

Roebuck, T. and Sperling, M. (2010) The glacial question, unsolved: a specimen commentary on lines 1-31. Glossator: Practice and Theory of the Commentary, 2. pp. 39-78. ISSN 1942-3381 Available at https://centaur.reading.ac.uk/30729/

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'THE GLACIAL QUESTION, UNSOLVED': A SPECIMEN COMMENTARY ON LINES 1-31

Thomas Roebuck and Matthew Sperling

We take our text from J.H. Prynne, *Poems*, second edition [Northumberland, 2005], 65-67. This poem comes with references to books and articles on geology, and they are referred to throughout our discussion by short-form titles. The full references are as follows:

Ordnance Survey Limestone Map, Sheets 1 and 2 [1955 edition], with Explanatory Text [1957]

K.W. Butzer, *Environment and Archaeology: An Introduction to Pleistocene Geography* [London, 1965], especially chapters 18, 21. 22, 28

W.B.R. King, 'The Pleistocene Epoch in England', *Quarterly Journal of the Geological Society*, 111 [1955], 187-208

G. Manley, 'The Range of Variation of the British Climate', *Geographical Journal*, 117 [1951], 43-65

R.P. Suggate and R.G. West, 'On the Extent of the Last Glaciation in Eastern England', *Proceedings of the Royal Society*, Series B: Biological Sciences, 150 [1959], 263-283

R.G. West and J.J. Donner, 'The Glaciations of East Anglia and the East Midlands: a differentiation based on stone-orientation measurements of the tills', *Quarterly Journal Geological Society*, 112 [1956], 69-87

1: 'The Glacial Question' (title)

One source for the poem's title is Charles Lyell, *The Geological Evidences of the Antiquity of Man* [London, 1863]. This work is divided into three sections: the first twelve chapters are concerned with anthropological questions about early man; the next seven chapters are about glaciers; and the final chapters concern biological evolution. At the beginning of chapter thirteen, the first section on glaciers,

under the subheading 'Superficial Markings and Deposits Left by Glaciers', Lyell introduces some context for the debate by saying 'In order fully to discuss this question, I must begin by referring to some of the newest theoretical opinions entertained on the glacial question' (230). The analogy here is with other 'the x question' phrases which were common from around the 1830s onwards: compare Thomas Carlyle's 'The Condition of England Question', chapter 1 of *Chartism* [1840]; 'The Woman Question', from late 1830s, on which see Elizabeth K. Helsinger, Robin Ann Sheets and William Veeder, eds., *The Woman Question: Society and Literature in Britain and America, 1837-1883* [Chicago, 1989]. Although Lyell's *Antiquity of Man* has been credited by many twentieth century commentators as a founding work of anthropology, W.F. Bynum has argued that in the nineteenth century the comments on biology and anthropology were seen as popularizations of ideas largely derived from other scholars (see 'Charles Lyell's *Antiquity of Man* and its Critics' *Journal of the History of Biology* 17:2 [1984], 153-187). If *Antiquity of Man* is a popularization, then the title might imply that Prynne is bringing the technical discipline of glaciology to a new (if not necessarily any broader) audience. But the use of the characteristically nineteenth-century formula 'the glacial question' places the poem within the historical context of the discipline of geology, rather than invoking geology as a current scientific practice. In that sense it is unlike the map, book and article references with which the poem concludes, which present a picture of a teleologically developing scientific discipline with which the poem is engaged: the most recent of the items referenced was published in 1965, just a few years before this poem was written. (We will introduce these items into our commentary as they become relevant; all discussions of geological scholarship are to the sources Prynne references.) *The White Stones* is elsewhere preoccupied with the histories of geology and geography. 'Frost and Snow, Falling' (*Poems*, 70-71) invokes the 'monk Dicuil' recording the perpetual daylight at summer solstice in Iceland (on Dicuil and his late antique sources see J.J. Tierney, ed., *Dicuili Liber de mensura orbis terrae* [Dublin, 1967]). In 'On the Matter of Thermal Packing' (*Poems*, 84-86) Prynne cites James Hutton's *Theory of the Earth* (first published as James Hutton, 'Theory of the earth, or, An investigation of the laws observable in the composition, dissolution, and restoration of land upon the globe', *Transactions of the Royal Society of Edinburgh*, 1/2 (1788), 209–304). Although historians of science have praised this work as an important contribution to the development of 'modern' geology, its title signals

its continuity with the seventeenth-century tradition of natural philosophy, in particular the 'sacred earth debate' launched in response to Thomas Burnet's work of Cartesian-inflected geo-history, *The Theory of the Earth* (first English translation, vol.1 [1684] and vol.2 [1690]; Latin first edition, *Telluris theoria sacra* [1681]). Such works were principally concerned with reconciling the empirical evidence of fossils with the account of creation in Genesis, and tended to offer an account of mountain formation based on the notion that the flood had lasting geological consequences for the entire earth. Such thinking can be traced back to Eusebius but was given a newly empirical and philosophical inflection in the seventeenth century. As Rhoda Rappaport has shown in her important book, early geology was very much an adjunct to sacred history and to debates on biblical chronology (see Rhoda Rappaport, *When Geologists Were Historians, 1665-1750* [Cornell, 1997]). So our poem's title, as in the *White Stones* generally, looks back to the history of geology as a discipline. It was Charles Lyell who also coined the word 'Pleistocene', in 1839: 'In the Appendix to the French translation of my "Elements of Geology", I have proposed, for the sake of brevity, to substitute the term *Pleiocene* for *Older Pleiocene*, and *Pleistocene* for *Newer Pleiocene*' (J.A Simpson and E.S.C. Weiner, eds., *The Oxford English Dictionary*, second edition [Oxford, 1989], s.v. 'pleistocene, adj.'; archived online at www.oed.com, integrated with the partly completed third edition; hereafter *'OED*'). The implication in Prynne's title is perhaps that modern scientific debates, although secularized, professionalized and disciplinized, are in fact part of far longer trajectories of a need to understand the history of the earth in religious terms. The title also resists parochial claims to the exact truth and objectivity of scientific methodologies by inviting the reader to historicize them.

2: 'Unsolved' (title)

There are two lemmas for the prefix 'un-' in the *OED*: one for those senses 'expressing negation', and another for senses 'expressing reversal or deprivation' (*OED*, s.v.v. 'un-[1]' and 'un-[2]'). Both entries seem relevant here. For senses 'expressing negation', we might compare a word like 'unfinished': this glacial question has not been solved. And for senses 'expressing reversal' we could compare 'unclassify' (see 'un-[2]', sense 3, quotation from 1859, meaning something which has been classified, and from which we remove that classification): 'unsolve' would here mean 'reverse the process of solving the question'. Both are characteristic practices of the poem.

The senses 'expressing negation' are consonant with the poem's reminders that what is being discussed is still up for active debate within the discipline of geology. This is made clearest in line 69, 'the Pleistocene is our current sense', perhaps recalling the closing remarks of W.B.R. King, as the outgoing President of the Geological Society, in the article which Prynne cites (and from which he draws the quotation in lines 55-58): 'Looking at the way the picture has changed, it is clear that the present one could not expect to be the final picture' (W.B.R. King, 'The Pleistocene Epoch in England', 205; for the quotation in lines 55-58, see 207). The senses 'expressing reversal' imply that the (singular and definitive) 'glacial question' is here being fragmented, breaking it down from a coherent geological argument and narrative about the most recent period of geological time, into the raw and geographically disparate bodies of evidence which geologists have linked together: the 'moraine' (line 11), the 'hippopotamus' (line 12), the 'birch trees' (line 21), etc. 'Unsolved' also implies 'un-broken down', 'un-fragmented', and invites us to view the poem as itself a process of 'breaking down' current intellectual and disciplinary divisions, in which poetry is rendered content-free and siphoned off from areas of knowledge. This aspect of Prynne's work has been much discussed: see Drew Milne's suggestive remark that Prynne's poetry offers various 'resistances to poetry's cognitive marginalization' (Drew Milne, 'The Art of Wit and the Cambridge Science Park', in Robert Crawford (ed.), *Contemporary Poetry and Contemporary Science* [Oxford: Oxford University Press, 2006], 170-188 [171]); N.H. Reeve and Richard Kerridge's discussion of Prynne's linguistic means for 'breaking out of the institutional space allotted to poetry and literature in late-capitalist culture' (N.H. Reeve and Richard Kerridge, *Nearly Too Much: The Poetry of J.H. Prynne* [Liverpool, 1995], 1); and Simon Jarvis's analysis of how Prynne's 'breadth of vocabulary draws attention to, and asks readers to resist, the division of intellectual labour by which powerful practices of knowledge are made to serve sectional interests' (Simon Jarvis, 'Quality and the non-identical in J.H.Prynne's "Aristeas, in seven years"', *Jacket* 20 [Dec 2002], http://jacket-magazine.com/20/pt-jarvis.html, n.p.; first published in *Parataxis* 1 [Spring 1991]). As a final possibility, the dictionary also records an obsolete antithetical sense of the word 'unsolve' from the seventeenth century, in which 'un-' was semantically redundant, and the transitive verb simply meant 'to solve' (*OED*, s.v. 'unsolve').

3: 'In the matter of' (line 1)

Prynne's first mature collection, *Kitchen Poems*, begins: 'The whole thing it is, the difficult / matter' (*Poems*, 10). Critics have taken this to launch a somewhat sterile debate on 'difficulty' in poetry; whereas it is clearly 'difficult / matter' which is of most concern here (on this point see Jarvis, 'Quality and the non-identical', n.p.). 'Matter' can refer both to intellectual and physical matter, and this is an equivocation central to the enterprise of the poem. It seeks to explore and critique the ways narratives of geological history are derived from physical 'matter' and then themselves become reified concepts which interpret the very matter from which they have been derived. Matter is derived from Latin *materia* meaning 'wood, timber, building material of which a thing is made'; this sense development also implies a gendered understanding, since *materia* comes from *mater*: 'usually explained as originally denoting the trunk of a tree regarded as the "mother" of its offshoots' (*OED*, s.v. 'matter, *n.*[1]'). In philosophical usage *materia* is the equivalent of Greek *hyle*, which suggests that the proper context for understanding this first sentence may be Aristotle's *Physics* 194a-b, where he expounds the distinction between 'matter' and 'form'. In its English usage history, *matter* in the intellectual non-physical sense has had differing significances within legal, economic, political and philosophical conceptions: most relevantly, *OED* sense 2b tags the phrasal formula 'in the matter of' as a legal formula, 'after post-classical Latin *in re*', which expands its later use 'with reference to any consideration, not just the subject of a dispute'.

