

Science, Empire, and Polymathy in Victorian Society:

George Douglas Campbell, The 8<sup>th</sup> Duke of Argyll

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I, Nathan Bossoh, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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## Abstract

This thesis investigates the scientific activities of the 8<sup>th</sup> Duke of Argyll, George Douglas Campbell (1823-1900), who was an important Victorian scientific aristocrat. Today the British aristocracy are predominantly perceived as a passive group whose contributions to society - predominantly stemming from the House of Lords - are at best minimal. The Victorian scientific aristocrats, in contrast, were known to be anything but passive. My thesis intends to provide a historical case study illuminating the life of one of these scientific aristocrats. Not only was Argyll a knowledge maker in his own right, I argue, but he also acted as a key facilitator, or broker, in knowledge networks dedicated to scientific and industrial advance across Britain and its growing empire.

Argyll is primarily known as an amateur gentleman of science, particularly vocal in his advocacy of theistic evolution. Yet due to this narrow conception most historians of science have largely overlooked other central aspects of his undertakings which ranged from ornithology, aeronautics, and geography, to anthropology, philosophical theology, and education. Thus, in providing a fuller picture of his engagements this case study will - for the first time - push Argyll's image beyond simply being seen as a critical contemporary of Darwin.

My thesis makes four arguments. Firstly, prior to the twentieth century, scientific authority was a product of birth, status, wealth and ability. Over time, birth, status, (and to some degree, wealth), became less important. Ability became

the primary means of securing scientific standing. As a result, the concept of the 'scientific aristocrat' slowly faded away. Secondly, Victorian aristocrats - theistic in their religious outlook – contributed to, and often created, the very conditions leading to the professionalisation of science and technology. Most crucially, their wealth enabled them to continue a pre-Victorian amateur tradition - known as "country house science" – whilst actively advocating for the institutionalisation of science and technology. Thirdly, in addition to the domestic space, government appointments provided key routes through which aristocrats such as Argyll could promote and legislate both science and technical education in Britain and throughout its empire. Thus, the complex and constantly shifting dynamics at play between the state and state actors, in the context of nationalism and imperialism, is an important theme in the history of late-Victorian science to which aristocrats form part of the picture. And fourthly, Argyll's polymathic involvement in areas as diverse as science, industry, theology, philosophy and education strongly imply that we should resist applying an overtly homogenous understanding regarding the engagements of the aristocracy. An analytical approach enables us to see the Victorian scientific aristocrats primarily as individuals interested in science and technology who happened to be connected through hereditary status.

## Impact Statement

My thesis has wide beneficial use in multiple domains. The core of my research is not simply to investigate the life of a Victorian aristocrat, but rather to provide historical insight into potential ways of illuminating the contemporary relationship between elite culture and the globalisation of science, technology and innovation. I conduct this task through a case-study analysis which leads me to larger concluding questions. Thus, although not addressing this directly, my thesis begins to point towards future methods of developing diachronic perspectives which relate to today's entrepreneurial meritocratic individuals and their use of science and technology to advance varying ends.

My project opens future research directions within the field of history of science, predominantly, more detailed analyses of the function/s of the aristocratic class in the development of modern science and technology through empire. And it also challenges the field of history of science and religion to take a more intersectional approach. More specifically, displaying greater awareness of themes such as empire, race, and technology as embedded aspects within the broad study of science and religion.

My thesis also has the clear potential to lead to academic articles, to which I already have two papers published. Furthermore, an academic book which explores

and illuminates the relationship between elite culture and global developments in science, technology and innovation would be highly beneficial to the academic field. Its specific significance would be in highlighting the explicit and implicit parallels which continue to exist between the Victorian scientific aristocratic class and the present day entrepreneurial meritocratic class.

Beyond the immediate academic landscape my work holds value within the wider policy sector. In recent years a growing number of historians have been actively engaging their work with government and policy – this is sometimes referred to as ‘applied history’. Science and technological innovations have become increasingly centralised components of our lives. Therefore, policy makers, civil servants, and academic historians would benefit from working alongside each other with the aim of gaining a better understanding of the benefits and pitfalls of our current dependence on science and technology in a globalised landscape. Through policy related journals such as *History & Policy* and the *Journal of Applied History* I am able to adapt my work - utilising methodological approaches from applied history - towards a non-academic policy engaged readership.

Finally, my research has potential impact within the Think Tank sector. Think Tanks - such as RAND (Research and Development) and Chatham House - are encouraging nuanced research into the ways in which societal relations, on national and international scales, are being shaped and re-shaped by scientific and technological innovations, especially with the rise of non-state actors. My work is primed to engage in these studies offering the crucial historical component largely absent in many Think Tank research outputs.

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A special thanks is reserved for my two official supervisors, Frank James and Joe Cain, and also my unofficial supervisor Efram Sera-Shriar. Each has been of immense value to my personal growth as an academic and I have cherished their expertise and friendship over the years.

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## **Introduction**

Over the last fifteen to twenty years a particular set of wealthy figures have played an increasing role in the development and distribution of science, technology and innovation. Their impact has already been felt across the world and international relations scholars have been quick to warn that this phenomenon is only set to expand in coming years.<sup>1</sup> These figures, otherwise known as tech billionaires, include the likes of Mark Zuckerberg, Bill Gates, Jeff Bezos, Elon Musk and so on, and they have become the associated faces of Big Tech companies such as Meta (formerly Facebook), Microsoft, Amazon, SpaceX etc. Virtually all these well-known tech billionaires are entrepreneurial meritocrats who envision science and technology as the best means to shape (and reshape) human interaction and progress. Yet as a result of their exclusive success legislators have been forced to take significant measures in developing regulation policies<sup>2</sup> precisely because these tech billionaires have gained such a global monopoly with no direct governmental accountability. Global risk analysts such as Professor Maha Hosain Aziz call this phenomenon the rise of the ‘non-state actor’. That is to say, globally influential figures who sit outside the bounds of state control.<sup>3</sup>

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<sup>1</sup> Seyle, C., Weiss, T. G., Coolidge, K., 2013. *The Rise of Non-State Actors in Global Governance: Opportunities and Limitations*. [online] One Earth Future: Available at <https://oneearthfuture.org/publication/rise-non-state-actors-global-governance-opportunities-and-limitations>>. p.10 [Accessed 2 June 2022].

<sup>2</sup> A few examples include GDPR which came into effect in 2018, and the Digital Markets Act and Digital Services Act which both reached an agreed consensus across the EU in the early months of 2022.

<sup>3</sup> Future World Order., 2020. *Keynote Speech on our Global Legitimacy Crisis at the Convoco Forum in Salzburg, July 2020*. [video online] Available at <https://www.youtube.com/watch?v=9QT8lpPsgx4&t=1065s> [Accessed 2 June 2022].

The term ‘globalisation’ is commonly used to describe the scale at which interaction (social, political, religious, trade etc) has developed and occurred over the last few centuries. However, amongst scholars it is contested what the term actually constitutes and there is no unified consensus as to when globalisation began.<sup>4</sup> Despite this, scholars are in agreement that science, technology, and innovation have been major tenets of globalisation, and this works to my advantage. Narrowing my own focus to the role of science, technology and innovation means that I can situate this thesis within a more definite period of history and region of the world. Adopting this narrower approach, historians and economists have placed much emphasis on the meritocratic class of the nineteenth and twentieth centuries when trying to understand the shift that took place from ‘small scale’ to ‘large scale’ science, technology and innovation (also known as Big Science)<sup>5</sup> with much of the regional attention placed on North America. There is good reason for this of course. Today the United States is the richest economy in the world, has the highest publication output of any country, and the vast majority of tech billionaires (as noted above) were born in, or, at some point, migrated there. However, this focus has meant that a specific group of preceding figures has been comparatively neglected in the literature. Yet, an analysis of this group’s activities reveals to us that science was an activity open to a very different social class as compared to today.

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<sup>4</sup> Steger, M. B., 2017. *Globalization: A Very Short Introduction*. 4th Edition. Oxford. OUP. pp.18-21.

<sup>5</sup> Agar, J., 2012. *Science in the 20<sup>th</sup> Century and Beyond*. Cambridge: Polity Press. pp.330

Situated in nineteenth-century Victorian Britain, members of this group did not consist of the meritocratic class (as with the names above), but rather the *aristocratic* class. Often perceived today as a passive group whose contributions to society (predominantly stemming from the House of Lords)<sup>6</sup> are at best minimal, the Victorian scientific aristocrats, in contrast, were known to be anything but passive. My thesis intends to provide a historical case study illuminating the life of one of the numerous Victorian scientific aristocrats, therefore, this thesis explores the cultural history of modern science and technology in Britain and its empire through the lens of the 8<sup>th</sup> Duke of Argyll. He was a Victorian aristocratic polymath who today is primarily known by historians of science for his involvement in scientific debates surrounding evolutionary theory and geology. Yet despite this limited perception, Argyll was in fact involved in a myriad of fields ranging from ornithology, aeronautics, geology and geography, to evolution, anthropology, education and philosophical-theology. Through this thesis I will investigate previously hidden aspects of Argyll's work, his impact on Victorian scientific society, as well as his wider influence on science and engineering throughout the British empire – all of which have been hitherto neglected in the scholarship.

A wealthy landowning aristocrat might seem like an unusual individual to investigate in attempting to reveal particular trends in the history of modern British science, but this couldn't be further from the truth. Taking a step back for a moment,

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<sup>6</sup> Many aristocrats do in fact still retain a great deal of local influence and so the passive view of contemporary aristocrats is not a true reflection in itself. ; In 1997 the Labour government introduced the House of Lords Bill. In 1999 after a compromise was reached on the Bill due to criticism by the Lords, it reached Royal Ascent meaning that from then onwards only 92 hereditary peers could remain in the House of Lords for an interim period.

we in fact see that numerous Victorian aristocrats invested remarkable amounts of their time and wealth engaging in scientific and technologically innovative activities. For example, the third Earl of Rosse (1800 - 1867) constructed a giant telescope named the 'Leviathan' on his Irish estate which remained the largest in the world until 1917. The third Baron Rayleigh (1842-1919) became the second professor of the newly constructed Cambridge Cavendish Laboratory in the 1880s and in 1904 he was awarded the Nobel Prize in Physics for his discovery of argon. The 8<sup>th</sup> Duke of Argyll (1823 – 1900) - the focus of this thesis - was a founder and first President of the Aëronautical Society of Great Britain (founded in 1866), the first British society successfully established towards the purpose of fully controlled flying machines - what we know today as aeroplanes. These three in no way exhaust the plentiful enterprises that scientific aristocrats engaged in but they do provide an initial sense of the breadth and depth of aristocratic engagement. Argyll's activities fit within this pattern and thus, as a comparatively unexplored individual, an exploration of his engagements offers rich opportunities to further expose the varying historical connections between scientific practice, class, and the institutionalisation and politics of science, particularly as endeavours which functioned within the context of British imperial expansion.

Central to an understanding of Argyll is the fact that he was not only a knowledge-maker in his own right, but, that he also acted as key a facilitator, or broker of knowledge. This was aided through his own status in Victorian society as an aristocrat and actively undertaken through the numerous networks dedicated to scientific and industrial advance which he fostered throughout his lifetime. Importantly this means that Argyll's influence in specific areas such as science and

engineering should not be judged solely by his experimental efforts and individually published scientific papers. If we adopt this approach we overlook other notable aspects of Argyll's contributions which stemmed from his ability to effectively initiate, lobby for, and promote a wide range of scientific goals both on a national and imperial level.

### Positioning my academic interest – and a historiographical overview

My specific focus on Argyll came as a result of my search for a concrete PhD focus as my Masters degree was coming to an end in 2018. At that time I wanted to look at the history of science and religion specifically in relation to debates surrounding Darwinian evolution. This general interest was motivated by my Christian upbringing, particularly as a Ghanaian-British national raised in an African Church to which my parents are the pastors. I had often heard through various media sources that there was (at best) a tension or (at worse) an unresolvable clash between the biblical creation story and evolution and I wanted to know if this was true and how this “clash” had originated. Beyond the specifics of creation and evolution, I, like many academics coming from a Christian background, wanted to know how the general idea of inherent conflict between science and religion - known by academics as the ‘conflict thesis’ - had become so popular in the present,<sup>7</sup>

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<sup>7</sup> For decades historians of science and religion have argued and demonstrated that the conflict thesis is largely a historically modern fabricated myth. The historical scholarship of James Ungureanu is probably the most recent to provide a detailed explication of the origins of the ‘conflict thesis’ which he locates in both European and American Christian intellectual history. Despite this, amongst the general public, surveys continue to show that although there are a wide range of views across the Global North pertaining to the relationship between science and religion, the notion of conflict is still one of the most popular perceptions. See Spencer, N., White, H., 2022. *‘Science and Religion’: Moving away from the shallow end.* [pdf]: Theos Think Tank. Available at:

and if this conflict had always existed throughout history. In reading through the historical literature, I often came across references to the 8<sup>th</sup> Duke of Argyll who was usually quoted as a prominent contemporary critic of the theory of evolution. Despite this, Argyll himself did not outright reject evolutionary theory. My Masters degree had already taught me that the relationship between science and religion was far more complicated than simply one of conflict and that in reality science and religion often shared in a much more positive relationship. My sense was that through the 8<sup>th</sup> Duke of Argyll, I could explore creation-evolution debates and this would help me to gain a deeper grasp of the complicated relationship between science and religion.

That was the context for the beginning of my PhD, however, my finalised PhD thesis has transformed into something I never intended. I began my PhD with the plan to focus on scientific and religious debates around evolution, yet through my study of Argyll I have investigated a much wider range of themes alongside science and religion including education, engineering, race, empire. In retrospect the reason for this is very obvious. Since his death in 1900 there has only been one major study of the 8<sup>th</sup> Duke of Argyll. This was a PhD thesis completed by Dr Kirsteen Mairi Mulhern in 2006 which served as the first detailed biography of Argyll since the

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<https://www.theosthinktank.co.uk/cmsfiles/Science-and-religion-2-Exective-summary.pdf>  
[Accessed 14 June 2022]; also Pew research Center., 2015. *Religion and Science*. [online] Available at: <<https://www.pewresearch.org/science/2015/10/22/science-and-religion/>> [Accessed 14 June 2022]; also see Pew Research Center., 2017. *Religious Belief and National Belonging in Central and Eastern Europe*. [online] Available at: <<https://www.pewresearch.org/religion/2017/05/10/science-and-religion/>> [Accessed 14 June 2022].

publication of his own autobiography in 1906.<sup>8</sup> Beyond this no significant standalone work has ever been devoted to Argyll's wider scientific engagement thus his fuller life has remained largely understudied. This is unfortunate because recent years have seen some book length treatments of other scientific aristocrats. For example, *William Parsons, 3<sup>rd</sup> Earl of Rosse: Astronomy and the Castle in Nineteenth-century Ireland* was published as an edited collection by Charles Mollan in 2016. And in 2017 *Elizabeth Ilive, Egremont's Countess* was published by Sheila Haines, Leigh Lawson & Alison McCann. This is not to say that there have been no studies at all which have looked at aspects of Argyll's life and work beyond Mulhern's thesis. Rather the issue has been that because Argyll engaged in so many areas of Victorian society including, politics, theology, philosophy, education, economy, poetry, science, empire, slavery and race, it is difficult (if not impossible) to situate Argyll within one particular specialism. In other words, Argyll was a Victorian polymath, a practice that, during his time, was becoming more and more unfashionable. As will become evident through my chapters, numerous scholars today from disparate historical approaches have written on Argyll where he is relevant to their work. Thus, Argyll's name can be located in scholarship looking at specific areas of the history of Scottish education, and also the history of theology, and the history of imperialism, and landed aristocracy more generally. As my focus has been more situated on the scientific side, what did I discover in relation to the literature on Argyll and science?

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<sup>8</sup> The 8<sup>th</sup> Duke of Argyll's autobiography was published by his third wife Ina Campbell in 1906; Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh

Like the above, Argyll's name is scattered in the history of science literature, sometimes as a prominent actor and at other times as a lesser actor. Argyll's name has appeared primarily in the context of late-Victorian evolutionary debates. In James Moore's *Post-Darwinian Controversies* (1979) Moore included Argyll in his study of twenty-eight Christians who were contemporaries of Darwin. He labelled Argyll a "Christian Darwinist" since Argyll had accepted evolution via a divinely guided process of natural selection whilst continuing to defend the specialness of man.<sup>9</sup> In 1983 Peter Bowler's work on *The Eclipse of Darwinism* helped to further Argyll's position in evolutionary debates by labelling Argyll as one of the leading British theistic evolutionists of his time.<sup>10</sup> Just under a decade later John Hedley Brooke published his seminal work *Science and Religion: Some Historical Perspectives* (1991) - a book that has shaped a generation of historical scholarship on science and religion. In his chapter on evolutionary theory Brooke also mentioned Argyll in relation to other Darwinian contemporaries stating that "In Britain, the duke of Argyll, the Roman Catholic St. George Mivart (1827 – 1900) and the Unitarian William Carpenter (1813-85), without denying that evolution had occurred, each claimed that Darwin's mechanism of natural selection was inadequate."<sup>11</sup> Works as such set Argyll's image moving forward. Argyll was firmly connected to biology as one of the leading British proponents of theistic

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<sup>9</sup> Moore, J., 1979. *The Post-Darwinian Controversies*. Cambridge: CUP. pp.218-221

<sup>10</sup> Bowler, P. J., 1983. *The Eclipse of Darwinism*. Baltimore & London: The John Hopkins University Press. p.49

<sup>11</sup> Brooke, J. H., 1991. *Science and Religion: Some Historical Perspectives*. Cambridge: CUP. p.386.



evolution.<sup>12</sup> Connected to evolutionary theory Argyll is also listed as an amateur geologist who first made a name for himself through the discovery of fossil leaves embedded among basalt lava on the Island of Mull in the early 1850s. Unfortunately for Argyll his controversial geological opinions have outshone his actual geological works after the early 1850s. Although he published numerous respected papers on geology, scholarship has routinely focused on his first geological discovery and then shifted towards his undying belief in catastrophism against uniformitarianism (see chapter seven for details of this debate). Thus, over the last few decades Argyll's name has been most associated with debates surrounding evolutionary theory and geology.<sup>13</sup>

Beyond evolution and geology, Argyll's work on anthropology has received some attention in scholarship over the last few decades. One of the earliest accounts was written by Neal C. Gillespie in 1977. Gillespie's published paper looked at the 1860s and 1870s contest between the anthropologist and archaeologist John Lubbock, the Archbishop of Dublin, Richard Whatley, and Argyll in relation to theories of human progression and degradation. A year later George Stocking

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<sup>12</sup> Even Mulhern's PhD on Argyll features one chapter dedicated to science yet the majority of the chapter's focus is Argyll's evolutionary engagement.

<sup>13</sup> ODNB, 2009. *Campbell, George Douglas, eighth duke of Argyll in the peerage of Scotland, and first duke of Argyll in the peerage of the United Kingdom*. [online] Available at: <https://www.oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-4500> [Accessed 2 June 2022]; Dictionary Of National Biography, 1901. *Campbell, George Douglas*. [online] Available at: <[https://en.wikisource.org/wiki/Dictionary\\_of\\_National\\_Biography,\\_1901\\_supplement/Campbell,\\_George\\_Douglas](https://en.wikisource.org/wiki/Dictionary_of_National_Biography,_1901_supplement/Campbell,_George_Douglas)> [Accessed 2 June 2022]; Bowler, P. J., 1988. *The Non-Darwinian Revolution: Reinterpreting a historical Myth*. Baltimore & London: The John Hopkins University Press. p.183; ABVR.,2004. Argyll, George John Douglas Campbell, Duke of (1823 – 1900) In: Lightman, B. 2004. *The Dictionary of Nineteenth-century British Scientists, Volume 1*. Chicago: UCP.55-59

published *Victorian Anthropology* in which he labelled Argyll as one of the last defenders of an explicitly biblical anthropology based on the theory of degradation. Since the 1970s other scholars such as Edward Beasley and James Moore have continued to highlight Argyll's controversial engagements in the domain of anthropology with not much added beyond what Gillespie and Stocking had already discovered.<sup>14</sup>

Through the much more recent work of the historian Matthew Stanley, Argyll's philosophical work on miracles has also begun to emerge. In his 2011 paper on uniformity and the laws of nature in Victorian Britain, Stanley drew attention to Argyll's *Reign of Law* (1867) in which Argyll argued that miracles did not violate the uniformity of nature because miracles were not 'supernatural' acts but rather 'natural' acts of God. Stanley's 2011 article was an initial inspiration towards my own investigations which led to my 2021 publication which looked at Argyll's role as one of the leading proponents of what I have termed the 'neo-Newtonian' view of miracles.<sup>15</sup>

Other historians of science have begun to write about Argyll and his reputation in broader terms, but this is always in terms of another primary focus. In *The X Club*

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<sup>14</sup> Gillespie, N. C., 1977. The Duke of Argyll, Evolutionary Anthropology, and the Art of Scientific Controversy. *ISIS*. [e-journal] 68(1). Available through Jstor Library Website <https://www.jstor.org/stable/230372> [Accessed 2 June 2022]; Stocking, G., 1978. *Victorian Anthropology*. New York: The Free Press. p.149.; Desmond, A., Moore, J., 2009. *Darwin's Sacred Cause*. UK: Penguin Group. p.365; Beasley, E., 2010. *The Victorian Reinvention of Race*. UK and New York: Routledge. pp.112-128

<sup>15</sup> Stanley, M., 2011. The Uniformity of Natural Laws in Victorian Britain: Naturalism, Theism, and Scientific Practice. *Zygon Journal of Religion & Science*, [e-journal] 46(3), 536-560. <https://doi.org/10.1111/j.1467-9744.2011.01198.x>; Bossoh, N., 2021. Scientific Uniformity or "Natural" Divine Action: Shifting the Boundaries of Law in the Nineteenth Century. *Zygon Journal of Religion & Science*, [e-journal] 56(1), 234-253. <https://doi.org/10.1111/zygo.12678>

(2018) Ruth Barton mentions Argyll at various points in relation to the theme of cultural authority. In this context, Argyll's general scientific works may be seen as a result of his overall Christian apologetic. To take Matthew Stanley's terms Argyll sat within the camp of 'theistic science' and sought to push back against the rising notion of 'naturalistic science' during the latter half of the nineteenth century.<sup>16</sup>

Finally, within the areas of engineering, education and empire Argyll's influence has been noted although this has been minimal at best. His role in mid-Victorian aeronautics was mentioned by the historian Richard P. Hallion in his *Taking Flight* (2003) - a long durée history of the development of aerial navigation. Argyll's reference in this work is brief but important as it demonstrates how Argyll's role in the founding of the Aëronautical Society of Great Britain fits into the larger history of flight.<sup>17</sup> In addition, it serves to shift the focus away from Argyll's dominant reputation within the areas of evolutionary debate and geology. Lastly, Argyll's reputation as a promoter of Western scientific and technical education within the context of the British empire has remained largely overlooked. This is despite Brendan P. Cuddy's 1980 PhD thesis on the Royal Indian Engineering College (1871 – 1906) where Argyll features prominently. At the time of the college's foundation Argyll was Secretary of State for India and thus he was the one who gave it the go ahead. In 1994 Cuddy wrote an article which summed up his 1980 thesis in which Argyll was again highlighted.<sup>18</sup> Even so, most historians remain

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<sup>16</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP; Stanley, M., 2015. *Huxley's Church & Maxwell's Demon: From Theistic Science to Naturalistic Science*. Chicago and London: UCP.

<sup>17</sup> Hallion R. P., 2003. *Taking Flight*. Oxford: OUP

<sup>18</sup> Cuddy, B. P., 1980. *The Royal Indian Engineering College, Cooper's Hill, (1871-1906): A case study of State involvement in professional civil engineering education*. Ph.D. London University.;

unaware of Argyll's role in the promotion of scientific and technical education within the context of empire.

This historiographical overview reveals the current state of scholarship on Argyll in relation to science. Overall the image is currently very fractured and incomplete and this needs to be rectified. A more complete picture of Argyll's scientific activities is needed and this is a key purpose of my thesis.

### The Framework for my thesis and chapters

In undertaking this project my thesis, for the first time, pushes Argyll's primary image beyond that of just a critical contemporary of Darwin and a geologist. As a result of my examination I make four key arguments which relate to the role of the British aristocracy in the wider history of science during the latter nineteenth and early twentieth centuries. Firstly, prior to the twentieth century, scientific authority was a product of birth, status, wealth and ability. Over time, birth, status, (and to some degree, wealth), became less important. Ability became the primary means of securing scientific standing. As a result, concept of the 'scientific aristocrat' slowly faded away. Secondly, Victorian aristocrats - theistic in their religious outlook – contributed to, and often created, the very conditions leading to the professionalisation of science and technology. Most crucially, their wealth enabled them to continue a pre-Victorian amateur tradition - known as "country house science" – whilst actively advocating for the institutionalisation of science and technology. Thirdly, in addition to the domestic space, government appointments

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Cuddy, B., Mansell, T., 1994. Engineers for India: The Royal Indian Engineering College at Cooper's Hill. History of Education, [e-journal] 23(1), 107-123. <https://doi.org/10.1080/0046760940230107>. p.113

provided key routes through which aristocrats such as Argyll could promote and legislate both science and technical education in Britain and throughout its empire. Thus, the complex and constantly shifting dynamics at play between the state and state actors is an key theme in the history of late-Victorian science to which aristocrats form an important part of the picture. And fourthly, Argyll's polymathic involvement in areas as diverse as science, industry, theology, philosophy and education strongly imply that we should resist applying an overtly homogenous understanding regarding the engagements of the aristocracy. An analytical approach enables us to see the Victorian scientific aristocrats primarily as individuals interested in science and technology who happened to be connected through hereditary status.

An issue I have wrestled with during the course of my PhD relates to my understanding of Argyll. Argyll's engagements are so vast that I soon recognised that a PhD thesis would not provide enough space to investigate all aspects of his work. Furthermore, Argyll's scientific output has to be understood in connection with his religious and political views and activities - not to mention his status as one of the richest landowners in West Scotland. During my first year, I initially struggled trying to fit Argyll into a useful framework to which I could carry out my thesis. Fortunately, during that year I came across the work of the historian Donald Opitz. I learnt that during the early 2000s Opitz had undertaken a PhD thesis which focused on the Victorian scientific aristocrats as a general network. His thesis entitled *Aristocrats and Professionals: Country-House Science in Late-Victorian Britain* (2004) looked at the role of the aristocratic country house as a site of science during the rise of scientific professionalisation between 1850 and 1920. Opitz

argued that historical scholarship on late-Victorian and Edwardian science had overwhelmingly emphasised the importance of new institutional arrangements and the professional growth of science “largely owing to the initiatives of the British middle-class and the increasing support of research by the British government.” Thus few works had looked at the role of aristocratic individuals and their utilisation of the domestic space as a place of research.<sup>19</sup> Thus Opitz summarised that country-house science provided “a model for the study of science at home as well as within purpose-built sites; it was a distinctive vision and an enterprise that, amid social hierarchies governed by class and gender, encouraged broad participation within a dynamic intellectual milieu.”<sup>20</sup> In a 2006 publication Opitz wrote that much had been written on the history of government funded research institutions, such as the European Council for Nuclear Research (CERN) or the Royal Botanic Gardens, Kew. But that the forerunners to these intuitions had been comparatively ignored. Yet if scholars all agree that a shift from ‘small’ science to ‘Big’ science took place during the twentieth century “we might ask what were those forerunner institutions and what became of them?”<sup>21</sup> Opitz’s work discusses Argyll but to a very limited extent, primarily because access to the Argyll archives has been very limited until much more recently.<sup>22</sup> Much of his thesis is thus situated around families such as

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<sup>19</sup> Opitz, D., 2004. *Aristocrats and Professionals: Country-House Science in Late-Victorian Britain*. Ph.D. University of Minnesota. p.ix

<sup>20</sup> Ibid., p.ix

<sup>21</sup> Opitz, D., 2006. ‘This House is a Temple of Research’: Country-House Centres for Late Victorian Science. In Clifford, D., Wadge, E., Warwick, A., Willis, M., eds. 2006. *Repositioning Victorian Sciences: Shifting Centres in Nineteenth-Century Thinking*. Cambridge: Anthem Press. Chapter 12. p.143.

<sup>22</sup> This is certainly a key reason as to why limited work on Argyll has been carried out. Mulhern said herself that she didn’t have access to the Argyll papers and so had to base her thesis completely on

the Balfours and Rayleighs. This ended up being useful for me because by the time I began my own thesis the Argyll archives had opened to public use. Opitz's thesis essentially contextualised my thesis for me - I could now situate Argyll within the broader framework of theistic Victorian aristocracy and country-house science.

With the above framework provided I have been able to situate Argyll and his science within the domestic context. However, my study on Argyll has also led me to move beyond the domestic space in order to consider the various geographies, or locations, of science that were available to an aristocrat like Argyll. As such *Chapter one* acts as an introduction to Argyll through a contextual analysis. I first explore what, since his death, has led to the erasure of knowledge about him in the contemporary world before proceeding to examine his birth, childhood, and teenage years until just before his succession to the Dukedom in 1847. In this chapter we learn about Argyll's education, his early love of natural history, the influence of his mother and father, and his entrance into political life. We also learn about his marriage, his tour across Europe and Africa, the crofting issues during the potato famine, and his ascent into the British scientific network.

Whilst chapter one takes a more generalised approach to Argyll, the next four chapters focus on specific themes. *Chapter two* homes in on Argyll's role in the passing of the Scottish Education Act of 1872. In this chapter we see that by 1855 Argyll had established himself amongst the British scientific network and that better education for the young had become of huge concern for him. Argyll thus used his parliamentary position in the House of Lords to push various scientific and

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his published and publicly accessible writings, Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh. p.7.

educational ends. Most successfully he promoted a Bill which dropped religious tests at Scottish universities so that more non-conformists (and as a result more men of science) could teach at Scottish universities. Even more significantly, Argyll was also behind the Scottish Education Act of 1872 which made education mandatory for children aged between five and thirteen.

*Chapter three* shifts from the national educational context to the imperial educational context. In this chapter I look at Argyll's part in the establishment of the Royal Indian Engineering College (RIEC) (1871 – 1906) as Secretary of State for India between 1868 and 1874. The primary task of the RIEC was to train British teenage boys for the civil engineering service in the Indian Public Works Department during the British Raj. I look at the fractured nature of the RIEC's opening as a college which served both national and imperial ends to which imperial visions of education and progress largely overshadowed indigenous Indian visions of education and progress. However, in this chapter I also demonstrate how Argyll's cabinet position – effectively as the Head of India – provided him with the power to create scientific positions to which British men of science could and did take up. We thus come to understand Argyll as both a creator and facilitator of Western scientific and technical education, and how empire was entangled in such grand visions.

In *Chapter four* we move from civil engineering to aerial engineering. Bringing an aspect of his life to light which has been almost completely neglected to date, I explore Argyll's ventures in the world of aerial navigation as a founder and first President of the Aëronautical Society of Great Britain (1866), the first British society dedicated to the study of aerial navigation. Argyll's principle contribution



came not in the form of practical engineering capabilities but in the form of attempts to demystify the principles of bird flight. His theistic tendencies were clearly intertwined believing that humans could come to understand the principles of bird flight because God had imbedded them in nature to which we, as His creations, had the capability to decipher. Therefore, once the principles of bird flight were unlocked we could then apply them to the construction of flying machines. Although Argyll did not live to see the birth of the aerial age, I show how his activities remained influential during the early 1900s and likely contributed to the Wright Brothers's first successful flight of 1903.

Staying with the theme of religious belief *chapter five* goes to the core of Argyll's philosophical and religious understanding in relation to science and miracles. During a period where a growing number of individuals and groups (including agnostics, liberal Christians and atheists) had begun to feel that that scientific explanations had ruled out the possibility of divine action, I show that Argyll, in his capacity as a philosopher and theologian, constructed an understanding of miracles in line with what I call the 'neo-Newtonian' perspective. This, for Argyll, successfully accounted for the continuation of miracles in an age of Huxley and Tyndall.<sup>23</sup> This chapter also introduces the effects of biblical historical criticism in the science and religion discourse of the nineteenth century.

Continuing with the theme of religion but transporting it from the arena of miracles to the context of slavery and anthropology, *chapter six* situates Argyll within the wider debates around the African slave trade and anthropological justifications. In this chapter I explore the late eighteenth- to early twentieth-century

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<sup>23</sup> See chapters five and seven for more details on the naturalists John Tyndall and Thomas Huxley.

context to which Argyll's own input is located during the 1860s and 1870s. I trace the emergence of eighteenth-century ethnology to the mid-Victorian period showing along the way how German biblical critical thought mirrored Edward B. Tylor's stages of cultural evolution. As a young boy Argyll himself had been indifferent to the problem of slavery, yet by adulthood he had become a major advocate for abolition. Aided by his anthropological knowledge as well as personal connections to Harriet Beecher Stowe, author of *Uncle Tom's Cabin* (1852), Argyll's theological anthropology also served as one of the earliest philosophical critiques of the newly emerging Tylorian anthropological framework.

Like chapter one, *chapter seven* once again takes a wide approach to Argyll through three case studies situated around the topics of: debate, cultural authority and legitimacy. In the first case study I provide a general assessment of Argyll's position and contribution to evolutionary debates, mostly through an assessment of his philosophical contest with Herbert Spencer during the 1890s. I then move on to the topic of cultural authority by exemplifying the ways in which the contentions between 'theistic science' and 'naturalistic science' played out in the writings of Huxley and Argyll also during the late-Victorian period. My third case study then promptly disrupts this image of Argyll as predominantly a scientific combatant by documenting his role during the 1890s as one of the initiators and supporters of Britain's first major 'Discovery' expedition to Antarctica (1901 – 1904). Unlike the first two sections Argyll's geographical involvement was largely devoid of the controversy usually highlighted by historians of science and we in fact find Argyll working seamlessly alongside his usual opponents to further the goal of Antarctic exploration.

### Limitations and future directions

Limitation to my thesis abound. There are many articles published by Argyll (or relating to Argyll) which address various aspects of science, technology, religion and so on that I have not discussed here. Some of these articles relate to the general topics I have discussed, such as race, evolution and cultural authority. However, there are also articles which take us into newer regions of Argyll's thoughts such as his writings on the origin of language in conjunction with Max Muller, or his debates with scientific naturalists such as George John Romanes, and E. Ray Lankester. During 2019 I had begun archival work at the Geological Society of London in order to expand knowledge of Argyll's geological engagement beyond his first major discover. However, those plans were halted by the arrival of Covid-19. Therefore, unfortunately, I have not been able to say much more about Argyll's geology beyond what is already known. Likewise, the onset of Covid-19 meant that any planned trips to the Inveraray Castle archives were all cut short as I lost access to those archives for almost two years. Thus ironically, although I am one of the first scholars conducting a significant project on Argyll to have public access to Inveraray archives, I in fact have not been able to access the records as expected. Finally, Argyll also published numerous books which I was not able to fully explore such as *Scotland As it Was and As It Is* (1887) and *The Unseen Foundations of Society* (1893). Because my focus was on the scientific and technological side I prioritised the reading of certain books. However, it would certainly be of use to read his many other works such as those listed above and more as they would provide an even more rounded picture of Argyll's life and thoughts. Nevertheless,

I am confident that this thesis does contribute something new not just to our knowledge of Argyll, but to our wider knowledge about the culture of Victorian science and who participated in it.

## **Chapter 1 – Formative years and the makings of a scientific aristocrat**

If there is any use in autobiographies, it is that they should reveal those personal elements which count for so much in the opinion and in the conduct of men<sup>24</sup>

George Douglas Campbell, the 8<sup>th</sup> Duke of Argyll, wrote this in his autobiography during the final years of his life. Within three years of penning of these words, at the age of seventy-six, he passed away in Inveraray Castle on 24<sup>th</sup> of April 1900. Following Argyll's death numerous letters of condolences were sent to his family; to many Victorians this moment constituted a great loss to British society. Argyll indeed exerted a profound impact nationally and internationally ranging from religion, philosophy and science, to politics, education, and imperialism. In one letter sent to Argyll's son (Lord Lorne, who became the 9<sup>th</sup> Duke), William Thomson (Lord Kelvin) - a close friend of Argyll's and a scientific peer – wrote that Argyll was “always full of kindness and interest through a wide range of subjects.”<sup>25</sup> Equally the University of St Andrews – of which Argyll became Chancellor from 1851 until his death – stated that he was a “statesman of the first rank”, one of the most polished orators of his time “and an eminent man of science.”<sup>26</sup> After a brief review of his life-work in geology the Edinburgh

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<sup>24</sup> 8<sup>th</sup> Duke of Argyll., 1906. *Autobiography and Memoirs*. Vol I. London: John Murray. p.167

<sup>25</sup> Inveraray Castle archives, Bundle 1633

<sup>26</sup> Argyll, *Autobiography*, II: 588

Geological Society remarked that Argyll indeed could have attained an even higher rank as a geologist, had his interests not been so divided, “In reviewing the Duke’s geological work one cannot help express a feeling of regret that an observer so able...could not have given the subject a larger share of his attention.”<sup>27</sup> But whilst personal letters and writings were warm towards Argyll, we find that dictionary entries have since painted him in a less positive light. Argyll’s entry in the *Dictionary of National Biography* (DNB) written by George Peel and Archibald Geikie in 1901 concluded by stating that although he undoubtedly exerted a useful influence on the scientific progress of his day, “the Duke of Argyll can hardly be ranked as a man of science”.<sup>28</sup> Perhaps unsurprisingly then Argyll’s most recent Oxford DNB entry (2004) written by H. C. G. Matthew takes a similar approach when it comes to his scientific output. Matthew writes that from the 1850s Argyll’s works on science and society “were characterized by a confidence which was impatient of understanding other opinions and arguments.” Even worse is the following comment where Matthew remarks that “his scientific writings, especially, became intemperate, relying increasingly on point scoring.”<sup>29</sup> Finally we can look to Argyll’s entry in *The Dictionary of Nineteenth-Century British*

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<sup>27</sup> Goodchild, J. G., 1903. Obituary notice of the Duke of Argyll, Patron of the geological Society of Edinburgh. *Transactions of the Edinburgh Geological Society*, [e-journal] 8(2),176-181. <https://doi.org/10.1144/transed.8.2.176>. p.181

<sup>28</sup> DNB, 1901. *Campbell, George Douglas*. Vol 1. [online] Available at: <[https://en.wikisource.org/wiki/Dictionary\\_of\\_National\\_Biography,\\_1901\\_supplement/Campbell,\\_George\\_Douglas](https://en.wikisource.org/wiki/Dictionary_of_National_Biography,_1901_supplement/Campbell,_George_Douglas)> [Accessed 6 June 2022]

<sup>29</sup> ODNB, 2004 [2009]. *Campbell, George Douglas, eighth duke of Argyll in the peerage of Scotland, and first duke of Argyll in the peerage of the United Kingdom*. [online] Available at: <https://www.oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-4500> [Accessed 6 June 2022]

*Scientists* also published in 2004. In this edited dictionary Argyll was not necessarily painted in a negative light, rather vast amounts of his scientific works were simply omitted. As a result Argyll is severely misrepresented. This can immediately be noticed by reading erroneous statement such as “Argyll’s impact on science was negligible at best.”<sup>30</sup> As the various chapters in this thesis will demonstrate, whilst these positions are perhaps understandable at their time of writing, they do not truly reflect Argyll’s engagement and wider influence in the areas of science and society.

