Church of Scotland Ministers and the Environment in the Scottish Enlightenment: The Evidence of the Old Statistical Accounts (1790-1797)

by Adrian Shaw

Abstract

Christian concern for the natural environment is not new: clergy of the Scottish Enlightenment were interested in and knowledgeable about the natural world, and some were expert natural historians. However, attitudes towards the natural world were very different from today: "improvement" rather than environmental protection was the dominant ideology. Educated in science as well as theology in Scottish universities, Church of Scotland ministers reflected these values in their contributions to the Statistical Account of Scotland. Published between 1791 and 1797, this comprised 938 parish accounts covering all of Scotland, the great majority written by parish ministers. Drawing on the accounts this paper explores ministers' interest in the natural environment and their attitudes towards it. It suggests that understanding enlightenment attitudes towards the natural environment helps give a context for later developments in ecotheology.

Keywords: clergy, enlightenment, environment, Scotland, improvement

Introduction

Ecotheology has brought new perspectives on our relationship with the natural world, and on contemporary environmental crises, including climate change and loss of biodiversity. It can also throw light on our relations with the natural world in the past. A useful definition of the purpose of ecotheology was set out by Bron Taylor in the first volume of *Journal for the Study of Religion, Nature and Culture*: "What are the relationships among human beings, their diverse religions, and the earth's living systems?"[1] This paper explores this question in relation to Scotland in the 1790s, and to the attitudes of the Church of Scotland clergy towards the natural environment in that decade, a time during which the natural environment in Scotland was being transformed by agricultural and industrial development.

Studies of past attitudes towards the environment are fraught with difficulties, as Lesya Sabada's critique of Lynn White's essay of 1967 makes clear.[2] White explored Christian anthropocentrism and its implications for our current environmental crises. This paper has more modest aims and it is empirical rather than theoretical. It examines writing by Church of Scotland ministers and investigates what this can tell us about their understanding of the natural environment. The paper describes the context, the Scottish Enlightenment, and how the education of ministers in Scottish universities helped shape their views. It goes on to introduce the source material for the study, *The Statistical Account of Scotland*, published between 1790 and 1797 and usually referred to as the Old Statistical Account (OSA) to distinguish it from the New Statistical Account of Scotland (NSA) of the nineteenth century.[3] The paper summarises the environmental subjects contained in the OSA, highlighting examples of expert knowledge by ministers. It concludes by examining the attitudes of ministers towards the natural environment and how they differ from contemporary ecotheological attitudes.[4]

THE CONTEXT: THE CHURCH IN ENLIGHTENMENT SCOTLAND

Scotland in the eighteenth century witnessed a remarkable outpouring of intellectual and practical activity that has become known as the Scottish Enlightenment. Philosophers like David Hume, Thomas Reid and Adam

1 Bron Taylor, "Exploring Religion, Nature and Culture," *Journal for the Study of Religion, Nature and Culture* 1 (2007): 5-24.

2 Lynn White, "The historical roots of our ecologic crisis," *Science* 155 (1967): 1203-1207.

3 John Sinclair, *The Statistical Account of Scotland* 21 volumes (Creech,1791-1797).

4 The paper draws principally on research for the author's PhD thesis: "Science, religion and the environment in the old statistical account of Scotland" (University of Glasgow, 2026) https://theses.gla.ac.uk/85958/ .

Smith; natural philosophers like Joseph Black and James Hutton, writers like Hugh MacPherson (author the stories of Ossian), and Robert Burns; and technologists like James Watt all contributed to a dynamic cultural and intellectual milieu. While much writing on the Scottish Enlightenment, such as the collections edited by Broadie and Stewart, has emphasised the centrality of philosophy, more recent studies including that by Jonsson have explored the relationship between enlightenment and environmental change.[5]

One expression of enlightenment thinking was a commitment to "improvement" and new modes of environmental management, as described by Whatmore and Jones.[6] Tom Devine has written how farming in lowland Scotland was transformed during the Scottish Enlightenment and how the rapid growth in coal mining laid the foundations for the carbon economy of the nineteenth century.[7] Church of Scotland ministers were both observers and participants in these developments. In the second half of the eighteenth century the Church was dominated by a group of ministers known as the "moderate" party. Reacting against the doctrinaire Calvinist legacy of the seventeenth century, ministers of the moderate party sought to cultivate restraint and to embrace enlightenment thinking. Richard Sher (1985) has described how the moderate party dominated the General Assembly of the Church, and how Church and universities in Scotland together created a milieu in which enlightenment thought could flourish.[8] Jonathan Israel has described such developments in Scotland as an example of state supported moderate enlightenment.[9] The opponents of moderation, including traditional Calvinists and younger evangelical ministers, collectively called the "popular" party, remained critical of the moderate party leadership, whom they considered too secular. While critical, members of the popular party were not necessarily opposed to enlightenment thinking. For example, a leading critic of the moderates was John Witherspoon, who emigrated to New Jersey where he was instrumental in the creation of Princeton University, and who was a signatory to the American Declaration of Independence. Enlightenment thinking,

5 Alexander Broadie, ed. *The Scottish enlightenment: an anthology* (Canongate, 1997); Michael A. Stewart, ed. *Studies in the Philosophy of the Scottish Enlightenment* (Oxford University Press, 1990); Fredrik A. Jonsson, *Enlightenment's frontier: the Scottish Highlands and the origins of environmentalism* (Yale University Press, 2013).