4: 'ice' (line 1)

Here 'ice' is both specifically the glaciers which are moving southwards through England during the Pleistocene Epoch, and more broadly the matter 'ice' which can take many forms. 'Ice' could become glaciers, but it could also form the 'caps' which 'melted' towards the end of page 64; it could also be the 'frozen water' which in 'On the Matter of Thermal Packing' 'caused / a total passion for skating' (*Poems*, 84). It is also the object of study at the microscopic level, in which ice's crystal structure can be investigated (see section 11, below). Its etymology is Teutonic, with cognates in Old Frisian, Old Low and High German, Middle Dutch and Old Norse; it is derived ultimately from Old Teutonic, **iso.* Prynne frequently implies an analogy between geological processes and the way words

accumulate historical significance from their etymological root and across their developing history (for more on this, see section 20, below; and for a recent critique of philological methodologies see Geoffrey Galt Harpham, 'Roots, Races, and the Return to Philology' *Representations* 106 [2009], 34-62). In this case the ice and the word 'ice' are both emanating from the north into Britain. Perhaps the 'invasions' of 'ice' also imply Danish and Scandinavian invasions of Britain (from the ninth to the eleventh century) which also brought with them northern words which were sedimented into the language. The significance of the north will return at several points in the poem: see the next section; section 17, on 'Norfolk', and finally the phrase 'We know where the north / is, the ice is an evening whiteness', in lines 66-67, in which the concern with northernness here set in train culminates.

5: 'invasions' (line 1)

A word taken from King's article on the Pleistocene Epoch:

> At the end of this long temperate period ice again invaded the area but did not occupy the whole of East Anglia. The glacier came from the north and spread out fan-wise from the Fens. It extended as far as Ipswich and has been termed the Gipping Glaciation. [...] To what extent the area was invaded again by ice is a moot point. (King, 'The Pleistocene Epoch in England', 199; see also 'invaded' on 195 and 201)

To speak of 'invasions' is of course rather less impartial than one might expect from professional science (as Prynne suggests in the word 'partial' in the next line). The implication here is that geology as a discourse might still be preoccupied with intimate and immanent relationships to the landscape which are assumed to be characteristic of primitive, pre-rational societies. But to imagine the 'ice' as a Nordic invader is perhaps to underestimate the extent of the debt which modern man owes to the ice: that it has also brought with it the 'boulder clay' to form land, as we discuss later (see section 41). Throughout *The White Stones* Prynne is pre-occupied with the notion that we owe an incommensurable debt to the landscape in which we live, one which is unpayable both because it is so vast and because the only ways in which modern society could conceive of paying a debt are irrelevant the kind of debt owed. Indeed it is the instruments

of modern scientific rationalism which have created a new schema for our relationship to the landscape in which conceptions of debt and responsibility are rendered meaningless. We might think here of a moment in 'Love in the Air': 'What you can / afford is *nothing*: the sediment on which we stand / was *too much*, and unasked for' (*Poems*, 56). And at the end of 'Frost and Snow, Falling' the notion of 'pleistocene exchange' is offered to the reader (*Poems*, 71). But what kind of 'exchange' is possible when what we have been given is not just so much greater than what we have given back (*Pariunt montes, nascetur ridiculus mus*) but also of an entirely different nature and kind?

6: 'frost' (line 2)

To the south of the 'invasion' of the 'ice' lies the frost, and we need here to distinguish precisely between 'frost' and 'ice'. Whereas ice in this poem refers to the massive body of frozen waters, advancing from the north to cover the landscape of Britain, 'frost' is the more temporarily frozen, indeed partially-thawed, water, which clings to the soil and rocks in the south of England. We can distinguish here too between 'frost', which is the frozen dew in the morning, and will evaporate by noon (see line 64, 'as the dew recedes'), and the 'permafrost', which is the permanently frozen land surface which covered even the south of England during the coldest periods of the Pleistocene Epoch.

7: 'beautiful' (line 3)

This is the first moment at which the technical geological language of the poem gives way to judgments of aesthetic and humane value. This is a repeated pattern of recourse: see, for instance, 'heart's / desire' (lines 26-7), 'we hope' (31), 'sentiment' (line 35), 'worst' (37). But of course a value-laden language was already covertly present from the very outset of the poem, in the notion that the ice moves by 'invasions'. '[B]eautiful' is also a product of the notion that the ice has invaded from the north: the frost is only valued as 'beautiful' because it is distinct from the savage and barbarous northern ice. So the semantic hollowness, the mushy and vague, paradoxically value-free triteness of 'beautiful' casts the implicit value judgements in the word 'invasions' into a new context and relief. Peter Middleton notes that the tension between the 'scientifically factual' in the poem and that which is in a 'fictional, subjective register incompatible with realist science' raises a question about the kinds of authority laid claim to by

different discourses: 'Prynne makes scientific discourses into lyric expression, and in doing so appears not only to disrupt those discourses by making the signifying process and the construction of the subject in language, visible, but to melt their claim to authoritative wisdom.' (Peter Middleton, 'On Ice: Julia Kristeva, Susan Howe and Avant-garde Poetics' in Antony Easthope and John O. Thompson (eds.), *Contemporary Poetry Meets Modern Theory* [Hemel Hempstead, 1991], 81-95 [88-90].) But this reproduces the logic by which poetry is separated from other kinds of knowledge. For us, the poem mounts a far more serious critique of modern divisions of knowledge and the marginalized status of poetry. A more complex and appropriately enabling model by which to read the combining of discourses in a poem such as this may be found in Prynne's own practice of the commentary, written far later but implicit as a composition practice in much of his work: 'The transfer of vocabulary from one sub-domain to another, by the devices of strong wit and rhetorical substitution, may imply, contend for, manoeuvre and cancel any number of part-parallel discourses and their transforms, thus equivocating about which discourse if any has primary claim to control the others while also intensifying the implications of such obliquity' (J.H. Prynne, *They that Have Powre to Hurt: A Specimen of a Commentary on Shake-speares Sonnets, 94* [Cambridge, 2001], 13). The obliquity of 'beautiful' here can't be explained away as a simple challenge to the 'authoritative wisdom' of scientific discourse.

8: 'head' (line 3)

This word implies a direction from which the poem's reader is studying the onset of the ice into the British landscape. 'Head' faces upwards, northwards, and is the resistant agent to the 'invasions' of the barbarous Hyperborean ice. Furthermore, it implies a relationship of priority (or even superiority) between the various layers of the structure of the rocks, on top of which is the 'head' of the 'frost'. The poem throughout is preoccupied by such multiple axes, and the way in which when analysing the vertical components and structures of the earth such analyses yield results which have consequences both broadly across Britain, and across Britain in time. 'Head' therefore compounds the vertical and horizontal axes of the geologist's analysis. Here too the language of bodily description is first introduced, which will be developed later in the poem in words like 'lobe' (line 19). This description of geological features in physical, bodily terms is characteristic of the poem's disciplinary merging of evidences from

distinct objects of scientific study: flora, fauna, climate, rock-formation, etc. In the geological articles Prynne recommends we study beside the poem, the geologist draws evidence from biological sciences, climatology, human sciences, and must synthesise this evidence together. The poet practices this here at a lexical level.

9: 'the sky cloudy' (line 4)

This is the first moment at which Gordon Manley's study of the variations in British climate is introduced into the poem. Manley stresses that it is important not to exaggerate the coldness of Britain during the periods of glaciation. Even during this period, there were warm currents of air (coming in from the open sea) which would thaw the snow on the top of the ice, and more importantly thaw the permafrost in the south of England. This condensation produced extensive cloud cover:

> I think there is much reason to assume that in glacial times the summer was very cloudy [...] Further, in the light of recent views on the meteorology of ice-caps, I surmise that the climate during glaciation in Britain was much more cloudy and disturbed than some have formerly thought. [...] In Britain, with a much lower altitude, the air from an open sea would give rise to widespread cloud at all seasons. (Gordon Manley, 'The Range of Variation of the British Climate', 56, 57)

Prynne's argument similarly stresses that the sky's cloudiness is a consequence of the fact that the 'invasions' were 'partial' (see 'so' in line 2). Ancient glacial Britain (around 10-8,000 BC) witnessed a period of wide climatic variation. Manley's larger argument seeks to 'throw light on the possible causes of climatic variation', in order to begin considering 'whether the present amelioration in north-west Europe will continue, and for how long' (43). In the same way that 'beautiful', discussed above, throws the implicit value-heaviness of the geologist's word 'invasions' into relief, so Prynne's later mention of 'the worst climate of all' (line 37) seems to be in dialogue with Manley's rather unreflective use of 'amelioration' to describe an increase in temperature. Andrew Duncan suggests that *The White Stones* as a whole 'foresees, without knowing it, that the disruption of thermal economy by the oil price rises of 1973 would end the optimism of the counter-cultural period' (Andrew Duncan, 'Response

to Steve Clark's "Prynne and the Movement"', *Jacket*, 24 [November 2003]: http://jacketmagazine.com/24/duncan.html, n.p.); similarly Prynne's engagement with climatology here seems to be proleptically troubled by global warming debates which would become so central in the decades since he wrote this poem. '[T]he sky cloudy' in line three also looks ahead to line 53, 'the sky, less cloudy now': we might take this shift to locate the move, in the second half of the poem, into early postglacial time and the beginnings of human settlement.

10: 'day' (line 5)

The word 'day' is a keyword in all Prynne's early poetry, from *Day Light Songs*, into *The White Stones* and at least until *Into the Day*. In 'Aristeas, in Seven Years' (*Poems*, 90-96), Prynne references a dissertation (G.S. Hopkins, 'Indo-European **Deiwos* and Related Words', *Language Dissertations Published by the Linguistic Society of America* (Supplement to *Language*) XII [1932], 5-83) which uses modern techniques of comparative philology to recover prehistoric, animistic religious practices, in which the Latin word 'deus' and the Sanskrit word for 'day' are etymologically connected. 'Day' is an object of divine veneration here, according to one modern critical-philological approach to language history (for more recent work on Indo-European civilization and philology see: M.L. West, *Indo-European Poetry and Myth* [Oxford, 2007]; David W. Anthony, *The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World* [Princeton, 2007]). Prynne's poetry often returns to the ambiguity of whether 'day' is synonymous with the period of 'daylight', or whether it is an abstract 24-hour, humanly-conceived period (see especially *Into the Day* for this). In other words 'day' inhabits multiple discourses and temporalities simultaneously: on the one hand it is abstracted, scientifically defined by modern technologies, completely secularized and demystified; on the other it is an object of mystery, of religious veneration and worship, a quasi-natural period defined purely by the emanation of light from the sun, an object of immanent ritual significance. It is probably also significant that Prynne's references in 'Aristeas' draw attention to the anthropological and linguistic-historical methods of recovering such significances: they are themselves the product of modern academic technologies. Many of these issues seem to be in play here. If the cloud cover is heavy and widespread, then the day is likely a fairly useless way of defining time-periods in the glacial age: if little light

makes it to the earth, then the 'day' is purely an abstract and secularized marker, useful to the geologist (or the poet-geologist), but of little relevance to the earth's primitive inhabitants. On the other hand, if the day can be 'packed' into the 'crystal', here day seems to stand-in for 'light' or at least 'day-light'. So this looks forward both in the sense that it looks to a time when the day's energies currently frozen in the ice will be unleashed through thawing, but also that it looks forward to a time when primitive man would be able to imagine the 'daylight' in such spiritualized, animistic terms.