The immediate question to ask is: why have personal addresses to him and his family been more positive, whereas dictionary entries (which are widely read) have been less positive? I would suggest three primary reasons for this. The first is the indirect fault of Argyll himself, namely, the fact that during his lifetime he developed a reputation as a Victorian polymath. Argyll’s interests took him across many fields of enquiry. However, this meant that he could never concentrate in one area of speciality. This issue becomes all the more pertinent when we realise that the nineteenth century was an age of increasing specialisation across Europe. With the explosion of knowledge caused by the steam printing press and the growing British empire, as well as the proliferation of new societies, associations and academic journals, it became less and less fashionable (and less possible) for one person to hold vast amounts of knowledge across varying domains. Instead, just as the ‘division of labour’ proposed by Adam Smith took hold of the modern industrial workforce, the ‘division of knowledge’ also increasingly took hold of the modern

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<sup>30</sup> Anon., 2004. Argyll, George John Douglas Campbell, Duke of (1823 – 1900) In: Lightman, B. 2004. *The Dictionary of Nineteenth-century British Scientists, Volume 1*. Chicago: UCP. p.58

intellectual mind.<sup>31</sup> As Peter Burke summarises in his own assessment of polymaths “By the late nineteenth century, the cultural climate was becoming less favourable to wide-ranging scholars”.<sup>32</sup>

The second reason brings us to Geikie, one of the authors of Argyll’s 1901 DNB entry. As mentioned, Argyll was worked in many areas of science, society and religion and it is difficult to summarise all his work.<sup>33</sup> The end of the nineteenth century was the age of specialism and the rise of scientific professionalisation. Things begin to make sense when we discover that Geikie was himself a professional geologist who disagreed with Argyll’s catastrophist view.<sup>34</sup> It is reasonable to assume that Geikie wrote the scientific section of Argyll’s DNB entry whilst Peel wrote the political section (Peel was himself a British politician and writer on economics and politics). As such, it is also reasonable to assume that Geikie saw Argyll’s failure to abandon catastrophism as a mark of scientific incompetence. Secondly, Geikie and Peel’s entry also either missed or omitted many of Argyll’s other scientific and religious pursuits such as his ornithological work (chapter 4) and his philosophico-theological works (chapter 5). Both 2004

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<sup>31</sup> Smith, A., 1776. *The Wealth of Nations*. London: W Strahan and T. Cadell ; and also Knight, D., 2009. *The Making of Modern Science*. Cambridge and Malden: Polity Press. pp.82-3

<sup>32</sup> Burke, p., 2020. *The Polymath: A Cultural history from Leonardo da Vinci to Susan Sontag*. New Haven and London: Yale University Press. p.127

<sup>33</sup> Even within my own thesis I have been forced to leave out many aspects of Argyll’s scientific and religious works which I would otherwise have wished to include purely due to space limitations.

<sup>34</sup> Catastrophism, broadly conceived, was the nineteenth-century idea that the world had been inundated by floods numerous times over the course of its history, these inundations being the primary cause of earth’s geology.



entries on Argyll discuss similar aspects to Geikie and Peel whilst overlooking similar parts that they too overlooked.

The third and final reason relates to Argyll's own autobiography which encompasses two volumes. Argyll begun writing his autobiography in 1897 which left him only three years before he passed away. Because of this volume one is entirely written by Argyll, however, only 1/6<sup>th</sup> of volume two is written by him. From chapter thirty-one of volume two onwards Argyll's third wife Ina Campbell took over, as she put it, the "unfinished 'Autobiography' of the Duke of Argyll".<sup>35</sup> By the time Argyll passed away he had documented his life up until the year 1857; this is where Ina picked up from. Therefore 5/6<sup>th</sup> of volume two is written by Ina Campbell. It is important to be aware of this because although Ina actively attempted to record crucial parts of Argyll's scientific ventures and networks, nonetheless, major aspects of his scientific engagements were diminished or completely omitted. Since Ina was only married to Argyll for five years before his death, she - for the most part - did not have direct knowledge of many his wide-ranging scientific activities and so had to piece together chunks through various avenues such as correspondence, public speeches, and Argyll's personal writings.<sup>36</sup>

Since autobiographies are a key primary source of information about an individual's life, historians who have investigated aspects of Argyll's scientific life have often turned to his two-volume autobiography. Yet my thesis brings to light three specific areas of his engagement which are either ignored or completely omitted by Ina. These being, 1) his role in the establishment of the Royal Indian

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<sup>35</sup> Argyll, *Autobiography*, II: 93

<sup>36</sup> Argyll, *Autobiography*, II: vii-viii

Engineering College (chapter 3) - to which only one page in the autobiography is dedicated, 2) his role in the formation of the Aëronautical Society of Great Britain (chapter 4) - to which there is no significant discussion. And 3) his role in the promotion of the 'Discovery' Expedition (chapter 7) – to which again there is no significant discussion. Since 1901, historians have almost consistently neglected these ventures and an obvious reason as to why is because the autobiography itself did little to address them.

With this in mind we must ask, what exactly led to Argyll's investigation of so many areas? What fascinated him about the sciences? And how did his religious upbringing influence his views? This chapter will examine these questions through a focus on Argyll's formative years, specifically from his birth to his first major scientific discovery in 1851 where a new phase of his life began.

Finally, as an aristocrat Argyll was part of the elite class within British society and this has important implications for what can be known about him. Unlike the vast majority of Victorian children born into working-class or lower-middle-class conditions, there is an abundance of preserved information about the aristocrats and their early years. This is mainly in the form of autobiographies and/or their lives and letters compiled by sons, daughters, or spouses. In Argyll's case his autobiography provides us with a wealth of insight into his early years and because of this the majority of this chapter will be based upon these. Yet as a warning to readers, it is incorrect for us to see the aristocratic upbringing as representative of the upbringing of the average Victorian child. This is because differences in class, gender and race accounted for drastically different living conditions. This is not to say that we cannot learn anything about Victorian childhood through the aristocrats,

but it is to say that we should practice caution when trying to understand Victorian childhood through the preserved records of the aristocrats.

#### A cultured family background

The 8<sup>th</sup> Duke of Argyll came from a well-cultured family background which included strong links to Inveraray, a town in Scotland about sixty-four miles North West of Glasgow. During the eighteenth century Archibald Campbell, the 3<sup>rd</sup> Duke of Argyll (1682-1761), was at the forefront of Scottish town planning and education.<sup>37</sup> The 3<sup>rd</sup> Duke - who supported the 1707 Act of Union - was a member of the Honourable Society of Improvers (founded in 1723) which was the first agricultural society in Europe, based in Edinburgh. The Society of Improvers was principally aimed at the agricultural, economic and national improvement of Scotland, and even though the Society of Improvers had disbanded by 1746<sup>38</sup> it was out of such societies and the connections formed within, that the foundations of Inveraray town emerged under the guidance of the 3<sup>rd</sup> Duke from the 1740s onwards. This mid-eighteenth-century Scottish (mainly landed) movement was part of a larger Enlightenment ideal of Scottish progress and modernisation. That the 3<sup>rd</sup> Duke was heavily invested in the New Town of Inveraray is evidently seen by the fact that he spent on average, around £3000 a year from 1743 until his death in

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<sup>37</sup> Chapter two will discuss the 3rd Duke's role in the forming of the Edinburgh Medical Faculty in Edinburgh University during the 1720s

<sup>38</sup> Bonnyman, B., 2012. Agrarian Patriotism and the Landed Interest: The Scottish 'Society of Improvers in the Knowledge of Agriculture', 1723-1746. In: Stapelbroek, K., Marjanen, J., eds. 2012. *The Rise of Economic Societies in the Eighteenth Century: Patriotic Reform in Europe and North America*. Hampshire: Palgrave Macmillan. pp.26-51

1761.<sup>39</sup> The designs for a new Inveraray Castle were put into action not long after the plans for the New Town also in the 1740s by the 3<sup>rd</sup> Duke (the castle itself being for the most part completed by 1760).<sup>40</sup> Prior to the development of the new castle, the 3<sup>rd</sup> Duke had initially planned to repair and restore the old castle. However, after reading a report (completed in 1744 by William Douglas, mason at Inveraray) on the state of the old castle, the 3<sup>rd</sup> Duke shifted focus and began plans for a fresh Castle. This castle would become the new seat of the Argyll family, a seat which continues to serve this purpose till the present.

Further evidence for the well-cultured background of the 8<sup>th</sup> Duke is seen by the types of visitors that the previous Argylls hosted at their Inveraray castle. For example, in 1773 Samuel Johnson (1709-1784), the distinguished author and lexicographer, visited the 5<sup>th</sup> Duke and Duchess at Inveraray castle. The visit occurred during the period when the construction of the New Town of Inveraray was well underway, and, just like the 3<sup>rd</sup> Duke, the 5<sup>th</sup> Duke played a central role in its continued development. During his time in Inveraray Castle Johnson spent an enjoyable evening with the Argylls in the Castle's north drawing-room which was furnished with "French furniture of Louis XVI era" and "Shepherds and

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<sup>39</sup> Gibbard, M., 2019. *Improving the Nation: investigating the principles of improvement in the new planned settlements of rural Scotland, c1700-1815*. Ph.D. University of Dundee. p.73

<sup>40</sup> Tindley, A., Gibbard, M., Diamond, A., 2019. Archived in the landscape? Community, family and partnership: promoting heritage and community priorities through the Argyll estate papers. *The Journal of the Archives and Records Association*, [e-journal] 40(1), 5-20. <https://doi.org/10.1080/23257962.2019.1567305> ; Cornforth, J., Hughes-Hartman, G., 1994. *Inveraray Castle: Home of the Duke and Duchess of Argyll*. Derby: Pilgrim Press. p.2 ; Gibbard, M., 2019. *Improving the Nation: investigating the principles of improvement in the new planned settlements of rural Scotland, c1700-1815*. Ph.D. University of Dundee. p.80

shepherdesses on the gay tapestry panels”, no doubt adding to the castle’s atmosphere of cultured nobility.<sup>41</sup>

In 1784 (the year of Dr Johnson’s death) another distinguished figure stopped by the Argyll abode whilst en route towards Staffa, an Island in Scotland, as part of a geological investigation. James Smithson (1765-1829), the English chemist and mineralogist, who later funded the establishment of the Smithsonian Institute, sojourned at Inveraray Castle with his travelling companions in early September of 1784. During his stay at the castle Smithson and his team dined with the Argylls where “French was spoken at their dinners, food was prepared by an excellent French cook, and French wines, tableware, and table manners were employed at all times.” Before continuing on his journey to Staffa the 5<sup>th</sup> Duke provided useful advice about the best route to take to arrive safely. Even going so far as to provide Smithson with a letter of introduction which would enable him and his companions to stay at the house of a man who lived in close proximity to their intended destination.<sup>42</sup>

Thus, through these selective examples above it becomes clear that since at least the eighteenth century the Argyll family had firmly cemented themselves as influential Scottish cultural figures and it was within this context of respectability, influence, hospitality, and leadership that George Douglas Campbell was born.

#### The formative years: family, natural history and the domestic laboratory

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<sup>41</sup> Campbell, A., 1885. *Records of Argyll*. Edinburgh: W. Blackwood. p.28

<sup>42</sup> Turner, S., 2020. *The Science of James Smithson*. Washington, DC: Smithsonian Books. pp.15-20

George Douglas Campbell, later the 8<sup>th</sup> Duke of Argyll, was born in Ardencaple Castle, Dunbartonshire on the 30<sup>th</sup> of April 1823. (Figure 1)



Figure. 1. Stipple engraving of George Douglas Campbell in 1853 aged 30, by James Rannie Swinton. © National Portrait Gallery.

He was the second oldest in a household of four born to John Campbell (1777-1847) - the third son of the 5<sup>th</sup> Duke of Argyll - and his second wife Joan Glassel (1775-1828) - the daughter of John Glassel who was a major Scottish figure in Virginia's tobacco economy.<sup>43</sup> Due to pregnancy complications after giving birth to her fourth child Glassel passed away in 1828 when George was just five years old. In fact, as we shall see, George's early life was surrounded by a number of tragic family deaths which certainly affected his upbringing. His youngest sister who barely lived to the age of one would pass away around the same period as his mother, leaving George with his brother John, sister Emma, and father. Although severely ill, before her death Joan Glassel was determined to instil religious principles in her children's lives. Whilst being treated for her illness by Anne Cunningham – who later become the third wife of John Campbell - at Clyde Villa, Joan asked for her sons to read the scriptures to her every night and morning. She also gave each of her sons a bible to read in order that they could cultivate their moral values alongside a strong Christian faith, something that was certainly not lost on George during his lifetime.<sup>44</sup> John Campbell, on the other hand was never one to open up much about faith, but as a man dedicated to the sciences, he sought to cultivate a spirit of natural enquiry in his children. Young George seems to have adopted his father's love of nature from an early age. He was delighted to receive a telescope from his father with which he regularly used to observe birds from a

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<sup>43</sup> See chapter six for more details on the Glassel family and their connections to slavery

<sup>44</sup> Argyll, *Autobiography*, I: 60

distance and listen to their distinguishing songs.<sup>45</sup> In his autobiography Argyll mentions that “at a very early age, how early I cannot quite remember, I began to write careful notes of every day’s observations on my favourite pursuit [ornithology]”.<sup>46</sup> The earliest records of these observations I have located are documented in diary notes he made from 1835 to 1836, at the age of twelve.<sup>47</sup> The large Dunbartonshire family house and grounds provided the Campbells with a form of private laboratory in which to observe natural phenomena and experiment upon them. This style of aristocratic domestic science would be pursued with vigour throughout the Campbells’ lives. It is interesting to note how young George’s love of nature stands in stark contrast to his aristocratic contemporary Robert Gascoyne-Cecil, later Lord Salisbury (1830 - 1903).<sup>48</sup> In Lord Salisbury’s biography his daughter notes that during his early years in Hatfield House Robert was totally

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<sup>45</sup> Argyll, *Autobiography*, I: 70 ; Telescopes seem to be a common theme within the scientific aristocratic circle. For example, on 2<sup>nd</sup> July 1792 a letter from the 2<sup>nd</sup> Viscount Palmerston to William Man Godschall mentioned his “largest Telescope which is in Hampshire”. See Southampton University Broadland Archives, MS62/BR/13AA/1/1/17; Equally, and far better known is the Leviathan telescope owned by the 3<sup>rd</sup> Earl of Rosse at Birr Castle, Ireland, which was the largest telescope in the world from the 1840s until the early twentieth century; Mary Ward (who was the cousin of the 3<sup>rd</sup> Earl of Rosse) also used the Leviathan for her own scientific work. Finally 2<sup>nd</sup> Baron Wrottesley (1798-1867) owned two observatories, one in Blackheath London and a second later constructed in Wrottesley Hall Staffordshire, both used for astronomical observations. See Armitage, J., 2006. *Lord John, 2<sup>nd</sup> Baron Wrottesley and the Wrottesley Hall Observatory*. [online] Available at: <<https://adsabs.harvard.edu/full/2006AntAs...3....5A>> [Accessed 28 June 2022]

<sup>46</sup> Argyll, *Autobiography*, I: 70

<sup>47</sup> Inveraray Castle, Bundle 919

<sup>48</sup> Salisbury was a Tory who would later become Secretary of State for India directly after Argyll held the post (see chapter three and also the conclusion for more details). Unlike Argyll Salisbury also became prime minister of UK three times. Thus, although aligned in their religious and scientific commitments, Salisbury and Argyll were not aligned in their political views.



“indifferent” to nature. This furnishes us with but one example of the diversity of thought existing between Victorian scientific aristocrats.<sup>49</sup>

Young George took much inspiration from his father; indeed, it is my view that George’s love of science and mechanics can be seen as a direct extension of his father’s own love. When Joan Glassel died, John Campbell continued to busy himself with private works on mechanical science and artisanal constructions in his workshop. Argyll notes in his diary how he used to watch in amazement as his father would use a steel and “richly-burnished” brass machine called the Rose Lathes to create “beautiful objects of rare woods and ivory, and of those lovely materials in combination which were highly ornamental.”<sup>50</sup> In John Campbell’s artisanal work we can see remnants of what the historian Simon Werrett has termed ‘thrifty science’. Thrifty science was the ubiquitous early modern understanding of objects and materials as repairable and experimentally open-ended.<sup>51</sup> By the nineteenth century, primarily due to new ideas of thrift proposed by Adam Smith and Jeremy Bentham as ‘saving money’, early modern notions began to erode. As Werrett notes, in the early nineteenth century changing ideas of thrift “obscured the open-endedness of earlier approaches [to objects and materials] in favour of a utilitarian understanding that identified objects as having, ideally, a single, use they were designed to fulfil.”<sup>52</sup> A good example of this is seen where Argyll notes in his

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<sup>49</sup> Gwendolen, C., 1922. *Life of Robert Marquis of Salisbury*. Vol I. London: Hodder and Stoughton. p.27

<sup>50</sup> Argyll, *Autobiography*, I: 84-85

<sup>51</sup> Werrett, S., 2019. *Thrifty Science: Making the Most of Materials in the History of Experiment*. Chicago and London: UCP.

<sup>52</sup> *Ibid.*, pp.178-9

autobiography that his father would mend everything that was broken. However, at the same time, drawing on this emerging nineteenth century utilitarian understanding, John Campbell also told George to never use a tool for something other than what it was designed for.<sup>53</sup> In John Campbell, who lived across the late-eighteenth into the nineteenth century, we see an example of this transition from ‘thrifty science’ towards a narrower view of science where objects and materials were increasingly seen as specialised instruments for one purpose.

### Cultivating natural history and knowledge

George and his siblings were home tutored by Presbyterian ministers during the early 1830s, however, George could never find it in himself to take lessons seriously - he especially disliked the study of Latin. As usual George preferred the study of nature and on one particular day he mentions that when sitting at his desk thinking about the redstart bird, to his delight, he unexpectedly saw that very bird perched on a stone just outside his window.<sup>54</sup> Events as such continued to invigorate young George’s love of ornithology.

Ornithology was not the only area of natural history that young George entertained. He was also an avid bug, crab, and shell collector. For example, in February 1842 he wrote a letter to his father explaining how he had “caught a very [pretty] specimen of a small shell embedded in a pebble of agate, itself being turned into agate. How long has this shell been there?”.<sup>55</sup> To satisfy his collecting desire

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<sup>53</sup> Argyll, *Autobiography*, I: 85-86

<sup>54</sup> Argyll, *Autobiography*, I: 72

<sup>55</sup> Inveraray Castle Archives, Bundle 682

his family acquired a small aquarium with which George regularly filled with small aquatic animals of various kinds. He was particularly fascinated with the process of metamorphism and would observe the hatching of birds from eggs and how certain animals turned into flying creatures in a number of days.<sup>56</sup>

George was also exposed to a wealth of literary works from young. John Campbell possessed a large library full of books of all different sorts in Ardencaple Castle. Thus, George would spend hours reading the works of towering Enlightenment figures such as David Hume, and Edward Gibbon with pleasure as well as explorers such as William Dampier and James Cook. He also never grew tired of reading about epochal events like the French Revolution.<sup>57</sup> George indeed enjoyed literary works but this is not to say that he necessarily agreed with the reasoning of people like Hume and Gibbon or the events of the French Revolution. Indeed when George later visited France in the early 1840s (as part of his wider foreign travels across Europe and Africa) he noted that for the most part he was unable to enjoy much of Paris because the image of the Revolution “poisoned any pleasure” he might have otherwise had in the city.<sup>58</sup> As we shall also see in chapter five Argyll’s vehement disagreement with Hume’s famous argument against miracles lead him to construct a novel counter-position from a philosophico-theological perspective against liberal theologians, agnostics and atheists.

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<sup>56</sup> Argyll, *Autobiography*, I: 81

<sup>57</sup> Argyll, *Autobiography*, I: 84

<sup>58</sup> Argyll, *Autobiography*, I: 189

Although George was cultivating his scientific and intellectual abilities it would not be until tragedy struck that his true capabilities would begin to blossom. The sudden death of his older brother would provide just such an occasion.

### Doubt, death, and the birth of philosophical thought

During the early 1830s George went through two thought provoking experiences that made a lasting impact on him. In 1828 German astronomers had predicted that in 1832 the comet known as Encke's comet would visibly pass by earth.<sup>59</sup> Argyll recalled in his autobiography that his father, who was very interested in its appearance, took him and his siblings to the highest tower in Ardencaple Castle in order that they could view it. The effect of this event upon him as a child brought his speculative faculties to the forefront. As the Campbells viewed the comet overhead on the day of its appearance what young George began to feel was an uncomfortable sense of helplessness about the immensities of time and space. Argyll remarked that this sense "entered into my very soul as a serious trouble."<sup>60</sup>

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<sup>59</sup> Argyll, *Autobiography*, I: 94 ; There is a potential discrepancy recognized within the above dates as Argyll recalled them. The comet Encke had been named after Johann Franz Encke (1791 – 1865), who in 1819 had calculated (rather than discovered) the comet's orbit. I have not been able to locate any predictive works by German astronomers in 1828, however, according to Encke's calculations the comets orbital period was noted at roughly every 3.3 years and so it could conceivably be the case that there was indeed a sighting in 1832 although the closest sighting to 1832 I have been able to source was in Rio de Janeiro in 1831. Sekanina, Z., 1991. Encke, the comet. [pdf] The Royal Astronomical Society of Canada. Available at: <<https://articles.adsabs.harvard.edu/pdf/1991JRASC..85..324S>>. [Accessed 28 June 2022]. p.328. This may again point to the subtle difficulties of accepting everything recorded within Campbell's autobiography at face value due to the gap of time between the events and his writing them down. However, in this case, this is a secondary issue and does not take away from the fundamental impact of the actual events at hand.

<sup>60</sup> Argyll, *Autobiography*, I: 94

For George the question that the Psalmist asked in Psalms 8:4 ‘what is man that you are mindful of him, and the son of man that you care for him?’, did not arise. Rather what arose in his mind was quite the opposite; he began to doubt this fundamental biblical belief. For George the vastness of the universe compared to the smallness of man was so undeniable that he couldn’t help but think of this great Christian teaching as perhaps an error. What eventually led him out of this dark place were the astronomical discourses of the Scottish minister Dr. Thomas Chalmers (1780 - 1847) first delivered in the 1810s. In 1815 Chalmers had succeeded in being elected minister of the Tron Church in Glasgow (despite opposition towards his election from the council due to his evangelical style of teaching) and soon after he began giving a series of extremely popular evangelic sermons on various theological topics, one of these being the relation of astronomy to Christianity.<sup>61</sup> His astronomy sermons had been delivered with the intent to defend the Christian faith from some suggested objections from the physical sciences and during 1832<sup>62</sup> at the tender age of nine years old George began to study these lectures recalling that

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<sup>61</sup> See Chalmers, T., 1817. *A Series of Discourses on the Christian Revelation, Viewed in Connection with the Modern Astronomy*. 6<sup>th</sup> ed. Edinburgh: John Smith and Son, for Chalmers’ published lectures; His published discourse was so popular that within 10 weeks of its publication it had sold 6000 copies, and within a year the book had gone into its ninth edition; See p.89 of *Memoirs of the life and writings of Thomas Chalmers*, Volume 2 (2018). Also see *Memoirs of the life and writings of Thomas Chalmers*, volume 1, pp.433-458 for details on his election as minister to Tron Church in Glasgow.

<sup>62</sup> This was also period of political upheaval. A profusion of prior events in Britain such as an increasingly critical stance towards the exclusionary electoral system eventually culminated in the Reform Act of 1832 which brought about many changes to the system in Scotland, England and Wales. Campbell’s father was a part of the House of Commons which unsuccessfully opposed the Act. See Argyll, *Autobiography*, I: 63-69 for more details.

I found that this phase of unbelief was of those which he dealt; and one of the arguments he used, drawn from the regions of analogy, struck me much at the time, and has often reoccurred to me since. It was common he pointed out, that in human history the fate of great empires has been decided on some field of battle infinitesimally small in geographical importance...there was, in fact, no relation whatsoever between the bigness of such an area or such a spot and the greatness of the issues which might be decided on it...I have since wondered how even at that time I failed to see that the physical littleness of man, and of his whole earthly habitation, cast a glorious light on the marvel of that intellect which could penetrate the depths of space 'and pour the light of demonstration over the most wonderous of Nature's mysteries'<sup>63</sup>

The second experience took place in 1837 when George was around fourteen. Nine years after the passing of his mother and youngest sister another tragedy struck the family when his older brother died of a chronic illness. George and his older brother had been prone to severe illness of the liver for many years and during 1836 they travelled to London to receive medical treatment. To the families' dismay however, this could not save the life of John who passed away one day suddenly in Ardencaple Castle whilst George was outside shooting his air-gun.<sup>64</sup> Argyll records in his autobiography the seemingly spiritual events surrounding his brother's death which would leave a deep impression on him.

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<sup>63</sup> Argyll, *Autobiography*, I: 95

<sup>64</sup> Argyll, *Autobiography*, I: 106

Opposite the window of the room where his brother had died were two large trees with branches that extended towards the castle visible to young George from his own room. Argyll writes that

On the day after my brother's death...I saw a white dove sitting on the end of a broken bough which was nearest to the window of the darkened chamber [his brother's room]. The bird was sitting in a crouching attitude and quite motionless. It commanded my immediate attention and surprise, because...I knew that, as a rule, tame domestic pigeons never do perch on trees, unless in places where the position of the dovecot leaves them no choice...so surprised was I that it was some time before I could satisfy myself that my eyes were not deceived. My astonishment, however, was much greater when, many hours later in the day, I went out with my father to take a walk, and in passing the ash-tree I saw the white pigeon still crouching on the bough...If I had been surprised and struck by its appearance on the first morning, the impression made on me by its persistence on the next became one of a mysterious reverence.<sup>65</sup>

The bird remained in its position on the branch near his brother's room unmoved until the funeral was over, whereupon, according to Argyll, it finally disappeared.

Although his mother and youngest sister had died in 1828 it was the death of his brother that permanently awoke George's speculative thought process. He had been close to his brother growing up and so his death was a terrible shock. Through this

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<sup>65</sup> Argyll, *Autobiography*, I: 106-107

distressing experience George began to ponder profound existential questions about life, death, and the nature of the universe. His mind began to turn towards philosophical thought in relation to religion and theology and, as a naturally inquisitive child, the exploration of the universe through science became more and more appealing to him.

My mind was always inclined to question, and to take note of, rather than to harbour doubt. And thus began with me that habit of pondering the difficulties of Christian belief which has remained with me ever since...The observations and the reasoning which had grown out of my father's teaching and investigation had impressed upon me the rooted conviction of the intelligibility of Nature-not, of course exhaustively, but in the sense of the human mind and reason being thoroughly responsive to the order of her facts and the purpose of her methods.<sup>66</sup>

For George science was not the end of natural investigation, rather science became a means to an end. This end, in his eyes, was to understand the philosophical and theological connection between the laws of nature and the human mind (both creations of God). This is crucial to an understanding of George's later activities as the 8<sup>th</sup> Duke of Argyll because although he partook in many scientific endeavours, his primary goal was always to consider and eventually understand the philosophical foundations of science from a theological perspective.

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<sup>66</sup> Argyll, *Autobiography*, I: 110



Education continued, the succession of the Dukedom, and entry into political life

After the death of his first son, John Campbell worried about the possibility of losing George. This worry was exacerbated when George William Campbell, the 6<sup>th</sup> Duke of Argyll (brother of John Campbell), died in 1839 with no son. Until this point, George and his father had enjoyed the privileges of an aristocratic lifestyle, yet, John Campbell was not the direct heir to the dukedom. But, with no son to succeed George William Campbell, John Campbell became the 7<sup>th</sup> Duke of Argyll in 1839. Furthermore, due to the death of George's older brother in 1837 George was bestowed with the courtesy title of Marquis of Lorne, meaning that he would inherit the Dukedom following his father's death. This singular event launched a new phase in the lives of the Campbell family. Fortunately, just a few months before the death of the 6<sup>th</sup> Duke of Argyll John Campbell had assigned new tutors to his two remaining children. A contract was written up and signed in August of 1839 assigning these tutors to be "the curator to George Douglas Campbell and Emma Augusta Campbell my children".<sup>67</sup> This was timely because if they were going to take charge of the family lands, they would certainly need a proper education.

Among the most influential of tutors on George's (now Lorne) life was J.S. Howson, an Anglican clergyman, later Dean of Chester. In Argyll's recollection Howson was the only tutor to have any considerable impact on his life. Howson first opened Argyll up to poetry, especially the works of William Wordsworth, Samuel Taylor Coleridge and Alfred Tennyson (later Lord Tennyson), during his tutoring years. As his most favoured tutor Howson and Lorne became quite inseparable and the two would attend Church of Scotland services together as well

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<sup>67</sup> Inveraray Castle, archives, Bundle 2639

as frequently converse about science and faith. Furthermore, Howson was one of two men to accompany Lorne on his travels across Europe and Africa between 1842 and 1844 (discussed below).<sup>68</sup> However, at this point, a few illustrations will shed light on just how integral poetry continued to be in Argyll's life after the introduction by Howson.

Between the time of Howson's tutorship and the death of the 7<sup>th</sup> Duke of Argyll in 1847 Lorne befriended the Wordsworths and in 1848, just a year after becoming the 8<sup>th</sup> Duke of Argyll, he visited the family at Rydal Mount. The Wordsworth family were the main company this day but Argyll also saw a 'paralytic' woman in the house. When tea was over Argyll asked Wordsworth to read one of his poems to which he chose "Tintern abbey" written in 1798. As Wordsworth read the poem he began to emphasise and deliver it with more and more passion. Although captivated by his words Argyll was slightly confused as to what had caused Mr Wordsworth to become so spirited; he could see that Mrs Wordsworth was strongly affected. Argyll later wrote down what had happened that day

The strong emphasis that he put on the words addressed personally to the person whom the poem is addressed struck me as almost unnatural at the time – "My dear, dear friend" and in the words "in thy wild eyes" it was not till after the reading was over that we found out that the old Paralytic, and doited woman we had seen in the morning was the sister to whom Tintern Abbey was addressed...Wordsworth apologised to the D[uche]ss for having read so loud...But we c[oul]d not have had so good an

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<sup>68</sup> Argyll, *Autobiography*, I: 126-129

opportunity of bringing out in his reading, the source and inspiration of his poetry – which it was impossible not to feel was the poetry of the heart.”<sup>69</sup>

Argyll was an intellectual man, but he was also a man of the heart. These two qualities he had taken from both of his parents - his mother’s more affective and poetic tendencies, and his father’s more analytic and rationalistic tendencies. Poetry remained a core component of Argyll and towards the end of his life he would go on to publish *The Burdens of Belief* in 1894, his first full length poetic publication which was a sort of compilation of his thought and musings on the facts of modern science in its relations with religion and philosophy.<sup>70</sup>

As well as his entry into and continued education in the world of poetry, Lorne at the same also entered into the world of politics when his father first took his seat in the House of Lords in 1839. Being the eldest son of a peer Lorne was now able to listen to the debates in both the House of Lords and House of Commons. Immersed in the curious world of parliamentary life through the peerage, Lorne’s mind was exposed to the foreign but exciting world of politics. At the tender age of sixteen Lorne developed an enduring passion for political affairs which would shape a core aspect of the rest of his life.

During the early 1830s a major dispute related to the patronage system within the Established Church of Scotland had been brewing and by the early 1840s and

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<sup>69</sup> Barker, J., 2003. *Wordsworth: A Life in Letters*. London: Penguin. p.305

<sup>70</sup> 8<sup>th</sup> Duke of Argyll., 1894. *Burdens of Belief*. London: Spottiswoode and Co. p.7

the issue was coming to ahead in parliament.<sup>71</sup> It is this context which would provide Lorne with his formative experience within the science of politics and the art of debate. As mentioned above Lorne's mind naturally gravitated towards questioning rather than blindly accepting the words of authorities, "It was not that I was disposed to rebel against legitimate authority. But it was that I needed evidence that any accepted authority should be indeed authoritative."<sup>72</sup> This is another important milestone in understanding Argyll's political thought as well as his wide-ranging scientific output. Argyll would not accept claims on the basis of assertion and authority, he preferred to come to conclusions about claims on his own accord. This proved to be consequential immediately within the political context of the Church of Scotland. During the early 1840s tensions in the Established Church of Scotland between Moderates and Evangelicals continued to grow.<sup>73</sup> The 7<sup>th</sup> Duke of Argyll might have been expected to side with the Moderates seeing as the current patronage system benefitted him as one of the largest landowners in Scotland, however through meeting the Evangelicals and also conversing with his son Lorne, he instead sought a compromise that might halt the impending schism that many could sense on the horizon. Kirsten Mulhern has

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<sup>71</sup> The patronage issue of this time surrounded who got to select ministers for individual parishes within the Established Church of Scotland. Since 1711 the Patronage Act had been passed which enabled landed individuals, who often owned the land connected to these parishes, to select the local ministers. But by the 1830s this system had been severely criticised to the point where it could not be ignored in parliament anymore.

<sup>72</sup> Argyll, *Autobiography*, I: 110

<sup>73</sup> Moderates and Evangelicals both considered themselves orthodox, but they were separated by differing theological views and different ways of doing church. In this instance the Evangelical perspective meant that they disagreed with the current way in which ministers were selected and so they called for change.

documented in detail the role that both the 7<sup>th</sup> Duke of Argyll and Lord Lorne played during this period.<sup>74</sup> What is clear from her work is that the 7<sup>th</sup> Duke's involvement in these affairs provided a route into the world of Church affairs for Lorne who assiduously studied and corresponded with his father throughout this period. In particular Lorne seems to have contributed to the framing of a Bill that his father proposed in parliament in May 1841.<sup>75</sup> Although this Bill - which sought a compromise between the Moderates and Evangelicals - was ultimately unsuccessful, its failure spurred Lorne further into action when in early 1842 he anonymously published his first book entitled *Letter to the Peers from a Peer's Son*. In this book Lorne defended the principles of the Evangelicals thus placing him firmly against the patronage system being defended by Moderates. It was also around this time that Lorne first came into contact with Lord Aberdeen who had opposed the 7<sup>th</sup> Duke's Bill.<sup>76</sup> This means that on first contact Lorne was not on friendly terms with Aberdeen. Yet a few years after the Scottish Church events Lorne and Aberdeen found liberal commonalities which resulted in a cherished life-long friendship. It was under Aberdeen's coalition government that Lorne, as the

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<sup>74</sup> Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh. p.71

<sup>75</sup> Inveraray Castle archives, Bundle 2928 and 2986

<sup>76</sup> George Hamilton-Gordon, 4<sup>th</sup> Earl of Aberdeen was a Conservative politician who joined the Peelite wing in the 1840s. He served as Prime Minister between 1852 and 1855. Aberdeen's religious position is not straightforward as he considered himself Presbyterian in Scotland but an Anglican in England. He was tolerant of other religious positions overall as will be evidenced in chapter two, see ODNB, 2010. Gordon, George-Hamilton -, fourth Earl of Aberdeen. [online] Available at: <<https://www.oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-11044?rskey=LMNXhD&result=2#odnb-9780198614128-e-11044-div1-d10710e920>> [Accessed 28 June 2022]

8<sup>th</sup> Duke of Argyll would receive his first Cabinet position in 1853 (See chapter two for further details).

In May 1843 470 Evangelical ministers led by Scottish figures such as Thomas Chalmers and David Brewster finally walked out of St Andrew's Church, Edinburgh, and proceeded to sign the 'Deed of Demission'. This action led to the official separation of the Evangelicals from the Established Church of Scotland who went on to establish the Free Church of Scotland.<sup>77</sup> Based on the fact that Lorne had been so sympathetic to the Evangelicals one might expect him to have joined the Evangelical movement. Indeed, Argyll notes how he felt many of the Church of Scotland liturgical practices to have been lifeless and lacking in spirit.<sup>78</sup> However, when it came to it, Lorne remained with the Established Church of Scotland. One might be drawn to thinking that Lorne simply betrayed Chalmers and the Evangelicals, but Mulhern warns against this as she unpacks the complex reasons which finally compelled Lorne to remain with the Established Church although remaining sympathetic to the Evangelical cause long after the schism. One of those reasons being the somewhat "violent" and "uncompromising" language and actions of the Evangelicals.<sup>79</sup>

Beyond the tense political Church affairs, the 1840s and early 1850s presented Lorne with many other formative experiences including attending his first British Association for the Advancement of Science meeting, his first of three marriages,

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<sup>77</sup> Lynch, M., 1992. *Scotland: A New History*. London: Pimlico. p.397

<sup>78</sup> Argyll, Autobiography, I: 128

<sup>79</sup> Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh. pp.76-77

mesmeric experiences, and his first forays into land improvement. It is to these events that we shall now turn.