6 Richard Whatmore, *The End of Enlightenment: empire, commerce, crisis* (Penguin, 2023); Peter M. Jones, *Agricultural enlightenment: knowledge, technology, and nature, 1750-1840* (Oxford University Press, 2016).

7 Tom M. Devine, *Clearance and improvement: land, power and people in Scotland 1700-1900* (Birlinn, 2010).

8 Richard B. Sher, *Church and University in the Scottish Enlightenment: The Moderate Literati of Edinburgh* (Edinburgh University Press, 1985).

9 Jonathan Israel, *Democratic Enlightenment: Philosophy, Revolution, and Human Rights 1750-1790* (Oxford University Press, 2011).

fostered by the Scottish universities, ran deep among Church of Scotland clergy of the late eighteenth century.

THE EDUCATION OF MINISTERS IN SCOTTISH UNIVERSITIES

Of importance in the development of Scottish enlightenment thinking and the theological formation of ministers were the five Scottish universities (Edinburgh, Glasgow, King's College and Marischal College Aberdeen, and St. Andrews). Students attending the universities, including those aspiring to be ministers, followed a four-year arts degree before specialising in their chosen field. The arts degree curriculum included science. For example, at Marischal College in the late eighteenth century, the curriculum included Greek, Latin, mathematics, religion, moral philosophy, logic, natural history, and natural philosophy.[10] In Edinburgh University, John Walker, Professor of Natural History (and a Church of Scotland minister) lectured students, including those preparing for the ministry, on a range of environmental subjects including botany, zoology, and geology.[11] Students of natural history were introduced to the system of species classification devised by Carl Linnaeus, and to the *Histoire Naturelle* of the French naturalist Georges LeClerc, Comte Buffon.[12] Alongside the empirical study of natural history, they were taught natural philosophy, the forerunner of the modern science of physics. In Scotland natural philosophy was dominated by the legacy of Isaac Newton, and was taught by professors such as Colin Maclaurin in Aberdeen, John Anderson in Glasgow, and John Playfair in Edinburgh.

The study of the natural environment through natural history and natural philosophy was closely associated with both moral philosophy and natural theology. Thomas Reid, Church of Scotland minister and Professor of Moral Philosophy in University of Glasgow from 1764, is principally remembered as the author of *Common Sense*, a critical response to David Hume's sceptical philosophy, but Reid also taught natural history and natural philosophy. Reid argued that the study of nature was both of practical use, and theologically important. It could contribute to the useful arts of trade and commerce, but also helped us "admire and love that Being who hath furnished this world with such a prodigious variety of things for our use and conveniencey."[13] Likewise in Glasgow

10 *Report of the Commissioners for visiting the universities of King's College and Marischal College, Aberdeen* (Stationery Office, 1838), 200.

11 Matthew D. Eddy, *The language of mineralogy: John Walker, chemistry and the Edinburgh Medical School, 1750-1800* (Routledge, 2016).

12 Paul B. Wood, "Buffon's reception in Scotland: the Aberdeen connection," *Annals of Science* 44 (1987): 69-190.

13 Paul Wood, *Thomas Reid on mathematics and natural philosophy* (Edinburgh University Press, 2017), 94.

University, in his *Institutes of Physics* (1777), Professor John Anderson explained his reasons for studying natural philosophy:

> The inducements to pursue this branch of philosophy; from curiosity, from the love of beauty, truth, and grandeur; from the advantages it brings to human life, by the improvement of arts, machines, and manufactures; and from manifold proofs it gives of wisdom, power, and goodness in the creation.[14]

Anderson also argued in an unpublished theological treatise of 1770 that belief in God was an essential part of human nature, and that design is a surer proof of God's existence than revelation.[15]

This brief introduction to the university education of students studying for the ministry points to the importance of the study of natural history and natural philosophy in the curriculum. It also suggests that the scientific study of the natural environment was consistent with reformed theology, and a desirable accompaniment to natural theology. As a result, it was entirely legitimate for church ministers to take an interest in the natural history of their parishes. The legacy of this education is evident in the ministers' parish accounts published in the OSA.

THE SOURCE: THE STATISTICAL ACCOUNT OF SCOTLAND (OSA)

In May 1790, Sir John Sinclair, a leading Scottish politician and landowner, and Commissioner to the General Assembly of the Church of Scotland, wrote to Church of Scotland ministers in over 900 parishes across Scotland, requesting them to prepare an account of their parish. Sinclair supplied a questionnaire containing 160 questions covering social and economic conditions, population, agriculture, industry and natural history.[16] In a determined campaign over several years Sinclair wrote repeatedly to ministers, cajoling, demanding, and eventually pleading with them to send a response. When all else failed he sent "statistical missionaries" into parishes to complete the task.

By 1797 this monumental survey had resulted in a complete set of parish accounts, 938 in total, published in the 21 volumes of the OSA. While called "statistical" accounts, they contain far more descriptive text than numerical data and provide invaluable information on Scotland at

14 John Anderson, *Institutes of Physics* (Andrew Foulis, 1777), 15.

15 David B. Wilson, *Seeking Nature's Logic: Natural Philosophy in the Scottish Enlightenment* (Penn State Press, 2009), 176.