11: 'crystal' (line 5)

This word looks back to the poem's initial concern with the 'matter of ice'. Here this matter is defined at a molecular-structural level as that of 'crystal'. So the animistic notion of the day's energies being 'packed' into the ice is qualified by the perspective of the scientist: in a very real sense, this process of 'packing' can be analysed and demystified by study of the ice's 'crystal' structure. Of course, this line looks to another key early poem, 'On the Matter of Thermal Packing' (*Poems*, 84-86), to which 'The Glacial Question, Unsolved' is a companion piece. In that poem, particular wartime memories are 'bound like crystal' (84), and the thawing and melting of the ice is a means of thinking about not only the recovery of those memories, but also the way the traces of their form *as memories* endure beyond this process of thawing: 'one critical axis of the crystal / structure of ice remains dominant after / the melt' (85). In our poem we are looking at this process from the other end: the ancient light and energy of the world from thousands of years ago is in the process of being stored in the crystal structure of the ice. The natural world is laying down traces and memories of itself for the later geologist to uncover. Or is it? Is it better to see this as the retrospective work of the geologist and poet-geologist, imaginatively transferring a whole world of human and moral agency onto a pre-civilized, pre-human glaciated Britain?

12: 'as' (line 6)

This is the first of nine 'as' clauses in the poem (see lines 14, 21, 29, 33, 45 (twice), 59, and 64). The poem likes to leave ambiguous several possible senses of these clauses: 'as' in the sense of 'equivalent to'; or 'in the same manner as'; or 'because'; or 'while'. In this sentence, 'as the thrust slowed' could posit a causal relationship: 'the

day was packed into the crystal *because* the thrust slowed'. Or it suggests that they simply happened at the same time: 'the day was packed into the crystal *while, unrelatedly*, the thrust was slowing'. In other words, sequence and causation are difficult to distinguish here. Prynne is problematizing the methodologies of geological deduction and logic as applied to the massively heterogeneous materials left on/in the earth since glacial times. There seems to be a circularity here at the heart of the geological project: that the geologist must posit that a causal, historical *sequence* is the framework in which materials (now synchronically arranged) must have been created and need to be understood, while then re-applying the tools which have been used to posit these sequence to explain how the sequence unfolded. This is an issue central to the poem's thinking about the relationship between geology and the geologist-poet, and it comes out clearly in lines 47-48: 'the facts / in succession, they *are* succession'. Here it also renders the syntactical structuring of the poem ambiguous. The intellectual apparatus of the poem not only frames the north-south movement of the ice as an 'invasion', it also itself invades its materials of study by turning them into a scientifically abstracted historical sequence.

13: 'thrust' (line 6)

Here the militaristic sense of 'invasions' is picked up again: the ice is thrusting as a swordsman might 'thrust' with his weapon. And a 'thrust' is always against some opposite surface or force which reciprocally resists the thrust (one thrusts 'against' or 'into' something). The word also has a frequent application in geology (see *OED*, s.v. 'thrust v.', senses 7 and 8, amply illustrated with quotations from the nineteenth and twentieth centuries). So here again there is an implied struggle between the 'ice' and the 'frost'. But the word 'thrust' can also mean 'the gist or the point of an argument' (ibid., sense 6e): a dead academic metaphor of implicit violence. Of course in this poem, the two senses are intimately related. The academic tools which project a violent and elemental struggle between the aggressors in the north and the peaceful resistors of the south onto the impassive surviving landscapes themselves have 'thrusts': other articles which they are attacking or demolishing (as we can see from explorations in the attached reading-list). 'Thrust' implies not only an excavation of the dead metaphors of scholarly language but an implicit critique of scholarly habits and methodologies themselves.

14: 'we come to / a stand' (lines 6-7)

This is the first instance of the word 'we' in the poem, and it stages in miniature the problems that this sentence of the poem has been exploring at length, of how to position oneself temporally in relation to this body of geological evidence. As such, the 'we' who is 'coming' stands in many different temporal relationships to the material simultaneously. This is an inert and imaginative community of poetic common readers, who are going on a scenic journey from north to south via the ice-flow. It is also a more defined community, a trained elite of specialized academic readers, learned in the specialized languages of geology which the poem is both drawing upon and critiquing. But it is moreover also the original primordial human inhabitants of the landscape, the conditions for whose life are being forged as the ice retreats from the land. The momentary image invoked by 'we come to a stand' calls to mind the original *homo erectus*, rising to a stand from his crouched posture. The moment of 'coming to a stand' is both an active resistance to the ice's 'invasions' ('taking a stand') but also a moment of inertia and halting of resistance ('coming to a stand-still'). In one of the articles cited in Prynne's references, geologists R.P. Suggate and R.G. West are taking an academic 'stand' about this particular place, using advanced techniques of pollen analysis and radiocarbon dating to substantiate earlier arguments (against recent critiques) that the coast of Norfolk is a rough marker for the southernmost extent of glaciation in Britain (R.P. Suggate and R.G. West, 'On the extent of the Last Glaciation in eastern England'). Suggate and West emphasize the extent to which this position has been under attack in recent years, and that they are using new evidence to take a stand and to draw a specific line on the map to which the ice reached (see section 27, 'Hunstanton to Wells', for more on this point). The geologists not only take a stand on this argument; they also project onto the deep past of the earth their own practice of 'taking a stand' by conceptualizing the movement of the ice in terms of 'advance' and 'invasion'. So the traversal of 'we' across several groups – the audience of poetry, the audience of geology, the geologers themselves, and the original humans who will dwell in the newly unfrozen earth – is necessary here because, in a sense, these groups are all the same anyway. They are the back-projections of particular modern academic habits of thought and technologies of evidentiary analysis and synthesis.

15: 'along' (line 7)

An important word for Prynne throughout his career. This is part of a nexus of words in the poem ('axial' [line 11], '"interior"' [18], '*inwards*' [28]) which are concerned with the geographical direction from which something is viewed. Do we view the land from the sea or the sea from the land? Do we see the ice as invading from the north or simply moving towards the south? More abstractly, 'along' also invokes the poem's concerns with 'limits' (49), '*margin*[s]' (17) and boundaries in general. The articles Prynne references are part of an intellectual practice which defines intellectual, physical and temporal boundaries. King's article, for instance, discusses recent attempts to 'fix a base' for the Pleistocene Epoch, and furthermore to define what status the Pleistocene should even be given as a time-division: there is 'no justification for according it the status of a "period" or a "system", and it is even questionable whether "epoch" and "series" are not too high' (King, 'The Pleistocene Epoch in England', 187-8). Temporal lines can also be derived from physical lines on the earth's rocks, and this is evident in another of the articles Prynne cites. R.G. West and J.J. Donner's article investigates how evidence of glacial advance and retreat can be reconstructed by observing the direction of stones deposited in formations parallel to the ice-flow, and the direction of striae on these stones: 'Many stones in till lie with their long axes parallel to the direction of the striae on the surfaces of the stones and thus parallel to the direction of ice movement' (R.G. West and J.J. Donner, 'The Glaciations of East Anglia and the East Midlands', 69). Direction of ice movement can be derived from tracing lines along rocks. It is this sort of physical evidence that then contributes towards larger attempts to define temporal boundaries between epochs. Finally, the boundary lines which concern the geologists in Prynne's references are disciplinary boundaries: many are keen to define which precise fields of research should be drawn upon for relevant data to determine facts of geological history: King makes a 'plea for basing the boundary [of the Pleistocene Epoch] on stratigraphical rather than climatological considerations' (187), whereas K.W. Butzer, in his monograph *Archaeology and Environment*, is keen to broaden evidence of the Pleistocene epoch into many fields at once (climatology, geology, paleobotany, anthropology) to create a complete picture of the cultures, climate and landscape of the Pleistocene Epoch (see section 18 for more on Butzer). How are disciplinary boundaries drawn around the heterogeneous evidences remaining from 10,000 BC? And how does the poem reflect on these divisions of intellectual labour?