#### The BAAS, marriage, and crofting issues in the 1840s

In 1840 Lorne was introduced to the British scientific community when he travelled with his father to the British Association for the Advancement of Science (BAAS) meeting being held at Glasgow that year. Since 1839 arrangements for the Glasgow BAAS meeting had been underway through the efforts of numerous Scottish scientific practitioners and enthusiasts. By late 1839 a meeting in the Glasgow town hall was held with over 180 people present which formed the basis of what came to be the Glasgow BAAS organising group.<sup>80</sup> The 7<sup>th</sup> Duke himself played an instrumental role as one of ten aristocrats involved in the initial set up. Additionally, at the BAAS meeting he acted as vice-president of Section G (mechanical science) as well as contributing to Section C (geology) where he gave notice about the occurrence of copper veins in Argyllshire and exhibited specimens of marbles from across Scotland.<sup>81</sup> It was here in the ‘parliament of science’<sup>82</sup> that Lorne first met some of the most eminent names of the period including Roderick Murchison, Adam Sedgwick, Charles Lyell, James D. Forbes, Edward Forbes, and Louis Agassiz, with whom he formed life-long friendships.

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<sup>80</sup> Morrell, J., Thackray, A., 1981. *Gentlemen of Science*. Oxford: OUP. p.209

<sup>81</sup> Anon., 1841. *Report of the Tenth Meeting of the British Association for the Advancement of Science Held at Glasgow August in 1840*. London: John Murray. p.99

<sup>82</sup> MacLeod, R. and Collins, P. eds., 1981. *The Parliament of Science: The British Association for the Advancement of Science 1831-1981*. Middlesex: Science Reviews

Lorne's passion for science grew steadily between 1840 and 1841 and in late 1841 he determined that he would pursue formal studies at Edinburgh University under J. D. Forbes who held the chair of Natural Philosophy. In November 1841 Lorne matriculated to Edinburgh University and began his courses with an enthusiastic spirit. A letter to his father in November provides us with a glimpse into Lorne's activities. "I find the lectures at the college very interesting – prof Forbes's class is the most amusing of course and some of his experiments are very [pretty]...I shall give you an account tomorrow of an experiment which he showed in the class, in regard to which I have had some discussion with him."<sup>83</sup> His days at university soon came to grief however, when he discovered that within a few weeks of attending, his proneness to illness - the same that had taken his brother's life - hindered him from attending lectures. The Edinburgh climate left Lorne open to distressing attacks of the body which included severe earaches. Thus, upon deciding to end his studies, and aside from his prior home tutoring, this was the only time that Lorne entered into formal education.

However, despite this tragedy Lorne's educational experiences did not simply end there. Aside from formal scientific classes, informal 'occult'<sup>84</sup> scientific experiences would also shape much of his thoughts on the question of the limits of science and scientific investigation.

Modern spiritualism first appeared in the 1840s in New York when reports of strange knocks or "raps" by the Fox sisters started to spread after becoming public

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<sup>83</sup> Inveraray Castle archives, Bundle 682

<sup>84</sup> I am using 'occult' in the early modern sense of meaning 'unknown' or 'unexplained' phenomena



knowledge. By the early 1850s the phenomena had arrived in Britain and within a short period of time flying tables, table rapping, seances and other occult phenomena of the like became widespread. Mesmerism, which was a type of hypnotic induction, had slightly different origins dating back to the time of the eighteenth-century German physician Franz Mesmer.<sup>85</sup> But both spiritualism and mesmerism had become widespread by the mid-nineteenth century.<sup>86</sup> In accord with many Anglican and Presbyterian clergy and men of science (famously including Michael Faraday who became well known for his attempts to disprove mesmeric claims and table turning in 1854)<sup>87</sup> Lorne too was sceptical about mesmerism, although he never fully dismissed it as false. Whilst the movement was still burgeoning in Britain one specific event in 1850 would challenge Lorne's *a priori* assumptions about these occult phenomena and almost make him a convinced believer.

Likely during his short time as an Edinburgh University student Lorne made the acquaintance of James Gregory who was professor of Chemistry at Edinburgh University. As a chemist Gregory was a distinguished man of science, however, he also devoted his spare time to attempting to prove the validity of mesmeric experiences. In 1850 Gregory invited Lorne (now the 8<sup>th</sup> Duke of Argyll) and a number of other guests to his house to witness his mesmeric experiments which Argyll gladly accepted. Gregory conducted two experiments with two different

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<sup>85</sup> Winter, A., 1998. *Mesmerized: Powers of Mind in Victorian Britain*. Chicago: UCP

<sup>86</sup> James, F. A. J. L., 2010. *Michael Faraday: A very Short Introduction*. Oxford: OUP. p.98

<sup>87</sup> Jenkins, A., 2017. *Michael faraday's Mental Exercises: An Artisan Essay-Circle in Regency London*. Liverpool. Liverpool University Press. pp.200-212

individuals where he put them both into a state of passivity and caused them to act in ways in which they wouldn't usually. The first experiment did not impress Argyll who felt that anyone could have staged it. However, for the second experiment Argyll was asked to partake in it himself. A female volunteer was hypnotised by Gregory and then told to move closer to Argyll. As she did so Argyll was told to picture an obscure place in his mind that the lady could in no way have known about. Argyll thus pictured an obscure room in Trentham (the Sutherland's seat). To his surprise, when the lady moved close enough she began to explain what Argyll was picturing in his mind, and to his absolute astonishment, she was correct. At this point Argyll could no longer deny the experiment, "What she had already said was enough for me. I could not doubt, nor have I doubted ever since, that she had seen and read the vision which I had recalled."<sup>88</sup>

Yet even with the success of this experiment Argyll wanted to make sense of what had happened in his own way and he employed what he saw as a scientific explanation for its occurrence. It isn't clear when exactly when Argyll became acquainted with David Brewster (although it is highly likely that this would have been during the time of the 1843 Disruption), but Argyll's own explanation was certainly influenced in part by an earlier conversation with Brewster who himself was a leading scientific experimenter into optics and polarisation. Argyll called what the lady had done not 'thought-reading' but 'picture-seeing'. Argyll did not think she had read his mind, rather he thought that she had physically *seen* in Argyll's eyes what he was thinking about. "Human beings in certain states of mental sensitivities may and do sometimes see what other human beings are vividly

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<sup>88</sup> Argyll, *Autobiography*, I: 330

redepicting on the retina of their eyes.”<sup>89</sup> A separate letter by Brewster may help to shed even more light on his and Argyll’s explanations. Although Brewster’s views were similar to Faraday’s there were some mesmeric experiences which Brewster did struggle to explain. In May 1851 Brewster wrote in his diary that “I have been at two mesmeric séances, one with Dr Macdonald and the Duke of Argyll, at a Mrs. Holmes’, who failed utterly in her clairvoyant pretensions. A count Possenti mesmerised her. The other was at Dr. Ashburner’s, where I saw things that confounded me”.<sup>90</sup> This suggests that Argyll and Brewster visited a number of mesmeric events together and whilst both men found many of these experiences mundane some left them perplexed and needing an explanation. In summary, Argyll and Brewster made two claims in attempting to explain these experiments scientifically. Firstly, they claimed that sometimes the images that we think about in our minds can be physically reproduced on the retina of our eyes. And secondly, they claimed that certain individuals in certain states of passivity are able to see the image on our eyes clearly enough to describe it.

Aside from Scottish Church conflicts, university and mesmeric experiences, the period between 1842 and 1844 saw the first meeting and eventual marriage between Lorne and Lady Elizabeth Levson-Gower of the Sutherland family, one of the wealthiest families in Britain at the time. In the latter months of 1842 whilst the Queen and her husband Albert (during this time styled as *His Royal Highness*) were visiting Scotland, they passed by Taymouth in September to which Lorne received

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<sup>89</sup> Ibid., p.331

<sup>90</sup> Gordon, B., 1881. *The Home Life of Sir David Brewster*. 3<sup>rd</sup> ed. Edinburgh: David Douglas. p.142

an invitation from Lord Breadalbane to be one of the guests in attendance. At Taymouth Lorne was one among a host of invited families, among them the Duchess of Sutherland and her daughter Lady Elizabeth Leveson-Gower. An immediate warm connection formed between Lorne and the Sutherlands over the course of the day, in particular between Lorne and Elizabeth. This initial connection continued to mature after the eventful visit to Taymouth. Between 1843 and 1844, and as a number of aristocratic children had the pleasure of doing whilst young, Lorne took a grand tour across Europe along with Howson and the physician Dr W. F. Cumming visiting places as close as Greece and Rome and also stopping in Africa. Argyll's visit to Africa was short; in passing across the Strait of Gibraltar - Europe's 'gateway' to Africa - he found himself at once transported from the "western world to the eastern world".<sup>91</sup> The only place Lorne, Howson and Cumming went to in Africa was Morocco but Lorne's brief stop there left him with a memorable impression. He noted that everything there to him was absolutely new. He witnessed camels being loaded, enslaved-girls with, as he described it, "true negro features". Turbaned Moslems and oriental streets and shops. Reflecting back on his short-lived venture into Africa Argyll notes in his autobiography that he felt that the Islamic government of Morocco had made the place barbarous and desolate.<sup>92</sup> He suggested that had African-European history panned out different Morocco could have instead been a rich and happy population as compared to its current situation.

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<sup>91</sup> Argyll, *Autobiography*, I: 244

<sup>92</sup> This is an interesting note as it displays early evidence of what would later come to be Argyll's degradation theory during his involvement in British anthropology during the 1860s. For an expansion on this see chapter six.

From Morocco Lorne travelled to Greece where he was initially disappointed with the sights. It was not until he reached Athens however, the famed city of Aristotle and Plato, that the beauty of Greece made itself felt. Athens had a profound effect on him and when it was eventually time to leave he was sad to have to go, finding that the city's charms grew upon him as time went on. However, in the midst of his travels Lorne kept in close contact with Elizabeth and when he returned he took Elizabeth's hand in marriage. On the 30<sup>th</sup> of July 1844 Dr Vernon Harcourt, Archbishop of York, duly united the two together at Trentham, the seat of the Sutherland's in Staffordshire, West Midlands. Thus two of the wealthiest landowning families in Scotland were now joined together through this union, which would prove to be very useful for many reasons as we shall see later in this chapter.

Argyll's marriage was a happy and fulfilled one. In his wife he found more than he could have asked for and on some subjects to his joy "excepting philosophy and the natural sciences" she was more widely read than himself.<sup>93</sup> With Elizabeth, Lorne had twelve children including Lady Frances Campbell who eventually married Eustace Balfour the younger brother of Arthur Balfour (later 1<sup>st</sup> Earl of Balfour). Elizabeth and the wider Sutherland family had a huge impact on Argyll's life in terms of widening his social network and exposing him to new areas of interest and ways of thinking. One brief example of their effect on him can be seen in his shifting political attitude. During the days of Robert Peel's premiership beginning in 1841 Lorne converted to the Peelite position and was averse to all forms of Whiggish politics. However, as Lorne's relationship with the Sutherlands

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<sup>93</sup> Argyll, *Autobiography*, I: 264

strengthened (themselves Whigs) his narrowly negative perception of Whigs slowly shifted to a much more positive one.<sup>94</sup>

Not long after their union the 7<sup>th</sup> Duke of Argyll gifted his son and new daughter-in-law with Roseneath Castle as their place of residence. Roseneath castle was on a peninsular very close to Ardencaple Castle and so for Lorne his new home bred an air of familiarity. With Roseneath castle as their own the Argyll family were now in possession of three country houses which included Ardencaple Castle and Inveraray Castle. In terms of acreage it is difficult to find out exactly how much land Argyll and his wife owned in the 1840s. However, figures for the 1880s reveal that that Argyll was in charge of around 175,000 acres of land worth over £51,000 a year. In fact due to this Argyll can be counted as one of only twenty-eight noblemen during the second-half of the nineteenth century who possessed over 100,000 acres of land.<sup>95</sup> Furthermore, as landlords over estates extending across vast stretches of West Scotland, land and tenant management was to be a top priority for the 7<sup>th</sup> Duke of Argyll. This was particularly so because the 6<sup>th</sup> Duke of Argyll, an absentee landlord for the most part, had left the Argyll estates a poor state before his death. In fact, Lorne's perception of his uncle was justifiably quite negative. When John Campbell, and eventually Lorne became the Dukes of Argyll, much of their time was spent trying to re-establish estate order, and most importantly form a good relationship with their tenants.<sup>96</sup> To make matters worse

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<sup>94</sup> Argyll, *Autobiography*, I: 265

<sup>95</sup> Gibbs, V., ed., 1910. *The Complete Peerage of England Scotland Ireland Great Britain and the United Kingdom*. London: The St. Catherine Press LTD. p.213

<sup>96</sup> Argyll, *Autobiography*, I: 28

between the period of moving into Roseneath Castle and the death of the 7<sup>th</sup> Duke of Argyll in 1847, various problems meant that the Argyll family had to work extra hard to keep themselves financially afloat. The two major issues which occupied the Argylls within this period were the Scottish Clearances, and the potato famine.

The details surrounding both the West Highland Clearances and potato famine have already been discussed by Michael Lynch and Mulhern<sup>97</sup> therefore, I will primarily focus only on the response of the Argylls to these two events. The overarching dilemma that landowners like the Argylls faced in the period between the late eighteenth century and first half of the nineteenth century was an immense population growth which led to land becoming increasingly scarce. This was fuelled in large part by the Irish Catholic migration to Scotland during the 1830s and 40s. By 1840 Glasgow had a Catholic population of around 40,000, but only two churches to accommodate for it.<sup>98</sup> In fact by the 1840s 7000 Irish immigrants had turned up on the Argyll estates itself.<sup>99</sup>

During the first half of the nineteenth century potato as well as kelp became a major source of food and consequently income for both landowners and tenants. Kelp itself caused a boom in the Scottish industry when it was discovered that seaweed could be burnt in open kilns to extract the alkali salts from it. It immediately became a new source of trade which supported the economy alongside the increasing West Highland population. However, by the late 1820s the price of

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<sup>97</sup> Lynch, M., 1992. *Scotland: A New History*. London: Pimlico. pp.371-373 ; Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh. pp.41-42

<sup>98</sup> Lynch, M., 1992. *Scotland: A New History*. London: Pimlico. p.404

<sup>99</sup> Argyll, *Autobiography*, I: 282

kelp dropped dramatically and subsequently in 1846 the potato famine ended any hopes of economic sustenance between landlords and tenants. The potato famine left Scots in a desperate situation. As one newspaper noted, travelling through the Western Highlands you could everywhere “see indications of this failure in the blighted appearance of the potato plant which has been found always to mark a disease and rot.”<sup>100</sup> With the Irish migration onto to the Argyll lands in the 1840s, the Argylls had to take action or otherwise risk losing income.

Between 1846 and 1847 the 7<sup>th</sup> Duke of Argyll along-side Lorne traversed their lands and spoke with tenants to assess the best course of action. They found that a large number of their tenants desired to emigrate to Canada for potentially better opportunities and so the 7<sup>th</sup> Duke of Argyll, with Lorne’s support, sent 2000 of them to Canada. On top of this 7<sup>th</sup> Duke and Lorne took advantage of a Loan Fund set up earlier by Robert Peel to help alleviate some of the difficulties that came with the repeal of the corn law (which Lorne himself had supported).<sup>101</sup> As Lorne travelled with his father across Tiree, the Isle of Mull, and other parts of their lands, he discovered that he had quite an aptitude for manual labour. Across their lands the Argyll family set up a large-scale system of agricultural improvement with the tenants with the aim of bringing eventual relief from the Highland famine caused by the potato failure. When Lorne and his father went to assess the situation at Ross of Mull, the South-Western region of the Isle of Mull, they saw bogs being drained, fences and holdings being reconsolidated and other major works being carried out. Difficult as it looked Lorne was fascinated with the process, he had never taken an

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<sup>100</sup> Carlisle Patriot., 1846. The Potato “Famine” in Scotland. *Carlisle Patriot*, 9 Oct. p.-d

<sup>101</sup> Argyll, *Autobiography*, I: 285-286



interest in land improvement before but seeing this first-hand a new passion was sparked that remained throughout his life. Thus from 1846 onwards in addition to science and politics, land improvement became a regular if unrecognised practice of his. Indeed, Argyll himself later wrote that “I have been known, more or less, in connection with my politics and with literature and with science, but nobody has ever noticed or known my work as a land improver.”<sup>102</sup>

In the wake of these challenges, difficulties only increased for Lorne when his father died in April 1847 and he succeeded to the Dukedom. Now aged 24 Lord Lorne became the 8<sup>th</sup> Duke of Argyll taking his seat at Inveraray Castle.<sup>103</sup> where he was now in charge of estates spanning across West Scotland including Kintyre, North Argyll, Tiree, the Hebrides, and the Ross of Mull. Although John Campbell was able to improve the overall state of the Argyll estates during his short time as the 7<sup>th</sup> Duke, all his efforts were not enough to bring financial equilibrium. By the 1850s the Argyll lands supplied the family with around £28,000 per year. (His wife - whose family wealth far outdid Argyll's - had also given him a generous sum of £20,000 soon after their marriage which went straight into paying off the family debt). However, already by 1847 their overall debt stood at an alarming £232,000.<sup>104</sup> The 8<sup>th</sup> Duke of Argyll thus put into action a long-term solution which would eventually amend the damage to his lands as well as rectify the poor tenant

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<sup>102</sup> Argyll, *Autobiography*, I: 292

<sup>103</sup> In 1892 the 8<sup>th</sup> Duke of Argyll was created 1<sup>st</sup> Duke of Argyll in the peerage of the United Kingdom. This certainly signifies his favourable reputation across Scotland and the entire United Kingdom.

<sup>104</sup> Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh. p.41

living conditions. In summary Argyll instructed his local agents to never put vacated crofts to competition. He thus “sacrificed the higher rents which men might be tempted to offer” in order to lay the foundation “for larger and more comfortable farms and an improved class of tenants.” This he pursued over the next forty years until the Crofters Act of 1886.<sup>105</sup> As we saw earlier, by the 1880s the Argyll lands were bringing in over £51,000 per year. This was quite the increase from the £28,000 in the 1850s which suggests that his long-term solution had some effect (although in this instance I have not account for inflation which may well render his solution far less effective than at first glance).

#### 1846-1851 Peelite politics and literary work

Between 1846 and 1851 a number of important events took place for Argyll. Firstly in 1846 the repeal of the Corn Laws cemented Argyll’s support for Robert Peel. Sir Robert Peel (1788-1850) was a politician who served twice as prime minister, 1834-1835 and then 1841-1846. Peel was a progressive by Tory standards. Prior to becoming prime minister he supported Catholic Emancipation which was effected in 1829. Subsequently, during his premiership the 1844 Factory Act was enacted which improved factory working conditions for women and children. Furthermore, under Peel the Corn Laws were eventually repealed in 1846 allowing free trade on imported corn. (This event disrupted Tory loyalties leading to various Peelite MPs joining up with some Whigs to form the Liberal Party of William Gladstone, who himself was formerly a Tory). Argyll himself was a supporter of Peel’s campaign

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<sup>105</sup> Argyll, *Autobiography*, I: 294

for free trade in the 1840s. But Argyll had actually become convinced of the merits of free trade through his own earlier personal experiences. Partly through the political writings of Adam Smith and after working through the potato failure, this experience provided Argyll with first-hand lessons in what he saw as the benefits of free trade. In one of his later books written on the subject of economics he wrote that

When the crash of the potato famine came, I had personal and painful experience of the economic lessons to be learnt from all its causes, and from all its results. I had to deal with a large population on some parts of my own property, many of whom were in danger of starvation. It was only by heavy outlays both on emigration and on agricultural works, that the danger was removed and a happier condition of things was at last established. I became a convinced Free Trader.<sup>106</sup>

Argyll was a confident man not afraid to air his opinion on a given topic and most importantly, he was not afraid of independent thought. These qualities were not always seen as favourable in the eyes of others however, and he would often find himself the object of critique. In 1850, after delivering a speech in the House of Lords, one MP remarked that there was nothing to stop Argyll from rising to a very high political office “except his too visible arrogance and conceit”.<sup>107</sup> Within the

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<sup>106</sup> 8<sup>th</sup> Duke of Argyll., 1893. *The Unseen Foundations of Society: An Examination of the Facilities and Failures of Economic Science Due to Neglected Elements*. London: John Murray. p.ix

<sup>107</sup> ODNB, 2009. *Campbell, George Douglas, eighth duke of Argyll in the peerage of Scotland, and first duke of Argyll in the peerage of the United Kingdom*. [online] Available at:

context of the 1846 free trade laws, although Argyll came from a Whig family background and would have been expected to follow the Whig political path he instead defected to the Peelite position.<sup>108</sup> To be a Peelite, or as they referred to themselves, ‘Liberal Conservative’, in the wake of the Corn Law repeal was to take up an ambivalent position on the political spectrum which lasted for upwards of twenty years until the uniting of the different components of the Liberal party under William Gladstone.<sup>109</sup>

Aside from the politics of free trade, Church affairs never strayed far from Argyll’s mind. The publication of his second book entitled *Presbytery Examined: an essay, critical and historical, on the ecclesiastical history of Scotland since the reformation* (1848) was another eventful moment in his life. Unlike his first publication, this work took a primarily historical approach. His reason for writing it stemmed from his exposure to the Anglican Church mainly through J.S. Howson who we have already encountered above. Through conversations with Howson, his visits to London with his family, and his expanding knowledge of Parliament, Protestantism, and the peerage, Argyll became more and more acquainted with the doctrinal differences between the Established Churches of Scotland and of England. These differences he felt had not been explored sufficiently in current literature. And as a consequence Anglicans still did not understand many of the unique qualities of the Church of Scotland, often viewing it as essentially the same as the

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<<https://www.oxforddnb.com/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-4500>> [Accessed 6 June 2022]

<sup>108</sup> 8<sup>th</sup> Duke of Argyll., 1893. *The Unseen Foundations of Society: An Examination of the Facilities and Failures of Economic Science Due to Neglected Elements*. London: John Murray. p.vi

<sup>109</sup> Hoppen, K. T., 2008. *The Mid-Victorian Generation, 1846-1886*. Oxford: OUP. pp.134-135 ; For more details see chapter two of this thesis

Anglican Church.<sup>110</sup> This publication, as well as his first book in 1842, began Argyll's literary career by propelling his name into the public sphere as a rising literary and political figure, even if some people disagreed with him on various points. By the end of his life Argyll would publish over fifteen books - not including numerous articles. In this respect a comparison of Argyll's written output with other scientific aristocrats of his time including Lord Rosse, Lord Rayleigh, Lord Salisbury and Arthur Balfour reveals that Argyll's work far exceeded their own, at least in terms of book publications. For example, Balfour only produced one major book called *The Foundations of Belief* in 1895. Lord Rayleigh published many scientific papers but in terms of books his only major work was *The Theory of Sound* (in two volumes). Mary Ward (1827-69), a cousin of the 3rd Earl of Rosse and a well-respected astronomer, microscopist and assistant to Brewster, drew the telescopes of both Newton and Rosse in Brewster's *Life, Writings, and Discoveries of Sir Isaac Newton* (1855). Ward perhaps comes closest to Argyll in terms of book publications. She wrote three scientific works during her lifetime, *Sketches with the Microscope* (1857), *The World of Wonders as Revealed by the Microscope* (1858) and the most popular of the three *Microscope Teachings* (1864). It is very likely that she would have continued to publish more scientific books had she not succumbed to a fatal accident when she fell from a steam carriage in which she was riding, the wheel of the carriage driving over her and killing her almost immediately.<sup>111</sup>

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<sup>110</sup> Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh. p.69

<sup>111</sup> National Trust, n.d. *Mary Ward*. [online] Available at: <<https://www.nationaltrust.org.uk/castle-ward/features/mary-ward>> [Accessed 6 June 2022]

### Conclusion – formative years and the making of a scientific aristocrat

By the time George Douglas Campbell became the 8<sup>th</sup> Duke of Argyll at the young age of twenty-four he had already experienced what could be considered a host of life altering events. These include his early grounding in Christian principles, natural history, and later introduction to the “parliament of science”. His introduction to the Westminster parliament of political debate. His travels across Europe and Morocco, marriage, and brief university experience. His experience as a land improver under his father’s guidance during the potato famine and highland clearances. But perhaps the two most important events which impacted Argyll were 1) the successive deaths of various members of his family, especially his oldest brother, and 2) his succession to the dukedom in 1847. By 1847 only his sister Emma remained alive, yet Argyll now had to bear the responsibility of the dukedom on his shoulders. Rather than crumble under the pressure, Argyll would capitalise on opportunities granted to him by his position of privilege. Argyll was a conservative Presbyterian (at least in so far as he remained a part of the Established Church of Scotland), yet politically liberal Scotsman; well-read, yet with no formal university education. He had begun to make his mark on wider society with his two book publications of the 1840s. However, over the course of the next twenty years Argyll’s name would rise to both national and international recognition in the areas of education, politics, science, technology and religion. As will be seen in the following chapter - and likely owing to his own lack of formal education - during the 1860s Argyll found himself at the forefront of national reforms in Scotland, reforms which would go on to reshape the entire Scottish education system.

## **Chapter 2: Nationalism and reform: the Scotland Education Act of 1872**

The previous chapter documented the early years of Argyll. We learnt that by the 1850s much of Argyll's thinking on science, religion and politics had been formed. We now move on to explore how Argyll's experiences and beliefs shaped the types of activities that he engaged in throughout his life. This and the next chapter will explore two distinct yet thematically similar undertakings in Argyll's life that have previously been examined individually, but never pieced together. These are, 1) the establishment of the Royal Indian Engineering College (RIEC) in 1871, and 2) the development of the Scottish Education Act of 1872 (or Education Act). Both events were directly related to educating younger generations and therefore, *education* will be the theme of these chapters. My aim will be to contextualise both the College and the Education Act primarily through a focussing on the year 1855. In the previous year Argyll had been elected president of the British Association for the Advancement of Science (held in Glasgow). In his 1855 address he positively promoted the belief that more education - especially scientific - was needed for future generations and society as a whole to thrive. Unknown to him at the time, fifteen years later he would have the opportunity to fulfil these desires.

In his 1975 article ““Hegemony” and the Amateur Tradition in British Science” Morris Berman stated that ‘The tradition of the wealthy amateur pursuing scientific research at his leisure was an ideal because of its association with the aristocrat and the “proper” way to live, and proved to be the single greatest constraint on Victorian

attempts at scientific professionalization.”<sup>112</sup> Contrary to this narrative it is my contention in this chapter and the next, utilising the theme of education, that the aristocrats weren’t just contributors but that in fact they (in many ways) created the very conditions that facilitated the rise of professional science and technology on an institutionally larger scale dominated by the middle-classes. Unpacking Argyll’s central role in both the RIEC and the Education Act will provide evidence for my contention.

### A general overview

As well as the scientific and political, Argyll was also involved in general education. Nowhere is this better seen than during his time as Chairman of the Royal Commission on education in Scotland between 1864-67 and Secretary of State for India between 1868-1874. Focusing in this chapter on his role as Chairman of the Royal Commission, during this period Argyll - amongst many other things – played a vital role in the constructing of the 1872 Education Act of Scotland. The Royal Commission (known as the Argyll Commission) was set up to investigate the state of the Scottish schooling system to assess whether improvement was needed. After discovering that basic essentials were drastically lacking for teaching, buildings and building facilities, the Scottish Education Act of 1872 was eventually passed which made elementary education (i.e. for children aged between five and twelve) compulsory. Prior to this there was no state mandatory regulation for the

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<sup>112</sup> Burman, M., 1975. “Hegemony” and the Amateur Tradition in British Science. *Journal of Social History* [e-journal] 8(2), 30-50. Available through: < Jstor <https://www.jstor.org/stable/3786265> > [Accessed 4 July 2022]. p.34.



education of elementary level children. As such I use the term ‘reform’ in my title to try to capture the specific nature of the Act, by which I mean ‘the process of making changes in order to improve something’. Educational reform did not come easily; Argyll himself faced a great deal of opposition in trying to push the Bill through parliament and, in the end, had to accept a number of compromises to allow its passage. It is also crucial to point out that in considering the Act we will inevitably run into important factors such as class, gender, and nationalism. Understanding how these aspects all played complicated yet central roles in the choices that Argyll made will help us to better understand Argyll the man as well as his enduring passion for education.

Finally, it is important to note here that the 8<sup>th</sup> Duke was in no way the first among the Argylls to utilise political authority as a means to advance educational transformations. As seen in the previous chapter, when the 3<sup>rd</sup> Duke of Argyll succeeded the 2<sup>nd</sup> Duke he quickly rose to prominence becoming the most important Scottish politician from c.1716 until his death in 1761. The historian Roger Emerson has argued that standard narratives surrounding the founding of the Edinburgh University Medical Faculty in 1726 have tended to ignore the central role of the 3<sup>rd</sup> Duke. Thus, Emerson himself has meticulously documented how the 3<sup>rd</sup> Duke, who was himself an amateur botanist and chemist, was intimately involved in the founding of the Edinburgh University Medical Faculty. In his research Emerson has noted that there is no direct reference to the 3<sup>rd</sup> Duke’s involvement in the founding of the Faculty (which is why historians have tended to overlook it), but after the Malt Tax Riots of 1725 and in order to reinstate order amongst chaos, the 3<sup>rd</sup> Duke was given “a nearly free hand” in relation to running

Scotland. This included influence over the affairs of Edinburgh University and according to Emerson “Control of the Town Council meant control over the university and over its appointments.”<sup>113</sup> Emerson cites a letter from the 3<sup>rd</sup> Duke dated 3<sup>rd</sup> of September 1725 which displays just how strictly he kept abreast of Edinburgh politics. It is clear from the letter that the 3<sup>rd</sup> Duke would have certainly known about and approved of the new chairs created in the university for the new Faculty.<sup>114</sup> Emerson thus concludes that “We should ask more questions about the political context in which institutions such as this are built and managed”.<sup>115</sup> This and the next chapter of my thesis will follow on from what Emerson has suggested. In following the 8<sup>th</sup> Duke of Argyll, I will contextualise the personal as well as political background behind the 1872 Education Act and the RIEC.

#### A missed opportunity at home

To begin this account, we have to briefly revisit chapter one - Argyll’s childhood. By doing so we are able to see part of the reason why Argyll was so keen to get involved in education. As we saw in chapter one Argyll and his sister received a home school education. There was nothing unusual about this of course, since many aristocratic families educated their children via home schooling either personally or through tutors, nurses and governesses. For example, before John William Strutt was first sent to school in 1852 he and his siblings sat under their nurse Miss Gibson

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<sup>113</sup> Emerson, R. L., 2004. The Founding of the Edinburgh Medical School. *Journal of the History of Medicine and Allied Sciences*, [e-journal] 59(2), 183-218. <https://doi.org/10.1093/jhmas/jrh066>. p.210.

<sup>114</sup> *Ibid.*, pp.211-212.

<sup>115</sup> *Ibid.*, p.218.

who taught them, amongst other general subjects, arithmetic.<sup>116</sup> At the age of eight Arthur Balfour along-side his siblings were first tutored by Mr Probert who practiced chemical experiments with the children in Wittinghame House.<sup>117</sup> Similarly, Argyll and his siblings received a home school education throughout the 1830s. However, whereas Strutt and Balfour eventually went on to public school and then university, Argyll did not. This was less to do with his abilities and more to do with his health. In chapter one I pointed out that in November 1841 at the age of eighteen Argyll enthusiastically matriculated at the University of Edinburgh in hopes of studying geology under professor James David Forbes. Yet to his dismay the unfavourable Edinburgh climate (at least to Argyll) began seriously affecting him. Due to his illness in this climate Argyll's opportunity to study at university came to an abrupt halt and a second opportunity never arose.<sup>118</sup> Decades later in the preface to one of his books entitled *The Philosophy of Belief* (1896) Argyll, opening up about his life, stated that

the many losses which a man must encounter – losses of which I am often painfully conscious – who has never been at either school or college, may have some considerable compensations. An attitude, indeed, of isolation

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<sup>116</sup> Opitz, D., 2004. *Aristocrats and Professionals: Country-House Science in Late-Victorian Britain*. Ph.D. University of Minnesota. p.58; also see Strutt, R. J., 1924. *John William Strutt: Third Baron Rayleigh*. London: Edward Arnold & Co. pp.12-13.

<sup>117</sup> *Ibid.*, p.60.

<sup>118</sup> See chapter one.

on subjects which have exercised the most powerful intellects since the world began, can only be an attitude of ignorance and presumption.<sup>119</sup>

To balance this out he went on to list some of the advantages of having an isolated education. The main point to note here is that after Argyll's attempt at studying at Edinburgh failed in the 1840s, he never received the chance to take up education at college or university again. This means that his only formal education was private. Aware of the limitations of his own intellectual capacity, it is likely that he felt the need to actively seek out opportunities through his various scientific and political positions to foster educational opportunities for the young - opportunities which he himself missed. This leads us directly to 1855 the year that Argyll (aged thirty-one) as president of the British Association for the Advancement of Science, positively advocated for more scientific education.

#### A promoter of scientific education

Within just a few years after its inception at York in 1831 the BAAS had become the most successful association for the promotion of science in Britain. Members of the association saw themselves as rivals to the Royal Society (this despite the fact that many of the BAAS members were also Fellows of the Royal Society). By the 1850s, it was common practice for scientific men and women from Britain and abroad to make their way to the annual meetings to hear, or indeed present on the

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<sup>119</sup> 8<sup>th</sup> Duke of Argyll., 1896. *The Philosophy of Belief, or, Law in Christian Theology*. London: John Murray, Albemarle Street. p.xvi.

latest developments in science and sometimes technology.<sup>120</sup> One of the most important traditions was the presidential address given each year by a man<sup>121</sup> of reputable character and standing in Britain. Liberal leaning scientifically attuned aristocrats conveniently served as excellent presidential candidates bridging the gap between government, science and society. Between 1831 and 1855, the BAAS could already claim powerful aristocratic support. The Earl of Rosse, the Marquis of Northampton and the Duke of Northumberland had already presided over the BAAS. In fact, prior to the mid 1850s no less than nine aristocrats had served as president of BAAS; Argyll's own opportunity came in 1855.<sup>122</sup>

As was standard practice, during the Liverpool BAAS meeting in September 1854 the members met to discuss arrangements for the coming year. A General Meeting was held on Monday the twenty-fifth in which, through a relatively peaceful process of deliberation (not always the case), Glasgow was proposed and agreed upon as the 1855 meeting venue. Following this, on the proposal of Sir Roderick Murchison, Argyll was elected and invited to accept the presidency.<sup>123</sup>

Argyll's election turned out to be a very suitable choice for 1855. In 1854 the position of Rector of the University of Glasgow had just become vacant after the Earl of Eglinton's two years had come to an end. Argyll (proposed by the Presbyterian university students), Thomas Carlyle (proposed by the liberal

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<sup>120</sup> Morrell, J., Thackray, A., 1981. *Gentlemen of Science*. Oxford: OUP.

<sup>121</sup> Since women were excluded from this role until 1967 when Kathleen Lonsdale became the first woman to be elected president of the BAAS.

<sup>122</sup> *Ibid.*, p.118.

<sup>123</sup> *Athenaeum.*, 1854. Twenty-Fourth Meeting of the British Association for the Advancement of Science. *The Athenaeum.* 30 Sep. p.1173c.

students) and Argyll's political foe Benjamin Disraeli (proposed by the conservative students) all became candidates. Nothing less than a sharp battle of wits and words took place during the final months of 1854. Numerous leaflets, flyers and posters were printed and handed out all across the university in an attempt to gain votes from the students. Glancing through some of the leaflets and posters is both illuminating and highly entertaining [Figure 2; Figure 3].<sup>124</sup> One such poster in support of Disraeli stated that

We are told, finally, that he [Argyll] is a RISING man. That *may* be; but our Lord Rector's Chair has never yet been filled by any who had not already RISEN. When his Grace accomplishes great deeds, we shall bail them gladly. Not *now* is the time, but *then*, for his troubles of an earliest life. Now shall they show this same spirit by TRIUMPHANTLY RETURNING THE RIGHT HONOURABLE B. DISRAELI!<sup>125</sup>

Interestingly one of the posters printed in support of Argyll capitalised on his recent BAAS election to presidency arguing that

His Grace has been appointed President of the British Association, in the prospect of its next annual meeting being held in Glasgow. The business of that great scientific body [the BAAS] will be transacted in our halls and class-rooms. The venerable Principal [of Glasgow University] is one

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<sup>124</sup> Inveraray Castle archives, Bundle 828.

<sup>125</sup> *Ibid.*

of its vice Presidents. Several of the Professors are also officially connected with the Association. The occasion is therefore peculiarly favourable for the Students of this University conferring the Rectorate upon the DUKE OF ARGYLE.

Appealing to Argyll's recent election to the BAAS undoubtedly served to bolster his public reputation for the position at right time. On the 15<sup>th</sup> of November the student votes were counted (Carlyle had recently withdrawn from the competition). The Presbyterian support proved powerful and Argyll comfortably defeated Disraeli with a majority vote of 269 to 147. Thereafter Argyll took the oaths as the newly appointed Lord Rector in the Common Hall of the College and in March of the following year gave his Inaugural Address.<sup>126</sup> In sum, by 1855 all the events of the latter part of the previous year had so conveniently worked together that Argyll's titles now included Rectorate of Glasgow University and president of the Glasgow BAAS meeting. Not to mention his lifelong title as Chancellor of St. Andrews University already attained in 1851.

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<sup>126</sup> 8<sup>th</sup> Duke of Argyll., 1855. *Inaugural Address Delivered by His Grace the Duke of Argyll on His Installation as Lord Rector of the University of Glasgow*. London and Glasgow: Richard Griffin and Company.

# TO THE STUDENTS OF THE UNIVERSITY OF GLASGOW.

GENTLEMEN,

Three Candidates are now before you for the Lord Rector's Chair. The eyes of thousands in every quarter of the empire are upon you, for they judge of the condition of the University and of your personal character by the individual you elect. It becomes you, therefore, to proceed thoughtfully and seriously in this matter.

You cannot elect Carlyle. He is a mere philosophic dreamer, a man of mysticism and shadow, a despiser of every thing solid and established. His infidelity and his contemptuous scorn of every thing that savours of Christian and Bible Truth, have completely sunk him in the estimation of every right-thinking student.