16 The Statistical Account of Scotland is available online at: https://stataccscot.ed.ac.uk/static/statacc/dist/home. All the accounts referenced below are accessible on the website.

the end of the eighteenth century. The accounts also hold up a mirror to the interests and attitudes of parish ministers across Scotland. From the OSA, it is possible to identify environmental subjects of interest to ministers and to explore their attitudes towards a wide range of environmental issues.

ENVIRONMENTAL SUBJECTS IN THE OSA

Of the 160 questions, 40 were under the heading "geography and natural history." Ministers were asked to describe the parish and its landforms, the soil, climate and weather; birds and animals; and its minerals and fossils. In response ministers wrote parish accounts of varying length and quality, with the shortest less than five pages long, while a few were of 50 pages or more.[17] The great majority of accounts provide useful information. For example, of the total of 938 accounts, the term "mountain" is found in 369 or 39% of all accounts and the term "bird" is found is mentioned 229 accounts (24% of all accounts). Hills are mentioned in 770 accounts, rivers in 675 and climate in 553. Likewise, descriptions of flora and fauna are well represented, with woods mentioned in 572 accounts, animals in 429 and fish in 423. Many ministers embraced Sinclair's request to write about environmental subjects with enthusiasm. There are too many accounts to describe more than a small sample in this paper, but the summary below highlights some of the main environmental subjects found in the accounts.

LANDFORMS AND WOODLANDS

Most parish accounts begin with a section describing the topography of the parish. For example, Angus Bethune at Alness, to the north of Inverness, commenced his account with a description of the "Situation, Extent, Soil and Produce" of the parish.[18] In Inveresk (Musselburgh) Alexander Carlyle began with a section entitled "Names, Situation, River, Hill, Etc."[19] Many ministers named the hills or mountains of the parish, but some went further. Joseph Smith, minister at Birse on Deeside in Aberdeenshire is an example:

> All the hills are rocky and covered with heath, interspersed with pasture, straths and green vallies. The hills produce a variety of herbs; also many sorts of berries, the blue berry, cranberry, cloudberry; in

17 All data is drawn from the author's PhD thesis. All the examples cited are by parish ministers unless otherwise stated.
18 Alness, County of Ross and Cromarty, OSA, vol. XIX (1797), 234.
19 Inveresk, County of Edinburgh, OSA, vol. XVI (1795), 2.

> rocky places, the bramble, rasp, and strawberry of a small size. In the mosses situated in the lower grounds of the parish are dug up the remains of old oaks, which appear to have been of a prodigious size.[20]

The amount of detail that Smith compressed into a few sentences is impressive. The minister introduced the ecology of the of the hills and the variety of mountain berries. He also described the mosses (peat bogs) which were not only a source of fuel but also held evidence of former woodlands.

Woodlands were described in 60% of parish accounts, with examples from all parts of Scotland. From Kilmalie, in Lochaber, in the west highlands, Alexander Fraser distinguished natural woods composed of indigenous species and plantation woodlands: "The trees, that grow naturally, are oak, fir, birch, ash, mountain-ash, holly, elm, wild geen, hazle, and the Scotch poplar. Those planted are, larix, spruce, silver fir, beech, plane, and fruit trees."[21] At Monymusk in the county of Aberdeen the minister, Alexander Duff, noted that, out of the total area of the parish, 9,337 acres (3778 hectares) there were 1,881 acres (761 hectares) of woodland. This included the plantation of Archibald Grant "who had the pleasure of seeing the trees arrive at maturity, and of deriving annually a considerable revenue from the sale of wood."[22]

Woodland planning was a prominent feature of large aristocratic estates during the century and widely approved by ministers. For example, at Canonbie near Dumfries, John Russel described healthy woodland, both natural and planted: "This parish abounds in woods. In the new plantations, plains, beeches, elms, firs of every description, poplars, etc. are making rapid progress, being properly fenced, and seasonably pruned."[23] The planting of new woodlands introduced into Scotland new species like larch *Larix decidua* (sometimes called "fir" in the accounts), both for commercial gain and to beautify the landscape. Ministers did not appear to be concerned about the impact on the landscape or biodiversity brought about by the planting of non-native species. Rather they welcomed the combination of utility and beauty in new woodland planting.

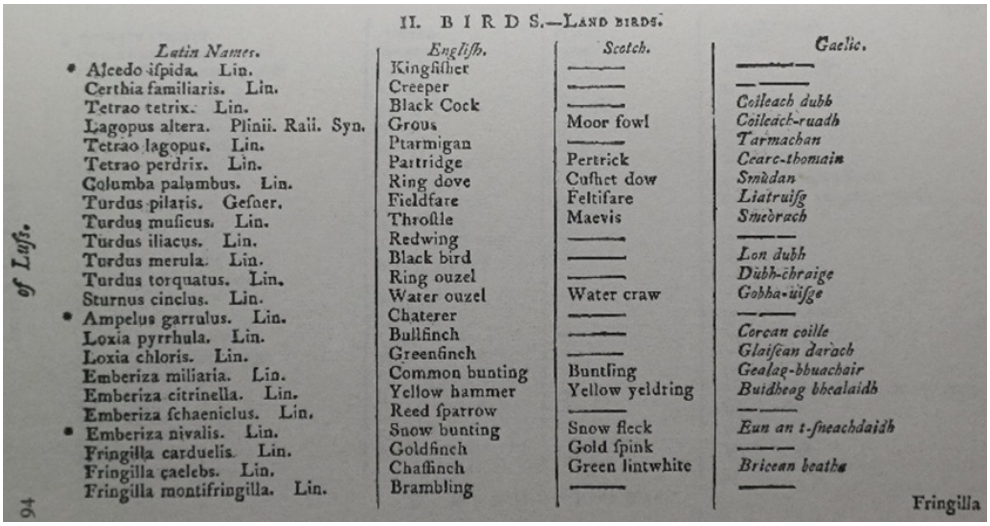
BIRDS AND ANIMALS

Most of the references to animals relate to farm animals, particularly to cattle and sheep. There are fewer references to wild animals, but some