16: 'coast' (line 7)

The word 'coast' crystallizes many of the questions raised by 'along'. Prynne's reading of Olson is clearly an influence here: in his lectures on *The Maximus Poems*, Prynne presents the progress from the first part of the poem (I-III) to the second part (IV-VI) as the movement from first looking outwards from the shore to the sea, to then turning inwards to face the interior landscape of America. He goes on to explain that for Olson, 'to look from the Gloucester coast out into the Atlantic is to look into the livelihood of the past, to look into the economic support of the whole of the beginnings of that race from which he felt he came, to look back to the cultural origins of the whole settlement of New England, and to look back to the mid-Atlantic ridges, those upthrusts of mountain ridges down beneath the Atlantic, which figure so largely in his imagination as the last residues of the birth of the great continents in the original orogenies which formed the earth as we know it.' (J.H. Prynne, 'On Maximus IV, V, & VI', lecture delivered at Simon Fraser University, B.C., 27 July 1971, transcription printed in *Serious Iron* [*Iron* 12] (ca. 1971), n.p.) The coast, in Prynne's reading of Olson, is 'that ambiguous delicate line between the land and the sea, with its prime sexual ambiguity that Whitman recognized with such delicacy', and it is 'the condition of coast [...] which creates the possibility for mythography' (ibid.). We wouldn't want to reduce these suggestive remarks to their paraphraseable content, except to suggest that perhaps the coast is 'ambiguous' because it is a site of repeated interchange between the land and the sea (see section 41 on 'eustatic rise', below). We might also note that 'coast' is a surprisingly uncommon word in *The White Stones*: 'shore' is a preferred alternative, which appears three times in 'Song in Sight of the World' (*Poems*, 76-77) whereas 'coast' does not appear at all. Because our poem uses the word 'coast' three times (lines 6, 27, and 71) and 'shore' once (73; the last word of the poem) we might consider how to distinguish between the two. 'Coast' here implies an abstract territorial or an administrative division: all the geological articles use the term the 'coast of Norfolk' because this is simply the proper name of that area of land. This is intensified in the poem because during the glacial period the 'coast of Norfolk' was submerged underneath the ice. It is a division only available to those living after the ice has retreated. So 'coast', as well as being 'that ambiguous delicate line', perhaps also embodies the movement into the administrative division of the land. 'Shore' is cognate with 'shear'

and derives ultimately from Proto-Germanic **skur-* 'cut' (*OED*, s.v. 'shore, n'). It therefore etymologically contains in it the idea of 'cutting' a dividing line between the land and the sea. 'Shore' is much more immediately susceptible to the ebb and flow of the tide, and the legal definition of shore (often specified as the 'foreshore', which appears in 'Song in Sight of the World') is specifically the area between high and low tide (for documents on this see Stuart A. Moore*, A History of the Foreshore and the Law Relating Thereto* [London: Stevens & Hayes, 1888]). Both words 'coast' and 'shore' point in two historical directions: back to the 'livelihood of the past' (as Prynne terms the uses of the shore in Olson which the poet-historian meditates upon), and the formation of the land in geological time; but also forward to a bureaucratized and modern conception of the land. (We may note tangentially here that Prynne leaves such livelihoods only implicitly present in this poem, and that this becomes especially pertinent in relation to the limestone map cited in the references: the map illustrates very clearly the 'curving spine of the cretaceous / ridge' mentioned in lines 32-3, but what Prynne doesn't take up from the map, despite mentioning its 'Explanatory Text' in his references, is the fact that this text is almost entirely devoted to the historical and modern industrial and commercial uses of the limestones of Britain [Ordnance Survey Limestone Map, sheets 1 and 2 [1955 edition], with Explanatory Text (1957)].) In the context of this poem, however, it is tempting to think that 'coast' faces towards the future and 'shore' towards the past; whereas in 'Living in History' (*Poems*, 41), where both words appear and are associated with the development of unspecified 'distinctions', it is far harder to plot a historical trajectory for development.

17: 'Norfolk' (line 7)

'Norfolk' derives from Anglo-Saxon meaning the 'Northern People', as distinct from the 'Southern People' (Suffolk) in East Anglia. The Angles are distinguished here between north and south. Embodied in the word we have a history of ethnic violence and struggle: both of the conquest of Britain by the Anglo-Saxons, and their subsequent renaming of places as part of their conquest of the island; and of the battles between the north and south Angles themselves. The notion of 'Northern' Angles implicitly also invokes the establishment of early administrative borderlines in the settlements of post-Roman Britain: a subject of concern to antiquaries and historians since the sixteenth century. Anglo-Saxon Britain's ethnic competitions and struggles are

implicitly projected backwards onto the Pleistocene Epoch by the designation of the ice as an 'invasion' from the north. But of course these two things are massively and implacably incommensurate: the contemporary traces of ice flows are being read through a history which is itself constructed out of internecine power struggle and violence in East Anglia. If Prynne is a 'Cambridge poet', then it is particularly suitable not only that he is discussing East Anglia, but also that Prynne was there close to the leading edge of geological enquiry: the Cambridge Sub-Department of Quaternary Research, where Suggate and West, cited in the references, were employed, had been founded in 1948 under the direction of Harry Godwin, a leading figure in late-glacial studies; and several of the sources referenced take note of contemporary developments in Cambridge, specifically with regard to advances in pollen analysis. Even closer to home, the geologist Walter Brian Harland, an early and influential advocate of the theory of continental drift, was a Gonville and Caius fellow (and subsequently life fellow) from 1950 until his death in 2003, and also shared with Prynne and Joseph Needham an interest in China, having taught at West China University in Chengdu. Notwithstanding Drew Milne's suggestion, after C.P. Snow, that 'Dining at "High Table" provides a forlorn example of the shared life-world in which natural scientists and literary intellectuals resist dialogue', in these notes we attend to the possibility of such collaborative or even collegiate exchanges more sympathetically (Milne, 'The Art of Wit and the Cambridge Science Park', 171).

18: 'That is a relative point' (line 8)

Here, again, the matter of scholarly argument and the fact of scholarly argument itself are conflated. 'Point' can mean both the site and place to which the ice reached southwards in Britain ('the coast of Norfolk') and the scholarly 'point' of argument or contention, which is 'relative' to other arguments in the field. The articles help to explain the 'relative' nature of this position: as discussed in section 14, above, Suggate and West's article in particular lays out recent challenges to the argument that the ice reached to the Norfolk coast. They present new data from pollen analysis and carbon dating to confirm this (older) view. Their figure 1, discussed further in section 27, below, helps us to understand the sense in which their argument for the southern margin of glaciation is 'relative' to other arguments: they also show the 'margin according to Farrington & Mitchell 1951' and the 'margin according to Valentin 1955' (Suggate and West, 'On

the extent of the Last Glaciation', 268). The approach of Karl W. Butzer's *Environment and Archaeology*, placed second in the list of references with which the poem concludes (which are neither alphabetical nor chronological, and thereby presumably non-arbitrary in the relation of their order to their relevance), also offers an illuminating context here. In a turn of phrase that seems particularly pertinent, Butzer's desiderated 'Pleistocene geography' is described as 'more a point of view than a scholarly discipline.' (Karl W. Butzer, *Environment and Archaeology*, 11.) Here he indicates his interdisciplinary vantage, where 'geography' indicates all that comes within 'the scientific description and interpretation of the earth as the world of man', and where his work draws on 'a wide range of fields including geography, geology, soil science, botany, zoology, meteorology' among the natural sciences, along with all of the 'delicate cultural aspects of paleo-environmental work' that fall 'within the scope of the prehistoric archaeologist' (3-4). Prynne's poem equally seems concerned with finding a point of view across kinds of knowledge as much as a disciplinary home, but by various means it demonstrates a resistance to any single and fixed viewpoint. As Simon Jarvis writes, it is one major lesson of Prynne's that 'The researcher-poet must attempt to give up a fixed vantage' (Jarvis, 'Quality and the non-identical', n.p.).

19: 'the / gliding was cursive' (lines 9-10)

A phrase dense with significance. On the simplest level, this seems glossable as 'the movement of the ice was not a straightforward southwards advance followed by a consistent northward retreat; instead, the levels to which the ice reached fluctuated up and down'. But that is a most vulgar simplification of these words. 'Cursive' signifies that the process of to-and-fro between ice and frost drew a pattern on the earth which looked like a handwritten script. In this context, 'cursive' is therefore suggestive of the hand-drawn maps which accompany the articles Prynne references: these lines are 'cursive' in the sense that they are hand-written and hand-drawn onto the earth by later geologists. Of course if projected backwards onto the original patterns left on the earth by the ice (e.g. rock striations, as in West and Donner, 'The Glaciations of East Anglia') then it implies that some god-like being has written this script onto the surface of the earth. Such suggestion of the spiritualized and animistic treatments of the significance of the earth's markings (as opposed to the scientific, secularized and abstracted practices of the geologists) suggests a

whole history of response to these markings on the earth which is primarily excluded from the poem, or at least only permitted to enter at the margins: the very animistic beliefs which a poem like 'Aristeas' invokes have already been erased by the processes of secularization and rationalization, of which the 'scientific revolution' (to which the poem gives expression) is only one part. 'Cursive' is also etymologically connected to significant words which occur in the later part of the poem, especially 'current' (both from L. *curro*). This sense of 'running', of sequential, forward motion, is central to the poem's concern with opening up problematics latent within geology as a scholarly practice. The implication behind 'curro' and 'cursive' is that the material records and traces left on the earth were always-already implicitly arranged in a sequential order (running forward across time and space). 'Gliding' is a technical term from crystal physics, meaning: 'Of particles in a crystal: to move, be displaced. Also of a crystal: to undergo glide' (*OED*, s.v. 'glide, v.', sense 9). This is the kind of process that ice crystals would undergo while melting and becoming denatured. A simultaneous double focus is implied: on the very large (the ice written 'cursively' onto the landscape), and on the very small (the molecular crystals of the ice 'running' (cursive) away as the ice melts). This modifies the significance of 'relative point' because it implies that the point of view is different depending on whether we are considering the macro-level movement of the ice or its microscopic structure (and of course the poem is inhabiting both structures simultaneously).

20: 'moraine' (line 12)

An eighteenth-century term (borrowed from French geology) which refers to the 'mound, ridge or other feature consisting of debris that has been carried and deposited by a glacier or ice sheet, usually at its sides or extremity' (*OED*, s.v. 'moraine, n.', sense 1). This is the first reference in the poem to the consequences of the ice's 'invasions': the generative deposits which help to shape the features of the landscape. In the geological context of this poem, such moraines are also the evidence for the movement of the ice. The poem has been moving through geological time, from the initial 'invasion' of the ice, its movement down to the 'coast of Norfolk', and finally now we have reached the deposits which the ice has brought with it. It is however of course these deposits which are the starting point of geological investigation, which is one of the reasons for the many temporal ruptures which we have traced in the first sentences of the poem. As

mentioned in section 4, above, the notion of accumulated geological deposits often acts as a metaphor for the ways in which language gathers significance across historical time: it is possible to trace etymologically the violent processes of formation of the English language in modern Britain itself (see section 17, above, on 'Norfolk'), and also relationships such as that suggested here by the next word, 'runs', which looks back two lines earlier to 'cursive' ('runs' being a translation of the Latin word *curro* from which 'cursive' is derived). The geological metaphor is the master trope of the nineteenth-century discourse on language, as when R.C. Trench, in an influential popularizing lecture series of 1851, makes an analogy between the work of the geologist and the work of the word-historian:

> Here too [in the English language] are strata and deposits, not of gravel and chalk, sandstone and limestone, but of Celtic, Latin, Saxon, Danish, Norman words, and then again Latin and French words, with slighter intrusions from other sources: and any one with skill to analyse the language might re-create for himself the history of the people speaking that language, might come to appreciate the diverse elements out of which that people was composed, and in what succession they followed one upon the other. (Richard Chenevix Trench, *On the Study of Words: Five Lectures Addressed to the Pupils at the Diocesan Training School, Winchester* [London, 1851], 61-2)

This line of thought can be traced back to the German philologists, especially Max Müller, who claimed in his *Lectures on the Science of Language*, 2 vols. [1864; London, 1994], 2:14, that 'There is no science from which we, the students of language, may learn more from than Geology'. (For superb overviews of the racialist ideologies behind nineteenth century German comparative linguistics (which Müller himself fiercely repudiated) see Stefan Arvidsson, *Aryan Idols: The Indo-European Mythology as Science and Ideology* [Chicago, 2006]; Thomas R. Trautman, *Aryans and British India* [Berkeley, 1997]; Thomas R. Trautman, ed., *The Aryan Debate* [Delhi, 2005]). Prynne's own practice, reading deeply into post-Saussurean linguistics and the workings of power and social exchange in language, rejects the naturalizing assumptions which allowed philologists to rely on paradigms drawn from geology (peoples do not come in 'successions', like glacial drifts, without the succession-boundaries being established

by slaughter); but something of this turn toward reconstructing and analyzing human history from the deposits it leaves in language remains in Prynne's thinking.