If you elect Disraeli, you virtually express your sympathy with his extreme *illiberal* views, which few of you entertain; you justify the loose *morality* contained in his writings, his frequent *ridicule* of Sir Archd. Alison, your late Lord Rector, his *contempt* for our *noble city* which he has frequently expressed in his speeches. You honour a *plagiarist*, who, though often taunted with his dishonest piracy, never yet dared to lift up his voice to defend it; you take by the hand a man who has brought upon himself the deserved contempt of members of every political sect. Are you prepared to do this?

We solicit your votes for the Duke of Argyle, a man in every point of view fitted for this important position. His geological discoveries in the Island of Mull, added to his previous attainments in science, have raised him to a high position as an original thinker and discoverer in the estimation of the most scientific men in the land, so that he now occupies the position of President of the British Association for the advancement of Science. His rising reputation as a statesman and an orator has drawn to him the attention of our leading statesmen; and as a consistent lover of truth he has hitherto pursued his path without a blot of any kind being attached to his honourable name.

Besides, the Duke of Argyle is a Scottish Presbyterian. Honour to the noble family of Argyle, which, so long as truth flourishes in Scotland, will be kept in everlasting remembrance! By electing the Duke of Argyle we place in the Rectorial Chair a man who represents our Literature, our Science, our Presbyterian Religion, and our Nationality.

Prostitute not then the only honour it is our privilege to bestow. Pass not by unrewarded, at our own door, one pre-eminent in nobility, in science, and in worth, nor go a-begging forsooth, to the time-serving supporter of his race, or the renegade to the principles of his country. As Scotchmen and members of a Scottish University, let the roll of our Lord Rectors, that glories in the names of Brougham and Macaulay, of Alison and Eglinton, be adorned with the not less illustrious name of ARCHD. DOUGLAS CAMPBELL,

**DUKE OF ARGYLE.**

DUKE OF ARGYLE'S COMMITTEE ROOMS,  
140 NORTHERN, 1854.

W. Hamilton, Printer, 137 Renfield Street.

Figure 2. A leaflet printed for Glasgow university students in support of Argyle. 1854.

Inveraray Castle Archives © 13<sup>th</sup> Duke of Argyll, Bundle 828.



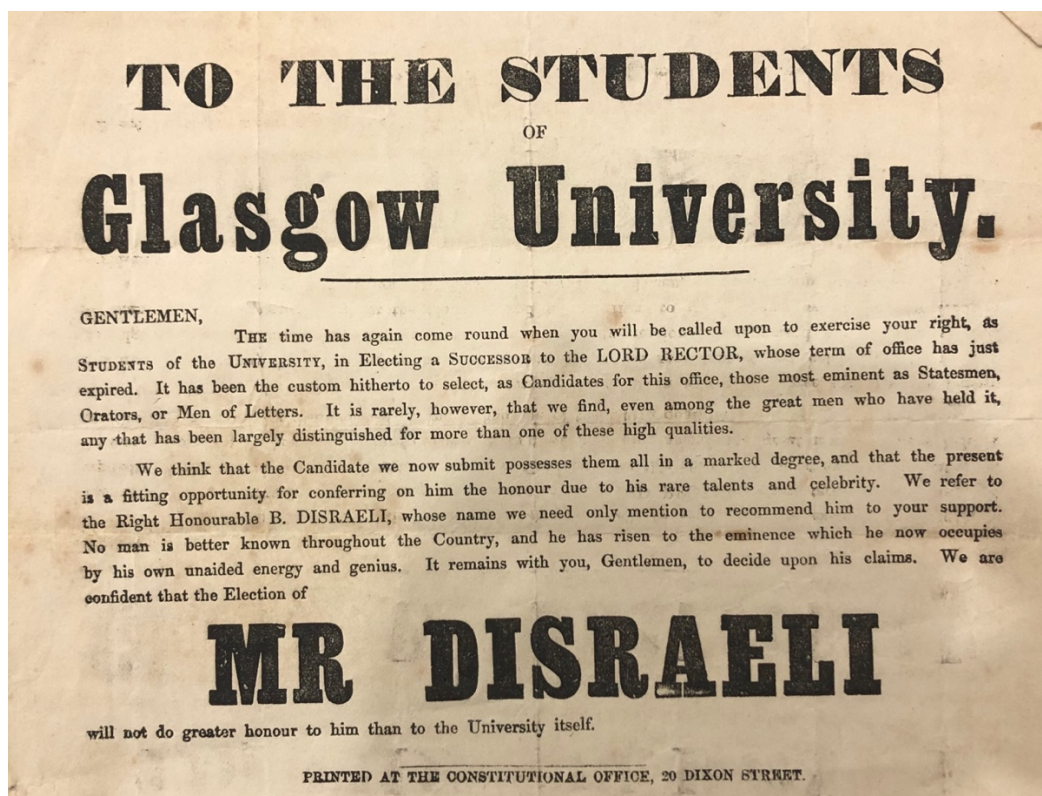


Figure 3. A leaflet printed for Glasgow university students in support of Disraeli's election.

1854. Inveraray Castle Archives © 13<sup>th</sup> Duke of Argyll, Bundle 828.

Argyll was caught slightly off guard at his election to the BAAS presidency, although he was not completely surprised.<sup>127</sup> He quickly realised that a number of factors had played into his election. Firstly, being in Scotland, a Glasgow BAAS meeting ideally needed a Scotsman of good reputation. Secondly, Argyll was friends with almost all of the founders of the BAAS through a mix of personal and public connections and so already had well established links. Finally, in attempting to remain modest Argyll stated that "There was, however, at least the shadow of a scientific excuse for the honour they did me".<sup>128</sup> This being his first major

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<sup>127</sup> Argyll, *Autobiography*, I: 572.

<sup>128</sup> *Ibid.*

geological discovery during the early 1850s. In 1850 upon climbing down a ravine in the rocks in Ardtun on the Isle of Mull one of Argyll's tenants discovered fossilised leaves among basalt lava (later found to be of the tertiary period). When the news was relayed to Argyll he asked the tenant to collect some more specimens, which he did. Argyll was curious as he knew that there was something unique about this find and after speaking to a number of scientific individuals he was encouraged to write and present a paper on the finding, which he did on the 1<sup>st</sup> January 1851 at the Geological Society of London. This was Argyll's first significant geological discovery (and paper) and from it his scientific reputation was to advance. (It is possible that Argyll's election to Fellow of the Royal Society in June of the same year was promoted by this discovery).<sup>129</sup> Argyll was indeed correct to suspect that these three factors had a part to play in his election. However, it is worth noting that he missed a likely fourth explanation. Argyll's father had been deeply involved in the previous Glasgow BAAS meeting in 1840. The 7<sup>th</sup> Duke was chosen as one of three aristocrats to aid in the pre-meeting arrangements and promotion of the event. In the geological section he read a notice about the occurrence of copper veins in Argyllshire and then exhibited various specimens of marble from different Scottish locations. And, lastly, he acted as the vice-president of Section G, mechanical sciences.<sup>130</sup> The 7<sup>th</sup> Duke was a well-known BAAS member and it is clear that Argyll's own interests and opportunities can - in a strong sense - be seen as an

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<sup>129</sup> Although this cannot be confirmed since Argyll's election certificate has not survived. See, Anon, 2020. *List of Fellows of the Royal Society 1660 – 2019*. [pdf] Royal Society. Available at: < [https://royalsociety.org/-/media/Royal\\_Society\\_Content/about-us/fellowship/Fellows1660-2019.pdf](https://royalsociety.org/-/media/Royal_Society_Content/about-us/fellowship/Fellows1660-2019.pdf) > [Accessed 4 July 2022]. p.23.

<sup>130</sup> Anon., 1841. *Report of the Tenth Meeting of the British Association for the Advancement of Science. Held at Glasgow in August 1840*. London: John Murray. pp.xiii, 99.

extension of his father's own interests and opportunities (or missed opportunities). Although Argyll was already well known as a skilled orator,<sup>131</sup> he nonetheless felt some anxiety at the prospect of having to present a speech in front of eminent scientific practitioners. To this end in the early months of 1855 Argyll spent as much spare time as he could cramming in-between his political duties as Lord Privy Seal - a point that we will return to. During these months he read up on geology, comparative anatomy and would attend the lectures of Professor Richard Owen at the Royal College of Surgeons when possible.<sup>132</sup>

Lord Wrottesley, a British aristocrat and astronomer had been a Vice-president at the BAAS meeting the year before. Not long before the Glasgow BAAS meeting Wrottesley sent an invitation to Argyll asking if he might visit his seat in Staffordshire early in September on his way to Glasgow before the meeting. This was ideal for Argyll since he would be travelling from his London Lodge in Kensington to Scotland and so could quite easily stay at Wrottesley's en route to Glasgow. Early in September Argyll and his wife Elizabeth travelled by rail to Wolverhampton and then by open carriage to Wrottesley. The scenery on this journey was not to Argyll's liking. During their trip they went through what had since the 1840s become known as "The Black Country", a heavily industrialised area of the West Midlands with coal fields that stretched from Wolverhampton to Dudley. In his diary he described his less than pleasant experience noting that

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<sup>131</sup> Balfour, F., 1930. *Ne Obliviscaris: Dinna Forget*. Vol I. London: Hodder & Stoughton. pp.14-15.

<sup>132</sup> Argyll, *Autobiography*, I: 573.

No other mineral district presents an aspect quite so odious. The bowels of the earth appear to have been lifted out, and so spread and heaped upon the surface that agriculture seems to be destroyed, and the whole country to be given up to carelessness and waste.<sup>133</sup>

For a nobleman who was part of the elite class the unfavourable scenery felt very foreign, but fortunately for him it did not last and the closer they got to their destination, the more pleasant their surroundings became. Upon finally reaching Wrottesley's residence he was pleased to find himself very much at ease helped by the sights of healthy vegetation and flourishing farm lands. Argyll spent two days at Wrottesley's, touring the residence and during this time they were able to speak about science and no doubt the BAAS address.<sup>134</sup> Although comparatively little has been written on this topic, aristocratic social gatherings (private or public) were a regular Victorian scientific practice.<sup>135</sup> A common interest or goal could help one locate an ally or allies and sometimes these newly formed relations could grow into lifelong friendships. As we can see in the case of Argyll and Wrottesley, common interests related to aristocracy, science, and the BAAS played a large part in solidifying their companionship.

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<sup>133</sup> Argyll, *Autobiography*, I: 573.

<sup>134</sup> Argyll, *Autobiography*, I: 573-4

<sup>135</sup> Opitz, D., 2006. 'This House is a Temple of Research': Country-House Centres for Late Victorian Science. In Clifford, D., Wadge, E., Warwick, A., Willis, M., eds. 2006. *Repositioning Victorian Sciences: Shifting Centres in Nineteenth-Century Thinking*. Cambridge: Anthem Press. Chapter 12.

On the 12<sup>th</sup> of September Argyll as president of the BAAS gave his address. His talk followed the usual procedures of a typical address. Nothing overly divisive was expressed although he did take the opportunity to hint at his disagreement with Lyell's uniformitarianism in favour of catastrophism whilst still managing to praise Lyell's overall geological knowledge.<sup>136</sup> He made sure that his speech positioned science in a positive light within British culture. To do this Argyll centred his talk on the theme of 'education for the next generation'. After a few short preliminaries, Argyll wasted no time in getting to the point. He claimed that

It is impossible to appreciate too highly the influence which science is evidently destined to have on the prospects of education, and we look for the time when its methods, as well as its results, will form the subject of teaching, not only as partially it has long done in our Colleges, but also in the humblest of our schools.<sup>137</sup>

Argyll followed up by mentioning his sadness at the death of Edward Forbes the previous year, before continuing to list the major developments that had taken place in science over the last decades relating to diverse fields such as astronomy, geology, anatomy, physiology, geography and so on. He then moved on to talk about the links between theoretical (abstract) science, practical science and state aid. His views in sum were that public authorities such as the government should

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<sup>136</sup> Anon., 1856. *Report of the Twenty-Fifth Meeting of the British Association for the Advancement of Science. Held at Glasgow in September 1855*. London: John Murray. pp.lxxxiii-lxxxiv.

<sup>137</sup> *Ibid.*, p.lxxiv.

not *naturally* be relied upon as the best supporters of abstract science. Since Britain was a place known for manufacturing it seemed obvious that state aid would almost always be directed towards the arts before the sciences. In relation to the success of the 1851 Great Exhibition held in Crystal Palace (organised by the civil servant Henry Cole and Prince Albert), Argyll concurred with Professor Whewell's post-Exhibition lecture stating that "practice has generally gone before theory - results have been arrived at, before the laws on which they depend had been defined or understood. Art, in short, has preceded science." But then in a twist he went on to note what he saw as an increasing reversal that seemed to be taking place. "But it is equally important to observe that, in recent times this order has been in numberless instances reversed. Abstract science has gone ahead of the arts."<sup>138</sup> Hailing the electric telegraph and recent results in chemistry for their theoretically grounded origins as opposed to practically grounded beginnings, Argyll went on to conclude that in fact the state *should* take an interest and encourage abstract science, even if only for economic purposes. He argued that once the results of abstract science became applicable to the arts, the commercial and manufacturing classes would immediately be able to exhaust "every resource of capital and... skill in giving to that application the largest possible development."<sup>139</sup> This was a subtle move by Argyll. By framing abstract science as a necessary precursor to economic growth, Argyll was attempting to lobby for government aid by arguing that in effect more state support towards abstract science would lead directly to new arts and manufacturing applications which would in turn boost the British economy. During

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<sup>138</sup> *Ibid.*, p.lxxx.

<sup>139</sup> *Ibid.*, p.lxxxii.

the Victorian period when a laissez-faire approach was taken to much of science, Argyll was urging that the quicker the government began to support abstract science, the quicker they would see a tangible return in their investment.<sup>140</sup>

Argyll then focused again on the younger generation. He strongly believed that almost any hope of long-lasting scientific progress relied on the next generation. He declared that “the Advancement of Science depends, above all things, on securing for it a better and more acknowledged place in the education of the young.”<sup>141</sup> He noted some of the current difficulties that had led to the reluctance of science being taught in schools. One being the idea that science might replace more traditional lessons such as religious teaching or the classics. But Argyll did not think this was true; he saw the promotion of science as something that should eventually exist as an essential element to all liberal education alongside more traditional courses. The more embedded science became, 1) the more we would see positive scientific advances, and 2) the more it would benefit society and individuals, especially in their relation to their mental capacities. However, for Argyll there were two parts to this, if science simply entered into the school curriculum as a set of results that students were simply required to memorise, these benefits would not be realised. The benefits of science would only be achieved if younger generations were taught to understand the *methods* of science, and above

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<sup>140</sup> Ironically, in passing by the Black Country on his way to the BAAS, of which he so disliked, Argyll was passing by the very location where industry, science, technology and government had already met. It seems for Argyll there was a dissociation between his claims for government aid in science and manufacturing, and the coal mines and iron foundries that lay at the heart of industrialisation in places like the Black Country.

<sup>141</sup> Anon., 1856. *Report of the Twenty-Fifth Meeting of the British Association for the Advancement of Science. Held at Glasgow in September 1855*. London: John Murray. p.lxxxii.

all the *history* of science itself.<sup>142</sup> Argyll ended his address on a philosophical note by speaking on the relation between science, philosophy and religion. In Argyll's view if knowledge of the discoveries, methods and history of science continued to remain superficial in the "popular mind", society would continue to fall prey to the most specious forms of error.<sup>143</sup> History teaches us to be cautious in our investigations, yet even when we do come to grips with a novel scientific principle we need not believe that its meaning has been fully uncovered. In fact, for every question that science answers, another is raised which seems unamenable to science. In this light Argyll - bordering on a 'god of the gaps' style argument - concluded that science is no threat to religion. The bounds of science may seem endless, but this is simply not true. Science has its limits, and those limits mean that no amount of scientific investigation will ever penetrate at those more profound questions that cause humans to wonder.<sup>144</sup>

Argyll's speech was well received and he was content with himself for achieving this milestone; of course not everything went perfectly. Argyll had developed a taste for speaking aloud in parliament on political and religious matters, but he was not so used to reading addresses from a written document (the standard BAAS method). He was aware that the tone of his reading voice might become boring and so did his best keep the audience attentive. Nevertheless, Argyll awkwardly recalled

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<sup>142</sup> *Ibid.*, pp.lxxii-lxxxiii.

<sup>143</sup> This was probably (at least in part) a reference to spiritualism and the wide-spread reports of table turning which had been imported from America into Britain in 1853 - both of which Argyll viewed with a degree of caution, see James, F. A. J. L., 2010. *Michael Faraday: A Very Short Introduction*. Oxford: OUP. p.99

<sup>144</sup> Anon., 1856. *Report of the Twenty-Fifth Meeting of the British Association for the Advancement of Science. Held at Glasgow in September 1855*. London: John Murray. p.lxxxvi.



that Whewell, who was at that point in his sixties, fell asleep at some point during the speech only to wake up immediately after it had finished to heartedly cheer and congratulate him.<sup>145</sup> By the mid 1850s Argyll had become a well-known figure in the world of geological science but during this period he had also been making a name for himself elsewhere. From the early 1850s he had set his sights on establishing himself in politics, and in 1853 his chance to do so duly arrived. As we have seen in the context of the BAAS, Argyll methodically utilized his platform to attempt to link government, science and society together. But before 1855 Argyll was in fact already on a mission to bridge government science and society from within parliament.

#### Liberal politics, and liberal education

When Argyll received his first cabinet position as Lord Privy Seal under Lord Aberdeen's coalition government (1852-55) in January 1853 (consisting of Whigs, Peelites, radicals and Irish members), his responsibilities were generally light. Lord Aberdeen had given Argyll free reign in regard to the matters that he could chose to take part in. As a young and still relatively unknown political figure Argyll was keen not to disappoint intending to slowly build himself up as a respected statesman rising through various cabinet positions. With the freedom allotted to him by Aberdeen, Argyll chose to manifest his liberalising tendencies in numerous parliamentary debates particularly from 1853 onwards. This is seen by the fact that by 1850 Argyll had only spoken three times in parliament, yet in 1853 he spoke on

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<sup>145</sup> Argyll, *Autobiography*, I: 577-578.

eighteen matters.<sup>146</sup> One matter of national importance that Argyll spoke out on was in August 1853 on the question of the system of University religious tests in Scotland. In May 1707 the Act of Union passed uniting the until then separate parliaments of England and Scotland to form the Parliament of Great Britain which would be based in Westminster thereafter. One of the laws that passed in the Acts was a religious test that had to be taken in Scottish Universities. This test served to filter professorship positions such that only those adhering to the Westminster Confession of Faith and stating allegiance to the Church of Scotland, could be appointed professors at a Scottish university. A hundred and fifty years had passed since then however, and by the 1850s there had been major shifts in the religious adherence of the Scottish and English public. The Disruption of 1843 meant that masses of learned Scotsmen and women who had joined the Free Church no longer adhered to the Church of Scotland. And in 1851 a census revealed for the first time that religious attendance across Great Britain was much lower than most had assumed. Out of a total population of 21 million only 5 million remained active within the Anglican tradition.<sup>147</sup> On the 15<sup>th</sup> of August 1853 both Aberdeen and Argyll spoke out in favour of a new Bill which would in effect enable potential university professors to bypass the religious test. However, Aberdeen tried to provide some leeway for opponents of the new Bill. For professors wanting to hold theological chairs, there would be no change to the required test, but for any other position he felt that “there seemed to be no reason why the Professor of Latin, for

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<sup>146</sup> Mulhern, K. M., 2006. *The Intellectual Duke: George Douglas Campbell, 8<sup>th</sup> Duke of Argyll, 1823 – 1900*. Ph.D. The University of Edinburgh. p.107.

<sup>147</sup> Matthew, H. C. G., Harvie, C., 2000. *Nineteenth-Century Britain: A Very Short Introduction*. Oxford and New York: OUP. pp.66-67.

example, should believe all the points of the Westminster Confession of Faith still less that he should be subject to the discipline and government of the Church of Scotland.”<sup>148</sup> Argyll too chimed in contributing an argument based on the scientific chairs held by prestigious yet non-conforming men in the University of Edinburgh, one of the few places that did not conform to the religious test (although they had done so in the past)

The chair of Natural Philosophy, from which the institution had derived the greatest renown, was filled by Professor James Forbes, a man whose advanced knowledge in many departments of science had acquired for him a European reputation. Forbes was a member of the Episcopalian Church—that very Church against which the test was specially directed. The Professor of Metaphysics was Sir William Hamilton—a worthy successor of the great men who spread the fame of the University towards the close of the last and at the beginning of the present century. Sir William Hamilton was also an Episcopalian. The Professor of Medicine was Mr. Simpson, a man also of European reputation, whose talents added fresh lustre to a school already famous. Professor Simpson was a member of the Free Church. All these eminent men would be shut out from the University, if the test was rigidly enforced.<sup>149</sup>

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<sup>148</sup> *Hansard* HL Deb. Vol.129 Col.1715, 15 August 1853. [online]. Available from: [https://api.parliament.uk/historic-hansard/lords/1853/aug/15/universities-scotland-bill#column\\_1715](https://api.parliament.uk/historic-hansard/lords/1853/aug/15/universities-scotland-bill#column_1715).

<sup>149</sup> *Ibid.*, Col. 1718.

This 1853 Bill supported by Argyll and Aberdeen would eventually become law, and although it was later repealed<sup>150</sup> the initial passing of this Bill highlights just one of the ways in which aristocrats such as Argyll and Aberdeen were at the forefront of professionalising feats through their successful attempts to open up scientific posts to a wider community.

Supporting a Bill which enabled non-conformists to attain professorships was not at all an unusual move for Argyll who was indeed a liberal minded politician. In Argyll's mind a liberal outlook meant being more inclusive. Yet Argyll was not so inclusive when it came to Roman Catholics; in his eyes, Catholicism was antithetical to liberty. In the 1860s Argyll openly stated in parliament that he was "a Protestant among protestants; I hate the whole ecclesiastical system of the Roman Church; I believe it to be dangerous to the faith and injurious to the liberties of mankind."<sup>151</sup> Argyll was a liberal with limits when it came to Catholics but this was a common thread within the general Protestant mindset. As the historian James Ungureanu has argued, when the Protestant reformers first broke away from the Roman Catholic Church in the sixteenth century they continuously depicted Catholics as superstitious, and more seriously, the corruptors of Christianity. According to Ungureanu "subsequent Protestants recapitulated this narrative in their struggles with Catholics, identifying themselves as that faithful remnant

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<sup>150</sup> *Universities (Scotland) Act 1932 (c.26)*. [online] Available at:

<<https://www.legislation.gov.uk/ukpga/Geo5/22-23/26/enacted>> [Accessed 4 July 2022] ; The 1853 Act was repealed at the passing of the Universities (Scotland) Act 1932 which extended the powers of the University Courts in appointing, removing chairs or professorships. Prior to this the right of appointment to any theological chair was vested in powers such as the Monarchy but this Act transferred this right to the University Courts. This is likely why the 1853 Act was repealed.

<sup>151</sup> *Hansard* HL Deb. Vol. 193 Col.191, 29 June 1868. [online]. [Accessed 7 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/lords/1868/jun/29/debate-resumed-third-night>

destined to restore true Christianity.”<sup>152</sup> Thus Argyll’s anti-Catholic mindset was the standard pro-Protestant mindset.

#### A rising Victorian aristocrat and promoter of science

The case of Henry Darwin Rogers’ (1808-1866) appointment to the professorship of natural history at the University of Glasgow in December 1857 is yet another example suggestive of the ways in which aristocratic influence and power furthered scientific professionalisation. The events leading to Rogers’ position took place during Argyll’s time as Rector of Glasgow University, Argyll being keenly involved in his eventual appointment. Rogers, a nominal Presbyterian,<sup>153</sup> was an American geologist who had become dissatisfied with the American geological community – especially within the American Association for the Advancement of Science. As such he was highly receptive to new scientific opportunities outside of the US. Subsequently in Scotland Argyll’s own work in geology meant that he, in turn, was receptive towards the geology of Rogers. Since 1829 William Couper, the professor of natural history, had been lecturing at Glasgow University, however, by the 1850s Argyll knew that Couper was ageing and so sought chances to replace Couper with a younger candidate who might re-invigorate the course. Argyll must have been extremely pleased when in the summer of 1857 Rogers expressed “the

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<sup>152</sup> Ungureanu, J., 2019. *Science, Religion and the Protestant Tradition*. Pittsburgh: Pittsburgh University Press. p.108

<sup>153</sup> Rogers’ parents were Presbyterians who had migrated from Londonderry, Ulster to Philadelphia in 1798. However, according to the historian Patsy Gerstner, Rogers himself never displayed a deep interest in any personal religion. In fact Gerstner says that Rogers was often more drawn to the radical lectures of people like Frances Wright who was an outspoken advocate of religious, social, and educational reform, see Gerstner, P., 1994. *Henry Darwin Rogers, 1808-1866*. Alabama: The University of Alabama Press. pp.9, 11

importance of resuscitating the long dead chair and of permitting largely and at least fairly a geological one” as opposed to how it had been under the previous lecturer “Little else than a teaching of Zoology”.<sup>154</sup> When Rogers first came to Scotland in early 1856 he immersed himself in British scientific culture via societies such as The Royal Society of Edinburgh, The BAAS and the Royal Institution. In April Rogers visited Argyll where, according to Rogers’ biographer, the two men “spent time studying geology and hunting grouse and surely discussing the professorship”.<sup>155</sup> Although by this time Argyll knew that Rogers was the right man to replace Couper, Couper still formally held the professorship. It was not until Couper died the following year in 1857 that Argyll could officially enable Rogers to take up the role of professor of natural history at the University of Glasgow (the first American to do so at the university) which he took up in December.

In summary, the 1850s were a time of growth for Argyll in terms of experience and it is clear that he was quickly becoming a well-known public figure. The promotion of science was always at the forefront of his mind and the 1850s had already afforded him numerous opportunities to promote and directly influence its expansion through the BAAS and in Scottish universities. This is further evidenced by the fact that Argyll was featured in the widely circulated publication of Thomas H. Ward’s *Men of The Time* (1857) which ran into a total of twelve editions. The main aim stated in the preface was to “furnish...a series of biographical sketches of eminent living persons in all parts of the civilised world”. This included artists, philosophers, men of letters, science and so on. Argyll received a short summary

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<sup>154</sup> *Ibid.*, p.205.

<sup>155</sup> *Ibid.*, p.198.

biography which mentioned a number of his achievements such as his two books of the 1840s, his scientific engagements and his political career to date. Interestingly, also listed in this book were two other aristocrats, the Earl of Rosse and Lord Wrottesley, who had also risen to prominence primarily for their country-house telescopic work in astronomy.<sup>156</sup> From 1853 to 1866 Argyll held, as a liberal, the ministerial positions of Lord Privy Seal and Postmaster General. Yet in 1864 his biggest opportunity to shape Scottish education arose in the form of the Royal Commission on Education in Scotland, later known as the Argyll Commission.<sup>157</sup> In his 1855 BAAS address he had passionately expressed that the future progress of society lay in the proper education of the young. Less than ten years later Argyll would in effect become overseer of a national Scottish project which would directly determine the future course of education for the younger generation.

#### Schooling in Scotland: the general state of education before 1864

Elementary education in Scotland (aimed roughly at children aged between five and thirteen) came in differing forms prior to the 1872 Act. Up until this point there was no standardised system; in fact before 1870 (the year that the English Education Act was established) England also had no standardised elementary education

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<sup>156</sup> Ward, T. 1857. *Men of the Time. Biographical Sketches of Eminent Living Characters*. London: Kent & Co. p.26.

<sup>157</sup> Prior to 1872 a Privy Council Committee covering education across England, Scotland and Wales did exist which looked into various aspects of elementary schooling such as the training of teachers, school inspections and grant aids. However, there was no ministry of education and so Argyll's role in the Argyll Commission was not actually part of his ministerial portfolios, see National Archives, n.d. *Committee of the Privy Council on Education: Minutes and Reports*. [online] Available at: < <https://discovery.nationalarchives.gov.uk/details/r/C6816> > [Accessed 26 July 2022]

system. Although the close timings of these Acts might suggest strong similarities, G.W. Alexander has argued that both Acts are best viewed primarily on their own terms. However, one connection that can be made would be the effects of industrialisation. This saw a large increase in the UK population, especially in urban areas. During the course of the nineteenth century it became apparent that the current schooling systems needed some measure of reform. In Scotland the main types of elementary schools were parish schools which had been set up by the Presbyterian Church of Scotland just after the Glorious Revolution through an Act of 1696. These parochial schools had been established in largely rural areas and remained the most numerous in existence until around the second half of the nineteenth century as they struggled to accommodate the generally rising Scottish population. (Scottish population history is complicated in the first half of the nineteenth century due to the mass Irish immigration by the 1840s juxtaposed against the Clearances which saw the removal of a large numbers of crofters with their families from the West Highlands and Isles).<sup>158</sup> Non-parochial Burgh schools increasingly catered for the towns and cities of Scotland. Furthermore, denominational differences had highlighted what seemed to be a serious problem of authority. For example, after the 1843 Disruption over 700 Free Church schools were erected by 1851 in an attempt to provide schooling opportunities that lay outside the confines of the Church of Scotland.<sup>159</sup> The breakaway meant that from the 1840s onwards the Church of Scotland slowly lost its monopoly on Scottish

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<sup>158</sup> Lynch, M., 1992. *Scotland: A New History*. London: Pimlico. pp.367-376.

<sup>159</sup> Anderson, R. D., 2011. *Education and the Scottish People 1750-1918*. [e-book] Oxford: Oxford Scholarship Online. p.75.



education to the Free Church. As a consequence it would have seemed to many that Scotland's unity was being eroded.

During the middle third of the nineteenth century there had been a general increase in the desire for good education. But many factors contributed to whether parents could actually fulfil these desires such as location, class and gender.<sup>160</sup> After a compilation period of eleven years *The New Statistical Account of Scotland*<sup>161</sup> was published in 1845 which aimed to produce an up-to-date analysis of parochial and non-parochial schooling. The *New Account* made it clear that the current system of education was very disordered. In some cases a parish school might have a well-supported teacher on a good salary paid by school fees, yet in the same village another teacher in a non-parish school would be poorly supported, dependant on the low fees paid by the students.<sup>162</sup> Within the curriculum standard school instruction consisted of the three Rs', reading, writing and arithmetic. But as Jane McDermid has shown, a surge in female schools and schoolmistresses meant that supplementary education differed between the sexes. According to McDermid there was

an increase not only in the number of female schools where the main purpose was to teach sewing, but also of schoolmistresses in parish

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<sup>160</sup> McDermid., 2006. Gender, National Identity and the Royal (Argyll) Commission of Inquiry into Scottish Education (1864-1867). *Journal of Educational Administration and History*, [e-journal] 38(3), 249-262. <https://doi.org/10.1080/00220620600984198>.

<sup>161</sup> The older (or first) *Statistical Account of Scotland* was completed by the British politician Sir John Sinclair between 1791 and 1799.

<sup>162</sup> Anon., 1845. *The new Statistical Account of Scotland*. Edinburgh and London: William Blackwood and Sons. p.309.

schools. Often the wife or sister of the schoolmaster, the mistress would teach the ‘ordinary branches of education’ to the younger children, as well as sewing to the girls, leaving the ‘higher subjects’ and older children to the dominie.<sup>163</sup>

In general, as McDermid argues, gender differences continued to favour males student who were more likely to be taught additional skills such as languages at the expense of females students who were less likely to learn these extra skills.<sup>164</sup> This was partly because it was strongly believed at the time that talented poor boys had a better chance of progressing onto university whilst girls required more domestic experience since that was where their skills would be applied most in later life. Another point noted in the *Account* was the inconsistency in student attendance due to seasonal labouring which meant that children were taken away from school periodically to earn money and harvest crops.<sup>165</sup>

In 1847 the Education Institution of Scotland (existing today as the EIS) was established through a union of school and university teachers in an attempt to increase the general quality of Scottish education. According to the Institution, prior to 1847 there was no “organised body in Scotland” whose duty it was to “ascertain and certify the qualifications of those intending to enter upon this office”. Members

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<sup>163</sup> In this context ‘dominie’ refers to a Scottish schoolmaster, see McDermid., 2006. Gender, National Identity and the Royal (Argyll) Commission of Inquiry into Scottish Education (1864-1867). *Journal of Educational Administration and History*, [e-journal] 38(3), 249-262. <https://doi.org/10.1080/00220620600984198>. p.250.

<sup>164</sup> *Ibid.*, p.251.

<sup>165</sup> Anon., 1845. *The new Statistical Account of Scotland*. Edinburgh and London: William Blackwood and Sons. p.572.

therefore took it upon themselves to work towards raising the standard of teaching, and in turn, general Scottish education. The Institution formed a Board of Examiners for the purposes of examining potential candidates and by 1851 - with 800 members - it received a Royal Charter. Unlike the top-down Privy Council Committee method of inspectors set up in the 1839 for the purposes of inspecting schools which were to receive (or had already received) government grants, the Institution attempted to extend help to teachers of all denominations and classes from the bottom up. As such, the body was self-funded by members and it is worth noting that by the 1860s the presidential chair had been occupied by adherents of the Church of Scotland, Episcopalian, Free Church, United Presbyterian, and Congregational denominations (there was no Catholic president).<sup>166</sup>

In 1843 the licenced Church of Scotland minister George Lewis published *Scotland A Half-Educated Nation* before subsequently leaving to join the Free Church at the time of the Disruption. In the book Lewis concluded based on his assessment, that the current Scottish schooling system had, until then, failed to properly support the needs of the growing population. However, despite the negative picture that Lewis painted, by the 1850s it was known that Scotland actually fared better than England, at least in terms of literacy rates. The literacy test was simply the signing of an individual's name on a marriage certificate (immediately excluding those who didn't marry). The test revealed in 1855 that 89% of Scottish men and 77% of Scottish Women could sign their names in

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<sup>166</sup> Inveraray Castle archives, Bundle 1748.

comparison to 70% of men and 70% of women in England and Wales.<sup>167</sup> As we will see in the next section Argyll was aware of the general state of Scottish education but as a patriotic Scotsman he remained hopeful in outlook. During the time of the Commission, Argyll would carry his voice through parliament in hopes of making permanent change.

### Investigating education in the 1860s

Three years before becoming Chairman of the Commission in 1864 Argyll sent a letter to William Gladstone from Campbeltown. In it he told of two instances that he had experienced first-hand in relation to some smart young Scotsmen he had met. The letter, dated the 21<sup>st</sup> September, provides strong evidence for - as well as further insight into - Argyll's abiding interest in pre-adult education. Argyll began the letter recalling the events of a few weeks earlier when he was visiting a remote part of the Island of Mull where the people were "numerous and very poor, and of Pure Celtic Breed". At the time he passed a small side-school and decided to go inside. On entering he discovered a handful of young children in a small thatched cottage upon and asked the master to let him hear them read. Argyll was impressed with their intonation and punctuation, but knowing that their grasp on the English language was weak, he decided to test them (likely to the horror of the children). Argyll continued

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<sup>167</sup> Knox, W. W., n.d. *A history of the Scottish People: The Scottish Educational System 1840 – 1940*. [pdf]. Available at: <[https://www.scran.ac.uk/scotland/pdf/SP2\\_1Education.pdf](https://www.scran.ac.uk/scotland/pdf/SP2_1Education.pdf)> [Accessed 7 June 2022]. p.3.

One little creature, with a rag of a kilt that hardly covered him, read a sentence about the mode of preparing lead ore, and the washing of it “to free it from all extraneous matter.” “What is extraneous?” I asked. Some of the older boys hesitated, but the little fellow with the kilt answered at once, “Not belonging to itself.” I have asked several people since to define the meaning of extraneous, and not one has given so neat and complete an answer as that urchin. He could not possibly have expected the question, not have been prepared for it.<sup>168</sup>

Argyll then told Gladstone of a second instance. This event had taken place just two days prior as he visited one family of the name Huie whilst touring the Argyllshire farms. Inside a room within the Huie’s small household he noticed “Sir W. Hamilton’s lectures, Thucydides and some Latin classics”. The sons in the family according to Argyll were the best ploughmen in the country, and he noted that one of them had taught himself Greek, Latin and French, had eventually made it to Glasgow University and had even become a teacher in a borough school. Argyll asked the boy a question about the professor of Greek at Glasgow (it seems Argyll took pleasure in quizzing young boys) to which the boy replied that though a good scholar himself [the professor of Greek], he was not a successful teacher, and “did not bring out fully the beauties of the Greek language.” Ending the letter to Gladstone on a patriotic and rather biased note, Argyll insisted that “I do not think one meets often this sort of stuff in any other country in the world, and Scotland

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<sup>168</sup> Argyll, *Autobiography*, II: 311.

has good reason to be proud of it.”<sup>169</sup> From this personal letter to Gladstone it is clear that years before being appointed head of the Commission, Argyll had already been conducting informal investigations into the state of Scottish schools.

In June of 1859 Viscount Palmerston began his second term as Prime Minister leading the newly formed Liberal party consisting of Whigs, Peelites and radicals after the defeat of the Conservative lord Derby by 323 to 310 votes in a Commons vote of no confidence. Argyll, raised in the Peelite and Liberal traditions, was not allocated a cabinet position during Derby’s short administration of 1858-1859. However, under Palmerston he was returned to his former position as Lord Privy Seal and in May 1860 became Postmaster General. Between the years of Derby and Palmerston, aside from the Commission that Argyll headed, there were at least three other Commissions that inquired into the state of UK education. The Argyll Report was therefore not alone at this time, but it did stand alone and above in its comprehensive nature.<sup>170</sup> The Argyll Report, which was titled the *Education Commission (Scotland)* was completed in three reports issued between 1865 and 1868. The Second Report published in 1867, which inquired into elementary education, was the most important and as such led to the most impactful changes with the 1872 Act. In a Commons sitting on the 10<sup>th</sup> June 1864 the government’s intention to set up a Scottish inquiry was confirmed and later in the same year

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<sup>169</sup> Argyll, *Autobiography*, II: 311-312.

<sup>170</sup> The other three Commissions were the: *Newcastle Commission* (1858-1861), *Clarendon Commission* (1861-1864) and *Taunton Commission* (1864-1867).