20 Birse, Birse, County of Aberdeen, OSA, vol. IX (1793),107.
21 Kilmalie, County of Inverness, OSA, vol. VIII (1793), 423. "Geen" is a wild cherry.
22 Monymusk, County of Aberdeen, OSA, vol. III (1792), 76.
23 Canonbie, County of Dumfries, OSA, vol. XIV (1795), 409.

ministers took trouble to list species of interest in their parish. John Stuart, minister at Luss on Loch Lomond, devoted seven pages of his account to tables listing the species of "Quadrupeds, land birds, waterfowls, reptiles and fish" found in the parish.[24] Figure 1 is an example, in which Stuart lists species of land birds found in the parish, giving their names in Latin, English, "Scotch" (the English language dialect of lowland Scotland) and Gaelic.

Figure 1: Extract from table of land birds included in the account of the parish of Luss



II. BIRDS.—Land birds.

Latin Names.	English.	Scotch.	Gaelic.
• Alcedo ifpida. Lin.	Kingfiſher	——	——
Certhia familiaris. Lin.	Creeper	——	——
Tetrao tetrix. Lin.	Black Cock	——	*Coilleach dubh*
Lagopus altera. Plinii. Raii. Syn.	Grous	Moor fowl	*Coileach-ruadh*
Tetrao lagopus. Lin.	Ptarmigan	——	*Tarmachan*
Tetrao perdrix. Lin.	Partridge	Pertrick	*Ceare-thomain*
Columba palumbus. Lin.	Ring dove	Cuſhet dow	*Snùdan*
Turdus pilaris. Geſner.	Fieldfare	Feltifare	*Liatruiſg*
Turdus muſicus. Lin.	Throſſle	Maevis	*Smeòrach*
Turdus iliacus. Lin.	Redwing	——	——
Turdus merula. Lin.	Black bird	——	*Lon dubh*
Turdus torquatus. Lin.	Ring ouzel	——	*Dùbh-chraige*
Sturnus cinclus. Lin.	Water ouzel	Water craw	*Gobha-uiſge*
• Ampelus garrulus. Lin.	Chaterer	——	——
Loxia pyrrhula. Lin.	Bullfinch	——	*Corcan coille*
Loxia chloris. Lin.	Greenfinch	——	*Glaiſean darach*
Emberiza miliaria. Lin.	Common bunting	Buntſing	*Gealag-bhuachair*
Emberiza citrinella. Lin.	Yellow hammer	Yellow yeldring	*Buidheag bhealaidh*
Emberiza ſchaeniclus. Lin.	Reed ſparrow	——	——
• Emberiza nivalis. Lin.	Snow bunting	Snow fleck	*Eun an t-ſneachdaidh*
Fringilla carduelis. Lin.	Goldfinch	Gold ſpink	——
Fringilla cælebs. Lin.	Chaffinch	Green lintwhite	*Bricean beatha*
Fringilla montifringilla. Lin.	Brambling	——	——

of Luſs.

94

Fringilla

Stuart was a minister naturalist of exceptional talent. The Latin names listed in the table are drawn primarily from Linnaeus, but he also references other sources, including Gesner and Pliny. Not only did Stuart make original contributions to natural history, but he was also a Gaelic scholar who, with his father, translated the bible into Gaelic. He is unique in the accounts in listing species in three languages and the "Scotch" dialect.

Birds are mentioned in 229 or nearly a quarter of all accounts. Among ministers who recorded birdlife was William Fraser from the island of Gigha in the Inner Hebrides.

> In winter the island is visited by the swan and woodcock, in summer by the swallow, corncraik (or cornrail), and cuckoo. The other birds frequenting it are, wild geese, ducks, and all the species of sea fowl common on the west coast: Pigeons, plovers, ravens, hooded crows,

24 Luss, County of Dumbarton, OSA, vol. XVII (1796), 238-271

> starlings, sparrow hawks, and jackdaws are very numerous. Of the last there are two kinds; one with a dark blue head, all the rest black; another with red feet, having the body and head black.[25]

The "red-legged jackdaw" is the chough *Pyrrhocorax pyrrhocoraxlatin*, then found in many islands but now extremely rare in Scotland. David Mackay at Reay in Caithness provided a list of 49 species of bird including "tillings, linnets, thrushes, hill sparrows, common sparrows, wrens, buntings, larks, swallows, yellow hammers, water-wagtails, titmice."[26] Some ministers described bird migration and listed seasonal visitors to the parish. Theories of bird migration were only gaining acceptance in the decades immediately before accounts were written, suggesting that some ministers were well informed on the subject. For example, John Hunter at Oxnam in the county of Roxburgh described migrant birds in the parish:

> The woodcock, and fieldfare appear in the beginning of October, and remain during winter. The curlew, the green and the grey plover, come in March, breed in the moors, and go in the latter end of harvest. The cuckoo, swallow, dottrel, and land and water rail, appear in May, hatch their young, and then disappear.[27]

Birds were of interest to the naturalist, then and now, because they were conspicuous in the landscape and relatively easy to identify. The detail with which some ministers described species, both resident and migratory points to the interest of many of the clergy in ornithology.