21: 'axial' (line 12)

Another word with a technical geological sense: the adjective derived from the noun 'axis', meaning 'A central ridge; the central line of a valley' (*OED*, s.v. 'axis, n.[1]', sense 12). 'Axial' to the 'Finchley Road' also suggests that the moraine runs at an angle to the Finchley Road. Which is an odd way of putting things, of course, because the Finchley Road was only built thousands of years after the morainal deposits were formed; it would be less anachronistic to put things the other way round. But 'axial' is a word of broader significance to the poem and to *The White Stones* as a whole. In 'Aristeas', the shaman tribal leader on the Siberian Steppes is briefly pictured 'With his staff, the larch-pole, that again the / singular and one axis of the errant world' (*Poems*, 92). The 'larch-pole' is axial here because, as Simon Jarvis explains very clearly, '[t]he world in such a construction of place is taken as itself 'errant', as wandering past the nomads, rather than vice versa, since wherever the larch-pole of the shaman's tent is placed is the clan's portable and temporary location' (Jarvis, 'Quality and the non-identical', n.p.). In the context of our poem, the moraine is being viewed in the abstracted language of geology. Devoid of immanence or deep connection with human experience of the landscape, it is possible for the moraine to be 'axial' to a completely arbitrary and (in temporal terms) parochial construct. Or the second possible way of reading this line is to suggest that geological features are now ordered by their relationship to the modern equivalent of 'larch-poles', like the Finchley Road. The question 'axial' invites is whether we are viewing the territories of Britain as abstracted and mathematically divided space or in ways which have continuities with the beliefs (as far as the modern anthropologist can reconstruct them) of the primitive inhabitants of the landscape. As we have already seen, it is tricky to make such a distinction in this poem, because the conception of ice as an 'invasion', say, is not clearly separable from the rhetoric of geological writing.

22: 'including hippopotamus' (line 13)

In-claudere: to shut in. The remains of the hippopotamus are 'shut into' the other morainal deposits, and need to be extracted from them

by geologists and analysed by paleozoologists. W.B.R. King explains the significance of the *Corbicula-Hippopotamus* fauna as evidence that the climate had become 'temperate or even warm', and he records its presence after the disappearance of the Gipping Glaciation, which 'reached the northern outskirts of London and moved along pre-existing valleys to Warlord and probably to Finchley':

> With the amelioration of climate the ice disappeared and considerable further erosion took place before river gravels accumulated. The climate on the whole remained cold except for a relatively short period, when it appears to have been warmer than today and many hippopotamuses lived in the district. (King, 'The Pleistocene Epoch in England', 200)

So King shows that the presence of hippopotamus remains is a sign of climatic 'amelioration'. In the interglacial period it was actually warmer than it was in modern Britain. So hippopotamus presence helps to revise and relativise teleological notions of changes in climate since the ice-age. It also offers a historicization of the more nostalgic vision of a unified period of a static ice-age which exists beyond day-to-day fluctuations. Of course, this isn't explained in the poem: one has to become a researcher in the alien field of the Pleistocene Epoch in order to be able to link the sudden appearance of 'hippopotamus' evidence with the 'retreat, followed / by advance' (lines 9-10) of the ice, which led to variable periods of cold and heat even in the glacial periods.

23: 'isn't a / joke' (lines 13-14)

Two senses of *joke* seem relevant here: both 'Something said or done to excite laughter or amusement' and, in a transferred sense, 'An object of or matter for joking' (*OED*, s.v. 'joke, n.', 1.a, 2). The hippopotamus fauna is important evidence for the geologists; but the one thing the geologists never mention about hippos is how funny they are. We might think that a poet would locate hippos along the Finchley Road, rather like the novelist a century before him introducing 'a Megalosaurus, forty feet long or so, waddling like an elephantine lizard up Holborn Hill' (Charles Dickens, *Bleak House*, ed. Stephen Gill [Oxford, 1996], 11), in order to exploit the comic potential of the overmatched time- and life-scales, with the exotic and unimaginably ancient animal trivialized by, and reciprocally

trivializing, the contemporary setting. But this is precisely what the poem insists we not do. Reeve and Kerridge's account of the shift of scale in the preceding poem in *The White Stones*, 'The Wound, Day and Night' – 'the responsive / shift into the millions of years' (*Poems*, 64) – is helpful here: for them, it is 'an interplay in which both partners reciprocate, since the intervention of a geological time-scale here does not simply dwarf the human scale and make it seem trivial. Nor is the presumed authority of a scientific account counterposed damagingly against a merely whimsical one' (Reeve and Kerridge, *Nearly Too Much*, 46).

24: 'the present fringe / of intellectual habit' (lines 14-15)

Capable of many possible glosses: (i) the present boundaries, especially disciplinary boundaries, of intellectual practice; (ii) present fringe practices in intellectual society, perhaps especially the writing of avant-garde poetry such as the reader is presently engaged in understanding; (iii) the margins of particular intellectual 'habitation' (see *OED*, s.v. 'habit, n.'[7]), perhaps suggestive of the ambit of Cambridge University, itself situated near the part of East Anglia which is the poem's object of study; (iv) the fringes of academic garments. All of these senses help to link the studies which the poem has been undertaking so far to the manifold institutional and intellectual contexts from which those studies have emerged. The whole sentence is also rendered ambiguous because it is unclear if the 'present fringe of intellectual habit' isn't a joke 'any more than' the hippo in the midlands isn't a joke; or if the hippo in the midlands *is* a joke, but no more so than 'the present fringe of intellectual habit'. In the case of senses (i) and (ii) the 'present fringe of intellectual habit' makes an analogy between the unexpected presence of a hippo in the south of England with the unexpected presence of geology in a poem, or at least geology outside its natural and conventional field of habitation (i.e. the references attached to the poem). The poem seems implicitly to be responding to critics of Prynne's poetry who might think he put all those scientific terms and references in them as a joke. This only seems like a joke if the reader is willing to dismiss the potentiality of poetry to treat on an imaginatively and intellectually wide range of subjects. Furthermore, analogies between physical and intellectual matter are no jokes because the poem is most concerned to collapse the distinction between intellectual and physical 'matter' (see section 3, above). The 'original orogenies' which Prynne finds Olson's *Maximus Poems* meditating on are not unproblematically

available entities, but complex bodies of knowledge shaped by the specializations of a fragmented and disciplinized culture. Such a disciplinized culture of course specifically takes place within the modern institution of the university. University institutions, our own 'intellectual habit', give shape to the structures of knowledge which allow us to turn the ridge into a 'moraine', to refragment the 'moraine' and discover the hippo, and then to reassemble the hippo fragments into a larger narrative of the Pleistocene Epoch and its climate.

25: 'as / the evidence is ready' (lines 15-16)

We know the hippopotamus lived in Britain, because we have the evidence. But 'as' is again ambiguous (see section 12, above), suggesting that the hippopotamus only lived *because* we have the evidence that it did. And also that the hippopotamus lived *as* evidence: that it constitutes a piece of evidence, and indeed the syntax implies that the structure of being evidence was already implicit in the hippopotamus' existence in the first place. The ambiguity here seems set to extend the concern with our ethical responsibility to the deep past to a region of potential seeming absurdity (although we must assume that this 'isn't a joke'): What restitution can there possibly be for the hippopotamuses who dwelt unpoetically upon the earth 10,000 years ago, who were wiped out by the same processes that made human settlement, and the long train by which we have arrived at the means to study those beings, possible?

26: 'for the successive / drift' (lines 16-17)

The 'successive drift' may refer specifically to the distinction between the lines of 'Older' and 'Newer' Drift, the deposits from the 'advance and retreat' of Pleistocene glaciation. Gordon Manley gives a useful map of this process in his figure 5 (Manley, 'The Range of Variation of the British Climate', 60). Here, once again, two reciprocal sense are operative: the hippopotamus lived 'as' (i.e. being) the evidence 'for the successive drift'; and because we have evidence 'for the successive drift' we know that the hippopotamus must have lived. 'Successive' is also taken up later by 'the facts / in succession, they *are* succession' in lines 47-8, a phrasing that crystallizes several of the poem's concerns: see section 12, above, for discussion of the involution of sequence and causation, and section 15 for the poem's interest in the mutual determining of physical and intellectual divisions.