Argyll was called to undertake the lead role and upon his accepting he became Chairman of the Royal Commission.<sup>171</sup>

### The Commission and its findings

In total there were eighteen Commissioners entrusted to carry out the inquiry. They were, Argyll (chairman), Robert Montgomery, Lord Belhaven (Lord High Commissioner to the General Assembly of the Church of Scotland), Henry Francis, Charles Bailie, Sir James Fergusson, James Moncreiff (Lord Advocate in successive Liberal administrations), James Craufurd, Archibald Davidson, David Mure, Alexander M. Dunlop, Adam Black (Twice Provost of Edinburgh), Alexander S. Cook, James Mitchell, John Ramsey and David Smith. (Two extra men were added as Commissioners for the Second Report, they were John Tait and John Brown, physician and Author).<sup>172</sup> There were six types of schools intended to be investigated. These were 1) Parochial schools 2) Burgh schools 3) schools receiving grants from parliament – otherwise known as Parliamentary schools 4) Middle-schools 5) Normal and Training schools 6) Adventure schools. On the 16<sup>th</sup> of August 1864 the Commissioners were officially appointed by Queen Victoria to begin their investigations, first meeting on the 4<sup>th</sup> of November. It wasn't clear exactly what needed to be done since this was the first time an investigation of this scale had taken place, but it quickly became apparent through discussion that

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<sup>171</sup> *Hansard* HC Deb. Vol.175 Cols.1591-2, 10 June 1864. [online]. [Accessed 7 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/commons/1864/jun/10/question>.

<sup>172</sup> I was not able to identify details about all of the Commissioners but have listed what I could, see the 8<sup>th</sup> Duke of Argyll., 1867. *Education Commission (Scotland)*. Second Report. Edinburgh: Thomas Constable. p.vii.

interviewing teachers who could act as first-hand witnesses would be a wise start. To this end the Commissioners decided to interview a range of Scottish teachers (and also non-teachers who were in some way knowledgeable about schooling) either orally or via replies (known as returns) to hand-written questions. In total thirty-eight witnesses were examined orally, and ninety-eight hand-written answers were returned between November 1864 and February 1865.

The First Report was published on eighteenth March 1865. The questions asked were designed to obtain as much information as possible in relation to the merits of a National system and it is clear reading through the First Report that the Commissioners attempted to utilise these oral and written replies to help identify the right direction for them to proceed. Although the Commissioners were all in agreement that a National system of schooling should replace the current denominational system, in reality, it wasn't very clear what a "National system" meant and there were conflicting answers by witnesses on what would constitute such a system. To take one example, on 19<sup>th</sup> November, Argyll sat in the Chair to examine Rev Dr. Stevenson, a minister of the Church of Scotland in the parish of Arbroath and South Leith. Stevenson was not a teacher himself but as a minister of a parish had first-hand knowledge of the general parochial schooling system. During the interview (known in the report as an examination) Argyll had discerned that Stevenson was in favour of a National school system and so proceeded to ask "What meaning do you attach to the phrase "a national system" , as distinguished from a denominational system", to which Stevenson replied "By a National System I understand a system under management appointed by the nation, superintended by functionaries known to the nation, and which would extend to every portion of



the population and every part of the country.”<sup>173</sup> If we now compare this reply to the one given by another witness on 10<sup>th</sup> December (Mr Dunlop in the Chair this day) the ambiguity about the term is revealed. When asked about the question of the current parochial system of schooling the university professor and son of a heritor<sup>174</sup> Archibald C. Swinton answered that “I think as far as they extend, they are a national system, though of course, from the increase of popularity they don’t meet all the wants of the country...”<sup>175</sup> As such, the question *what constitutes a National system?* was one that the Commissioners would have to work towards providing a precise answer for. With the oral and written responses gathered and accounted for by early 1865 the Commissioners pulled all their data together. In summary they found that ninety-nine of the witnesses were in favour of some sort of National system, whilst twenty-two were not, and fifteen gave no opinion on the question. With the compiled oral and written responses, it was clear that a National system was the preferred route, however, the Commissioners did not see this data as conclusive enough to end the inquiry. As they stated in the Second Report

While...we attach considerable weight to the individual opinions thus expressed, it was impossible to make them alone the foundation of any definite result. It very soon became apparent that the greatest diversity of

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<sup>173</sup> 8<sup>th</sup> Duke of Argyll., 1865. *Education Commission (Scotland)*. First Report. Edinburgh: Thomas Constable. p.64.

<sup>174</sup> A ‘heritor’ was the landowner of a parish. This term was used up until the early twentieth century.

<sup>175</sup> 8<sup>th</sup> Duke of Argyll., 1865. *Education Commission (Scotland)*. First Report. Edinburgh: Thomas Constable. p.263.

impression prevailed as to the state of existing facts in relation to education in Scotland - that the information on this subject was of the most limited and uncertain description - and that the opinions we had obtained were founded upon impressions which might turn out to be considerably in excess of or within the real facts.<sup>176</sup>

The Commissioners had a general idea of what they wanted to achieve but there was no clear plan of action. The results of the First Report therefore gave them a clear path to follow up on and the Second Report was the outcome. Indeed, as we will see, the results of the Second Report led to the Commissioners deciding to work on what would become the Third Report. Between time of the initial appointment in 1864 until the time that Argyll was pushing for an Education Bill in 1869, the Report would morph into a something that none of the Commissioners could have expected.

With the First Report published, the next inquiry was appointed on 26<sup>th</sup> December 1865. A number of methods were used to extract the required data needed and to focus this Report on elementary level schooling. Firstly, aiming to gather a general picture of the level of education in Scotland, the Commissioners directed schedules (a specific statement to be signed) to be sent to the Registrars of birth, deaths and marriages for every parish and registration district in Scotland. The Registrar would then send the schedules to each minister in their districts to sign the document if they agreed with the statement. This method worked to a limited

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<sup>176</sup> 8<sup>th</sup> Duke of Argyll., 1867. *Education Commission (Scotland)*. Second Report. Edinburgh: Thomas Constable. p.xviii

extent as only the rural and smaller town registrars complied with the schedules. Registrars in larger towns such as Glasgow and Aberdeen declined to undertake the task due to lack of time.<sup>177</sup> However, with what was returned - and based on the population of Scotland at the 1861 census (3,062,294) - the Commissioners reckoned that they had attained general details on at least 4/5ths of the Scottish population in terms of their level of education. With this background information the Commissioners decided to carry out the rest of the inquiry via personal visitations - this method provided the most detailed information in the entire Inquiry. Elementary schools were broken up into three main areas, 1) the Lowland parishes of Scotland 2) the Towns of Scotland, 3) and the Hebrides and West Highlands. For each area Assistant-Commissioners were sent to personally investigate and assess the schools. It would have been extremely time consuming to appraise every school in each area and so the Assistant-Commissioners aimed to visit as many as possible and with the information gathered, draw up a generalised picture.

#### Lowland parishes of Scotland: results

Two Assistant-Commissioners were sent to investigate the Lowland parishes of Scotland. In total they visited seventeen counties with 133 parishes between 1865 and 1866. The main results are captured in the tables below.<sup>178</sup>

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<sup>177</sup> *Ibid.*, p.xviii

<sup>178</sup> Duke of Argyll., 1867. *Education Commission (Scotland)*. Second Report. Edinburgh: Thomas Constable. pp.xxv, Xxxi, xxxiv-xxxv.

Parishes visited within 17 counties	Assessment of teaching quality	Quality of school buildings	Percentage of scholars on the roll aged between 4 and 15 (i.e. children attending school)
133	6% Very good  45% Good  29% Fair  13% Indifferent  7% Bad	69% In good shape	69%

Table 1. Results of investigation into Lowland parishes in Scotland, carried out by Two Assistant-Commissioners between 1865 and 1866

Number of schools under the Church of Scotland	Number of scholars on the roll in <u>CofS</u> schools	Number of schools under the Free Church	Number of scholars on the roll in Free Church schools	Number of schools Under the Society for the Propagation of Christian Knowledge (SPCK)	Number of scholars on the roll in the SPCK	Other schools: General Assembly, Episcopalian, and Catholics schools
519	33,251	617	48,860	202	10,054	N/A

Table 2. Results of investigation into lowland parishes in Scotland carried out by Two Assistant-Commissioners between 1865 and 1866

In terms of religion, the numerous differing denominations had been a constant worry for the Commissioners but - to their surprise - they were able to report favourably on these circumstances. It seemed from their inspection that denominational differences did not affect the education of Elementary level scholars in any significant way. The Report concluded that “With regard to religious differences between parents and managers of schools...as far as they [the Assistant-Commissioners] can discover, these have no effect in keeping the children from

school.” Parents sent their children a particular school without much regard for which denomination the teacher belonged to. Rather, it was discovered that “parents are influenced more exclusively by the success of the teacher, without regard to denomination.”<sup>179</sup>

There were concerns such as the issue of attendance that had been highlighted by the *New Account* twenty years earlier. In almost all cases it was clear that there were more children on the roll than in actual attendance.<sup>180</sup> With a new and thorough understanding gained, the Assistant-Commissioners summarised the state of Lowland parochial and non-parochial schooling in an ambivalent tone

The teachers may be good, or they may be utterly incompetent: they may be wealthy men, or they may be starving: they may be under official supervision, or the entire management of the school may devolve upon themselves, and they may be responsible to no one. The children may attend school, or they may not attend, but grow up in absolute ignorance.<sup>181</sup>

Despite these specific concerns however, the overall analysis was one of satisfaction and hopefulness especially in relation to the parish schools which were seen as in a “general state of efficiency”.<sup>182</sup> The Report concluded that “The

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<sup>179</sup> *Ibid.*, p.xxv

<sup>180</sup> *Ibid.*, p.xxv

<sup>181</sup> *Ibid.*, p.xliv

<sup>182</sup> *Ibid.*, p.xxxiv

Elementary education of the country is, on the whole, better than was generally anticipated” but suggesting that “it might be made easily much more satisfactorily than it is.”<sup>183</sup>

### The Towns of Scotland

The towns of Scotland presented the Commissioners with different findings to the Lowlands. The first problem was that unlike the rural areas of Scotland, most of the larger towns did not send back schedules and so no really useful information could be produced from them. The Commissioners decide therefore to progress straight to stage two, which was to again send two Assistant-Commissioners to investigate. In this case it was determined that Glasgow alone would be the town of inquiry. Glasgow was selected because according to the Report there was no other city where the educational wants of the inhabitants were exhibited on a larger scale. Therefore, results from Glasgow would supply sufficient data which could represent all of the other large manufacturing towns throughout the country.<sup>184</sup> According to the 1861 census Glasgow had a population of 395,503, and within this total population the Assistant-Commissioners focused on the children between the ages of three and fifteen.

The report described that unlike the rural areas of Scotland there were no parochial schools in the cities and burghs of Scotland. The only schools to be found were schools established by private individuals for their own means known as Private Adventure schools as well as Session schools and Mission schools which

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<sup>183</sup> *Ibid.*, p.xliv

<sup>184</sup> *Ibid.*, p.xlv.

were both connected to congregations attending a particular church. Aside from these, Catholic, Episcopalian and Subscription schools also existed.<sup>185</sup> Private Adventure schools, with eighty-eight in Glasgow alone, facilitated the teaching of around 19% of the scholars in Glasgow, but their overall report did not fare well. The report stated that they were “so badly ventilated as to necessitate the door being kept constantly open. It is attended by a poorer class of children than is to be found in the Parliamentary schools of the district.”<sup>186</sup> Just like in the Lowlands, the Private Adventure schools in the towns of Scotland were seen as detrimental to general elementary education.<sup>187</sup>

Session schools fared much better. They were connected with both the Established and Free Churches and were seen as corresponding to the rural parochial schools. Known as “Session schools” because they were under the management of a minster and kirk-session, only forty-six existed throughout the Glasgow districts. However, in contrast to Private Adventure schools which catered to only 6938 scholars, Session schools catered to nearly double this number (12,560 scholars) meaning that 36% of scholars were under the educational guidance of these schools.<sup>188</sup> Session schools were generally reported as “Excellent” yet there was still an evident problem surrounding class. According to one of the Assistant-Commissioners, the fees of these schools had of recent years increased which meant

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<sup>185</sup> *Ibid.*, p.xlviii.

<sup>186</sup> *Ibid.*, p.xlix.

<sup>187</sup> Private Adventure schools received very harsh critique overall. Out of fifty visited only one was considered thoroughly satisfactory. The Commissioners concluded that “Such schools are almost invariably detrimental both to the health and education of all the children who attend them.” *Ibid.*, pp.xxxvii-xxxviii.

<sup>188</sup> *Ibid.*, p.lii.

that poorer children could no longer afford to attend them. This meant that parents had no choice but to send them to schools of a lesser quality. Mission schools, were the next best option but it was noted that a more centralised government system could mitigate these evils.<sup>189</sup>

Mission schools themselves were similar to Session schools except they were voluntary subscription schools that were connected to churches other than the Established and Free Churches. In Glasgow there were twenty-five across the districts with a total of 4469 students on the roll amounting to just about 12% of scholars being educated in these school. Mission schools catered specifically to the poorest of children charging just 1d or 2d a week (and sometimes no fees at all). Some of the teachers assessed displayed excellent ability, however, due to the level of ability of the children, only the most rudimentary forms of education could be taught for the most part.

With the more dominant and less prevalent schools appraised the Report drew its conclusions. There were 98,767 children of school age, however only 41,248 on the roll leaving 57,519 or around one third of scholars unaccounted for.<sup>190</sup> In terms of accommodation, since two thirds of children were not on the roll, schools could satisfactorily maintain all children in attendance, however, in theory they could not do so if all children actually turned up. Crucially, Private Adventure school were seen as the biggest failures whereas the Session schools were seen as the most admirable, although reforms were still needed to improve them.

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<sup>189</sup> *Ibid.*, p.liii.

<sup>190</sup> *Ibid.*, p.lv.



### The Hebrides and West Highlands

The Hebrides (consisting of the Inner and Outer Hebrides) and West Highlands presented a special case in the Report, partly due to the persistence of the Gaelic language which did not exist anywhere else. The natural features of the Hebrides, consisting of hundreds of islands, rugged mountains and rapid streams, meant a lack of infrastructure and facilities for communication leading to isolated inhabitants. Furthermore, since most of the Commissioners could not speak Gaelic, Mr Nicolson, a native Gaelic speaker, was appointed as the primary Assistant-Commissioner to carry out the investigations. However, his investigation only reached the Hebrides and so, as with the case of Scottish towns, the data had to be generalised to the West Highlands. Nicolson first reported from his observations that the Gaelic language had been a hindrance to the inhabitants, especially the working poor. Since there was not enough work to go around due to the large population, and many of them couldn't speak English, natives were confined to the islands unable to travel to the Highlands to seek better conditions and higher wages. He therefore remarked that an English education would be the main addition required to change the status of the inhabitants.<sup>191</sup>

The Report noted a number of other key details: there were thirty-two parishes and Side-schools and ten Parliamentary schools. The Side-schools were established through an Act in 1803 to support the parochial schools as they alone could not accommodate for all the children on roll which by the time of Nicolson's visited stood at 12,070. In term of religious education it was only in 1802 that a Bible was

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<sup>191</sup> 8<sup>th</sup> Duke of Argyll., 1867. *Education Commission (Scotland)*. Second Report. Edinburgh: Thomas Constable. p.lxvii.

published in Gaelic, and only 1811 before a Gaelic School Society was established to begin teaching the people to read it since most could not read.<sup>192</sup> However, following the now familiar pattern, religious diversity did not make much of a difference in terms of the education that parents opted to choose for their children. There were non-parochial schools in the Hebrides but Nicolson could only find seventeen of them in the Hebrides and according to his inspection, they were in a generally unsatisfactory state.<sup>193</sup>

Aside from this, other non-parochial schools included twenty-nine General Assembly Schools and twenty-seven Free Church schools. In relation to attendance Nicolson observed that “the irregularity of attendance at the schools is one of the most striking and discouraging facts to be noticed...A glance at the roll in most cases shows that the months of November, December, January, February, March and July are the only ones in which the schools can be said to be in full operation.” The irregular attendance was due to many factors such as difficulty of accessing schools and children seasonally required for agricultural work. But according to Nicolson, the most pertinent reason was the “ignorance and apathy of the parents” plus the “lack of energy on the part of the teacher” in motivating children to study.<sup>194</sup> There were four main conclusions on the Hebrides listed in the Report. They were 1) most people still couldn’t read or write, 2) most still couldn’t speak English 3) the current schooling system was inefficient, and 4) denominational differences present no obstacle to the establishment of a uniform system of

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<sup>192</sup> *Ibid.*, p.lxx.

<sup>193</sup> *Ibid.*, p.lxxv.

<sup>194</sup> *Ibid.*, p.lxxii.

education in the future.<sup>195</sup> Nicolson himself concluded by sharing his personal memories of his experience investigating the Hebrides. He said

I have now described the educational state and wants of this district...but...I doubt whether I have sufficiently represented the urgency of the need that there is for public interposition....I wish it were possible to call up visibly to others, as vividly as they dwell in my own remembrance, the many interesting and eager young faces that have appealed to my sympathies in these remote and isolated places.<sup>196</sup>

### Recommendations

With the Hebrides now accounted for, it was left to the Commissioners to provide their recommendations towards a National system which might rectify many of the defects of the current system. The recommendations (numbered from 1 to 39) can be loosely broken up into two sections, the first half representing minor changes, and the second half representing major changes to be made. Within the first half, one of the major problems with Scottish education was the inconsistent quality of teaching, poor building facilities, and the fact that the parochial schools only existed in the Lowlands. The commissioners did not think it wise, however, to simply try to extend the parochial system across the whole population of Scotland. Instead they suggested a scheme of improvement in which all schools could remain as they were whilst being reformed through a better system of parliamentary grants and

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<sup>195</sup> *Ibid.*, p. lxxii.

<sup>196</sup> *Ibid.*, p.lxxxi.

government inspections.<sup>197</sup> In regard to parochial schoolmasters it was noted that a disproportionate amount currently adhered to the Church of Scotland even after the passing of an 1861 Act which dropped religious tests for schoolmasters. As such, it was suggested that teachers explicitly be selected regardless of their denomination to produce more equality.<sup>198</sup> Parochial Schoolmasters also held their offices *ad vitum aut culpam*.<sup>199</sup> The commissioners were strongly against this reporting that that “one great cause of inefficiency...in the Parochial schools, is the permanent tenure upon which the schoolmaster holds office.” Therefore they recommended that, “the tenure *ad vitum aut culpam* should be abolished as regards future appointments.”<sup>200</sup>

These changes were mainly aimed at parochial schools but this was a problem since in total there were still well over 2000 non-parochial schools in the towns and rural parts of Scotland that needed to be properly accounted for. Thus, the report moved onto the major changes that they wished to promote. The most important of these was implementing a “central authority”. It was believed that many of the defects could quickly be remedied if Scottish schooling could function under one coherent system instead of differing systems.<sup>201</sup> They recommended that this should be done by an appointed Board of Education which would, firstly, determine the number and character of schools required in each parish or burgh. Secondly, incorporate into the National system as many of the existing schools as needed.

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<sup>197</sup> *Ibid.*, p.clxxiv.

<sup>198</sup> *Ibid.*, p.clxxv.

<sup>199</sup> Which means: *for life or until removal due to misbehaviour*.

<sup>200</sup> *Ibid.*, p.clxxvi.

<sup>201</sup> *Ibid.*, p.clxxvii.

Thirdly, enforce the erection of new schools if and when required. And fourth ensure that teaching, buildings, and facilities are maintained at a good standard.<sup>202</sup> The Board would work on a purely local level with a specific appointment of temporary and permanent representatives. This would include: one representative member chosen by the Universities of St. Andrews, Glasgow, Edinburgh and Aberdeen. The chief magistrates of Edinburgh, Glasgow, Dundee, and Aberdeen (to hold office for three years). One representative chosen annually by the Commissioners of Supply from Inverness, Perth and Ayr. And finally, three permanent members headed by a chairman and secretary.<sup>203</sup> At the local level the Board would make sure that schools were annually inspected; that new schools would be erected if needed, but that only schools within the new National system would be subject to Government grants. All teachers under this system would have to obtain a certificate of competency by the Committee of Council or University Examiners. But the Board would also have the ability to take away a teachers certificate upon certain conditions, for example if a teacher were found guilty of immoral conduct.<sup>204</sup> Finally, in terms of meeting the costs for this new National system the Commissioners recommended that a maximum rate of 2d for scholars in the rural areas and most towns and 2½d for scholars within the Hebrides and the larger towns such as Glasgow.<sup>205</sup>

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<sup>202</sup> *Ibid.*, p.clxxvii.

<sup>203</sup> *Ibid.*, p.clxxvii.

<sup>204</sup> *Ibid.*, pp.clxxxii-clxxxiii.

<sup>205</sup> This is because it was assumed, based on their calculations, that all the costs for building repairs, construction, accommodation could be covered by 2d. in the rural areas and certain towns with the aid of the state, whereas the Hebrides and larger towns would need much more work since there were much fewer parish schools in those areas already in existence, *Ibid.*, p.pclxxii.

### The final report: Burgh and Middle-class schools

As was made clear in the Second Report, besides Glasgow, the towns of Scotland had not received adequate attention. To this end Mr Harvey and Mr Sellar were again deployed as Assistant-Commissioners in August 1866 to investigate the remaining schools. Their report, completed by the end of 1867, led to the third and final *Education Commission (Scotland)* report in 1868. This report, much shorter in length due to the fact that there were far fewer schools to investigate, focused on the Burgh and middle-class schools in Scotland. In nineteenth-century Scotland the definition of the ‘middle class’ was flexible and so the Commissioners divided the term into its social and educational contexts to arrive at a meaningful definition. They then settled on a social understanding of the middle class the group of people between the landed aristocracy, wealthy professional and the commercial classes on the one hand, and the labouring classes on the other. And an educational understanding of this class as scholars who completed their education at sixteen since by this point they were in secondary school.<sup>206</sup> Secondary schools themselves were categorised into three main classes: Burgh schools; Academies (or Institutions) which were schools founded by subscription and sometimes directly linked to Burgh schools; and lastly, Private schools which were private property schools maintained by private means.<sup>207</sup>

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<sup>206</sup> 8<sup>th</sup> Duke of Argyll., 1868. *Education Commission (Scotland)*. Third Report. Edinburgh: Thomas Constable. p.vi.

<sup>207</sup> *Ibid.*, p.vii.

In terms of figures it was found that out of the Scottish schools which had provided Returns to the Assistant-Commissioners, around two-thirds of the middle-class population were receiving education. The Commissioners could not resist a remark on the difference between student attendance in Scotland as compared to England.

Let the Commissioners remark the number of children attending these Burgh schools, and note their significance. The mere fact, for example, that 390 children are attending as day-scholars at the Burgh school of Ayr, a town with less than the population of Reading or Canterbury, is it itself, irrespectively of the quality of the education in that Burgh school, a most healthy symptom. Where in England could we produce such an instance of interest and confidence in a public school among the middle classes of our rural population?<sup>208</sup>

Extending their Comparisons to Germany, the Commissioners noted that whereas in German universities there was one matriculated scholar for every 2600, in Scotland there was a matriculation rate of one scholar in every 1000.<sup>209</sup>

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<sup>208</sup> *Ibid.*, pp.viii-ix.

<sup>209</sup> There may be some bias in this report. The Argyll Commissioners did not discover this information, instead they referenced a detailed report into education undertaken by Matthew Arnold (who was a poet, social critic, and school inspector) published in 1868 under the title *Schools and Universities on the Continent*. In this report Arnold had explained that, whereas the matriculation rate in German states is about one to every 2,800, many Prussian students in fact attended German universities outside of Prussia (for example Jena and Heidelberg) such that the matriculation rate was closer to one student to every 1,100 in these places, see Arnold, M., 1868. *Schools and Universities on the Continent*. London: Macmillan and co. p.223.

Another pleasing find was that it seemed all Scottish towns had either at least a functioning burgh school or Academy. On top of that, there was ample accommodation for more scholars to be put on the roll at any time because currently only half of the spaces in many of these schools were actively filled by students.<sup>210</sup>

The rest of the findings are listed in the table below

<b>Assessment of teaching quality in middle-schools</b>	<b>Quality of school buildings</b>
71% with university level training  (however only 36% with an actual university qualification)	34.5% good  25.5% fair  30.9% indifferent  9.1% in bad condition

Table 3. Results from the Third Report, Middle schools, 1868<sup>211</sup>

Concluding this very short investigation, the commissioners could state with confidence that “the Burgh and other secondary schools of Scotland are in satisfactory condition, and superior to the majority of the English Grammar schools.”<sup>212</sup>

In terms of recommendations, very few were made. Some key reforms suggested were that, firstly, secondary schools should be subject to an annual public examination by competent inspectors (the report noted that 80% of Middle-school

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<sup>210</sup> 8<sup>th</sup> Duke of Argyll., 1868. *Education Commission (Scotland)*. Third Report. Edinburgh: Thomas Constable. p.ix.

<sup>211</sup> *Ibid.*, p.xiii.

<sup>212</sup> *Ibid.*, p.xi.



teachers already agreed to this). Secondly, Burgh school costs needed to drop. This was because high admission fees had largely barred poorer parents from being able to send their children to those schools meaning that their only options were cheaper schools of a lesser quality.<sup>213</sup> Thirdly - and no doubt largely promoted by Argyll – more science and mathematics teachers were needed in order to systematically instruct students in order to improve their “faculty of observation” and “mental habit of method and arrangement”.<sup>214</sup>

### The Bill in the House of Lords

With the three Reports published Argyll quickly moved to introduce them as a Bill in parliament. On 25<sup>th</sup> February 1869 Argyll stood up in the House of Lords to present the Bill. His main point centred around the drastic changes in religious diversity over the centuries since the founding of the Reformed Church of Scotland under John Knox. Argyll stated that

In the view of John Knox the whole population of the country was to be of one Church, and under these circumstances it was natural and perfectly right that the national system should be strictly denominational; that is to say, when the people were all of one religion and one Church it would be perfectly natural, and in my opinion perfectly right, that Parliament should connect education with the teaching of that Church. But, unfortunately, we are not now in the position in which John Knox was,

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<sup>213</sup> *Ibid.*, pp.xxii-xxiii.

<sup>214</sup> *Ibid.*, p.144.

or in which he hoped Scotland would be. For though we are not much divided in as regards doctrine, yet we are keenly divided on points of ecclesiastical discipline, and we can no longer hope for the establishment of a united system of education under any one Church. Under these circumstances I think a great step is now proposed by the system provided by this Bill—to cut off the connection between education and the conduct of particular religious bodies.<sup>215</sup>

Argyll did not view these ecclesiastical divisions as ideal, but it seems he was a realist about the current state of Scotland. Instead of clutching to an outdated system, as things now stood, Argyll saw the need for religious and even secular tolerance.

Since at least the early 1860s Argyll had been slowly but keenly developing an intimate knowledge of Scottish schooling and he felt very strongly that a new National system, as proposed in the Reports, would improve and indeed save Scotland from an otherwise impending national decline in its educational merits. Argyll was confident that this Bill would pass with little modification, and he was severely disheartened when at the second reading in the Lords on 19<sup>th</sup> March, the majority of the members criticised it. At this reading the English nobleman, Lord Denbigh, brought up the fact that that in contrast to Argyll's claim about the representatives of the 1864 Commission being comprised of all the leading

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<sup>215</sup> *Hansard* HL Deb. Vol.194 Col.298, 25 February 1869. [online]. [Accessed 7 June 2018]. Available from: <https://api.parliament.uk/historic-hansard/lords/1869/feb/25/presented-read-a-first-time>.

religious bodies, a Catholic representative was in fact absent. Denbigh himself had converted to Catholicism in 1850 and was involved in Catholic charitable work for the rest of his life. His concern with the Bill in this way reflected his own concerns about the substantial powers of the Established Church (England or Scotland) as compared with limited powers of the Catholic Church.<sup>216</sup> Denbigh also raised the precarious problem of denominations. In noting that the Bill was drawn up by Presbyterians to the benefit of Presbyterians, he lamented that not only the Catholics, but also Episcopalians would suffer under its passing. Although in theory the Bill was meant to deal solely with Scotland, in truth it had potential ramifications that extended across the whole of England and Ireland, particularly in relation to the sensitive issue of religious and secular teaching. Denbigh captured this concern in professing that he looked upon this Bill “as the thin edge of the wedge by which secular education, as it is miscalled, will be extended hereafter to England and Ireland.”<sup>217</sup> He saw an impending danger in the Commissioner’s aims to enable non-denominational teaching, suggesting that subjects taught under this new system would be “so diluted to suit their scruples as to be practically useless, or else some one’s conscience must be wounded.”<sup>218</sup> Amongst a number of other worries and objections raised, Argyll was called to respond accordingly. He addressed the major issues, such as the lack of any Catholic representation, by arguing that already under the current national system Catholics stand on the

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<sup>216</sup> *Hansard* HL Deb. Vol.194 Cols.1767-1768, 19 March 1869. [online]. [Accessed 7 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/lords/1869/mar/19/no-11-second-reading>.

<sup>217</sup> *Ibid.*, Col.1769.

<sup>218</sup> *Ibid.*

outside, and as such, a lack of Catholic representation was not a radical departure from what was already in place. On the denominational issue, Argyll once again restated that the Lords could not ignore the fact that Scotland today was in very different place compared to its past. Religious diversity was now a reality which needed to be addressed, and even though there was still division on ecclesiastical disciplines, there was for the most part, “tolerable unity in points of purely religious doctrine”. Argyll argued that it was purely a fallacy to suppose that the National system was connected solely with the Established Church, teaching positions were open to masters and mistresses of all denominations. In sum, teachers who adhered to the Church of Scotland had no inherent monopoly within Scottish education and schools should reflect this.<sup>219</sup>

Argyll did receive some support, notably from The Earl de Gray and Ripon, like Argyll, a liberal politician, who was much more complimentary towards the Bill in acknowledging it as a step in the right direction. However, the overall feeling in the House of Lords was one of dissatisfaction. The Bill – as was becoming clear – signified much more than just a localised reform Act. An interplay of national and religious conflicts of interest were deeply embodied within with all sides claiming a personal stake in its eventual outcome. Evidently the new Scottish National system implicitly spoke to fears about the changes that could manifest in across the nation and it was this concern that motivated many doubts about the Bill. Argyll was certainly troubled by the idea that his opponents seemed to be ignorant of the current religious and educational state of Scotland, or, simply that they had not bothered to learn much about Scotland in the first place. But Argyll’s own position

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<sup>219</sup> *Ibid.*, Col.1780.

and view was itself a source of complexity. The historian Michael Lynch points out that although Argyll was amongst some of the leading and most compelling Scotchmen representing Scottish affairs in parliament,<sup>220</sup> his liberalism itself was contradictory. Whilst someone like John Bright could say that with the rise of liberalism “history now belonged to the intelligent and moral person as opposed to the kings and emperor” Argyll, a wealthy aristocratic landowner, belonged to that very party. To a conservative aristocrat present during the reading Argyll’s Bill seemed like a radical and detrimental departure from a tradition that ultimately shifted power away from the “kings and emperor”.

By 12<sup>th</sup> April when the Scottish Bill was again raised in parliament a number of the Lords presented petitions against it. The Duke of Marlborough presented a petition that had been signed by a large number of iron masters and coal owners in the West of Scotland. (Possibly suggesting that the petitioners saw the loss of their child workforce to school education as a cost they were not willing to take.) Lord Dalhousie and Lord Airlie concurred with Marlborough in appealing to postpone the Committee on the Bill. Argyll was hugely disappointed by this outcome but stated that he could not resist the appeals of the noble Dukes and noble friends. As a final solution Argyll suggested that another reading of the Bill, revised and updated addressing the objections and criticisms, could take place at some point in May. Whether unfortunate or indeed fortunate for Argyll, the proposed May date never materialised and it would be three years later in 1872 that the Scottish Education Bill would once again be brought to the House of Lords - at that point

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<sup>220</sup> Lynch, M., 1992. *Scotland: A New History*. London: Pimlico. p.416.

under very different circumstances. As was his nature Argyll certainly did not remain idle during this extended three-year gap. Under Gladstone's Liberal term as prime minister between 1868 and 1874 Argyll assumed his most prominent cabinet position as Secretary of State for India, and this would see him embarking on one of his most important imperial scientific projects in the form of the RIEC, discussed in the next chapter.

### Scottish education and the passing of the Act in 1872

Between the raising of the first Bill in 1869 and the final Bill in 1872 (with Argyll was at the India Office) Lord Advocate Young had attempted to introduce the Bill in parliament a second time. But this too failed on account of the objections raised regarding the Scotch Education Department being located in London instead of Scotland.<sup>221</sup> Furthermore the English Education Act of 1870 had by this time successfully passed whilst Scotland was effectively still in the same position from three years previously. Determined to succeed, Argyll presented the amended Bill on 5<sup>th</sup> July 1872 this time continuously pressing the fact that England was now two years ahead of Scotland on this matter. Argyll's theory of education consisted of three stages: parents, churches, and the state. If parents failed to educate their children it was the duty of the churches to step up, but if the churches also failed, it was then the duty of the state. Argyll utilised his theory in arguing that in England, parents and churches had both failed and so the state had rightfully stepped in.<sup>222</sup>

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<sup>221</sup> Scotland, J., 1972. The Centenary of the Education (Scotland) Act of 1872. *British Journal of Educational Studies*, [e-journal] 20(2),121-136. <https://doi.org/10.2307/3120213>. p.122.

<sup>222</sup> *Hansard* HL Deb. Vol.212 Cols.674-688, 5 July 1872. [online]. [Accessed 7 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/lords/1872/jul/05/second-reading>.

He continued to lay out the principles of the Bill. He talked about the necessity for state involvement owing to the growing population which had now largely outgrown the parochial system. And that Scotland unlike England did not need to fear a national system destroying the denominational schools since the religious conduct in the various Scottish schools were virtually the same (bar Catholics and Episcopalians). He also argued that involvement in religious education should be directed away from the government to the management of local bodies to recognise the requests of secular schools who would not want religious education. This secular freedom was not a hidden agenda to rid Scotland of religious education, rather it was the natural extension of Argyll's own religious realism and tolerance. Argyll dreaded the idea of a completely secular Scottish education system, but he also believed that Scotland could not rely on its now outdated parochial system anymore. Therefore, in Argyll's eyes, freedom from religious teaching for secularists served as a compromise enabling each school to decide whether it wanted to include or remove religious education.<sup>223</sup>

Responses to the Bill were very different compared to 1869 and although there was still much disagreement many of the Lords were now in favour of the newly proposed Bill. The Duke of Richmond stated that he was glad to be able to agree with much that had been stated by Argyll remarking that "it would be a very disastrous thing for the people if some settlement of the question with regard to the education of the people was not speedily come to" a sentiment that was now widely agreed upon by almost everyone involved in the Bill.<sup>224</sup> Nonetheless flaws were

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<sup>223</sup> *Ibid.*, Col.681-688.

<sup>224</sup> *Ibid.*, Col.688.

still perceived. Although happy with much of the change, Richmond himself argued that the new proposal was very different to the first in 1869. Instead of simply extending and improving the parochial system of Scotland, the Bill as it currently stood would “at once put an end to that system”<sup>225</sup> The Earl of Airlie, who had opposed the 1869 Bill, was now much more welcoming of the present one. Yet he opposed the suggestion that examiners for schoolmasters and schools be appointed under the Scotch Education Department instead of the universities where they were currently sourced because this would sever the important and direct link between the elementary schools and universities.<sup>226</sup> Richmond and Lord Rosebery both opposed Argyll’s views on secular education arguing that under these measures the religious teachings given under the guidance of Scottish parishes would decline leading to the inevitable decline in Scotch conduct and industry.<sup>227</sup>

Despite the problems raised, at the end of the reading it was agreed that the Bill be moved to a Committee and by the beginning of August Argyll optimistically noted in parliament that the most recent amendments from the Commons did make some modifications but not drastic changes to it. On this basis he saw no reason why any Lord should oppose the Bill as it now stood. There would still prove to be some difficulties but despite this the Bill was eventually agreed and after three difficult years of parliamentary debate - eight years of work on the part of Argyll - the sixth of August saw the Bill become law. The 1872 Education (Scotland) Act which eventually passed saw the old parochial system transformed into a new

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<sup>225</sup> *Ibid.*, Col.689.

<sup>226</sup> *Ibid.*, Col.695.

<sup>227</sup> *Ibid.*, Col.688-695, 696-697.



public National system managed by local school boards. These local boards were headed by a Board of Education who were subsequently responsible to the Scotch Education Department, the 'Central Authority', based in London. In 1869 Argyll had wanted the Board of Education to be a permanent, however, with the 1872 Act the Board was arranged to last only for a maximum of five years before devolving its powers directly to the Scotch Board of Education.<sup>228</sup> The examination of teachers and the supplying of certificates of competency - which had been carried out under the Scottish Universities - was directly transferred to the Scotch Education Department and teachers would no longer have the guarantee of tenure.<sup>229</sup> Education became compulsory for children, but under the 'Conscience Clause' any child could be withdrawn by their parents from any religious teachings or observances that they did not want to be part of. Religious observances and practices themselves were relegated to the beginning and end of the school day but not during.<sup>230</sup> The effects of this Act, perhaps predictably, became apparent over the final quarter of the nineteenth century. Private and denominational schools began to disappear whilst elementary schools under the National system continued to increase and by the early 1900s 89% of Scottish schools had been established under the National system as compared to 71% in 1875.

## Conclusion

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<sup>228</sup> *Education (Scotland) Act 1872 (c.62)*. [online] Available at: <<http://www.educationengland.org.uk/documents/acts/1872-education-scotland-act.html>> p.373.

<sup>229</sup> *Ibid.*, p.391.

<sup>230</sup> *Ibid.*, p.397.

Argyll's devotion towards matters of education seemed to stem largely from his own missed opportunities in receiving formal public education early in his life. Personally aware of the limits of his isolated studies, he sought out opportunities to ensure that young Scottish children could always receive the benefits of public education. After eight years of work the eventual passing of the 1872 Education Act - which has shaped Scottish education ever since - embodied Argyll's hopes in theory, yet in reality the Education Act rested on a number of compromises that Argyll did not initially envision. As I have shown, National schooling was not his only involvement in education. From the 1850s onwards, Argyll increasingly involved himself in a range of activities including, the 1853 University tests Bill in Scotland, his BAAS address in 1855, and Henry Darwin Rogers' appointment as professor of natural history at Glasgow university in 1857. In all these cases Argyll's decisions were strongly guided by his abiding interest in the sciences, his liberalism, and religious tolerance, and on these principles, he advocated for what he thought would best improve the condition of Scotland as a nation. However, his influence was not limited to Scotland alone and when he assumed the role of Secretary of State for India in 1868 Argyll quickly turned his efforts to the development of India through the tools of science, education and empire.