NUISANCE SPECIES

Not all the descriptions of species were dispassionate. Ministers considered some birds to be a nuisance, including eagles, ravens and hawks. James Lapslie, minister at Campsie in Lanarkshire reported on the threat of eagles to young lambs: "a visit of which amongst the flock is dreaded as much as that of the fox."[28] Foxes feature prominently in lists of nuisance species. At Golspie in the northern highlands, William Keith devoted two pages to their destruction noting: "much to the honour of this county, upwards of £100 sterling is yearly expended by it for the purpose

25 Gigha and Cara, County of Argyll, OSA, vol. VIII (1793), 51-52.
26 Reay, County of Caithness, OSA, vol. VII (1793), 574.
27 Oxnam, County of Roxburgh, OSA, vol. XI (1794), 320.
28 Campsie, County of Stirling, OSA, vol. XV (1795), 324.

of extirpating that noxious animal."[29] Charles McHardy at Crathie in the Grampian mountains recorded that a scheme to rid the country of vermin had resulted in the killing of "634 foxes, 44 wild-cats, 57 pole-cats; and 70 eagles, 2,520 hawks and kites; 1,347 ravens and hooded crows."[30] McHardy was a keen observer of the natural history of his parish, but he was happy to record the slaughter of nuisance species in a way that is shocking to twenty first century sensibilities.

Some ministers were actively involved in hunting nuisance species, including seals. At St. Cyrus, in the county of Kincardine on the east coast, William Walker noted that: "The seals are the greatest enemies of our salmon fishing." He went on to describe a seal hunt in the summer of 1791: "to destroy these enemies and rivals." The minister witnessed "three of them killed in this manner. The effect has been beneficial to the fishing; for more than twice the quantity of salmon were taken the ensuing season."[31] Like McHardy, Walker was a minister naturalist, who wrote knowledgeably about geology, but his endorsement of the seal kill reflects the attitudes of most ministers towards nuisance species. There are few accounts in the OSA that show any evidence of a romantic attraction to wild species such as seals or eagles.

CLIMATE AND WEATHER

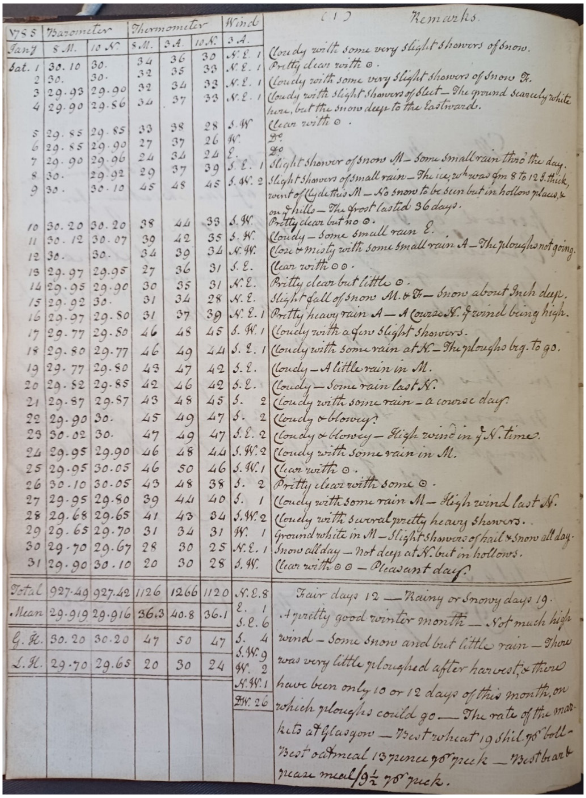
In such a wet and windy country, it is not surprising that descriptions of climate and weather occur so frequently, with climate mentioned in 553 (59%) of all accounts. For example, at Tullieallan, in the county of Perth, David Simson described the climatic advantages of his parish: "Surrounded by the river Forth and well sheltered by the elevation of the ground, this parish possesses, at all seasons, a more mild and temperate climate than many other parts of Scotland, in the same latitude."[32] Discussion of the climate was frequently linked to health and disease. At Errol, also in the county of Perth, William Herdman, assistant minister, noted the effect of land drainage on health and wealth: "The whole country is naturally wet, and it is the draining and improving of it within these last 50 years, which has contributed so much to its value and fertility. Some time ago, the ague was a very prevalent complaint; it has now in a great measure disappeared."[33] The negative impact of a damp

29 Appendix for Golspie, County of Sutherland, OSA, vol. XXI (1799), 220-222.
30 Crathie, County of Aberdeen, OSA, vol. XIV (1795), 348-350.
31 St Cyrus, County of Kincardine, OSA, vol. XI (1794), 94.
32 Tulliallan, County of Perth, OSA, vol. XI (1794), 547.
33 Errol, County of Perth, OSA, vol. IV (1792), 480. "Ague" refers to marsh fever or malaria.

climate on health is repeated in many accounts as are the benefits of agricultural improvement.