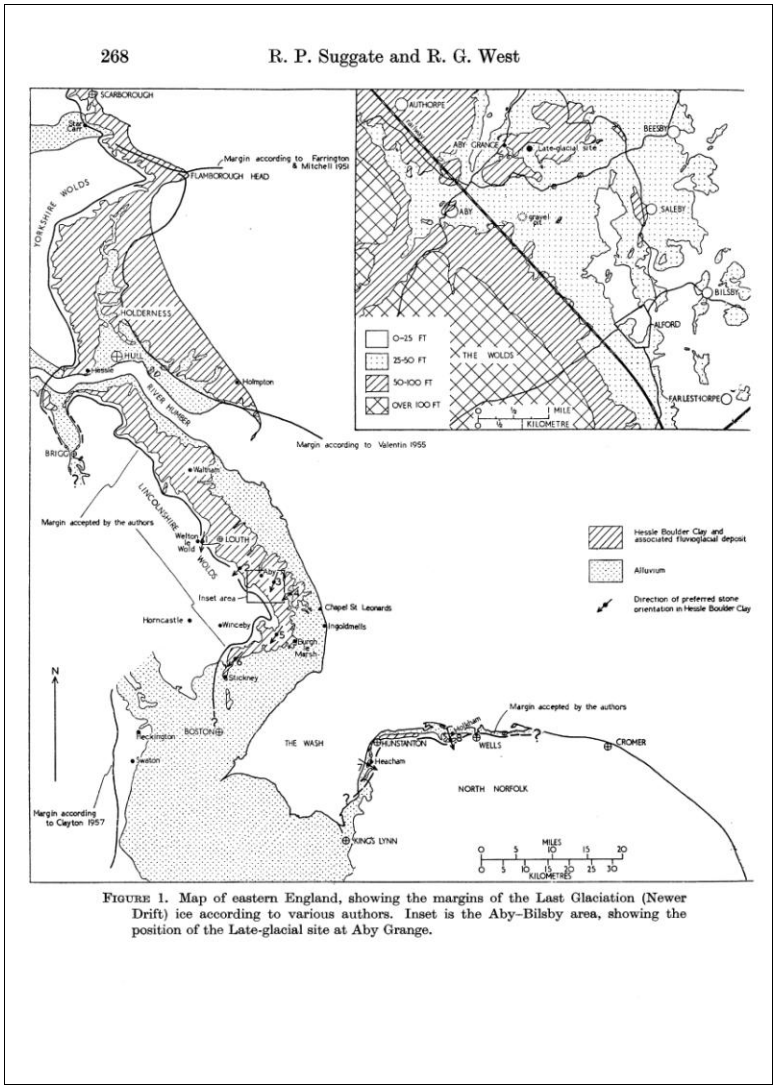

FIGURE 1. Map of eastern England, showing the margins of the Last Glaciation (Newer Drift) ice according to various authors. Inset is the Aby–Bilsby area, showing the position of the Late-glacial site at Aby Grange.

27: 'Hunstanton to Wells' (line 18)

Figure 1 in Suggate and West's article fixes the southern extent of the last English glaciations along a line which runs just inward from the northern coast of Norfolk, passing (from west to east) through the towns of Hunstanton, Wells and Cromer (Suggate and West, 'On the Extent of the Last Glaciation in eastern England', 268). The verse-

paragraph beginning here contains the densest and most continuous pattern of reference to the geological articles, counterpointed with usages which continue to problematize the investigative and inductive means of the geologists themselves. The implicit promise of clarity in 'the clear', suspended at the end of the line just before the line is cleared into the blank right margin, then immediately complicated by its problematic reference to 'margin', turns out to foreshadow the means by which this paragraph will combine close reference to particular data and arguments from the scientific literature with a language partly derived from and partly in opposition to the procedure and assumptions of this literature.

28: '*margin*' (line 19)

Another word taken up from the scientific literature (Suggate and West's figure 1 labels its line the 'margin accepted by authors') but also, in common with the use of words such as 'along' (line 7), 'coast' (7), 'axial' (12), 'fringe' (14), and later 'interior' (20) and '*inwards*' (30), a word which traverses several different kinds of system-boundary at once: the edge of the ice, but also the extent of current disciplinary knowledge; the line on which the scientists constructing that knowledge take their 'stand'; and a poetic margin, insofar as the poet concerned to investigate such knowledge in his work removes himself to the edge of traditional poetic practice, and draws on a lexical and informational set beyond the normative range of poetic elements. This is reaffirmed first by the placement of '*margin*' at the left-hand margin of the page – an unusually overt deployment of this kind of verse technique in the context of a poetics which elsewhere deliberately evades such affect – and second by the setting of the word into italics. The italics first seem to mark the word up as a quotation, thereby setting it apart from the rest of the poem's language, but then to call into question the basis of such a neat division, since 'margin' is in fact a relatively non-specialist word which has applications in any number of daily usages, and the effect of the italicisation is rather to call into question why 'margin' might have a status any different from more obviously technical terms ('moraine', 'striations') or from terms which have a similarly complex reach across different discourses ('axial', 'successive'). In placing the margin at the Hunstanton to Wells line, Suggate and West's article, as the abstract states, 'reasserts the traditional southern limit […] on which doubt had recently been cast by various authors on topographical inference alone' (263). So the competing recent margins

('according to Farrington & Mitchell 1951'; 'according to Valentin 1955'; 'according to Clayton 1957') are themselves superceded on the inadequate evidentiary basis they begin from, since they set wrongly the margin for what is inferentially appropriate (topography, but not pollen analysis and radiocarbon dating).

29: 'from which hills rise' (line 19)

Again drawing on Suggate and West: 'In north Norfolk the hills rise more rapidly from the coast, and at most the marginal lowland is a mile or two wide' (278). This raises once more the question of which direction one faces in, from any margin, coast or limit: the margin previously marked the lower extent of a body of ice located north of it, but here we look inwards, south or south-west, to where the hills 'rise' inland. This is the first of three instances of 'rise' in the paragraph (see lines 31 and 33): the movement from this first verb usage to the subsequent two noun usages models a semantic progression (insofar as a 'rise' is the preterite outcome of something rising), but this movement is complicated by the fact that the three instances of 'rise' refer to quite different processes of the earth (see sections 41 and 42, below).

30: '"interior"' (line 20)

One definition of 'interior' is: that which is '[s]ituated within and at a distance from the coast, or frontier of a country' (*OED*, s.v. 'interior, a. and n.', sense A.1c). But since the dimensional extent of a coastline, which twentieth-century fractal geometrists have pondered as 'the coastline problem', is potentially infinite, and since anyway the merest quantum of distance is still 'a distance', this again posits an understanding of the nature of the land to which boundaries are constitutive but also vexed. Why should we consider places further removed from the sea or ocean to be further *inside* something (the quotation marks seem to ask, raising the word slightly from its context as if with tweezers)? The word 'interior' also suggests, of course, that inner and inward aspect of the mind or soul traditionally considered to be more intrinsic or spiritual than that which is surface, exterior or bodily. And, importantly in this context, the word adds a governmental or administrative dimension, in the sense of '[t]he internal or "home" affairs of a country or state; the department concerned with these' (ibid., sense B.3).

31: 'the stages broken through' (line 20)

'Stage' has two senses in geology: it is both 'a division of a stratigraphic series, composed of a number of zones and corresponding to an age in time; the rocks deposited during any particular age', and also 'A glacial or interglacial period' (*OED*, s.v. 'stage, n'). Again the choice of word instantiates a questioning of the boundary, relation and priority between the physical evidence the geologists study, and the conceptual means they reciprocally derive from and bring to bear on that study. Both these senses develop, by a rich process of historical shifting and transference, from the roots of stage as '[s]tanding-place; something to stand upon', from Old French *estage* via Italian *staggio*, 'station, dwelling' and ultimately Latin *stare*, with many special senses and figurative applications diversifying from these roots in the process. Literally, then, the 'stages' which are the north Norfolk hills formed by the deposits of the terminal moraine are 'broken through' in the sense that the Wash, the large estuary at the meeting of Norfolk and Lincolnshire formed by the ice-lobe discussed in section 32, below, marks their north-western extent. But this is also an interruption in the continuous stratigraphic evidence that the geologists can find in these hills, and hence of the periodization they can establish on the basis of this evidence. The implication is that the glacial action which forms the Wash, itself reconstructed through one kind of study, disrupts the evidence for another kind of study. But of course, behind this there lurks a pun on the notion of a scientific 'break-through', a moment of discovery in which we might pass beyond one 'stage' of knowledge into another; the effect is to collapse the distance between physical realities, their becoming evidence, their becoming knowledge derived from this evidence, and this knowledge exerting an influence within a larger field of disciplinary study. To collapse the distance, but also to suggest that these 'stages' may come into conflict with each other.

32: 'the lobe bent south-west into the Wash' (line 21)

Suggate and West's figure, described above, also illustrates the part of the glacier which the authors name in their abstract as 'a lobe pushing into the Wash' (Suggate and West, 263). 'Lobe' is a common term in glaciology (King also describes the British glaciers as 'a series of ice-lobes': 204) but to cast it as 'bent' into the Wash is oddly to relegate the force and agency of the ice-sheet. To be bent into something is to fit yourself to its pre-existing shape, whereas in fact it was the

projecting lobe of the glacier which *created* the Wash, excavating it by erosion and depositing the materials inland. The word 'lobe' of course has several senses in different fields; as many kinds of 'roundish projecting part', it is mainly (and originally) found in biology, describing parts of ears, lungs and livers, but also has uses in botany, as well as geology. In the biological sense 'lobe' may be picking up the 'beautiful head' of line three: if the head is the area of frost below the southern extent of the glacier, the 'lobe' is appropriately positioned at the side like a protuberant ear. In the light of the earlier use of 'cursive', the sense of 'lobe' in calligraphy also seems relevant: it is '[a] curved projecting part of a letter' (*OED*, s.v. 'lobe, n.'), such as that curved projection attached to the mainstroke in the b of 'lobe' itself.

33: 'that sudden warmth which took / birch trees up into Scotland' (lines 22-23)

The 'sudden warmth' refers to the Allerød oscillation – a window of climatic amelioration in early postglacial Europe, beginning around 10,000 years ago, which was followed by a drop in the temperature. The presence of birch trees is one of the key paleobotanical indicators of climatic conditions, since, as Manley writes, 'for such trees to survive the mean temperature must exceed 50° for at least 1 ½ months', and since we know from the research of the pollen analysts that '[d]uring this phase tree-birches extended rapidly northward from Holstein to Southern Norway and from southern England at least to southern Scotland' (Manley, 52). Butzer similarly shows areas of birch growth to have occupied 'most of England and Denmark', the extent of which he illustrates in a figure, confirming the fact that as the 'remnants of the British glacier in the Scottish highlands disappeared', the 'arctic tree-limit' would indeed have reached Scotland (Butzer, 403-5, and figure 72 on 404).

34: 'As / the 50° isotherm retreats' (lines 23-24)

This describes the drop in temperature subsequent to the 'sudden warmth' of the Allerød oscillation. Manley has a figure to illustrate the shifts of the 50° isotherm – which is to say, the contour line indicating the upper limit of the zone in which the July mean temperature reached 50° F – through the period of this oscillation. Even if it cannot be equated with 'changes in the extent of land and sea [...] we can observe how the retreat of the 50° isotherm is

commensurate with that [difference] which we know now to exist between groups of windy cool summers, and fine anticyclonic summers' (Manley, 52-3). '[R]etreats' is once again a loaded word; since the isothermic contour line is part of the apparatus of the specialist earth scientist, to picture its 'retreat' in the face of the southward invading temperature drop is perhaps to allow the climatologist's own technologies to become vulnerable to the same hostile oppositional energies which motivate the understanding of ice movement as invasion. To deflect the advance of cold weather into the retreat of the abstract contour-lines that serve to denote warmer climatic conditions is to invert the relationship between the tools of the discipline and the objects of its study that has obtained so far in the poem.