### **Chapter 3: Engineering reconstruction: Argyll as Secretary of State for India and the construction of the Royal Indian Engineering College**

This chapter follows on from chapter two by focussing on Argyll's role in the establishment of the Royal Indian Engineering College (RIEC). I have chosen the term 'reconstruction' in my title to capture the specific nature of the RIEC in distinction to the 1872 Education Act, by which I mean 'the act of restructuring something after it has been damaged or destroyed'. Argyll was a key player behind the establishment of the RIEC. Situated in Cooper's Hill, Surrey near Egham, the RIEC was a college intended to educate British teenage boys for civil engineering services in the Indian Public Works Department (IPWD). The RIEC was set up with two main purposes in mind, 1) to serve as an example of an innovative method of scientific and engineering training in contrast to the dominant method of apprenticeship and pupillage which had previously prevailed. And 2) to be able to send more, as well as better equipped civil engineers to work for the IPWD. The idea was that completing the course would ensure that the engineers sent to India had the necessary skills. The former was a national aim and the latter an imperial one. As might be expected the finalisation of the RIEC was not a simple procedure and Argyll again faced a great deal of opposition.<sup>231</sup> However, it is important to note that in contrast to the 1872 Act, Argyll's position as Secretary of State meant that he was in a much higher role of authority and thus largely above the necessity

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<sup>231</sup> Brendan Cuddy has already revealed the workings of the RIEC post 1871 until its eventual closure in 1906. Here I will address a gap by contextualising Argyll's role in the initial proposal and development of the RIEC, see Cuddy, B., 1980. *The Royal Indian Engineering College, Cooper's Hill, (1871-1906)*. Ph.D. London University.

to compromise with ‘dissenters’. In the end as we will see, under Argyll’s direction, plans for the college would go ahead despite the fact that numerous institutions across Britain would oppose it. Thus, through this chapter one of my central aims will be to demonstrate the ways in which gentlemanly amateurs like Argyll were sometimes *responsible* for creating the very conditions that enabled the rise of middle-class institutionalised, professionalised science and technology on both national and imperial scales. We revisit similar themes to the last chapter including, class, gender, politics, nationalism, but here we will also come into contact with issues of imperialism in the Victorian British context.

#### The rise of Gladstone and the India Office

After Lord Derby’s resignation early in 1868 the Queen promptly sent for Disraeli to become Prime Minister of Britain, and on accepting he became leader of the Conservative government. His leadership, however, was short lived. In December, Gladstone - who had recently taken over from Lord John Russell - as leader of the Liberal party - defeated Disraeli in the General Election that month.<sup>232</sup> Throughout the 1860s the Liberal party had been quite unstable, thus as K. Theodore Hoppen notes, during the mid-to-late 1860s Gladstone’s intention was to reunite the party together after “the debacle of 1866-7.” This it seemed to Gladstone could only be done if he could secure the premiership of UK. Before Disraeli’s defeat therefore, Gladstone was already actively

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<sup>232</sup> Lord John had become Prime Minister in 1865 but resigned after his failed attempt at passing a Reform Bill in 1866.

attempting to reunite the Liberals by focusing on the Disestablishment of the Irish Church,<sup>233</sup> a subject which successfully saw the unification of the Liberal party against the Conservatives. While still acting as opposition to the Conservative government Gladstone was able to act partially on Irish Church matters in pushing both his Suspensory Bill as well as the Church Rates Bill through Parliament. Throughout all of this Argyll continued to support him in personal correspondence as well as in the Lords. On the 29<sup>th</sup> June 1868, Argyll, in line with his religious realism, made a speech in the Lords on the issue of the Disestablishment arguing that

[Of the Church of England it may be said that] she has been the symbol of national life at; great periods of our history, and that she has been - and I trust, still is - the standard-bearer, of the Protestant feelings and opinions of the people. But can it be said of the Irish Church that she ever has been the symbol of national life to the Irish people? Can it be said that she represents the religious feelings of the people? No, the contrary is the fact. And if the disaffection of the Irish people is a purely traditional disaffection, at least you must admit that the Established Church is a traditional remembrance of the misery and oppressions of their former history.<sup>234</sup>

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<sup>233</sup> Hoppen, T. K., 2008. *The Mid-Victorian Generation 1846-1886*. Oxford and New York: OUP. p.594.

<sup>234</sup> *Hansard* HL Deb. Vol.193 Col.180. 29 June 1868. [online]. [Accessed 8 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/lords/1868/jun/29/debate-resumed-third-night>.

Although they disagreed on certain matters of religion (Gladstone coming from an Anglo-Catholic background whilst Argyll a firm Presbyterian), Argyll's continuous political support lead to him to receiving a high position in Gladstone's new fifteen strong cabinet ministers - namely as Secretary of State for India. The position was established in 1858 after the Indian Revolt of 1857-8 (often labelled, by the British, as the 'Indian Mutiny') which had seen the transfer of the East India Company's administration directly to the Crown. The position of Secretary of State arose because parliament could not be expected to take on Indian matters alongside everything else it had to deal with, and India was seen as too much of a prized possession to lose.<sup>235</sup> As Disraeli had claimed, to the British, India was like the "jewel" in the Queens crown,<sup>236</sup> and so what was sought was someone who could largely separate themselves from Home affairs to focus on Indian matters. This person would be surrounded by a body that had personal experience and/or knowledge about India and who would act as advisors to the Secretary of State. After much debate in parliament throughout the early months of 1858 an Act was passed in August which made allowances for the appointment of a 'Council of India' composed of fifteen experienced men each paid £1,200 per annum.<sup>237</sup> The powers of the Council varied in that

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<sup>235</sup> Singh, S. N., 1962. *The Secretary of State for India and His Council*. New Delhi: Munshi Ram Manohar Lal. pp.1-2.

<sup>236</sup> In 1876 an Act was passed in parliament which conferred to the Queen the title of 'Empress of India' to which Disraeli had a leading hand in seeing through.

<sup>237</sup> Singh, S. N., 1962. *The Secretary of State for India and His Council*. New Delhi: Munshi Ram Manohar Lal. p.9.

for most situations that arose - not directly involving finances or the purchasing of a building - the Secretary of State could overrule the majority decision but had to provide adequate reasoning for doing so. However, when issues involving finances or building purchases arose, the Secretary of State could only move ahead with a plan if he gained a majority support from his Council.<sup>238</sup> The relevance of this point will become understood later in this chapter. On the 9<sup>th</sup> of December 1868 Argyll assumed his position as Secretary of State for India (the sixth person to hold the office) and this role - new to both Argyll and Britain itself - would become the most significant cabinet position that he would hold.

#### Interest in India and Sir Syed Ahmed Khan

Based on his correspondence and political activities, it is clear that Argyll's interest in British-Indian matters increased significantly during the 1850s and 60s due in large part to the radical nature of the Indian Revolt. As I mentioned in chapter one Argyll's character meant that he held a natural scepticism towards the word of authoritative figures such that he preferred to investigate topics (which he deemed important) on his own accord. This is precisely what happened when, after a detailed personal investigation into the British governance of India prior to 1857, Argyll published a short yet notable book entitled *India Under Dalhousie and Canning* in 1865. The book (composed of two articles he initially published in the *Edinburgh Review* in 1863) contained numerous arguments but the central premise intended to set straight the causes

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<sup>238</sup> *Ibid.*, p.10.

and events surrounding the Indian Revolt. Argyll himself primarily referred to the events of 1857-58 as the 'Indian Mutiny' which gives us further insight into his heavily pro-imperialist stance. Within the pages of the book Argyll made the case that much of the blame in relation to the cause of the revolt had been, and continued to be placed on the two Governor-Generals who were in office during the time of the Revolt (Lord Dalhousie who held office between 1847 and 1856, and Lord Canning from 1856 to 1862.) But this blame, Argyll argued, was completely misplaced. Instead, if one scrutinised the records for themselves they would see that Dalhousie and Canning should rather be respected for their excellent management over all the various affairs during that unprecedented period. Where others had blamed Dalhousie for his supposed 'policy of annexation' and Canning for his supposed mismanagement of the 'mutiny',<sup>239</sup> Argyll instead suggested religion, class and caste as the primary origins of the revolt claiming that

[caste] is the power which some writers and speakers in this country have regarded as trivial; and which their ignorance of native character has led them to set aside as less capable of explaining the Mutiny of the Bengal Army than plots or conspiracies of which there is no trace

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<sup>239</sup> *Newcastle Journal*, 1858. The Annexation of Oude. *The Newcastle Journal*, 9 October. p.2f.; *Bell's Weekly*, 1858. The Rebellion in India. *Bell's Weekly Messenger*, 22 February. p.2ef; *Hansard* HC Deb. vol.148 cols.1478-1543, 16 February 1858. [Online]. [Accessed 5 July 2022]. Available from: <https://hansard.parliament.uk/Commons/1858-02-16/debates/9ab7eb05-f8f9-420c-99d1-2d35c2b76b21/India%E2%80%94AnnexationOfOude>.



what-ever, and which, if they had existed, could never have accounted for the curious and terrible phenomena of 1857.<sup>240</sup>

*India Under Dalhousie and Canning* was tainted with bias as it sought to project Britain in a position of superiority over India (although as we will see in chapter six this was not in a racially deterministic sense). Yet at the same time Argyll did not shy away from also criticising parliament as well and British public for their ill-treatment of Dalhousie and Canning up until their deaths in 1860 and 1862 respectively. Furthermore, although essentially downplaying or ignoring many of the other factors contributing to the Revolt, Argyll was in fact not wrong to point to class and caste as one of the most significant factors. It was certainly not the only reason, but as recent research has argued, class and caste were and are both essential aspects to an understanding of the religious and social dimensions that undergirded the onset of the Revolt.<sup>241</sup>

It was through his writings on Dalhousie and Canning that Argyll would eventually become acquainted with an important Indian figure a few years later. In 1864 a society named the Scientific Society was founded in Ghazipur, India, by the well-known populariser, reformer and polymath Sir Syed Ahmed Khan (also referred to as Syed Ahem) (1817-1898). Syed Ahmed was born in Delhi

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<sup>240</sup> 8<sup>th</sup> Duke of Argyll., 1865. *India Under Dalhousie and Canning*. London: Longman, Green, Longman, Roberts, & Green. p.77.

<sup>241</sup> Singh, H., 2013. Class, Caste, Colonial Rule and Resistance: The Revolt of 1857 in India. In: Barker, C., Cox, L., Krinsky, J., Nilsen, A. G., eds. 2013. *Marxism and Social Movements*. Leiden and Boston: Brill. 299-316.

in 1817 and although his family had served in the Mughal courts, he himself joined the East India Company as a court official in 1838. By 1841 he had been promoted to junior judge and posted to Fatehpur Sikri. From the 1840s onwards, and with his rising status both amongst Britons and Indians, Syed Ahmed pursued his developing interest in science, technology and religion through the publication of numerous books including *Tashil fi Jar-e Saquil* (roughly translating to ‘Principles of machines’) (1844), *Fawa'id Al-afkarfi ilmal Al-firjar* (roughly translating to ‘Advice for the use of the [mathematical] compass’) (1846) and *The Mahomedan Commentary of the Holy Bible* (1863-65).<sup>242</sup> With the opening of the new Scientific Society in 1864, and in line with Syed Ahmed’s interests, the stated aims were to translate works of Western literature, science and arts to bring them to an Indian audience. Having worked as part of the East India Company (before it was dissolved) Syed Ahmed supported Western education and spent much of his life encouraging the people of India to adopt Western methods of learning and technology. At the opening of the Scientific Society Syed Ahmed stated that “The Reason, gentlemen, why we are all so backwards nowadays, is that whilst we are learned in and benefitted by the philosophy, sciences, and arts of antiquity, we are almost

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<sup>242</sup> Qidwai, S., 2020. Sarah Qidwai, Sayyid Ahmad Khan: A Familiar Figure in an Unfamiliar Historical Setting. [online] Available at: < <https://mosseprogram.wisc.edu/2020/03/11/qidwai/> > [Accessed 5 Jul 2022].

entirely ignorant of those of modern times, which the youth of the present age seems to much to admire.”<sup>243</sup>

Shortly after Argyll had published his articles on Dalhousie and Canning in the *Edinburgh Review* they were translated by G.F.I. Graham, the biographer of Syed Ahmed, and sent directly to him. Argyll probably got to know about this translation sometime in 1864 and upon discovering Argyll’s pleasure in hearing about the translation, Graham, who likely knew about his scientific interests, wasted no time describing the new Scientific Society to Argyll. Graham informed Argyll about the new Society set up by Syed Ahmed and added a request for Argyll to become a patron. A letter from Syed Ahmed dated to February of 1865 containing welcome information about the official opening of the Society signals that Argyll had accepted the request of Graham probably in late 1864 and had sent funds towards the society by February of 1865

My Lord Duke,

I have been directed/instructed by the Scientific Society to send Your Grace, the Society’s Patron, a special letter containing the welcome information that the Institute for the erection of which funds have been raised by the natives of this District and by the Members of the Society generally, was formally opened by W.F. Williams, Commissioner of the Meerut Division on the 14<sup>th</sup> Inst. That this great

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<sup>243</sup> Graham, G. F. I., 1885. *The Life and Work of Syed Ahmed Khan*. Edinburgh and London: William Blackwood and Sons. p.74.

work was commenced and finished under the Patronship of Your Grace and that thus your name has been handed down to the natives of this part of India and to their posterity as the first English Duke under whose patronship a work of the greatest utility to the people at large has been brought to a successful issue, will be, I trust, gratifying to your feelings. Hoping that Your Grace may remain associated with the Society as its patron.

I remain  
MY LORD DUKE  
Your most obedient  
Servant  
Syud Ahmud<sup>244</sup>

Notwithstanding the fact that Argyll was in fact a Scottish rather than English Duke, he met Syed Ahmed in person four years later when Syed Khan came to England in 1869 with his two sons who had been granted scholarships to study in Britain. Argyll had intended in some way to honour the life and work of Syed Ahmed and was aptly able to do so on the 6<sup>th</sup> of August at the India Office when, as Secretary of State for India, Argyll officially presented Syed Ahmed with the

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<sup>244</sup> Letter of Syed Ahmed Khan to Argyll, dated to the 15<sup>th</sup> of February 1865, received through personal correspondence with Sarah Qidwai who completed her thesis on Sir Syed Khan in 2021 and has been instrumental to this section of my thesis.

insignia of the Companion of the Star of India,<sup>245</sup> after which they moved from ceremonial formalities to luncheon and an informal chat before Argyll retired to his private quarters for the evening.<sup>246</sup>

Aside from his direct engagements with Syed and the Scientific Society in India, Argyll was also friends with the German philologist and pioneer of British Indology, Max Müller, and the two began and kept up a correspondence from the mid-1860s until their deaths. (Argyll and Müller were both born in the same year and died in the same year). Their initial acquaintance and friendship began in 1861 when Müller gave his first set of lectures on philology at the Royal Institution which Argyll attended. A year later Argyll published an article called ‘The Supernatural’ in the *Edinburgh Review*<sup>247</sup> and when in 1864 Müller read the article, both men met and thereafter began their life-long correspondence. Müller’s work had a considerable impact upon Argyll’s views on Indian culture, history, and religion and in December 1868, when he assumed the India Office, Müller wrote a letter of congratulation. In it he rejoiced in the fact that “this great task of governing and benefitting India” should have fallen to someone who knew the “greatness of that task and all its opportunities”, and that India had “been conquered once. But India must be conquered again; and that second

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<sup>245</sup> This did not provide Khan with the prefix Sir, that was reserved for 1888 when Khan was awarded title of Knight Commander in 1888, see Qidwai, S., 2021. *Sir Syed (1817 – 1898) and Science: Popularization in Nineteenth Century India*. Ph.D. University of Toronto. p.ix.

<sup>246</sup> Graham, G. F. I., 1885. *The Life and Work of Syed Ahmed Khan*. Edinburgh and London: William Blackwood and Sons. pp.97-100.

<sup>247</sup> Bossoh, N., 2021. Scientific Uniformity or “Natural” Divine Action: Shifting the Boundaries of Law in the Nineteenth Century. *Zygon Journal of Religion and Science*, [e-journal] 56(1), 234-253. <https://doi.org/10.1111/zygo.12678>.

conquest should be a conquest by education.”<sup>248</sup> In the same letter Müller also shared his thoughts on the state of modern Indian religion stating that “India can never be anglicized, but it can be reinvigorated”. Müller was aware of the vast differences between Western Christianity and the various Indian religions thus he acknowledged the role of Christian missionaries but still concluded that “The Christianity of our nineteenth century will hardly be the Christianity of India.”<sup>249</sup> Despite the religious challenges, both Müller and Argyll were keen to promote education in India, however, they had different ideas about how this “conquest by education” was to be achieved. Whereas Müller’s aims were focused on raising a national feeling of pride in India by encouraging Indians to study their own ancient heritage, Argyll’s aims - as we shall see – focused on a far more Westernised technical and industrial development of India, largely at the expense of the Indians themselves.

A week into his new role Argyll wrote to Lord Mayo, Viceroy and Governor-General of India, saying that

You will have heard before this reaches you that I have received the seals of the India Office in the new Administration. Indian politics are fortunately, for the most part, unconnected with party struggles at home, and I hope that there will be nothing to prevent me from having

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<sup>248</sup> Argyll, *Autobiography*, II: 271.

<sup>249</sup> Müller, G. A., 1902. *The Life and Letter of the Right Honourable Friedrich Max Müller*. New York and Bombay: Longmans, Green, and Co. pp.357-358.

an open and confidential communication with you on every question affecting the government of India.<sup>250</sup>

Lord Mayo was a well-known member of the Conservative party at home and Argyll's letter suggests that he hoped that party politics would not affect politics in India.

To understand Argyll's purpose in pushing for the formation of the RIEC in his new cabinet position we need to understand a little more about the engineering context in both Britain and British India during this period. It is to this that we now turn.

#### The Public Works Department and the Indian engineering problem

The East India Company (EIC) began in the seventeenth century as a British trading company in India. According to Mike Chrimes "Modern British engagement with South Asia can be dated to the establishment by Royal Charter of the (English) East India Company in 1600, and the diplomatic mission of Thomas Roe to the Mughal court 1615-18."<sup>251</sup> Although it began small, by the nineteenth century Britain had gained large amounts of territory in India and was employing "a significant number of British engineers in the period 1780-

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<sup>250</sup> Argyll, *Autobiography*, II: 269-270.

<sup>251</sup> Chrimes, M. M., 2015. Architectural dilettantes: construction professionals in British India 1600-1910. Part 1. 1600-1860: The age of the dilettante. *Construction History*, [e-journal] 30(2), 15-44. Available through: Jstor Library website < <https://www.jstor.org/stable/44215906> > [Accessed 8 June 2022]. p.15.

1950.”<sup>252</sup> This was mainly supplied through the Public Works Department formally known as the Indian Public Works Department<sup>253</sup> (established by Lord Dalhousie in the early 1850s) which was part of the Indian War Department under control of the ‘Military Board’. According to B.P. Cuddy the tasks of the IPWD were to “irrigate, to build bridges, roads, railways and ports: to spread the benefits of Western technology over the face of the subcontinent.”<sup>254</sup> Similarly, Peter Scriver notes that during the nineteenth century the Department was a “prime, even literal, exemplar of this metaphorical “scaffolding” of empire.” Through the IPWD the British were “significantly restructuring the Indian subcontinent, both spatially and technologically.”<sup>255</sup>

In the 1850s emerging financial problems related to the capital expenditure on Indian engineering works within the Military Board led to the separation of the Board from the IPWD which was subsequently set up under new management within the government in 1855.<sup>256</sup> Due to the military nature of the Department before 1855 the staff mostly consisted of military engineers. However, expenditure on civil projects began to grow significantly from the 1860s leading to huge sums of money being spent on these projects. In 1861, for example, a total of just under £4,000,000 was spend by the Department on

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<sup>252</sup> *Ibid.*, p.16.

<sup>253</sup> The short hand for the Indian Public Works Department is IPWD, however, in this paper I will also refer to the IPWD as simply the Department.

<sup>254</sup> Cuddy, B., 1980. *The Royal Indian Engineering College, Cooper’s Hill, (1871-1906)*. Ph.D. London University. p.39.

<sup>255</sup> *Ibid.*, p.39.

<sup>256</sup> *Ibid.*, pp.39-40.



various projects - civil building works amounting to around £390,000 of that expenditure. However, by 1870 over £6,000,000 was spent on varying projects - civil building works this time amounting to almost £800,000.<sup>257</sup> These large sums signified a need for an increase in engineers, but due to the amount spent on civil projects, civil instead of military engineers were required.

The need for civil engineers increased even more after 1869 when Argyll successfully pushed through a new government policy that got rid of the need for external companies to provide labour for Indian railways. Before this new policy was approved larger public works projects in India (particularly railway lines) were carried out through the employment by the British government of specific (usually English) companies. The government would guarantee the company 5% on the capital outlay as well as one-half of all surplus profits above the 5%. During the early months of 1869 Argyll began to think about means by which carrying out large public works would not require the aid of external companies which had resulted in government financial losses due to the guaranteed 5% pay-out and surplus pay-out. Upon further inquiry into this matter Argyll spoke to a former chairman (named Mr. Childers) of one of the railway companies. Afterwards he spoke to his own Council and all agreed with his case stating that the government should indeed raise the money and sort out

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<sup>257</sup> *Ibid.*, p.41.

the labour itself.<sup>258</sup> To Lord Mayo he shared his thoughts on this question stating that

I am myself disposed to think that as regards railways we might now dispose with the agency of companies altogether. We could raise the money on our direct security at 4 per cent., whereas we guarantee 5 per cent. to the companies; and besides this, we sacrifice our right to one-half of any possible surplus of profits over and above the 5 per cent. ... Might we not succeed in inducing the natives to invest more largely by the plan I suggest of disposing with the agency of companies?<sup>259</sup>

By the 30<sup>th</sup> of July Argyll was able to report to Mayo that “I have announced in Parliament the new railway policy, apparently with general approval”,<sup>260</sup> although there were some minor objections against it, this policy became official by August 1869. Thus from 1869 onwards the government took direct control of large Indian public works projects, and the need for qualified civil engineers was further heightened.

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<sup>258</sup> *Hansard* HL Deb. vol.198 cols.521-536. 23 July 1869. [online]. [Accessed 8 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/lords/1869/jul/23/railways-india-financial-statement>.

<sup>259</sup> Argyll, *Autobiography*, II: 269-272.

<sup>260</sup> *Ibid.*, p.273.

Within this imperial context the origins of the RIEC can be traced back to at least the start of 1869. Problems between civil and military engineers in India extended back much further, but under Argyll three serious issues would present themselves which further suggested the need for some form of reconstruction within the IPWD. Before we look at these three issues we need to briefly unpack the financial and social context in India that existed between the military and civil engineers.

#### Engineering problems within the Department: The beginnings of the RIEC

Prior to Lord Mayo as Governor-General of India, Sir John Lawrence held the position between 1864 and 1868. Ten years before Lawrence assumed this position the Department was almost exclusively staffed by Military men. In 1854 however, an initial set of civil engineers (small in number) were sent to India from England. During the 1860s, as it became clear that civil engineering services were needed across India, certain revisions were implemented including improved salaries in 1864-5. In fact, between 1864 and 1868 the number of civil engineers doubled in comparison to the number of any other officers or engineers as seen by the table below.

	JANUARY 1864.	DECEMBER 1868.
Royal Engineer Officers ... ..	199	201
Other Military Officers employed as Engineers ...	110	110
European Civil Engineers ... ..	209	436
Native Civil Engineers ... ..	37	36
Total ...	555	783

Table 4. Showing the number of various engineers employed between 1864 and 1868<sup>261</sup>

Although there was a general increase across the board, the one area where there was a small decrease was in the number of native civil engineers (who already had the lowest number of engineers in the Department). This can be seen as a nod to the fact that all the various engineering works in India were perceived exclusively in terms of consolidating the British Empire and as such should not be carried out by foreigners (even if it was their own land). Argyll himself was very clear about the imperial nature of the India Office which he now occupied. In contrast to his plea for Disestablishment of the Church of Ireland enabling more Irish autonomy, Argyll staunchly asserted his authority as the supreme head in all Indian matters, “The Secretary of State is supreme in all matters whatever, except ... direct grant or appropriation of money to persons, either here or in India, which might be made for the purpose of political jobbery. ... I need hardly say that it makes the Secretary of State practically supreme in all matters, whether they do or do not cost money.”<sup>262</sup> This contrast between Irish autonomy and Indian domination might be better understood by discerning Argyll’s own ideology. In his eyes, Ireland was not in the same economic, religious or social position as India. Ireland was Christian and home to well

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<sup>261</sup> Anon., 1868. *Summary of the Principal Measures Carried out in the Public Works Department During the Administration of Sir John L. M. Lawrence Viceroy and Governor General of India, From January 1864 to January 1869*. Calcutta: Public Works Department Press. p.2.

<sup>262</sup> Singh, S. N., 1962. *The Secretary of State for India and His Council*. New Delhi: Munshi Ram Manohar Lal. p.26.

respected men of science such as his noble contemporary Lord Rosse and John Tyndall (even if Tyndall sometimes downplayed his Irish descent). Crucially Ireland also sent MPs to Westminster, but India did not have these liberties. In this sense Ireland was at a point where it could progress on its own and the Church of England only served as a hinderance to this progression. On the other hand, India was comprised of numerous non-Christian religions, and in Argyll's eyes, severely lacking in groundwork and infrastructure and Western education.<sup>263</sup> British control over India then was not a hinderance but rather a benefit.

Returning to the IPWD, the period between 1864 to 1868 saw increased grants for public works. For the years 1864-65 the total funds allocated to public works was £5,101,829 and for the years 1867-68 it went up to £6,919,500. However, the actual expenditure for each year fell short of the funds given because the grant money was regularly redirected towards military and sometimes irrigation works.<sup>264</sup> These redirected funds were used to supplement military accommodation and projects such as barracks, hospitals, rest-houses,

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<sup>263</sup> 8<sup>th</sup> Duke of Argyll., 1865. *India Under Dalhousie and Canning*. London: Longman, Green, Longman, Roberts, & Green. pp.40-41, 65.

<sup>264</sup> According to the *Summary of the Principal Measures Carried out in the Public Works Department* in 1868, the years which saw the irrigations works laid down could be regarded as "among those which have been most fruitful of good" against the worst enemies of "this great country...drought and famine", see Anon., 1868. *Summary of the Principal Measures Carried out in the Public Works Department During the Administration of Sir John L. M. Lawrence Viceroy and Governor General of India, From January 1864 to January 1869*. Calcutta: Public Works Department Press. pp.5, 27-28.

buildings for the comfort and amusement of the men, and fortification works such as that of the Bombay harbour.<sup>265</sup>

In contrast to the above military funds there was no increase of expenditure on ordinary public works until it was decided that an extra £260,000 be injected into public works for the years 1869-70. On the other hand, there was a decrease of £260,000 in public works funding for the years 1865-66 during the time that the military grants were increased.<sup>266</sup> In relation to railways, in 1864 there were over 2000 miles of railways open in India but by 1869 it was predicted that there would be over 4000 miles of railway necessitating a huge increase in capital expenditure. This indicated a serious need for qualified railway engineers who could undertake this expansion. During 1869 three incidents occurred which further widened the already present rift between the civil and military engineers, plus the need for more civil engineers in India.<sup>267</sup>

#### The three incidents against military engineers

The first incident began late in 1868 when the civil engineers sent a memorial to the Viceroy, Lord Mayo, titled *Civil Engineer Grievances in the Department*. This document, said to be based on “Official Documents and Reports to the Government” had appeared in columns of the *Engineer* and *Engineering* in late 1868 and early 1869. Its intent as stated was to show the “harsh, unfair, and

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<sup>265</sup> *Ibid.*, pp.12-14, 16.

<sup>266</sup> *Ibid.*, p.29.

<sup>267</sup> *Ibid.*, p.41.

unreasonable anomalies which now existed in the Department, as between the Civil and the Military element.”<sup>268</sup> The problems listed were numerous but probably two of the most important to mention were the disparities in pay, and the retirement and pension possibilities. The payment issue had lingered on for many years. The memorialists quoted a passage from the first 1864 Inquiry into the Public Works Account which noted - amongst a number of things - that one third-class military executive engineer received a higher salary than the civil superintending engineer who is of a higher rank. The memorialists then quoted from the 1867-8 *Report of the Orissa Famine Commission* which had stated that “the necessity of a well-considered system for the supply of a large body of civil engineers is daily more apparent”, going on to say that “the rules which regulate salaries and pensions require revision. The salary on which a young civil engineer commences his duties seems to be too low” despite the fact that young civil and military engineers both essentially held the same appointments.<sup>269</sup> On the subject of pensions the memorialists noted that military engineers could retire on a pension after twenty-one years of service, however, for civil engineers, retirement was only granted after thirty. Furthermore, for civil engineers, service before the age of twenty-two did not count as actual service and so the earliest that any civil engineer could hope to retire was at the age of fifty-two.<sup>270</sup> Based on these matters of concern the memorialists concluded with

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<sup>268</sup> Inveraray Castle archives, Bundle 1724.

<sup>269</sup> *Ibid.*

<sup>270</sup> *Ibid.*

a request to rectify these inequalities. Months passed however without a response from the Viceroy who it seems did not think it a grave enough concern to deal with.

The second incident took place in June of the same year after a serious barrack failure which resulted in the injury of seven people and the deaths of four others. An official inquiry into the tragedy concluded that the military executive engineer Major W. Jackson was to blame. Under Jackson the construction was completed but the failure was to do with the poor quality of the lime used in the mortar mix. Jackson was soon removed from the Department and the civil engineers wasted little time in pointing to his removal as evidence that military engineers were indeed unfit to carry out vital Indian engineering works.<sup>271</sup>

The third incident only added fuel to the flame when two months later the Secretary to the Government of India (GOI), Colonel Strachey, published a statement against the civil engineers in England that was seen to be a statement of ignorance at best, or direct falsehood at worse

Whereas the Governor-General in Council is given to understand that,  
in the Civil Engineering profession in England it is a recognised  
practice for civil engineers employed by public companies and

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<sup>271</sup> Cuddy, B., 1980. *The Royal Indian Engineering College, Cooper's Hill, (1871-1906)*. Ph.D. London University. p.45; 1<sup>st</sup> Baron Armstrong., 1882. *His Grace the Duke of Argyll on Indian Public Works and Cooper's Hill College. A Reply with Correspondence between His Grace and the President of the Institute of Civil Engineers*. London: E. & F. N. Spon. pp.16-18.



otherwise to receive, in addition to the salaries paid them by their employers, commission on contracts given out, or stores and materials ordered or inspected by them, and other like pecuniary considerations for services done, or intended to be done, which are considered legitimate sources of emolument; and whereas a considerable number of civil engineers, who have practiced in England, have lately been employed by the government of India, and the number of such engineers is likely to increase.<sup>272</sup>

This was the final straw for the civil engineers in India. Not long after the statement an anonymous civil engineer in India asked the editor of *Engineering* to reprint the statement by the Indian government within their columns with corrective remarks by the anonymous engineer.<sup>273</sup> He saw the statement by the Indian government as a mockery of everything that English civil engineers both in England and India stood for. It portrayed them as a group of men who accepted bribes as a legitimate source of income to which the anonymous author described as a “scandalous falsehood”.<sup>274</sup> In calling attention English engineers the Governor-General had perhaps wittingly or unwittingly provoked the wrath of the Institution of Civil Engineers (ICE) in England. The disagreements and

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<sup>272</sup> Inveraray Castle archives, Bundle 1724.

<sup>273</sup> This was published on the twenty second of October in *Engineering* to the English audience.

<sup>274</sup> Inveraray Castle archives, Bundle 1724.

disparities in India had now officially reached Britain and could no longer be brushed to one side.

When the ICE read about the incident its president Charles H. Gregory wrote a letter to Argyll asking for a meeting with him to set the record straight. On the 27<sup>th</sup> of October Argyll sat down with members of the ICE to listen to their requests and not long after the deputation, he communicated the matter with Lord Mayo, and although a formal retraction statement swiftly followed (within two weeks of the first statement), the damage had been done.<sup>275</sup>

The series of events that took place during 1869 created a deep rift between the civil and military engineers in India that could not be easily rectified. The civil engineers demanded change and thus tried to expose the inequalities inherent in the Department but for the most part their efforts yielded little favourable results. Instead of bottom up change what was needed was top down change. Unknown to the civil engineers at the time was that since the beginning of the year high standing figures had indeed been pondering and planning ways to reconstruct the seemingly defective system, then, currently in place.

#### The scope of British engineering and the Indian problem

In July 1868 The Public Works Council Minutes recorded that in England “only 22 candidates having passed at the recent examination whereas 40 is the number of civil engineers required by the gov<sup>t</sup> of India, it is submitted that another

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<sup>275</sup> *Ibid.*

examination be advertised to be held in December”<sup>276</sup> This amendment was not unique to 1868: previous years had also seen a similar problem with not enough candidates being sent to India. The origins of this conundrum lay in the (then) new plan set up by Lord Stanley, the first Secretary of State for India in 1858. In 1859 Stanley established a method for sending young English civil engineers to India to supplement the military engineers - although not very many in number<sup>277</sup> (native Indian engineers were conspicuously out of the question). The system entailed an open examination held on a yearly basis, or, as evidenced by the Minutes of 1868, bi-yearly if numbers weren’t sufficient. The examination was limited to young males (as females were barred from taking part) with a rough upper age limit of twenty-five, and as a requirement they had to have at least three years of hands-on experience. In nineteenth-century Britain there was no single route into professional engineering so young boys who were interested in engineering (or whose parents had forcefully urged it upon them) had to weave their way into the industry usually through the apprenticeship system. This system was extremely practical, essentially consisting of a master (experienced engineer) and apprentice who would follow and learn from the master ‘on-the-job’. Theoretical training in areas such as mathematics and

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<sup>276</sup> Public Works Council Minutes. 1<sup>st</sup> January 1867 to 30<sup>th</sup> June 1869. p.30; All Public Works Council Minutes cited in this chapter are held at the British Library.

<sup>277</sup> The first year only saw twenty-four places advertised for, with only fourteen eventually being appointed, see Thornton., W. T., 1871. *Copy of all Correspondence which has taken place up to the present time between the Secretary of State for India in Council and the Governor General of India in Council, in reference to the Establishment of an Engineering College at Cooper’s Hill*. London: House of Commons. pp.3-4.

physics was not part of the traditional engineering route in Britain (although military engineers did receive some theoretical training at colleges in Addiscombe, Woolwich or Chatham).<sup>278</sup> Even when the ICE was established in 1818 it explicitly stated that it “Prescribed no Curriculum, held no examinations, granted no diplomas and conferred no degrees”.<sup>279</sup>

In fact, when a comparative investigation into engineering in Britain and Europe was completed and published in 1870 by the ICE Council it concluded two things. Firstly, that “in England the profession of engineering is entirely unconnected with the Government” and secondly, that there was in England “no public provision for engineering education”. The case was perhaps overstated but there was certainly some truth to it. The 1870 publication reported that in comparison to England other governments were actively involved in technical education, France being the best example having their Government Corps of Engineers in existence under two divisions.<sup>280</sup>

Back in England, and due largely to the open examination system under Lord Stanley, the problem of ‘cramming’ could and did occur. Young boys following their masters around on various jobs could do their best to excel, or, pay no attention to what they were learning. Once the latter group completed the minimum years required a cramming session with a tutor in the months leading

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<sup>278</sup> Black, J., 2009. The military influence on engineering education in Britain and India, 1848 – 1906. *The Indian Economic and Social History Review*, [e-journal] 46(2). 211-239. <https://doi.org/10.1177/001946460904600203>. p.216.

<sup>279</sup> *Ibid.*, p.218.

<sup>280</sup> Institution of Civil Engineers., 1870. *The Education and Status of Civil Engineers, in the United Kingdom and in Foreign Countries*. London: Institute of Civil Engineers. p.x.

up to the open examination could provide them with the information needed to pass. The impending dangers of this method were obvious, boys with little to no skill (or passion) for engineering were (at least periodically) being set to work on major construction projects in India which required precision and proper practical experience.

#### Top down reconstruction: Argyll, Chesney and the new college

By the time Argyll became Secretary of State for India the number of civil engineers in the IPWD had noticeably increased – partly due to the new parliamentary policy pushed by Argyll in 1869. At the start of 1869 Argyll and a cohort of key figures began corresponding on the engineering situation in Britain and its supposed defects in the IPWD. These key figures included Dr Alfred Wrigley - Head Master of Clapham Grammar School, W.T. Thornton - Secretary of the IPWD and Major George Chesney - IPWD Accountant. Out of all the above, Chesney and Argyll played the most important roles - Chesney even more so than Argyll. George Chesney was born in Tiverton on 30<sup>th</sup> April 1830 and he entered the EIC Military Academy in Addiscombe in 1848. In 1850 he was posted to the IPWD as a qualified engineer although after being injured in the Siege of Delhi in 1858 he taught at Thomason College of Engineering in Roorkee and by 1860 left to become Head of the Accounts Department in the IPWD. Thus, Chesney's military engineering knowledge and IPWD experience was gained from the inside, unlike Argyll whose knowledge and experience was gained from the outside. The idea for a new English college for India likely

developed in the mind of Argyll during 1868 or early 1869. However, he was not the only one to have such thoughts. On the 28<sup>th</sup> February 1869 Thornton wrote to Argyll saying “Your Grace will recollect that, on your lately mentioning to me that you had been thinking of the expediency of establishing a college in England ... I took the liberty of saying that a similar idea had occurred to myself and that I had been talking over the matter with Major Chesney and Dr Wrigley”.<sup>281</sup> Wrigley himself had already written a letter on the 30<sup>th</sup> of January which was read by Thornton and Chesney. The letter had stated that the current open examination was a failing method in need of change and went on to propose a new system in which students would first be examined on mathematical and scientific subjects and upon passing, stay in England to enter a “special course” for two years. Within these two years they would be properly instructed in engineering, surveying, architecture, Indian history, geography, politics and the Hindustani language. Regular tests would filter out under performing candidates and at the end of the course the successful candidates would then be sent to India to begin work in the IPWD.<sup>282</sup> This suggestion by Wrigley is perhaps the first detailed proposal circulated in relation to a new English system although his letter at no point explicitly mentioned establishing a new college. Nevertheless, these basic ideas would serve as the core of the

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<sup>281</sup> Thornton., W. T., 1871. *Copy of all Correspondence which has taken place up to the present time between the Secretary of State for India in Council and the Governor General of India in Council, in reference to the Establishment of an Engineering College at Cooper’s Hill*. London: House of Commons. p.3

<sup>282</sup> *Ibid.*, p.5.