A few ministers took a scientific interest in meteorology and recorded details of the weather regularly. James Meek, minister at Cambuslang in Lanarkshire near Glasgow, recorded daily measurements of temperature, barometric pressure and wind direction at the manse from 1785 to 1806.[34] His parish account included a summary of the data kept in his journal and register, illustrated below. The journal also included Meek's observations on the impact of the weather on farming, harvests and market prices for agricultural commodities in nearby Glasgow. Like John Stuart, Meek can be described as a "minister naturalist", who combined high office (Meek was Moderator of the General Assembly in 1795) with a commitment to meteorological recording.

Figure 2: Extract from Meek's journal and register. Image reproduced courtesy of University of Glasgow Archives and Special Collections, Manuscripts Collection.



1785	Barometer		Thermometer			Wind	(1) Remarks.
Jany	8 M.	10 N.	8 M.	3 A.	10 N.	3 A.	
Sat. 1	30.10	30.	34	36	30	N.E. 1	Cloudy with some very slight showers of snow.
2	30.	30.	32	35	33	N.E. 1	Pretty clear with ⊙.
3	29.93	29.90	32	34	33	N.E. 1	Cloudy with some very slight showers of snow F.
4	29.90	29.86	34	37	33	N.E. 1	Cloudy with slight showers of sleet — The ground scarcely white here, but the snow deep to the Eastward.
5	29.85	29.85	33	38	28	S.W	Clear with ⊙.
6	29.85	29.90	27	37	26	W.	Do
7	29.90	29.96	24	34	24	E.	Do
8	30.	29.92	29	37	39	S.E. 1	Slight shower of snow M — Some small rain thro' the day.
9	30.	30.10	45	48	45	S.W. 2	Slight showers of small rain — The ice, wh was fm 8 to 12 I. thick, went off Clyde this M — No snow to be seen but in hollow places, & on y hills — The frost lasted 36 days.
10	30.20	30.20	38	44	33	S.W.	Pretty clear but no ⊙.
11	30.12	30.07	39	42	35	S.W.	Cloudy — Some small rain E.
12	30.	30.	34	39	34	N.W.	Close & misty with some small rain A — The ploughs not going.
13	29.97	29.95	27	36	31	S.E.	Clear with ⊙⊙.
14	29.95	29.90	30	35	31	N.E.	Pretty clear but little ⊙.
15	29.92	30.	31	34	28	N.E.	Slight fall of snow M. & F. — Snow about Inch deep.
16	29.97	29.80	31	37	39	N.E. 1	Pretty heavy rain A — A Course N. y wind being high.
17	29.77	29.80	46	48	45	S.W. 1	Cloudy with a few slight showers.
18	29.80	29.77	46	49	44	S.E. 1	Cloudy with some rain at N. — The ploughs bg. to go.
19	29.77	29.80	43	47	42	S.E.	Cloudy — A little rain in M.
20	29.82	29.85	42	46	42	S.E.	Cloudy — Some rain last N.
21	29.87	29.87	43	48	45	S. 2	Cloudy with some rain — a course day.
22	29.90	30.	45	49	47	S. 2	Cloudy & blowey.
23	30.02	30.	47	49	47	S.E. 2	Cloudy & blowey — High wind in y N. time.
24	29.95	29.90	46	48	44	S.W. 2	Cloudy with some rain in M.
25	29.95	30.05	46	50	46	S.W. 1	Clear with ⊙.
26	30.10	30.05	43	48	38	S. 2	Pretty clear with some ⊙.
27	29.95	29.80	39	44	40	S. 1	Cloudy with some rain M — High wind last N.
28	29.68	29.65	41	43	34	S.W. 2	Cloudy with several pretty heavy showers.
29	29.65	29.70	31	34	31	W. 1	Ground white in M — Slight showers of hail & snow all day.
30	29.70	29.67	28	30	25	N.E. 1	Snow all day — Not deep at N. but in hollows.
31	29.90	30.10	20	30	28	S.W.	Clear with ⊙⊙ — Pleasant day.
Total	927.49	927.42	1126	1266	1120	N.E. 8, E. 1	Fair days 12 — Rainy or Snowy days 19.
Mean	29.919	29.916	36.3	40.8	36.1	S.E. 6	A pretty good winter month — Not much high wind — Some snow and but little rain — There
G. H.	30.20	30.20	47	50	47	S. 4, S.W. 9	was very little ploughed after harvest, & there have been only 10 or 12 days of this month, on
L. H.	29.70	29.65	20	30	24	W. 2, N.W. 1	which ploughs could go — The rate of the markets at Glasgow — Best wheat 19 shil. pr boll — Best oatmeal 13 pence pr peck — Best bear & pease meal 9½ pr peck.
						Dw. 26	

IMPROVEMENT

"Improvement" is perhaps the most important concept in understanding the attitude of ministers towards the natural environment that is revealed in the OSA. In eighteenth-century Scotland, the term "improvement" meant, in large part, the application of enlightenment thinking to the natural environment. It was closely associated with agricultural change from the middle of the eighteenth century. Tom Devine (1990) explained how landowners, driven by potential financial gain, invested large capital sums in reorganising their estates. This included the application of scientific principles to farming; reorganising field systems on rational lines; crop and animal breeding; and the extensive use of mineral fertilisers (marl and lime) to improve crop yields. In this work, landowners and farmers in Scotland enjoyed almost universal support from parish ministers. The OSA records many examples of agricultural improvement across Scotland. Ministers noted with enthusiasm how lime and marl were applied to the soil to reduce soil acidity and increase fertility; they recorded the names of new breeds of livestock and new crop varieties; the obligations on tenants to practice crop rotations; examples of new technology adopted by farmers including lightweight ploughs and threshing machines; how fields were being enclosed with dykes (stone walls) or hedges; the draining of wetlands to provide new farmland; and planting of new woodlands.