35: 'secular' (line 25)

A scientific term, which is used in many branches include astronomy, geography, geology, meteorology to refer to 'processes of change: Having a period of enormous length; continuing through long ages' (*OED*, s.v. 'secular, a. and n.', sense 7). Under sense 7b, the *OED* cites Hugh Macmillan's *The True Vine; or the analogies of our Lord's allegory* [London, 1871], 'The earth has its secular seasons as well as its annual' (v.176). This term appears briefly in Manley's article 'The Range of Variation of the British Climate', where he cites another geologist's view that 'the dimensions of the minor secular fluctuations of which we have knowledge appear to be about half the order of magnitude of those comprised in the post-Glacial and historic period since the Climatic Optimum' (51). 'Secular' here is being used in an etymological sense, from Latin *saeculum* 'age', whereas it is normally used in a transferred sense to mean 'the world', and hence the secular as opposed to the sacred. By being used in such an etymologically precise sense, quite contrary to normal usage, the word seems to insist on the sense of a geological process of change over an enormous length of time, *and specifically not* the secular world as opposed to the divine. The secular world is so firmly in control of the scientific, rationalist language of the poem that there is no need to worry that even direct invocation of the word 'secular' might conjure its opposite, 'the sacred'. The use of the word therefore seems to imply a 'subtraction narrative': that the movement from the sacred to the secular is simply a process of removing misleading and primitive accretions which have intervened between subjects and their rationalistic perception of their place within the environment, the state

and the economy. It is as though the notion of the 'secular' itself contains no ideological content. However, in the wider context of the poem (see section 10, above, on the word 'day') this usage cannot be so innocent. In the context of a poem that does seek to encompass and give credit to, albeit beneath the immediate surface of the language, earlier beliefs about the relationship between man and the planet, the word 'secular' seems to embody the process by which the secular modern state presents itself as natural and ideologically neutral. Of course, the development of geology has itself been seen as part of the rise of secularity. On the one hand, this is because of a large process in which all epistemic values came to be judged by scientific standards (for a classic statement see Hans Blumenberg, *The Legitimacy of the Modern Age* [Cambridge, Mass., 1983]; more recently see Stephen Gaukroger, *The Emergence of a Scientific Culture: Science and the Shaping of Modernity, 1210-1685* [Oxford, 2006], which unusually argues that it was western science's uniquely powerful and distinguishing ability to graft itself onto religious values and epistemes which ensured its rise to dominance). On the other hand, geology in particular presented challenges to the biblical narrative of creation which decisively showed that the world was far more ancient than biblical history claimed (see Paolo Rossi, *The Dark Abyss of Time: The History of the Earth & the History of Nations from Hooke to Vico* [Chicago, 1984].) So by invoking the word 'secular' in a context which seems deliberately to exclude reference to the 'secular versus the sacred', the poem precisely invites the reader to think about how 'secularity' constituted itself as a substantial and non-natural body of thought, of which the discourses of this poem are a part. (For recent discussion of subtraction narratives and secularity see Charles Taylor, *A Secular Age* [Cambridge, Mass., 2007]).

36: 'laid down' (line 25)

Of the many possible senses here, the most relevant is *OED* 'lay, *v*', sense 51d 'To put down (money) as a wager or a payment; to pay (a debt)'. It is as though the traces of the 'secular weather' have been laid down by the ice sheets in the fossilized pollen (see below) to be redeemed at a later date. Here we have a model of investment and exchange is projected onto the ice and the geological processes in which it participates (a 'pleistocene exchange' (*Poems*, 71)). It goes without saying that no such principle is in operation, and is only retrospectively applied by a poet preoccupied with the 'absurd /gift'

(*Poems*, 63) which modern civilization has received from the implacable natural processes of the late Pleistocene Epoch.

37: 'pollen' (line 25)

Suggate and West's article deploys the technique of pollen analysis for much of their evidence. Several of the other sources referenced mention pollen analysis as one area in which the Quaternary Sub-department in Cambridge, where Suggate and West worked, were making great advances in this period (see Butzer, 7, and King, 197, 200). When a glacier retreats (by melting) it deposits the pollen that it has carried, which was bound up in its structure. This survives (is 'laid down') in fossilized remains, and can be analysed as a means of determining the relative age of depressions in the land, and hence of glacial extent. Much later, for instance in the sequence *To Pollen* (Brighton, 2006), Prynne will become deeply interested in the multiple historical and cultural significances of pollen: as dust (from L. *pulvis*); as flour; and in the verb 'to pollen', meaning to dust something with many different kinds of fine particle.

38: 'separable advances' (line 26)

The most detailed account comes in West and Donner: developing upon the summary offered by King of the East Anglian glaciation, they identify 'a pattern of direction and stratigraphy in which three successive episodes of ice advance may be distinguished' (69), and they label these the Cromer, Lowestoft and Gipping advances.

39: 'striations are part of the heart's / desire' (lines 28-29)

Striation derives from the Latin *stria* meaning 'furrow', and in geology refers both to the broad furrows cut into the earth's surface, and to the markings left on stones by glacial ice (see R.G. West and J.J. Donner, 'The Glaciations of East Anglia' for a detailed consideration of this subject). It is therefore part of a network of references to the deposits left by the ice: 'moraine', 'drift', 'ridge', etc. But in what sense they are part of the 'heart's desire' is mysterious and difficult to gloss. It is useful here to point to other similar formulations in the *White Stones*, many of the poems in which are concerned with deep psychic connections between man, the landscape and its history. In 'Quality in that Case as Pressure' (*Poems*, 78), the speaker is 'gorged / in the transgressions of folding / the orogeny of passion' and 'the / invasion of ancient / seas'. He goes on four lines later to use the

phrase 'heart/heartland', which suggests that in 'Glacial Question' we should be alive to the possibility that the 'heart' is not only human but the '"interior"' of the landscape too. In 'The Wound, Day and Night', a poem to which 'Glacial Question' is a companion (they are printed side-by-side one another) we hear an elegiac longing for the origins of the landscape (unmediated by the technical geological language of 'Glacial Question'):

> I am born back there, the plaintive chanting
> under the Atlantic and the unison of forms.
> It *may* all flow back again if we suppress the
> breaks, as I long to do
>
> (*Poems,* 64)

These passages deserve long discussions in their own right, but here it is sufficient to observe that the land and its history, its original and ancient creative energies, are often the objects of desire in *The White Stones.* What is surprising in 'The Glacial Question' is that this language rubs up against far more technical discussion of geology as a discipline. This invites the question of where the poem itself stands in relation to the geological articles it is commenting upon. Is the poem a means of liberating atavistic desires and needs from the sectarian and exclusive world of contemporary academic politics? Or are the claims of poetry to mediate such desires exposed as triumphalist when placed alongside the specialized scientific contexts from which redacted versions geological knowledge emanated to the wider public?

40: 'parkland' (line 29)

Perhaps looking back to the 'sudden warmth which took / birch trees up into Scotland' in lines 22-23. The word *parkland* is in Butzer's discussion: most of England and Denmark is occupied by 'birch parkland', as distinguished from the 'birch woodland' which dominated Northern France and Northern Germany (Butzer, 403). But his word-choice is enigmatic, given that every historical sense recorded for 'park' specifies it as an enclosed, humanly managed land-feature ('A *park* was distinguished from a *forest* or *chase* by being enclosed' [*OED*, s.v. 'park, n.']). One attraction for Prynne's poem, then, is perhaps that this word blurs the line between natural and nurtured physical formations: as if the action of glacial retreat had the legal and economic power to create parkland. The syntax of this

clause is ambiguous: it may be an elided construction parallel to the previous one, hence 'the parkland *is part of* what is coast (just as the striations are part of the heart's desire)'; or it may be an expansion upon the previous, hence 'the heart's desire, *which is to say*, the parkland of what is coast'. But what would either of these be saying?

40: '*inwards from which*' (line 30)

See section 16, on 'coast' and section 30, on 'interior', above, for the primary significance of this. But the italicization of this three word phrase is somewhat enigmatic. One possible model for the italics here may be found in the first paragraph of Merleau-Ponty's chapter 'The Spatiality of One's Own Body and Motility' in *Phenomenology of Perception*:

> The word 'here' applied to my body does not refer to a determinate position in relation to other positions or to external co-ordinates, but the laying down of the first co-ordinates, the anchoring of the active body in an object, the situation of the body in face of its tasks. Bodily space can be distinguished from external space and envelop its parts instead of spreading them out, because it is the darkness needed in the theatre to show up the performance, the background of somnolence or reserve of vague power against which the gesture and its aim stand out, the zone of not being *in front of which* precise beings, figures and points can come to light. (Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Colin Smith [London and New York, 2002], 115; originally *Phénomènologie de la Perception* [Paris, 1945]; first English edition, 1962.)

David Trotter has previously suggested the relevance to Prynne's writing of this passage, arguing for the homology between Merleau-Ponty's 'definition of bodily space' and Prynne's entry of 'lyrical argument [...] into the field of discourse', whereby 'the fields [the poems] enter – politics, economics, geology – mark the limit to how far any subjectivity can be taken.' (David Trotter, *The Making of the Reader* [London, 1984], 221-2.) Merleau-Ponty's deployment of italics to mark out bodily space as 'the zone of not being *in front of which* precise beings [...] can come to light' provides a model for understanding Prynne's similar deployment in the 'coast / *inwards from which*, rather than the reverse', although Prynne's syntax is

characteristically less resolute, and thereby perhaps less ready to be certain about what will come to light inwards from coast. The implied overlay of bodily-spatial and land perspectives takes up a thread suggested elsewhere in the poem, in the use of terms such as 'head' (line 3), 'lobe' (21), 'striations' (28), 'basal' (33) and 'spine' (34), all drawn from a field where the discourse of the earth sciences interleaves itself with the vocabulary of human biology (and note that Suggate and West's article was published in 'Series B: Biological Sciences' of *Proceedings of the Royal Society*). To strengthen the connection between Merleau-Ponty and geological thinking we could compare John Clarke's notes to Olson's 'Mythology Seminar' of Fall, 1964:

> The Phenomenology of Perception of the 20th c. ended the Neolithic period, 1910 – the return of the possibility of a paratactic poetics, as with Pleistocene man, when poetry and mythology were one, *mythos-logos* intact.