RIEC, although just as with the Scottish Education Bill, not without modification and serious contention.

Just under a month later Chesney affirmed Wrigley's proposal stating that "the system at present in operation has proved a failure" going on to explicitly suggest the potential of a new English college. Differences of opinion were forthcoming. Although mostly in agreement, Chesney suggested omitting surveying as proposed by Wrigley because it "does form a subject of general education. Those schools which profess to teach it teach nothing of any value." These differences of opinion would continue to undergird much of the discussion surrounding the eventual English college.<sup>283</sup>

There are a number of important and connected points as to why these men were so keen to set up a new college in England - especially in relation to Argyll. For these men working in the Indian context there were essentially two issues that needed to be rectified. These were 1) providing enough, and supposedly better, civil engineers for the ever-increasing public works in India that had been projected over the coming years. And 2) reforming the English engineering apprenticeship system by providing a college that would provide good practical *as well* as theoretical scientific and engineering knowledge. The former was an imperial aim and the latter a national aim, and it was thought that a new English college might deal with both issues simultaneously. India itself was home to four engineering colleges in Roorkee (opened in 1847), Poona (1854), Calcutta

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<sup>283</sup> *Ibid.*, p.7.

(1856), and Madras (1858) and the new English college supporters had considered potentially sourcing civil engineers from them. However, they firmly opted against this due to the lack of required facilities at these colleges.<sup>284</sup> And the fact that young British candidates would have to travel to India at the expense of the state to complete the course prior to securing a place in the IPWD. This is not to say then that the new college would be the first to teach science and engineering in England or the first scientific enterprise to receive state funding. But it would be one of the first, if not the first college of its kind - founded under an imperial framework – to function as a state supported institution at a time when the laissez-faire way of thinking was still predominant, especially in relation to state involvement in science. In this way Argyll's cabinet position coupled with his liberal support for science positioned him as a critical and powerful component in the successful founding of the RIEC.

During March Argyll proposed the idea of the new English college to his Council members to which there was a mixed reaction. Only five of the fifteen members fully supported the scheme, whilst others rejected it. H.W. Murphy for example voiced his immediate concerns in relation to the problem of detaining the teenagers in England for another three years just to train them in this new college after passing the initial test. With no estimates yet provided, he also

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<sup>284</sup> Scriver, P., Prakakash, V. eds., 2007. *Colonial Modernities: Building, dwelling and architecture in British Indian and Ceylon*. Abingdon: Routledge. pp.75, 256; Kumar, D., 2012. *Science and the Raj: A study of British India*. [Online] Oxford: Oxford Scholarship Online. Available through: Oxford Scholarship Online website: <<https://oxford.universitypressscholarship.com/view/10.1093/acprof:oso/9780195687149.001.0001/acprof-9780195687149>> [Accessed 5 Jul 2022]. Chapter four.



rightly pointed to the problem of expenses and who exactly would cover the costs of erecting an entirely new college.<sup>285</sup> Some members were ambivalent about the proposal. Sir F. Halliday, for example, said that he would reserve his final views until he had properly discussed the matter with the rest of the Council as it was such a large question.<sup>286</sup> Reading through the replies of the Council one thing does start to become clear. That is, although many of the Council members didn't support the proposal for a new college, they all seemed to be under no illusion that some sort of reform *was* needed, one that was however, much less radical than Argyll's proposal. Mr Macnaghton, after rejecting the idea for the new College, offered up his own solution which was to utilise the various colleges already operating in England such as Sandhurst and Woolwich to source potential candidates. Once found these candidates could then be sent to Chatham to undergo training and once complete, they could be deployed to India for service in the IPWD.<sup>287</sup> Ultimately however, due to the unfavourable responses of the Council the proposal could not formally move ahead. Just as Argyll's push for the Education Bill had failed at the hands of his opposition, his idea for a new college had - it seemed - also failed. But Argyll was not the type of person to give up so easily. Although the idea had stumbled, Chesney, Thornton and the rest of the new college supporters, which now included five members of the Council of India, had time to rethink their strategy and over the

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<sup>285</sup> Inveraray Castle archives, Bundle 1724.

<sup>286</sup> *Ibid.*

<sup>287</sup> *Ibid.*

next few months they focussed their efforts on the specifics of the proposed course, budget plans, and potential locations for the college.

By mid-1869 a number of the details had been fleshed out. In July Thornton wrote to Argyll discussing a number of key principles of the new college. These included the number of candidates to be admitted annually, how their fees might cover the cost of the building rental, and who they might hire as staff. He suggested that on the assumption that fifty men were needed yearly in India 150 candidates should occupy the college annually. (Thornton seemed to be suggesting here that he expected many of the students not to complete the three-year course, so with an upper limit of 150 students every year the college could guarantee that at least fifty would pass to go to the IPWD). In terms of finances he calculated that staff salaries, student boarding at the college, and building rental would amount to £17,600 which would be mostly covered by the annual student fee of 100 guineas. The remaining net expense for a three-year period (equalling £37 per head) would still need to be covered by the state but at least it was significantly less than £17,600. On the topic of the college's curriculum Thornton agreed with Dr Wrigley's recommendations which separated the education into three main categories: 1) purely scientific 2) purely practical and 3) intermediate (i.e. the application of the purely scientific to the purely practical).<sup>288</sup> By October Council of India members such as Major General Baker had become intimately involved in the arrangements of the new college. Baker confirmed his agreement with what had by now been largely settled

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<sup>288</sup> *Ibid.*

including that the college would aim to send fifty candidates to India per year and that the college would be based in London or at least close to London. There had been some disagreement on the lower and upper age limit of candidates entering the college, however, the consensus was that they would be between sixteen and twenty-one. Another key point was who the principal of the new college might be. Baker thought that a military man might do the best job as he would provide the civil engineers with a “quasi-military *esprit de corps*”. As such, and upon the approval of Argyll, he suggested that Major Chesney should be appointed to the role.<sup>289</sup>

Compared to earlier in the year the plans for the new English college had advanced significantly and in November Argyll sent a letter to the GOI in which he explained the newly developed plans; a reply was received five months later towards the end of March. In the letter signed by GOI members the proposed college was seen as a matter of great uncertainty and they regarded it as, at best, an experiment instead of a well-founded project. The GOI also stated that it was unsure that one new college should be the only route into the IPWD given the unpredictable expansion of civil engineers since 1856, rather civil engineers should be able to come to India regardless of where they had gained experience in England. Despite these concerns however, they didn’t reject the proposal outright but pointed out that any costs for such a college should not fall on the state. The GOI also recommended that based on the current and projected number of engineers in total in the IPWD a new college should host not 150 but

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<sup>289</sup> *Ibid.*

120 students on a yearly basis. Probably most importantly in this letter the GOI agreed to allow Chesney to be relieved of his position as Accountant so he could return to England to take up the new position. However, they suggested that instead of an entirely new college being erected, the Royal Military Academy at Woolwich should be opened up to candidates for the IPWD who upon passing the entrance exam, could do the three-year course and then be sent to India.<sup>290</sup>

The period of June to August saw the definitive turning point. In June Argyll circulated a draft reply amongst his Council to be sent to the GOI. In this letter Argyll stated his surprise at the reluctance of the Indian government to go fully ahead with his proposal. He said that a salary increase for civil engineers would just attract more unskilled civil engineers to India and that his proposal would rectify not just the salaries but also the *quality* of the civil engineers coming from England. He also pointed out that the Royal Military Academy proposal would be costlier and take up more time compared to the new English college proposal, and that 150 students would be the maximum number for whom provision could be made.<sup>291</sup> A vote was then taken a few weeks later and with only eleven Council members present the majority carried the vote in favour on the new proposal. Two days later Argyll sent the draft reply as an official letter

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<sup>290</sup> Thornton., W. T., 1871. *Copy of all Correspondence which has taken place up to the present time between the Secretary of State for India in Council and the Governor General of India in Council, in reference to the Establishment of an Engineering College at Cooper's Hill*. London: House of Commons. pp.18-22; Since the Royal Military Academy taught cadets of the Royal Engineers and Royal Artillery, one reading of this proposal was that all these new engineers would come under military command.

<sup>291</sup> *Ibid.*, pp.22-23.

to the GOI which signified his and the Council's decision to go ahead with the plan.<sup>292</sup> On the 28<sup>th</sup> of July Argyll presented the financial plan of the college in the House of Lords, and subsequently in a Commons sitting on the 9<sup>th</sup> of August Mr Grant Duff, the Under-Secretary of State for India, announced the plans to establish an engineering college for the purposes of preparing candidates for the IPWD.<sup>293</sup>

With the decision now in effect, it was left to finalise and then carry out the proposal. However, memorials opposing the college appeared throughout 1870 as it became more and more clear that this the new college was on path to becoming established. On the 13<sup>th</sup> of August Glasgow University sent a letter of disapproval to Argyll (who was no longer Rector) about the prospects of the new college stating that its existence would necessitate a monopoly over all British universities in terms of candidates for India. This would only be a detriment to universities such as Glasgow which already had dedicated engineering departments as students would be deterred from studying there.<sup>294</sup> A similar case was argued by Francis T. Bond, the principal of Hartley Institution (now the University of Southampton), in November. Bond himself was more critical of the current system in place but saw the new English college

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<sup>292</sup> Cuddy, B., Mansell, T., 1994. Engineers for India: The Royal Indian Engineering College at Cooper's Hill. *History of Education*, [e-journal] 23(1), 107-123.  
<https://doi.org/10.1080/0046760940230107>. p.113.

<sup>293</sup> *Hansard* HC Deb. Vol.203 Col.1733, 9 Aug 1870. [online]. [Accessed 8 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/commons/1870/aug/09/india-public-works-department> .

<sup>294</sup> Inveraray Castle archives, Bundle 1724.

proposal as a radical change stemming from what he saw as the same government that had created the problem in the first place.<sup>295</sup> Bond suggested a change in the current arrangement but one less radical than an entirely new college. More memorials were received over this period and it was clear that Argyll, Chesney and the new English college supporters would need to take action to ease the unrest.

Chesney, now back in England, set out to look for a suitable location and building and between July and October and found five potential sites including hotels in Richmond and Eastbourne. None, however, seemed suitable.<sup>296</sup> Chesney had heard about another estate building in Cooper's Hill, Surrey near Egham owned by Baron Grant and had enquired about it but was only able to make an in-person visit early in October. Upon returning from his visit, and in noting that both Thornton and Baker were in agreement, he quickly wrote to Argyll proclaiming the building to be "so remarkably suitable for the college" that it seemed "a pity not to make an effort to secure it."<sup>297</sup>

A few weeks later in the Council Minute book it was recorded that "It is recommended that Sir Digby Wyatt<sup>298</sup> and Colonel Chesney be empowered to

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<sup>295</sup> Bond, F. T. 1870. *A Letter to His Grace the Duke of Argyll, K.T.* Southampton: A. Dyer. p.16.

<sup>296</sup> See Public Works Council Minutes, 1869 to 1871. 20<sup>th</sup> July 1870. pp.89, 183; also see Inveraray Castle archives, Bundle 1724.

<sup>297</sup> Inveraray Castle archive, Bundle 1724.

<sup>298</sup> Sir Digby Wyatt was a British architect and surveyor of the East India company. He had been called to draw up a report on the purchase of the Cooper's Hill estate which he did in October after Chesney's visit. Chesney was very pleased with the report stating that it is "if anything stronger than what I have written as to the suitability and cheapness of the place", see Inveraray Castle archives, Bundle 1724.

purchase the Cooper's Hill Estate for a sum not succeeding £55,000.”<sup>299</sup> This transaction was subsequently completed early the following year before another parliamentary hearing took place into the feasibility of the new college.

#### A new professional civil engineering college: the RIEC established

On the 3<sup>rd</sup> of March 1871 at a Commons sitting, Mr Dickinson rose to ask what the costs on the state would be for the opening and sustaining of this new college, as well the retiring pensions rate for professors and other employees of the institution. With all the figures now at hand Mr Grant Duff responded confidently stating that “There will be no charge on the revenues of India account of the Engineering College; the fees will be slightly in excess of the charges.” He explained that there would be eleven professors and instructors on salaries varying from £3-700 per annum to which nine would be entitled to pensions. The annual charge for the college would be £18,350 with interest amounting to £3600. These costs - totalling £21,950 - would be covered by the 150 students each paying £150 per annum. Thus, a surplus of £550 would remain and in this way the college - it could be claimed - did not come at the expense of the state but rather to its benefit.<sup>300</sup>

A draft prospectus of the course syllabus and advertisements for the first competitive examination into the college had already gone out the previous year

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<sup>299</sup> See Public Works Council Minutes, 1869 to 1871. 9<sup>th</sup> Nov 1870. pp.126, 275.

<sup>300</sup> *Hansard* HC Deb. Vol.204 Col.1272, 3 March 1871. [online]. [Accessed 8 June 2022]. Available from: <https://api.parliament.uk/historic-hansard/commons/1871/mar/03/question-1>.

(the first competitive exams taking place in June 1871).<sup>301</sup> The course itself consisted of compulsory subjects such as Mathematics (pure and applied), Civil and Mechanical Engineering, Architecture, Surveying, Mechanical drawing, Physical Sciences, Hindustani history and Geography of India, and Accounting. And optional subjects such as (Higher) Mathematics, (Higher) Physical sciences, (Higher) Architecture, and Freehand drawing. The course was divided into three terms per year with the standard Easter, Summer and Christmas holiday breaks. By the third and final year students were expected to study at least two terms directly under a civil or mechanical engineer to gain satisfactory practical experience.<sup>302</sup>

Things moved quickly into place and the civil engineering college was now gearing up for its inauguration which took place on the 5<sup>th</sup> of August 1871. Argyll and Chesney had both been at the forefront of the new establishment and it was appropriate to have both men, the Secretary of State and the Principal of the new college, give the opening speeches. Two hundred guests turned up on the day and in Argyll's speech he gave a brief sketch of the history and reason for the new civil engineering college noting the failure of the previous system under Lord Stanley. He talked about the success of the new civil college and in an attempt to disarm the institutions and individuals still against it, claimed that the college would not have a monopoly but instead was open to "all the world". Chesney then followed up giving an explanation of the course of education that

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<sup>301</sup> Public Works Council Minutes, 1869 to 1871. Nov 1870. p.285.

<sup>302</sup> Inveraray Castle archives, Bundle 1724.



was expected to give to candidates who entered the Cooper's Hill college.<sup>303</sup>

Within the next month the civil engineering college opened its doors and began teaching its first set of students who would be sent to India three years later. The early vision of creating an English college for the benefit of English civil engineers had now come to fruition with the opening of the Royal Indian Engineering College.

#### The civil engineering issue and the failure of the RIEC

After the RIEC had officially opened Argyll's role in the College naturally declined as he could rely on Chesney to take on the presidential role practically running the place on a daily basis. In fact, it is not until the 1880s when Argyll engaged once again in matters relating to the RIEC.

By 1881 the RIEC was in a stage of restructuring. This was partly because Chesney had left the College to take up a new position as Military Secretary to the Government of India. And also because the RIEC had been underperforming over the last few years, resulting in a large loss of state money. This was actually somewhat welcome news to the Institution of Civil Engineers in England because - perhaps surprisingly - over the last ten years they themselves had become dissatisfied with the RIEC.<sup>304</sup> However, the ICE was unwillingly provoked to public action following a remark by Argyll given in a debate at the

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<sup>303</sup> *Observer*, 1871. Opening of the Indian Civil Engineering College. *The Observer*, 6 Aug. p.6ab.

<sup>304</sup> 1<sup>st</sup> Baron Armstrong., 1882. *His Grace the Duke of Argyll on Indian Public Works and Cooper's Hill College. A Reply with Correspondence between His Grace and the President of the Institute of Civil Engineers*. London: E. & F. N. Spon. pp.22-24.

House of Lords in July 1881. In his address, and in speaking about the historical reasons for opening the RIEC, Argyll stated that the pre-1871 civil engineers sent to the IPWD had been of subpar standard. Furthermore, Argyll seemed strongly to imply that many of the barrack construction failures, such as the one caused by Major Jackson, were actually caused by the civil instead of military engineers.<sup>305</sup> Argyll's words, in short, had cast an entirely negative portrayal of the civil engineers prior to the opening of the RIEC. The ICE was at once outraged but also confused. Outraged because they saw themselves as representing British civil engineers so an attack on civil engineers was an attack on the ICE. But also confused because it had been assumed since its opening that Argyll had been fully aware that the pre-1871 barrack failures had been the fault of military rather than civil engineers. Due to these complications the ICE published a response in *Engineering* on November 4<sup>th</sup> 1881. They agreed that of late the IPWD has been costing the government more and more, but clarified that this was no fault of civil engineers. If anything, since the barrack failures were the fault of military engineers, the surplus expenditure and the time spent of fixing these issues was the fault of military engineers.<sup>306</sup>

The ICE also took this prime opportunity to make some of their own remarks about the RIEC since it was now a public matter. A few days later, the ICE published another article in *Engineering* in which they aired their thoughts about the RIEC. They argued that the RIEC should never have opened in the first place

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<sup>305</sup> *Ibid.*, p.6.

<sup>306</sup> *Ibid.*, p.12

because its existence was never well justified. They argued that Argyll, Chesney and the other founders of the RIEC went ahead with the college without properly “consulting either the Government of India or the Institution of Civil Engineers”, and even when they did, Argyll and Chesney simply ignored the fact that both the GOI and ICE disapproved of the college.<sup>307</sup> In closing their response the ICE concluded that 1) the RIEC was an “unnecessary” establishment from the start. That 2) all it had done was to gain an unfair monopoly on public works services in India. And that 3) it would be best to go back to a Stanley i.e. pre-RIEC ‘open competition’ method of examination which would provide students across multiple engineering colleges in Britain with the potential to join the IPWD.<sup>308</sup>

Finally, to get to the bottom of the confusion about why Argyll had seemingly targeted the civil engineers as the root cause of barrack failures, the then president of the ICE, James Abernethy, sent Argyll a private letter on the 29<sup>th</sup> of November 1881 with an attached report detailing the events of the early barrack failures within the IPWD. Just under two weeks later Abernethy received a letter back from Argyll. In this letter Argyll stated that he had investigated the report and come to the conclusion that “You were quite right in the representation you have made that the design and execution of the Barracks which failed were not under control of the Civil Engineers”...but rather...“those officers were all

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<sup>307</sup> *Ibid.*, p.22.

<sup>308</sup> *Ibid.*, p.24.

military and not civil engineers.”<sup>309</sup> In this letter Argyll then went on to clarify his position regarding why he had framed the failure as a civil instead of military engineering fault stating that

I make this report to you of the result of my inquiries with great pleasure, because it was entirely by accident, and not by design, that the remarks I made last Session in the House of Lords seemed to point specially against the Civil as distinguished from the Military branches of the Indian Engineering Services. ... In the Papers presented to Parliament in March, 1873, the grounds on which we acted [in establishing the RIEC] were explained, and in those Papers no such distinction appears. We thought that, as regards both branches of the Service, there was evidence of occasional failures, of cases of deficient training and of inadequate quality.<sup>310</sup>

Thus, according to Argyll, the controversy and confusion caused by his remark was nothing more than an accident of words. Although there is no reason to doubt that Argyll was telling the truth here, his letter, as well as the rest of the discussion and debate surrounding the RIEC in the early 1880s, is illuminating in many ways. From it we learn that the RIEC remained a site of contest in which organisations such as the ICE felt that its existence had never been warranted.

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<sup>309</sup> *Ibid.*, pp.43-44.

<sup>310</sup> *Ibid.*, p.44.

This also brings us to an unavoidable conclusion – that the ICE was correct in exposing Argyll, Chesney and the other founders as holding a monopoly over other colleges and universities regarding the opening of the RIEC and for the most part ignoring objections from those institutions. Thirdly, the financial situation shows that – in contrast to what the founders had hoped - from 1871 to 1881 the RIEC had gone from running at a projected net profit of £550 to running at a deficit. According to the calculations of the ICE that specific number was a deficit of £321 per student sent to India.<sup>311</sup> This was due to multiple reasons including the expenditure used to repair all the badly constructed barracks. Plus the number of students at the RIEC did not meet the costs of running the RIEC (since by the mid-1870s it had become evident that not as many civil engineers were needed in India as had been thought by Argyll when he first became Secretary of State for India in 1868.)<sup>312</sup>

Unfortunately for Argyll and the other founders, the RIEC's life-expectancy was drastically reduced first when Chesney stepped down as president in 1880. This in fact marked the transition back to the 'open examination' again under the presidency of General Sir Alexander Taylor. From 1881 the RIEC lost its monopoly of sending students to India because young boys could now attend

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<sup>311</sup> Or £96,093 in total, *Ibid.*, pp.37-38; Cuddy has calculated that by March of 1883 the total cost to the Government had risen to £108,265 and as such the student fees were increased from £150 to £180 per annum, see Cuddy, B., 1980. *The Royal Indian Engineering College, Cooper's Hill, (1871-1906)*. Ph.D. London University. p.225.

<sup>312</sup> *Ibid.*, pp.36-8; also see *Hansard* HL Deb. vol.263 col.999, 15 July 1881. [online]. [Accessed 8 June 2022] Available from: <https://api.parliament.uk/historic-hansard/lords/1881/jul/15/address-for-papers>.

any other engineering college to study engineering and attempt to work in the IPWD.<sup>313</sup> By 1900 Colonel Sir John Ottley of the Royal Engineers, as the new president, implemented drastic changes to the RIEC aimed at cutting costs to preserve the college. His aims, however, backfired when, as part of his larger plans, he dismissed several key members of staff, including the Professors of Hydraulics, Chemistry and Physics.<sup>314</sup> By this point in the early twentieth century, it is interesting to note that in some ways Argyll's national vision for the RIEC and scientific training in general had somewhat come to pass. This can be seen by the fact that the dismissal of the RIEC staff members did not go down in silence, and instead, leading British scientific figures such as Lord Kelvin, Lord Rayleigh and Sir William Crookes fought back when they sent memorials to the Secretary of State of India in protest at Ottley's actions.<sup>315</sup> Although ultimately unsuccessful in reinstating the removed staff members, Cuddy notes that this dismissal caused such a stir precisely because "the scientific community, which at that time was beginning to assert its own professionalism, saw the Cooper's Hill dismissals as an affront and injurious to scientific education in Britain."<sup>316</sup> Thus, in this way we can see that although the RIEC would close six years later, it had indeed played a crucial, if often

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<sup>313</sup> Cuddy, B., Mansell, T., 1994. Engineers for India: The Royal Indian Engineering College at Cooper's Hill. *History of Education*, [e-journal] 23(1), 107-123.  
<https://doi.org/10.1080/0046760940230107>. p.117.

<sup>314</sup> *Ibid.*, p.118.

<sup>315</sup> *Ibid.*, p.119.

<sup>316</sup> *Ibid.*, p.120.

forgotten, role in the rise of scientific professionalism by the turn of the century. This national context cannot, however, be separated from its imperialistic and hegemonic origins which meant that its very existence was always fragile. Ultimately, although failing to achieve its nationalist and imperialist goals, it is certain that the RIEC was an important Victorian institution that affected - and in many respects - helped to shape British science and engineering on a small-scale as well as British-Indian relations on a large scale. Perhaps fortunately then, Argyll himself was peacefully buried South of Inveraray Castle six years before the grand vision of the RIEC was finally put to rest in 1906.

#### Conclusion: professionalisation, British education and imperial pursuits

When the college opened in September 1871 it employed as staff, four professors, three instructors and a Draughtsman. One of the staff members was the chemist Herbert McLeod appointed as professor of Experimental Science for fifteen years. As the historian Hannah Gay has noted, during the first three quarters of the nineteenth century science was largely seen as a respectable gentlemanly pastime. However, by the 1870s “the political élite was beginning to accept more professional scientists within its ranks, and the state was beginning to support careers of the kind that McLeod had.”<sup>317</sup> Gay’s statement here supports Cuddy’s view in which we see that Argyll was directly involved in securing professional scientific positions for people like McLeod. Since the

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<sup>317</sup> Gay, H., 2003. Science and Opportunity in London, 1871-85: The Diary of Herbert McLeod. *History of Science*, [e-journal] 41(4),427-458. <https://doi.org/10.1177/007327530304100403>. p.428.

early 2000s historians have increasingly shifted away from the older binary historical narrative supposed between the decline of amateur science and the rise of professional science.<sup>318</sup> More recently Ruth Barton has offered a newer and more nuanced description of Victorian science, social standing and professionalism that accords much better with my own research on Argyll. Suggesting that up until the 1880s scientific standing was “achieved through an interaction of scientific achievement with social status. Over time, gradually and unevenly, increasing weight was given to scientific achievement and decreasing weight to birth and wealth in ascribing position in the scientific community.”<sup>319</sup> In this light, and if we take Argyll as a case study, professional science certainly increased towards the end of the nineteenth century but not simply at the expense of the gentlemanly amateurs. Rather, as I argue, gentlemanly amateurs like Argyll were in fact often *responsible* for creating the very conditions that aided the rise of middle-class institutionalised and professionalised science and technology on local and imperial scales.

As well as its professional aggrandisement the RIEC was at its core an imperial (and heavily gendered) project (and one that is still relatively under-researched likely due to its decline and closure in 1906). Successful male candidates sent to India went primarily to spread the “benefits” of Western knowledge usually at the expense of the native Indians who were given no say

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<sup>318</sup> Turner, F. M. 2009. *Contesting Cultural Authority*. [e-book]. Cambridge. CUP. Available through: Cambridge Core website < <https://www.cambridge.org/core/books/contesting-cultural-authority/5A6B8DCCC11876A500FFC9610CC96707> > [Accessed 5 Jul 2022]. p.33.

<sup>319</sup> Barton, R., 2018. *The X Club*. Chicago: University of Chicago Press. p.25.



in the plans for the college. Much has already been written on British India<sup>320</sup> and so for the purposes of concluding I note that the history of Western scientific development (especially British) is often tied up with wider imperial pursuits. In the case of the RIEC, Argyll, as a man of science, mobilised his own authority in spreading Western science and technology across the British Raj. It is difficult to judge the impacts of his choices in any exact way, but it is certainly true to say that Argyll's choices and actions certainly played a role in the modification of the subcontinent of India during the mid-nineteenth century.<sup>321</sup>

This chapter has provided us with one strong example of the ways in which aristocrats could both create and facilitate the rise of professional middle-class science and technical education. The next chapter will provide us with yet another example of a similar case. We thus turn from civil engineering to aeronautical engineering to see how Argyll's Victorian contributions to the field of aeronautics influenced the development of the aeroplane and its success by the early twentieth century.

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<sup>320</sup> Stockwell, A. J., 1999. British Expansion and Rule in South-East Asia. In: Porter, A. ed., 1999. *The Oxford History of the British Empire: The Nineteenth Century*. Oxford and New York: OUP. Chapter seventeen; *Ibid.*, Chapter twenty.

<sup>321</sup> In a 2020 news report by the Indian news channel WION the presenter Palki Sharma referenced Mux Müller's letter to Argyll about Indian education during the period when Argyll had just become Secretary of State for India stating that "the British custom-made Indian history to suit their purpose", see WION., 2020. *Is India truly free of the British?*. [video online] Available at: < <https://www.youtube.com/watch?v=qcbn2h0PqAw&t=1s> > [Accessed 16 June 2022].

## **Chapter 4. A Victorian hope for aerial navigation: Argyll as a theorist of flight and the first president of the Aëronautical Society of Great Britain**

### **Introduction**<sup>322</sup>

In this chapter a number of the themes from chapter three return such as science, engineering, empire and aristocratic influence. But whereas the previous chapter looked at Argyll's influence in the development of civil engineering within an imperial context, this chapter will look at Argyll's influence in aeronautics, or aerial navigation, and the eventual achievement of aeroplane technology. Argyll's own contribution to the science of aeronautics came not in the form of practical engineering capabilities, but instead through his attempts to demystify the principles of bird flight. With the secrets of bird flight uncovered, it was hoped that skilled engineers could then apply those deciphered mysteries towards the construction of a flying machine.

As will soon become evident however, although machine flight was indeed a technological innovation which has since transformed global methods of transit, most people during the nineteenth century simply viewed this type of flight as an impossible absurdity. Thus, I will contend that the establishment of the Aëronautical Society of Great Britain (ASGB) in 1866, with Argyll as first president for thirty years, constituted a unique turning point in aeronautical studies

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<sup>322</sup> Much of the information in this chapter is taken from my previously published paper, see Bossoh, N., 2021. A Victorian hope for aerial navigation: Argyll as a theorist of flight and the first president of the Aëronautical Society of Great Britain. *Endeavour*, [e-journal] 45(1-2), 1-11. <https://doi.org/10.1016/j.endeavour.2021.100753>

both in terms of its theoretical basis and its transatlantic respectability, hitherto unappreciated in the standard histories.<sup>323</sup> As we will see, Argyll's ultimate claim was that the laws of flight were embedded in nature and accessible to humans as a result of God's design. It was therefore up to humans to move beyond bird observation on a purely aesthetic level as well as the well-worn flight of balloons - which Argyll referred to as "mere toys"<sup>324</sup> - to apprehend the underlying principles of bird flight. Only then could humans have any hope of achieving mechanical flight.<sup>325</sup> This emphasis, infused with aristocratic respectability, underlay Argyll's position in the advancement of aeronautics through the efforts of the ASGB, an organisation he helped found and sustain, and whose proceedings shaped the progress of the nascent field of aerial navigation on both sides of the Atlantic.

#### The dilemma of machine flight in the nineteenth century

When Baden Baden-Powell (1860–1937), president of the Aëronautical Society of Great Britain (ASGB), invited the eminent physicist William Thomson, Baron Kelvin (1824–1907) to join the society in 1896, Kelvin declined stating, "I am afraid I am not in the flight for 'aerial navigation'. I was greatly interested in your work with kites; but I have not the smallest molecule of faith in aerial navigation

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<sup>323</sup> Hallion, R. P., 2003. *Taking Flight: Inventing the Aerial age, from Antiquity Through the First World War*. New York: OUP; Reese, P., 2014. *The Men Who Gave Us Wings: Britain and the Aeroplane 1796-1914*. South Yorkshire: Pen & Sword Aviation.

<sup>324</sup> 8<sup>th</sup> Duke of Argyll, 1867. *The Reign of Law*. London: Alexander Strahan. p.179.

<sup>325</sup> This could be seen as a Victorian continuation of Francis Bacon's philosophy of science where Bacon spoke of the practical benefits to be derived from nature once nature was understood, see Gaukroger, S., 2001. *Francis Bacon and the Transformation of Early-Modern Philosophy*. Cambridge: UCP. p.71.

... you will understand that I would not care to be a member of the aëronautical society”.<sup>326</sup> Within a decade the Wright brothers accomplished the world’s first successful human flight in a machine, decidedly bringing aerial navigation into a new age. Why was Kelvin so pessimistic about aerial navigation? The answer lies in the overlapping space of Victorian aeronautics and ornithology.

With the first flight taking place in Paris in 1783 ballooning had long become an established form of aerial travel and entertainment within Europe.<sup>327</sup> As Caitlín Doherty<sup>328</sup> has documented in her study on early balloon voyages, at its inception “ballooning represented a utopian vision that promised a new social order and forecast man’s control over nature from his new position in the upper atmosphere”. But with increasing ascents and descents its limitations quickly became apparent. Most men and women had no means to participate in balloon flights in person and so their only experience was as observers. And even for balloonists such as John Jeffries (1744–1819), an American born physician, the lack of steering capability was a challenge which threatened to devalue the scientific potential of ballooning.<sup>329</sup> These issues which carried over into the nineteenth century lent to the image of ballooning as chiefly a public spectacle. On the other hand, aerial *navigation*, or the ability to control flight speed and direction at will, was a wholly

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<sup>326</sup> Reply to Major Baden-Powell from Lord Kelvin, 8<sup>th</sup> December 1896, quoted in Hallion, R. P., 2003. *Taking Flight: Inventing the Aerial age, from Antiquity Through the First World War*. New York: OUP. p.167.

<sup>327</sup> *Ibid.*, chapter two; Holmes, R., 2014. *Falling Upwards: How We Took to the Air*. London: William Collins.

<sup>328</sup> Doherty, C. R., 2017. ‘Transporting thought’: cultures of balloon flight in Britain, 1784-1785. *The British Journal for the History of Science*, [e-journal] 50(2), 229-247. <https://doi.org/10.1017/S0007087417000280>[Opens in a new window]. p.247.

<sup>329</sup> *Ibid.*, p.234.

different enterprise (although not unconnected) which began to gain some, although very little, interest at the turn of the century. It held the promise of pushing beyond the limitations of ballooning yet its pursuit by men of science and engineers required that they advance their contemporaries' limited understandings of the atmosphere, wind dynamics, and, most critically, principles of bird flight. Because these problems seemed legion, Victorians largely ignored the study of aerial navigation altogether in favour of other more promising areas of science and technology such as steam power and telegraphy as evidenced by Kelvin's scepticism. However, not all Victorians were content with the idea of simply leaving the territory of the birds unexamined. In the eyes of a still young and enthusiastic George Douglas Campbell, it was "a simple matter of obvious fact" that we could attain aerial navigation in the future, or at least come to fully understand its principles.<sup>330</sup>

#### Ornithology in the domestic context: Ardencaple Castle

Educated at home from an early age, the young George had the privilege of growing up on a large country estate with ample opportunities upon which to observe creatures in their natural habitats. Although interested in natural history, ornithology became his main love and it is clear that his first telescope, given to him by his father John Campbell, served to encourage his developing love of the study of birds. By the time young George was only sixteen we can already perceive a striking sense of confidence regarding his ornithological knowledge. In a response to Sir James Stewart of Allanbank, a Scottish painter with whom young George had

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<sup>330</sup> Argyll, *Autobiography*, 1: 77.

developed a strong connection with over the years, young George proceeded to challenge his deduction about the flying speed of the frigate bird (a seabird):

I was amused with your description of the frigate bird, but you have drawn a deduction from the length of its wings and smallness of its body which I am afraid will not hold good. You seem to think that its flight must in consequence be very quick, or to use your own words, “prodigious.” Now a bird’s flight is in the inverse ratio to the size of its wing in proportion to the weight of its body, as you may see by comparing the flight of the heron (whose wings are enormous in proportion to the weight of her body) with that of the red-throated diver (whose wings are so small that it requires the bird to make them go like a fly-wheel to keep her up at all). You will find that the latter goes at a tremendous rate while the former goes in a slow and laboured manner; the greater the bird’s downward tendency in proportion to its supporting power, the quicker the bird flies, because the greater is the impetus which the wings have merely to direct and support<sup>331</sup>

Here young George underlined a difference, which he presumably deciphered based on his observations, that birds with smaller bodies and larger wings tended to fly slower compared to birds with bigger bodies and yet smaller wings. Suggesting that flight speed depended on an inverse relationship between a bird’s wing size to its body weight. As we shall see, young George’s studies on bird flight continued into

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<sup>331</sup> Argyll, *Autobiography*, II: 563.

adulthood and resulted in various publications, including, most importantly, a key chapter of his influential book *The Reign of Law*.<sup>332</sup>

#### Ornithology in the imperial context: data and access

Before proceeding further with young George's story into adulthood, it will be useful here to step back to take a look at the wider picture surrounding the question of why scant attention was given to the science of bird flight before the 1860s. For us to do so we need to understand a little more about how imperialism shaped the subfields of ornithological research as it emerged within its first few decades.

Ornithology as a science owes its origins largely to the late eighteenth-century leading French naturalist Comte de Buffon (1707 - 1788) who, in 1739, was appointed keeper of the Jardin du Roi in Paris which housed an ever-growing collection of natural history and ethnographic specimens from across the world. During his lifelong appointment as keeper - his main job was to inventory the King's natural history cabinet.<sup>333</sup> Buffon's lasting legacy was encapsulated in his massive forty-four Volume Encyclopedia *Histoire Naturelle* (the first Volume appearing in 1749). Volumes sixteen to twenty-four were dedicated to the natural history of birds then known and this was one of the first times where birds received such explicit and detailed focus. In the decades to come Europeans followed in the footsteps of ornithological pioneers such as Buffon and Jacques Brisson (1723 - 1806), and by the 1850s it was possible to call ornithology a recognised science

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<sup>332</sup> 8<sup>th</sup> Duke of Argyll., 1867. *The Reign of Law*. London: Alexander Strahan. Chapter three.

<sup>333</sup> Curran, A. S., 2011. *The Anatomy of Blackness: Science & Slavery in an age of Enlightenment*. Baltimore: The John Hopkins University. p.75.

boasting of an increasing community of savants working on well-defined areas such as natural history, classification, and anatomy. As interest in ornithology expanded among savants as well as the general public, collections began to shift from the arena of private cabinets to the more public arena of societies and museums. By the 1840s the British Museum was home to one of the largest ornithological collections in Britain although the Zoological Society's collection was not far behind.<sup>334</sup> Yet, much of this knowledge was as a direct result of imperial empiricism on the one side and the omission of indigenous forms of ornithological knowledge on the other. Taking Britain as an example, its empire had grown significantly since the eighteenth century and in simple terms this meant that Britain had greater access to vast regions of the globe including parts of India, the West Indies, Africa, Canada, and Australia - even compared to its European counterparts.<sup>335</sup>

To develop a comprehensive understanding of the complex diversity within bird taxonomy and natural history one needs to gather empirical information about birds from numerous regions of the world. Factors such as climate conditions (tropical regions accommodating much more biodiversity as compared with temperate regions), and sources of food will affect the types of bird species that develop in different parts of the world. The geographical size of a region plays its role too. The smaller size and cooler climate of Britain and its Isles in comparison to a warmer and vastly larger continent such as Africa, means that you can expect to find a greater range of biodiversity in Africa (as ornithologists often did indeed

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<sup>334</sup> Anon., 1845. *Report of the Fourteenth Meeting of the British Association for the Advancement of Science; Held in York September 1844*. London: John Murray. p.215.