Throughout the accounts ministers celebrated these achievements, encouraged landowners to make changes, and lamented its absence where improvement was not in evidence. In the southeast of Scotland, the fertile lands by the river Tweed saw early improvement. Adam Murray, the minister of Eccles in Berwickshire, delighted in the progress in his parish:

> The farms are all enclosed in the very best modern manner; and on many estates, the hedge rows, which are all in a thriving state, when seen at a distance by the traveller, exhibit the appearance of a highly cultivated garden. Of late years, great improvements have been made in agriculture, through the whole county of Berwick; but in no parish have they been carried on with greater rapidity, and to greater advantage, than in this.[35]

Murray praised the new sense of order and beauty in the landscape but made no mention of the impact of the changes on habitats or biodiversity. In the west of Scotland, in Ayrshire, the minister of Kirkoswald, Matthew

35 Adam Murray, minister at Eccles, County of Berwick, OSA, vol. XI (1794), 232.

Biggar, dedicated nine pages of his account to describing the progress of agricultural change in his parish, praising the improving landowners, particularly Thomas Kennedy, Earl of Cassilis.[36] He noted that 40 years ago the parish was: "generally in a wild and uncultivated state" but "now exhibits a state of improved agriculture, superior to most of the districts of Carrick."[37] Ministers were not impartial and may have exaggerated the changes in their enthusiasm for the new methods of farming, but their commitment to improvement is not in doubt.

Very few ministers questioned the ecological impact of improvement, but one was David Dow at Cathcart, near Glasgow. Like most other ministers, Dow noted that in agriculture "prejudice and superstition have yielded to reason and self-interest."[38] Unusually, he was aware of the impact on wildlife, for example on the abundance of fish in the river Cart: "Various causes have contributed to diminish the quantity of trouts in the Cart, which, it is said, once, greatly abounded with them." He identified the use of agricultural lime as one cause. He went on to note that there were still wild flowers by the river but that "the boar, the wolf, and even the deer, to whom these woods proved a defence, are now no more to be found in this country; and it is to be feared, that their more harmless vegetable inhabitants, will also share the same fate."[39] Dow's parish was near Glasgow, a city that was experiencing rapid population growth and industrial development. Dow's account suggests that the seeds of thinking about conservation were present in the 1790s even if they appeared in only a small number of accounts.

MINERALS

Some of the most striking descriptions of environmental subjects by ministers are found in the discussion of minerals, including lime, silver, lead and building stone. The descriptions often include a discussion on how minerals might be exploited, particularly coal, which was mentioned in over two thirds (659) of the accounts. In coalfield parishes ministers described the operation and geology of coal mining, often in detail. For example, at Lasswade near Edinburgh, John Paton devoted a quarter of his account to minerals. In the parish there were coal seams: "small and great, almost innumerable; but in the barony of Loanhead, about the

36 Kirkoswald, County of Ayrshire, OSA, vol. X (1794), 484-492.
37 Kirkoswald, 486, 488.
38 Cathcart, County of Renfrew, OSA, vol. V (1793), 341.
39 Cathcart, 345, 347.

middle of their course through the parish, they amount to twenty-five in number, of workable seams from two to ten feet in thickness."[40]

In Ayrshire, James Wodrow wrote a detailed description of the geology of the coal measures in his parish of Stevenston, including an illustration of the geology showing the coal seams in cross section.[41] Such was the importance of coal to economic development that many ministers whose parishes contained no known coal reserves wrote hopefully about finding it, or complained about the cost of transporting it from the coalfields to their parishes. Coal and iron ore were found together in Lanarkshire where Archibald Bruce, wrote: "there is throughout the parish of Shotts such a profusion of coal and iron stone, as might, and in all probability soon will employ several such furnaces. Should this prophecy be verified, what a change in the appearance and product of Shotts may be expected!'[42] Bruce was witnessing the birth of the iron industry in Lanarkshire. The rapid growth of this industry in the years following his account created an urban industrial landscape that was badly polluted.[43] However, there is no sense of uncertainty or irony in his exclamation. The impact of burning coal on an industrial scale has become a global concern because of its contribution to climate change, but to ministers such as Bruce writing in the 1790s, coal mining and the iron industry offered exciting new opportunities.

Conclusion

The purpose of this paper is to demonstrate that Church of Scotland ministers, writing in the last decade of the eighteenth century, were interested in and knowledgeable about the natural environment. The large number of references to the natural environment in the OSA include descriptions of landforms, geology, climate, flora and fauna. The accounts also include multiple references to the development and exploitation of natural resources for farming and industry. Collectively these developments were part of the transformation of the economy and environment of Scotland and the emergence of the industrial economy in the nineteenth century. The accounts strongly suggest that ministers were almost wholly in favour of these developments. Their attitude towards the natural environment was primarily utilitarian, praising developments

40 Lasswade, County of Edinburgh, OSA, vol. X (1794), 280.
41 Stevenston, County of Ayrshire, OSA, vol. VII (1793).
42 Bertram Shotts, County of Lanark, OSA, vol. XV (1795), 61-62.
43 David Bremner, The industries of Scotland: their rise, progress, and present condition (Edinburgh, 1869), 32-57.

in farming that enhanced productivity, and enthusing about the development of coal mining that could provide cheap fuel for industry and domestic consumption. Obstacles to "improvement", including pest species, were generally treated critically in the accounts.