(Cited in Charles Olson, *Collected Prose*, eds. Donald Allen and Benjamin Friedlander, [California, 1997], 425). Prynne's poem thus takes a phenomenology centred in bodily space as a model for understanding the relationship between coast and 'interior' in a manner that bids to reunite this Olsonian long-distance connection. Compare how 'coast', in Prynne's understanding of Olson, 'creates the possibility for mythography', with how a Merleau-Ponty, for Olson, can reunite *mythos* and *logos* for the first time since the Pleistocene. But in our present poem, there can be no simple return to an integrated Pleistocene poetics. The Pleistocene Epoch is itself a construct of modern scientific geology. Prynne's enounter with Olson is clearly formative for the development of *The White Stones* (for which see, tangentially, Keith Tuma 'Ed Dorn and England,' *The Gig* 6 [July 2000]: 41–54; for Prynne's reading-list on British historiography devised for Olson, see John Thorpe to Kenneth Irby, *Earth Ship* 4/5 [Sep 1971]: 1–2; and for Prynne's reading-suggestions on geology to Olson see Ralph Maud, *Charles Olson's Reading* [Carbondale, 1996], 153, 181). But in 'The Glacial Question' he takes Olson's geological encounters with the 'original orogenies' a bit further. Whereas Olson draws from the language of geology Prynne invokes the entire intellectual practices and systems of academic geology; whereas there is something triumphalist about the epic poet in *Maximus* encountering 'original orogenies', here that process of looking into the earth's past

is mediated by heavily overdetermined and specialized intellectual apparatus.

41: 'the eustatic rise' (line 31)

The world-wide rise in sea-level caused by the melting of the ice-caps. During the period of extensive glaciation world-wide sea-levels were considerably lower than today. These three lines need to be read in the light of Suggate and West's discussion of the physiographical setting of Holderness, east Lincolnshire, the Wash and north Norfolk' (278):

> The fen deposits surrounding the Wash, due to a post-glacial aggradation consequent upon eustatic rise in sea-level, extend as a fringe northwards along the coast of east Lincolnshire. There, a belt of undulating lowland formed of boulder clay intervenes between the flat Post-glacial deposits and the hilly chalk country of the Lincolnshire Wolds, but neither margin of the boulder clay lowland is distinct. Local stream aggradation causes the Post-glacial margin to merge into the boulder clay lowland, which in turn merges into the Wolds owing to deposition of boulder clay on the lower slopes.

So in these lines we have to picture a rising sea that picks up boulder clay ('the deposits' of the glaciers) and carries this clay north to the coast of Lincolnshire. Several things are of note. The first is to point out that geologists know this process took place because the boulder clay from the region of north Norfolk has been deposited in Lincolnshire. Secondly, it shows that evidence for the 'margin' to which the ice advanced should not be simply drawn locally from whatever site is thought to be the limit of that advance. Glacial advance and retreat, combined with overall eustatic rise after glaciation and the consequent alteration of the level of the land, has meant that the evidence of glaciation could be spread elsewhere in Britain or indeed to the Continent. This is a conceptual advance on the argumentation offered so far in the poem, where local evidence is used to derive evidence of climate and glacial extent. Thirdly, this is the latest moment in geological time the poem has yet reached. Fourthly, the lines imply that the present inhabitants of Britain owe some debt (albeit over a hugely distant time) to the glacier which has

brought the boulder clay southwards, which is then able to maintain the shoreline and to resist the encroachment of the rising sea.

42: 'basal rise' (line 33)

The rise in the level of the sea-level due to (i) the encroachment of water after the melting of the ice; (ii) the materials which form the new basal level of the land, the boulder clay (which syntactically these words seem to expand upon). This phrase appears not just in geology, but also in many branches of science to refer to the relative lowest point of a scale, body, physical space etc. Words which cross disciplines (e.g., as here, words that appear in both biology and the physical sciences) are common in Prynne's poetry, increasingly so from *Brass* onwards. In the late writing, Prynne tends to remove the anchoring of a phrase in a specific field or disciplinary context (as this poem offers most clearly in its references). This process perhaps implies that common terminology and rhetorics across the sciences imply deep structures which underpin all scientific claims to knowledge. Perhaps this present poem operates slightly differently, by drawing attention to the repeated claims of the geologists cited to draw physical and temporal lines and limits. In King's article on the Pleistocene Epoch, 'basal' usual refers to the lowest limit in time into which we can be said to have emerged into the Pleistocene Epoch (see, e.g., 190). This is a disciplinary practice which seems in the poem to be regarded more as a habit of thought and intellectual approach than anything inherent to the materials studied.

43: 'what we hope to call' (line 33)

Here recognition of the 'heart's desire' for 'original orogenies' and 'the plaintive chanting / under the Atlantic' (*Poems*, 64) enters the poem again. What we are hoping to call land here is, of course, the glacial drift deposits (the moraine, fossilized pollen, remains of the hippopotamus, boulder clay) which will form the 'basal' level of the coast (specifically in Lincolnshire, as Suggate and West's article discusses). The 'ice' is now re-imagined as a productive force, creating the conditions for future human habitation of Britain. This is the most explicit moment, in the first half of the poem, at which the reader is placed into the circumstances of an imaginary observer at the end of the ice-age. In the earlier parts of the poem it is more common to look at the evidence from the perspective of a later geologist, or poet-geologist. But paradoxically we are in the position

of an ancient primitive human viewer with the knowledge of a twentieth-century geologist, who is aware that over the long term these glacial deposits will form the new base level of the English landscape. The hopefulness here perhaps looks towards Edward Dorn's example: in *The North Atlantic Turbine* [London, 1967], published two years before *The White Stones*, Dorn issues what seems like advice to young British poets:

> Thus those children
> could start by naming themselves and the rocks
> in a larger than
> national way and then more intimately,
> if only for a more hopeful world
>
> (41)

For Robert Sheppard, Dorn's example shows through in Prynne's writing in his 'various attempts to avoid humanistic and accepted socio-historical representations of Britain' (Robert Sheppard, 'Artifice and the everyday world: Poetry in the 1970s', in Bart Moore-Gilbert (ed.), *The Arts in the 1970s: Cultural Closure?* [London, 1994], 129–51, [138]). This emphasis on the geological perspective as a force for the political imaginary of 'a more hopeful world' is an important antidote to Donald Davie's early reading of Prynne's geological interest. Davie writes that '[i]n Hardy and Auden and Prynne alike the long temporal perspectives of geology induce a quietness which, though it is undermined by apprehension, seems like a liberation', since 'the geological or geographical time scale at least serves to reveal the absurdity of all forms of Utopian revolution.' (Donald Davie, *Thomas Hardy and British Poetry* [London, 1973], 120.) Simon Jarvis has already dispatched Davie's portrait of Prynne as 'a Hardyesque poet of modest political hopes whose principal concern is to rebuke those who aspire more immoderately than himself' (Jarvis, 'Quality and the non-identical', n.p.), but in the context of glacial time it seems important to reiterate this. When the second half of our poem calls into question whether 'the Pleistocene Epoch itself / has come to an end' (lines 57-58), Davie is right to say that Prynne sees 'humankind […] as inhabiting a span between an ice age long past and another which is imminent' (Davie, 122); but then again, we *do* inhabit such a span, even if the next ice age may be 200 million years away; and the quietism here is all Davie's own. Let us compare Prynne's lines with their source in King's concluding remarks:

> The question of where "post-glacial" time begins is under discussion particularly by the pollen analysts, but wherever it is placed it need not carry with it the position of the upper limit of the Pleistocene Epoch. Although the Glacial Period may be considered to have ended (though this is open to doubt so long as ice-caps exist in the world) it is questionable whether there has yet been sufficient change in the marine faunas to justify a claim that the Pleistocene Epoch itself has come to an end. (King, 'The Pleistocene Epoch in England', 207)

What we find is a careful interrogation both of the means of scientific enquiry and of the conceptualization of the results of that enquiry into systems of knowledge, where the significance of these systems is partly constituted by nomenclatorial questions (witness the closely contested use of 'position', 'limit', 'epoch', and 'period', even in this one short paragraph). As these glosses make clear, Prynne's poem takes on and problematizes such questions with an urgency (political, intellectual, ethical) which bears directly on current issues of value, identification and responsibility, and which precisely seeks to enable the possibility of political 'hope'; the versifying of King's words, with their syntax now pushed tight against the medial- and end-stops in Prynne's lines, itself seems to be the bearer of such a charged and risky hopefulness.

44: '"land"' (line 33)

Cognates of 'land' are commonly found in other Teutonic languages, and derive from Old Teutonic, **landō*, which is cognate with Old Celtic **landā* via French *lande*. Related words in Celtic languages include *land, lann* 'enclosure' in Irish; *llan*, enclosure and church, in Welsh; in Cornish *lan* and in Breton *lann*, both meaning 'heath'). Linguists therefore belief that the earliest sense of 'land' was *OED* sense 3a: 'A part of the earth's surface marked off by natural or political boundaries or considered as an integral section of the globe'. This sense of the word 'land' is attested from c725AD in Old English. In this sense, signifying a specific portion of the land, belonging to a family or landowner and marked by geographical or legal boundaries, has much in common with the senses in Irish and Welsh just cited. The extended sense of *OED* 1, 'The solid portion of the earth's surface, as opposed to *sea, water*', seems to have come in

shortly afterwards, and is attested in *Beowulf* and in Bede from around 900AD. But the two possible meanings imply substantially different conceptions of the earth: one which is closely related to immediate familial and social contexts, the other a more abstractly conceived and totalizing entity. Prynne's writing makes much of the distinction between these two senses and the political, social and intellectual differences they imply. As discussed in the section 14, above, it is often unclear in the poem whether 'we' refers to geologists, poets, readers, or the early human beings who begin to emerge into life later in the poem. Here it seems that the aspirations of each of these groups to use the word 'land' are importantly distinct: the geologist might aspire to a differing conception of the land, more in line with *OED* sense 1, to the original primitive man, whose immediately localized conception of 'land' would have more in common with sense 3a. In other words, the multiple senses of '"land"' (suggestively de-naturalized by being placed in quotation marks) trace the differing historical periods and social contexts within which that emergent 'land' is conceptualized. But again, the access to primitive hopes in which context 'land' is given spiritual significance is only imaginable within the context of modern geological writing, in which an awareness of 'the eustatic rise' and the 'basal rise' gives a sense that the earth is a mobile and developing system rather than a static given.