Ministers' writings reflected their belief in an enlightenment vision of improvement, moral and aesthetic as well as economic. Conservation or concerns about the impact of new economic development on the environment were largely absent from their thinking. Ministers were educated in Scottish universities by professors, some of whom were themselves Church of Scotland ministers, and they were encouraged to study the natural environment and its management both for its practical utility and to understand better the beauty of God's creation. A few ministers recognised that there were ecological consequences arising from agricultural and industrial development, but the great majority were enthusiastic about the benefits rather than concerned about the consequences. Only later generations would appreciate the profound environmental consequences of the development of coal mining and the growth of the carbon economy. However, this does not mean that ministers were ignorant about the natural environment. Far from it: the accounts demonstrate a depth of understanding about the natural world that ecotheologians of the twenty first century might reflect upon and learn from. For example, over 90% of ministers wrote an account the soils of the parish, often with comments about how soils could be improved. The term "minister naturalist" is appropriate for many of these ministers who were expert in natural history.

University teaching in Scottish Enlightenment promoted both natural theology and natural sciences and ministers were encouraged to believe that scientific exploration of the natural environment was consistent with the doctrines of the reformed Church of Scotland. Studies from elsewhere in Europe would help clarify the extent to which enlightenment thinking and natural theology helped shape attitudes of clergy towards the natural environment in different denominations across Europe. This would help give us a better understanding of the "ecotheology" of the European enlightenment. It is a subject worthy of study to provide the context to contemporary development of ecotheology.

Bibliography

Anderson, John. *Institutes of Physics*. Andrew Foulis, 1777.

Bremner, David. *The industries of Scotland: their rise, progress, and present condition*. Edinburgh, 1869.

Broadie, Alexander, ed. *The Scottish enlightenment: an anthology*. Canongate, 1997.

Buffon, Comte de. *Histoire Naturelle*. (36 vols.) Imprimerie Royal, 1749-1804.

Devine, Tom M. *The Transformation of Rural Scotland: Social Change and the Agrarian Economy 1660 -1815*. Edinburgh University Press,1994.

Devine, Tom M. *Clearance and improvement: land, power and people in Scotland, 1700-1900*. Birlinn, 2010.

Eddy, Matthew D. *The language of mineralogy: John Walker, chemistry and the Edinburgh Medical School, 1750-1800*. Routledge, 2016.

Gordon, John. *The New Statistical Account of Scotland*. (15 vols.) W. Blackwood, 1834-1845.

Israel, Jonathan. *Democratic Enlightenment: Philosophy, Revolution, and Human Rights 1750-1790*. Oxford University Press, 2011.

Jones, P. M. *Agricultural enlightenment: knowledge, technology, and nature, 1750-1840*. Oxford University Press, 2016.

Jonsson, Fredrik. A. *Enlightenment's frontier: the Scottish Highlands and the origins of environmentalism*. Yale University Press, 2013.

Mossner, E. C. "Philosophy and biography: the case of David Hume." *The Philosophical Review* Vol. 59 (1950):184-201.

Oram, Richard D. *Where men no more may reap or sow: the Little Ice Age: Scotland 1400–1850*. Birlinn, 2024.

Reid, Thomas. *An Inquiry into the Human Mind on the Principles of Common Sense*. Edinburgh University Press, 1997.

Report of the Commissioners appointed for visiting the universities of King's College and Marischal College, Aberdeen. HMSO, 1838.

Sabada, Lesya M. "The God Both of Squirrels and of Men - The Challenge of the White Thesis." In *Contemporary ecotheology, climate justice and environmental stewardship in world religions*, edited by Louk A. Andrianos and Tom Sverre Tomren. Embla Akademisk, 2021.

Shaw, Adrian. "Science, religion and the environment in the old statistical account of Scotland". PhD thesis. University of Glasgow, 2026.

Sher, Richard B. *Church and University in the Scottish Enlightenment: The Moderate Literati of Edinburgh*. Edinburgh University Press, 1985.

Sinclair, Sir John. *The Statistical Account of Scotland*. (21 vols.) W. Creech, 1791-1797.

Stewart, Michael. A, ed. *Studies in the Philosophy of the Scottish Enlightenment*. Oxford University Press, 1990.

Taylor, Bron. "Exploring Religion, Nature and Culture." *Journal for the Study of Religion, Nature and Culture* Vol.1 (2007): 5-24.

Whatmore, Richard. *The End of Enlightenment: empire, commerce, crisis*. Penguin, 2023.

White, Lynn. "The historical roots of our ecologic crisis." *Science* Vol.155 (1967):1203-1207.

Wilson, David B. *Seeking Nature's Logic: Natural Philosophy in the Scottish Enlightenment*. Penn State Press, 2009.

Wood, Paul B. "Buffon's reception in Scotland: the Aberdeen connection." *Annals of science* Vol.44 (1987): 169-190.

Wood, Paul B. *Thomas Reid on mathematics and natural philosophy*. Edinburgh University Press, 2017.

Adrian Shaw, PhD student, University of Glasgow.
ashaw@ecocongregationscotland.org