<sup>335</sup> Porter, A. ed., 1999. *The Oxford History of the British Empire: The Nineteenth Century*. Oxford & New York: OUP.



encounter).<sup>336</sup> Yet, because Britain was an imperial power this was not such a problem. Essentially, what Britain lacked in its comparatively smaller geographical size and temperate climate, it more than compensated for through its substantial access to the rest of the world.

Perhaps one of the best examples demonstrating how imperialism shaped the focus of ornithology can be seen by a summary on the progress of bird knowledge in the 1840s by the English geologist and naturalist, Hugh E. Strickland (1811 – 1853). In 1844 he gave a report to the York meeting of the British Association for the Advancement of Science. In essence this report provided the most up-to-date analysis of the state of ornithological knowledge. Yet whilst giving due credit to numerous European naturalists Strickland rarely made mention of extra-European engagement with birds except when calling attention, for example, to the “rude paintings” of birds produced by the Chinese natives.<sup>337</sup> Modern scholarship has since highlighted the development of indigenous ornithological knowledge outside of European engagement.<sup>338</sup> In discussing the ornithology of particular global regions Strickland not only discussed the taxonomical work done within Europe but he also spoke of the current state of ornithological knowledge in geographical regions which the European empires currently occupied or had previously

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<sup>336</sup> Smith, A., 1838-1849. *Illustrations of the Zoology of South Africa. Aves*. London: Smith, Elder and Co.

<sup>337</sup> Strickland’s report was entitled “Report on the Recent Progress and Present State of Ornithology”, see Anon., 1845. *Report of the fourteenth Meeting of the British Association for the Advancement of Science; Held in York September 1844*. London; John Murray. pp.219-220.

<sup>338</sup> Jacobs, N. J., 2016. *Birders of Africa: History of a Network*. United States: Yale University; Mukharji, P. B., 2021. Darwin’s bulbuls: South Asian cultures of bird fighting and Darwin’s theory of sexual selection. *BJHS Themes*, [e-journal] 60, 63-79. <https://doi.org/10.1017/bjt.2021.3>.

occupied, such as parts of Africa, British India, the West Indies and parts of South America. Within these specific locations Strickland's conclusion followed the same blunt line of reasoning: that until Europeans had entered these regions fairly recently to begin empirical observations and recordings, there was hardly any scientific ornithology worth speaking about.<sup>339</sup> Coming towards his concluding remarks Strickland focused his report on the current gaps and future directions of ornithological knowledge. Amongst a range of other suggestions, Strickland urged for more precision and uniformity in overall bird taxonomy, and also for more information of the natural history of exotic, i.e. non-European birds, stating that "A vast and fascinating field of research awaits the naturalist who shall devote himself to observing, as well as collecting the ornithology of foreign regions"<sup>340</sup>

Within this imperial context, if we shift our focus to the subfields of study to which Strickland prioritised, substantial attention was given to classification, natural history, and anatomy. However, out of the full fifty-one-page report there are only two very brief mentions of work relating to the science of bird flight. Indeed, no individual would have raised an eyebrow if these two mentions had been altogether omitted. This provides strong initial support for my argument that the science of bird flight did not become a recognised area of study in Europe until the latter half of the nineteenth century. In the sections below I will look at how post-1860 aeronautical enthusiasts addressed the early lack of engagement amongst naturalists surrounding the science of flight. Before that I want to make the case

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<sup>339</sup> Anon., 1845. *Report of the fourteenth Meeting of the British Association for the Advancement of Science; Held in York September 1844*. London; John Murray. pp.186,191,194-195.

<sup>340</sup> *Ibid.*, pp.217, 219.

that imperialism was a significant reason as to the lack of early engagement with the science of bird flight, particularly in Britain.

As mentioned above, in order to obtain a comprehensive understanding of birds in relation to classification, anatomy, and natural history, a global empirical outlook was necessary simply because there was not enough bio-diversity amongst British birds alone. Thus, ornithological information benefitted greatly from imperial connections, and as such, the information distributed through these imperial sources became a high priority in the same way that ethnographic reports gathered from imperial sources (travellers, missionaries, colonial officials, military personnel) became a high priority for ethnographers and anthropologists.<sup>341</sup> However, the same challenge did not appear if trying to study bird flight. One did not need to compare a bird from Africa with a bird from America because bird flight worked (and works) on broadly the same principles throughout the world due to the constraints of gravity and wind dynamics. Of course, the flight mechanics of smaller birds is noticeably different from that of larger birds (as Argyll had noted as a teenager), but this could easily be accounted for in a place like Britain simply by comparing large birds (such as albatrosses) with medium sized birds (such as kestrels) and smaller birds (such as humming-birds). In sum, whilst imperial connections were instrumental to the production of European ornithological knowledge and therefore greatly sought after, imperialism was not necessary for bird flight. As a result, throughout the early emergence of ornithology, serious studies dedicated to the

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<sup>341</sup> Sera-Shriar, E., 2016. *The Making of British Anthropology, 1813-1871*. [e-book] Pittsburgh: University of Pittsburgh Press. Available through: Jstor Library website < <https://www.jstor.org/stable/j.ctt1djmj1r> > [Accessed 26 June 2022]. p.53.

science of bird flight were passed over for the more pressing areas of classification, anatomy, and natural history.

Out of the above categories it is to the science of bird flight that Argyll devoted most attention. Yet his initial drive to understand the principles of flight was a passion cultivated through his father's - much earlier - dedication to the science of bird flight and its relation to the potential realisation of aerial navigation.

#### The Cayley-Campbell correspondence

Throughout his adult life, and in his many literary works, Argyll frequently mentioned and gave credit to his father for instilling his interest in birds and subsequently mechanics. In one obituary of the 7<sup>th</sup> Duke, the author noted, "He was attached to scientific pursuits and was well acquainted with the principles of chemistry and mechanics".<sup>342</sup> The 8<sup>th</sup> Duke noted in a seminal explanation of the principles of bird flight in *The Reign of Law* that: "I owe to my father ... my knowledge of the Theory of Flight which is expounded in this chapter ... his love of mechanical science, and his study of the problem during many years of investigation and experiment, made him thoroughly master of the subject".<sup>343</sup> Aeronautical enthusiasts considered their discipline a science from very early on, and in practice the main savants working in this area were ornithologists who studied the principles of bird flight, as well as engineers who attempted to apply those principles to machines and engines that they built. During the early decades

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<sup>342</sup> Cave, E., 1847. *The Gentleman's Magazine*. Volume XXVIII. London: John Bowyer Nichols and Son. p.81.

<sup>343</sup> 8<sup>th</sup> Duke of Argyll, 1868. *The Reign of Law*. London: Strahan and Co. p.170

of the nineteenth century when investigation into manned flight was “liable to derision and ill-natured remark”,<sup>344</sup> the 7<sup>th</sup> Duke carried out his own experiments in secrecy with a small team of men (primarily John Hart and Robert Bryson) whilst corresponding extensively with Sir George Cayley (1773–1856)—a leading aeronautical figure.

In the 1810s the 7<sup>th</sup> Duke (who was just John Campbell at this point) began writing letters to Cayley. Their correspondence continued well into the 1820s and reveals to a great extent the types of struggles faced by early enthusiasts of aerial navigation. After reading the papers on flight by Cayley in the *Philosophical Magazine*, with great appreciation, Campbell wrote to Cayley on the 29 November 1817 to reveal his hitherto extremely secretive support for experiments in aerial navigation. He stated, “It is now above thirty years since I first became impressed with the idea that aerial navigation either in the large or the small way was possible and at that time I collected all [the] information that the then state of science afforded.”<sup>345</sup> In Campbell’s next letter, gratified by the positive nature of Cayley’s reply and, no doubt feeling an air of freedom to speak on such topics openly, Campbell expounded on his thoughts about flight. He stated that if we could harness the correct principles of flight, we could go beyond current ballooning technologies and “aerial navigation may be attained.” But to do so we would need to take the “larger bird for our models and with this we should be more likely to attain this

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<sup>344</sup> A letter sent by the surgeon Sir Antony Carlisle to his friend George Cayley on the 12<sup>th</sup> November 1809 described aerial navigation as extremely liable to “derision” and “ill-natured remark”, see Reese, P., 2014. *The Men Who Gave Us Wings: Britain and the Aeroplane 1796-1914*. Barnsley: Pen & Sword Aviation. p8.

<sup>345</sup> National Aerospace Library (hereafter NAL), Cayley-Campbell Correspondence, 29 November 1817.

object in view, than by attempting to guide bodies actually floating in the atmosphere. A bird is by no means a floating body.” At the end of the letter, Campbell mentioned that Cayley should not make any public mention of it until satisfactory experiments had been carried out, because it was unnecessary to draw public attention.<sup>346</sup> This caution reflected Campbell’s awareness of the wider pessimistic attitude towards the idea of aerial navigation, as well as his worry that a premature publicising of their experiments would only hinder their progress. In a letter back to Campbell, Cayley wrote that “it is an extremely difficult thing to construct a purely mechanical aerial vehicle.” This being the case, Cayley suggested to Campbell that they should each contribute the substantial sum of £50 for the purpose of experimenting together, especially if ever they had the chance to meet; Cayley lived in Brompton whilst Campbell was in Inveraray Castle.<sup>347</sup> J. Laurence Pritchard, one of Cayley’s biographers, has surmised that this probably constituted “the first occasion in the history of aeronautical science where two men of scientific attainment entered on experiments of this kind”.<sup>348</sup>

Although it is possible to form only a rough picture of the types of experiments that Campbell carried out through his letters, it is clear that he indeed did devote much time to aerial experimentation. In August 1818, Campbell speaks of a failed experiment in London where the wings of a contraption were too “powerful” and so could not move with sufficient velocity to raise the greater weight of a 28-pound

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<sup>346</sup> NAL. Cayley-Campbell Correspondence, 18 December 1817.

<sup>347</sup> *Ibid.*, 19 January 1818.

<sup>348</sup> Pritchard, J, L., 1961. *Sir George Cayley: The Inventor of the Aeroplane*. London. Max Parrish. p.107.

object (presumably a small steam engine) at hand. He also speaks in the same letter of tests done in Glasgow with an engine which had been applied to a pair of “narrow wings” which in this case did fly around a room used for the experiment, however this too had problems of its own.<sup>349</sup>

In contrast to such engineered experiments by savants like Cayley and Campbell, other proposed methods of flight failed to promise practical feasibility. In an 1835 issue of the popular *Mechanics Magazine*, one author speculated on a method of aerial navigation where one might attach thirty-three eagles in a specific configuration to a wickerwork whilst dangling a piece of meat in front of them. This then would compel them to fly forwards, and then one would control the direction of flight by angling the meat in the desired direction. The anonymous contributor was not so ignorant, however, to assert this as *the* method to achieve aerial navigation, and he concluded to the editor that “I will not trouble you anymore on a subject which may appear in its childish state, as bordering on the ridiculous”.<sup>350</sup> This anecdote underlines the seriousness with which Campbell pursued his interest, despite the more popular (if not ridiculous) discussions that occupied the entertaining space of fanciful speculation. In either case, we see the common interplay of ideas cross-pollinating aerial navigation with ornithology.

### The foundations of the Aëronautical Society of Great Britain

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<sup>349</sup> NAL. Cayley-Campbell Correspondence, 19 August 1818.

<sup>350</sup> Anon., 1836. *The Mechanics Magazine, Museum, Register Journal and Gazette*. October 3 – April 2. Vol XXIV. London: J. Cunningham, Mechanics’ Magazine Office. pp.200-1.

The Victorian aeronautical enthusiasts sought more formal means by which to network and further their studies. Cayley himself attempted to establish an aeronautical society four times during his life, but to his anguish not enough support was mustered, and his earnest attempts ended in failure.<sup>351</sup> In fact Cayley's generation did not produce an aeronautical society, but the next generation of enthusiasts did. Some two decades later, the beginnings of an ultimately successful effort took place at the annual meeting of the British Association for the Advancement of Science, held in Birmingham in 1865, where the British inventor Frederick William Brearey (1816–1896) presented with the appeal:

Now that public attention was directed to these scientific efforts, and that the balloon was becoming more than a toy, he [Brearey] would at once propose the formation of a society, to be supported by subscriptions and donations, by which experiments could be conducted in its own grounds, and with its own apparatus, for the furtherance of investigations in aërology locomotion<sup>352</sup>

By “scientific efforts” Brearey was referencing the record-breaking ballooning ascents that the meteorologist James Glaisher (1809–1903) and aeronaut Henry Tracey Coxwell (1819–1900) achieved, reaching the unprecedented ascent of

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<sup>351</sup> Reese, P., 2014. *The Men Who Gave Us Wings: Britain and the Aeroplane 1796-1914*. South Yorkshire: Pen & Sword Aviation. pp.9-10.

<sup>352</sup> Anon., 1866. *Report of the Thirty-Fifth Meeting of the British Association for the Advancement of Science; Held at Birmingham in September 1865*. London: John Murray. p.17. ; Frederick Brearey presented this talk, which was entitled “Remarks upon Aerial Navigation, Suggested by Mr Glaisher's late Balloon Ascents,” to the Meteorological Section of the BAAS.



37,000 feet.<sup>353</sup> By the mid nineteenth century, aside from mere entertainment and exhibition purposes, ballooning had found use in three distinct areas: reconnaissance in war, scientific exploration, and communication between distant geographical points.<sup>354</sup> Despite its co-opting by showmen for public entertainment, ballooning nevertheless provided serious scientific figures like Glaisher a stage upon which to perform a range of experiments, especially into atmospheric phenomena.<sup>355</sup> For this reason, Glaisher joined Brearey and others in mobilising to establish an aeronautical society, particularly because he recognised the lack of progress in achieving aerial navigation amid the constraints of ballooning technology. As he later recalled,

The desire which influenced me was to ascend to the higher regions and travel by its means in furtherance of a better knowledge of atmospheric phenomena...I soon found that balloon travelling was at the mercy of the wind, and I saw no probability of any method of steering balloons being obtained. It even appeared to me that the balloon itself, admirable for vertical ascents, was not necessarily a first step in Aërial Navigation, and might possibly have no share in the solution of the problem. It was this

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<sup>353</sup> Anon., 1863. *Report of the Thirty-second Meeting of the British Association for the Advancement of Science; Held at Cambridge in October 1862*. London: John Murray. pp.384-385.

<sup>354</sup> Anon., 1863. *The American Annual Cyclopaedia and Register of Important Events of the year 1862*. Vol II. New York: D. Appleton & Company. p.184.

<sup>355</sup> Holmes, R., 2014. *Falling Upwards: How We Took to the Air*. London: William Collins. pp.193-225

conviction that led to the formation of the Aëronautical Society a few years since...<sup>356</sup>

Within a year of Brearey's appeal, the would-be founding members of the society met at Argyll's Kensington town house in London, on the 12<sup>th</sup> of January 1866 to lay the groundwork.

Six men attended: in addition to Argyll, Glaisher, and Brearey, there was Hugh Welch Diamond, Francis Herbert Wenham, and James William Butler—also men of science who aspired to realise aerial navigation. Glaisher read an address noting that the subject of aeronautics had not yet been properly recognised as a distinct branch of science due to the unscientific nature of ballooning. He stated that “balloons have been, with but very few exceptions, employed merely for exhibition or for the purpose of public entertainment” and “sundry performances”. These public ballooning feats simply pandered to the public taste for “the grotesque and the hazardous, which have tended so far to degrade the subject [of aeronautics].”<sup>357</sup> Contrasting the failure of ballooning with the goals of the newly formed society, Glaisher stated that

A chief branch of inquiry by the Society would be the department relating to the mechanical expedients and inventions for facilitating aerial navigation, and obtaining or aiding a change of locality at the will of the

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<sup>356</sup> Glaisher, J., 1871. *Travels in the Air*. London: Richard Bentley & Son. p.xiii

<sup>357</sup> *First Annual Report of the Aëronautical society of Great Britain*. pp.5-6

aeronaut. Nearly all contrivances for this purpose have hitherto failed, or have only been successful to a very limited extent.<sup>358</sup>

With the establishment of the ASGB it was confidently hoped that aeronautics might finally “take its standing among the sciences”.<sup>359</sup> After this address a number of important formalities were discussed and decided on such as how the society would be funded (annual subscriptions and donations), who could become Members (men) and Associates (women), and the naming of the president (Argyll), vice-presidents (the Duke of Sutherland, Argyll’s brother-in-law; Lord Richard Grosvenor; and Lord Dufferin and Claneboye), treasurer (Glaisher) and honorary secretary (Brearey).

A second preliminary meeting was held again at Argyll Lodge a month later, on 12<sup>th</sup> February 1866. Brearey reported on having written a letter of application to the Commissioners of Patents, asking for a record of all patents relating to the subject of aeronautics. His application was successful, and the Commission provided the ASGB with all of the specifications that Brearey had requested (dating back to 1617!). Importantly, at this early stage Argyll suggested that the society should aim to publish a journal. This suggestion likely resulted in the society’s *Annual Reports*, a fundamental resource for understanding the early progress of aeronautics prior to the achievement of manned flight. In the ensuing months, further meetings of this council were regularly held, usually at Stafford House, Sutherland’s imposing London palace, offering another context for aristocratic domestic science.

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<sup>358</sup> *First Annual Report of the Aëronautical society of Great Britain*. p.7

<sup>359</sup> *First Annual Report of the Aëronautical society of Great Britain*. p.6

Argyll became involved in other crucial elements of the Society's formation, in connection with France. By 1863 a group of men in France, including Felix Nadar, the first person to take aerial photographs, had already established their own *Société d'encouragement de la locomotion aérienne au moyen du plus lourd que l'air*. The president, Jean-Augustin Barral (1819–1884), had heard about the nascent British society, and with little time wasted proposed that the two societies enter a co-operative partnership to work toward achieving the mutual goal of aerial navigation. At the May 1866 Council meeting, after reading this proposal, Argyll was directed to sign the letter of reply accepting the French society's request. This communication marked the beginning of an established friendship between the two societies that would last for years.

#### 1866: The Aëronautical Society established

Following the series of preliminary council meetings, the first public meeting of the ASGB was held on the 27<sup>th</sup> June 1866 in the Great Room of the Society of Arts in London. Since 1843 Prince Albert had been president of the Society of Arts, and before his death in 1861, he sent a letter to Argyll in 1859 stating that “you seem to have absolutely mastered the nature of the birds’ flight and the causes which stand in the way of aerial navigation succeeding on the principles as yet followed.”<sup>360</sup> Although it may have been a stretch to suggest that Argyll had “mastered the nature of the birds’ flight,” the noblemen’s shared, liberal ideas in applying science and art to industry proved useful in securing the Society of Arts as the meeting place

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<sup>360</sup> Argyll, *Autobiography*, II: 184-185

for the ASGB. (with Prince Albert's death his eldest son had swiftly taken the presidency of the Society of Arts by 1863).

At the first meeting Argyll, as president, took the chair, and Brearey made an introduction giving five reasons for the establishment of the Society. These included the well-known problem of ridicule and lack of current respect for the study of aeronautics, which could only be alleviated with action. On a more existential level, the fulfilment of an "almost universal desire" to obtain more command over the "comparatively unoccupied space which has continually eluded all attempts" was another driving force.<sup>361</sup> For reasons such as these the ASGB was being "established for the advancement of Aërial Navigation, and for Observations in Aerology connected therewith".<sup>362</sup>

After Brearey's remarks, Wenham proceeded to read his paper, "On Aerial Locomotion and the Laws by Which Heavy Bodies impelled through Air are Sustained." His paper suggested from observation that in general birds, especially large birds, did not exert as much muscle energy as was commonly thought. In many cases they could sustain flight with minimal to no wing motion for extended periods of time, partly owing to speed, and partly to the ratio of wing span to body weight. His paper also importantly proposed for the first time, the idea of superposed wings on gliders based on his observation of pelican flight formations, that is, gliders with four or six wings, as opposed to two, in order to increase the lift

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<sup>361</sup> *First Annual Report of the Aëronautical society of Great Britain*. p.8; One could perhaps interpret Brearey's statement as an extension of imperialism over land to imperialism of the atmosphere.

<sup>362</sup> Male, C., 2016. *A Short History of the Royal Aëronautical Society*. [pdf] RAS. Available at: < [https://www.aerosociety.com/media/9728/raes\\_history\\_in\\_11\\_parts-2016.pdf](https://www.aerosociety.com/media/9728/raes_history_in_11_parts-2016.pdf) > [Accessed 13 June 2022]. p.48.

area. This very idea became the basis for many early aeroplane designs in the twentieth century.<sup>363</sup> Wenham alongside Argyll (as we will see below) represented some of the first major British theorists dedicated to uncovering this otherwise hidden aspect of ornithology.

After Wenham concluded, Argyll declared his appreciation for the new theory that tackled a problem on which not much work had been undertaken.<sup>364</sup> He then conveyed his own thoughts on how aerial navigation would work in the future. He suggested that flying machines would traverse the air not with muscular power like a bird flapping its wings, but rather with a motive force using mechanical engines. Although the proper motive force for flying machines would be contested throughout the nineteenth century, Argyll's prediction would eventually become the accepted conceptual method for aeroplanes from the twentieth century onwards. He then proposed why this would be beneficial not just for the small circle of enthusiasts at the meeting but the rest of humanity, suggesting that vessels would be able to carry multiple people as opposed to just an individual. As Argyll noted, the mechanical principles of bird flight up until this point suffered from a lack of serious scientific study aside from a few theories that had become largely accepted due to their popularity. One notable theory that Argyll referenced was in William Paley's *Natural Theology* first published in 1802. One section of Paley's book, often overlooked by historians of science, is one of the rare early attempts to give a lucid description of the mechanics of bird flight. However, in that section Paley invoked a theory that by the time the ASGB was established had been largely

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<sup>363</sup> *First Annual Report of the Aëronautical society of Great Britain*. pp.10-40.

<sup>364</sup> *First Annual Report of the Aëronautical society of Great Britain*. pp.40-41.

discredited. After beautifully describing the anatomy of birds in a chapter on “Comparative Anatomy,” to show how wise the Creator was, Paley went on to say that “the bodies of birds are blown up [through the inhalation of air] from their lungs...and thus rendered buoyant”.<sup>365</sup> In contrast, one of the fundamental principles that had been established by aeronautical experimentalists since the time of Cayley and John Campbell was that birds were *heavier-than-air* at all times, and at no point did they float on air owing to their buoyancy.

#### Aristocracy, science, industry and influence

Historian of aviation Richard P. Hallion wrote favourably about the beginnings of the ASGB as being “a quintessentially Victorian institution: the creation of upper-class gentlemen and nobles possessing a passionate curiosity about flight, a special sense of responsibility for the future of the realm ... and a belief they had a special obligation to work for society’s benefit”.<sup>366</sup> Contrary to prevailing negative narratives portraying secluded and unproductive upper-class Victorians, especially towards the end of the nineteenth century, the ASGB was headed by prominent aristocrats: Argyll, the Duke of Sutherland, and the politician and businessman Lord Richard Grosvenor. Hallion continued, “Thanks to the Duke of Argyll and a group of like-minded colleagues, a society existed for the encouragement of reputable experimentation and the exchange of reliable information”.<sup>367</sup> He also

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<sup>365</sup> Paley, W., 1821. *Natural Theology*. London: Richardson & Co. p.195.

<sup>366</sup> Hallion, R. P., 2003. *Taking Flight: Inventing the Aerial age, from Antiquity Through the First World War*. New York: OUP. p.115.

<sup>367</sup> *Ibid.*, p.119.

noted that, acting as an important patron of science before the rise of state sponsorship, the six men who met at Argyll Lodge on the 12<sup>th</sup> January 1866 “formed the most important aeronautical organization created prior to the twentieth century’s tremendous proliferation of governmentally supported research establishments”.<sup>368</sup> It becomes clear here that the involvement of the aristocracy in the ASGB contributed an air of respectability and confidence amongst middle-class enthusiasts of aerial navigation. Over the course of the late Victorian period, this respectability and confidence slowly infected the wider aeronautical community as well as the general public, as we shall see below.

Respectability was not limited to the ASGB by any means. A case in point involving Argyll is the British Association for the Advancement of Science. In their seminal book of 1981 *Gentlemen of Science* Arnold Thackray and Jack Morrell touched on the importance of aristocratic patronage in the early years of the BAAS.<sup>369</sup> As a reformist association against what they saw as the retrogressive spirit of the Royal Society, the BAAS established itself as a cultural force during the nineteenth century with the intention of representing British science as a whole, a claim of course fraught with nationalist and imperialist overtones. A large part of this vision would be accomplished through complicated but fruitful relations with gentlemen (and, at times, gentlewomen) of rank. This of course often equated to a strong preference for liberal minded, scientifically attuned aristocrats who served as symbolic figures representing the supposed positive values of science and British culture. Inevitably, there was a hierarchical system of leadership in the BAAS that

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<sup>368</sup> *Ibid.*, p.115.

<sup>369</sup> Morrell, J., Thackray, A., 1981. *Gentlemen of Science*. Oxford: OUP. pp.109-18.



typically barred Catholics, Tories, women (apart from roles as patronesses or ticketed guests at the annual meetings) and, according to their standard, no working-class men. This hierarchy was mirrored to a large extent by the ASGB, although in contrast to the BAAS women could become members of the ASGB (albeit as Associates) from the very beginning. In his 1855 address, discussed in chapter two, Argyll made a case for the economic benefit of the application of abstract (or theoretical) science to industry claiming that “the moment any result of science becomes applicable to the arts, the unfailing enterprise of the commercial and manufacturing classes takes it up and exhausts every resource of capital and of skill in giving to that application the largest possible development”.<sup>370</sup> Eleven years later Argyll put his words into action as a founder and first president of the ASGB. Uncovering “Theory of Flight” represented the abstract aspect of science and the eventual invention of a manoeuvrable flying machine was, for Argyll, that theory put to practical and ultimately industrial use.

In 1981 the historian Martin J. Wiener had advanced the idea that the middle and upper classes otherwise known as the “articulate” classes held an “ambiguous attitude towards modern industrial society” thereby aiding heavily in the decline of its industrial spirit.<sup>371</sup> By studying the origins of the ASGB Wiener’s thesis is strongly challenged by my own work in two ways. First, by focusing on the aristocratic Argyll family, we see a sustained concern for the study of mechanics and its potential applications lasting throughout the nineteenth century. And,

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<sup>370</sup> Anon., 1856. *Report of the Twenty-Fifth Meeting of the British Association for the Advancement of Science; Held at Glasgow in September 1855*. London: John Murray. p.lxxx.

<sup>371</sup> Wiener, M.J., 1981. *English culture and the decline of the industrial spirit, 1850-1980*. Cambridge: CUP. p.ix.

second, we see the complete reverse of Wiener's argument; that is to say, it was precisely *because* of these upper-class Victorians that an industrial science shifted from obscurity into recognition. In the eyes of Argyll and his colleagues, gentlemanly respectability lay at the heart of liberal industrial progress and the final goal of aerial navigation was but one manifestation of this grand vision.

The private domestic space was instrumental to the realisation of the ASGB, and this is perhaps best seen by investigating the role of birds within Argyll's own country and town houses. Through this investigation we can reveal the wider connection between the aristocratic domestic space and the practice of Victorian science.

#### Domestic ornithology and aristocratic town and country houses

Birds were a ubiquitous feature in all of Argyll's country and town houses. When Argyll and his wife Elizabeth first went house hunting in London during the early 1850s (when Argyll's Westminster duties began to surge) the final decision leading towards buying their new villa in Camden Hill, Kensington, lay not primarily in the size or layout of the house (although those aspects were factored in) but rather, simply on the presence of birds. On their first viewing – at that time the property belonged to the Dowager-Duchess of Bedford - Argyll was pleasantly surprised to discover an abundance of bird varieties including starlings, and nut-catchers nesting, flying, and hunting all around the Bedford grounds. After their viewing Argyll immediately ordered his agent to arrange to purchase the Villa. Argyll later remarked in his autobiography that “the birds settled everything”.<sup>372</sup>

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<sup>372</sup> Argyll, *Autobiography*, I: 392

Aside from recognising the ubiquity of birds present during Argyll's life, it is also necessary to emphasise the significance of domestic spaces for scientific practice amongst Victorian aristocrats in general. Argyll's explanation of the principles of bird flight developed as a direct result of this tradition and so it cannot be separated from his work. We have already seen how as a boy Argyll utilised Ardencaple Castle as his primary base for observation and experimentation; this was a method that remained with him throughout his life. In contrast to Argyll's public work in various London meeting chambers his domestic spaces afforded him private retreats conducive to his studies of nature—within what historians often categorise as a form of private laboratory.<sup>373</sup> In Argyll's autobiography we see a clear case of this in his London house; his third wife Ina Campbell wrote that he used to speak of “the refreshment it afforded him to turn from important matters affecting the welfare of the nation, which required strenuous and engrossing thought, to the restfulness of Nature.”<sup>374</sup> Some extracts from Argyll's 1876 personal diary show what he undertook once back in his private field laboratory. On the 26<sup>th</sup> April at Inveraray Castle Argyll noted that, “the little spotted woodpecker has made his appearance in the garden and one day I saw him in the act of producing his peculiar rattle”.<sup>375</sup> Argyll also kept various natural history diaries throughout his lifetime to record his observations and discoveries. Reading through his diaries the reader is taken on a fascinating and extremely personal tour of Argyll's private life in which

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<sup>373</sup> James, F. A. J. L., ed., 1989. *The Development of the Laboratory: Essays on the Place of Experiment in Industrial Civilisation*. London: Macmillan Press. p.3

<sup>374</sup> Argyll, *Autobiography*, II: 336

<sup>375</sup> *Ibid.*, p.337

one is tempted to conjure up visual images of Argyll in his country houses surrounded by nature as he intently observes the behaviour of the various wildlife he encounters. This brief extract from just one of many diary entries contain Argyll's sighting of a pair of oystercatchers at Inveraray Castle, May 1872:

My attention was attracted by the vociferous cries of a pair of oystercatchers flying over the loch, and circling round a very large bird which at first, and at a considerable distance I took for a black backed gull. It soon, however, wheeled nearer and suddenly stopped in the well-known hovering position which proclaims the osprey...The hovering of the osprey is very different from that of the kestrel being sustained by a sort of heavy and laborious flapping which gives the impression of difficult laborious exertion....<sup>376</sup>

This practice of returning to the private laboratory (field or otherwise) was not at all unique to Argyll, rather, it was an integral aspect of Victorian aristocratic domestic science, involving a highly influential network that included Argyll and others, typically connected through family and marriage.<sup>377</sup> Another clear example of this method of practice, can be seen in John William Strutt, 3rd Baron Rayleigh (1842–1919), appointed as Professor of Experimental Physics at University of Cambridge's Cavendish Laboratory in 1879. Although this new role provided him

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<sup>376</sup> Inveraray Castle Archive. Bundle 299, diary entry from May 1872.

<sup>377</sup> Within this highly influential network Donald Opitz has identified members of the Balfour, Campbell, Cavendish, Gascoyne-Cecil, Parsons and Strutt families as partakers in this aristocratic practice.

with an otherwise ideal space to conduct experimental research, he would still revert back to working in his country house at Terling Place, Chelmsford (Essex) whenever possible. Similar to Argyll, Rayleigh showed an inclination for retreating to his private laboratory. According to Opitz, “Rooms in the Cavendish Laboratory substituted for his Terling workshops, though he returned to his country laboratory to work at experiments during vacations.”<sup>378</sup> Moreover, in concluding the first ever BAAS presidential address in an overseas location of the British empire - on this occasion the city of Montreal, Canada - Rayleigh noted his optimism regarding the multiplication of laboratories in recent years. He nevertheless warned listeners to “discourage too great reliance upon the instrument maker” because much of the best original work had been done “with the homeliest appliances”.<sup>379</sup> As Opitz argued, in the context of the debates over scientific naturalism, “Extensive country-house networks ... provided influential, alternative visions for professionalizing science than those advocated by the scientific naturalists. The evangelical, private practice associated with the aristocratic circle represents an important, domestic

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<sup>378</sup> Opitz, D. L., 2004. *Aristocrats and Professionals: Country-House Science in Late-Victorian Britain*. Ph.D. University of Minnesota. p.158.

<sup>379</sup> Rayleigh’s address was entitled “Address by the Right Hon. Lord Rayleigh”, Lord Rayleigh., 1885. *Report of the Fifty-Fourth Meeting of the British Association for the Advancement of Science; Held at Montreal in August and September 1884*. London: John Murray. p.21. ; despite this, it is interesting to note that by the 1880s Rayleigh himself had become more accustomed to well-equipped laboratories beyond his own country house. Frank James has noted that when Rayleigh took up his post at the Royal Institution in 1887 as Professor of Natural Philosophy he complained of a lack of proper instruments to work with, see James, F. A. J. L., 2021. *Instruments from Scratch? Humphry Davy, Michael Faraday and the Construction of Knowledge*. [pdf] Bulletin of the Scientific Instrument Society. Available at: < <https://discovery.ucl.ac.uk/id/eprint/10122862/1/RI5%20Instruments%20from%20Scratch.pdf> >. [Accessed 27 Jul 2022]. p.10.

tradition extending beyond the Victorian period....”<sup>380</sup> It is worth pointing out here that when Argyll and Rayleigh met they would often discuss the flight of birds (this was sometimes at one of their country houses). Although according to Rayleigh’s son Robert John Strutt “The discussions were not very fruitful...The Duke did not understand the principles of mechanics well enough to see the weak points in his own theories, and while Rayleigh was trying to frame some statements of his objection which he could understand, would pass on to something else, without realizing that Rayleigh considered his theory impossible.” Opitz has pointed out from his own research that this particular quotation is an example of erasure as Robert Strutt took this section out of his mother’s unpublished diary omitting her completely from the conversation since it was on a scientific subject. Although there is no need to question the idea that Rayleigh had multiple problems with Argyll’s theory of flight, it is not clear from this quote alone exactly to what extent he disagreed with Argyll.<sup>381</sup> Regardless of their disagreements on flight, Argyll’s own private field laboratory experiments fit within the overall pattern of country-house science, particularly given the theological framing of his ornithological studies, to which I now turn.

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<sup>380</sup> Opitz, D. L., 2004. *Aristocrats and Professionals: Country-House Science in Late-Victorian Britain*. Ph.D. University of Minnesota. p.153; see Barton, R., 2018. *The X Club*. Chicago: University of Chicago Press, for the context of debates over scientific naturalism in Victorian Britain

<sup>381</sup> See Strutt, R. J., 1924. *John William Strutt, Third Baron Rayleigh*. London: Edward Arnold & Co. p.129

Argyll's theology of flight in *The Reign of Law*

Argyll, like his father, was a keen observer and experimenter on birds. Nowhere is this better seen than in chapter three ("Contrivance a Necessity") of Argyll's *The Reign of Law* first published in 1867.<sup>382</sup> This was by far his most popular book with a fifth edition within a year. By 1890 the book had gone into its nineteenth edition and had also circulated across many parts of the world including America, Australia and Japan.<sup>383</sup> Historians are well aware of the popularity of Argyll's book and have correctly pinpointed one aspect of its enduring reputation: that is Argyll's powerfully-argued contribution as one of the leading theistic evolutionists alongside his contemporaries Richard Owen (the anatomist), and St. George Mivart (the Catholic biologist) in the 'post-Darwinian controversies'.<sup>384</sup> However, historians have tended to overlook the other compelling reason for the book's sustained reputation: its continued relevance in the world of aeronautical studies within and beyond the Victorian period. The study of bird flight and the subsequent attempts to actively apply those theoretical principles to manned flight became an increasingly common theme as the nineteenth century progressed. Whilst unskilled in engineering (unlike his father), Argyll was a seasoned ornithologist, and his

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<sup>382</sup> Parts of this book had already appeared in separate chapters. For example, chapter three first appeared in *Good Words* in 1865 titled as 'Reign of Law', and chapter one had appeared in 1862 in the *Edinburgh Review*. See chapter five for more on Argyll's 1862 *Edinburgh Review* article.

<sup>383</sup> 8<sup>th</sup> Duke of Argyll., 1898. *What is Science*. Edinburgh: David Douglas. p.30; In fact according to reports during the 1870s and 1880s Argyll's book is said to have circulated extremely well in Japan. In 1879 the *Aberdeen Evening Express* noted that his book was in great demand amongst the students of English literature in Japan, see *Evening Express*, 1879. Japanese Philosophical Students. *Aberdeen Evening Express*, 28 October. p.2f.

<sup>384</sup> Moore, J., 1979. *The Post-Darwinian Controversies*. Cambridge: CUP; see also Brooke, J. H., 1991. *Science and Religion: Some Historical Perspectives*. Cambridge: CUP. p.386.

ornithological studies provided a highly valuable resource for both wider popular circles as well as within smaller scientific ones.

In line with a long tradition of English natural theology dating back to the seventeenth century, Argyll's key thematic approach, employed in all of his writings on science and religion, was summed up at the end of chapter two in *The Reign of Law* where he stated that

It is, indeed, the completeness of the analogy between our works on a small scale, and of the Creator on an infinitely large scale, which is the greatest mystery of all. Man is under constraint to adopt the principle of Adjustment, because the Forces of Nature are external to and independent of his Will. They may be managed but they cannot be disobeyed.... How imperious they are, yet how submissive! How they reign, yet how they serve!<sup>385</sup>

By "principle of Adjustment" Argyll meant our ability as humans to manipulate the laws of nature in order to be inventive. In effect Argyll argued that creation was nothing short of the work of God who chose to govern through immutable forces of nature. These "Forces of Nature" could not ultimately be broken, hence their immutability; however, they *could* be manipulated or "Adjusted," and it was this capability to manipulate the laws which provided man with the ability to study, experiment, and utilise nature as the means towards directed ends. Chapter three of his book then detailed his study of birds, including the laws and principles that

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<sup>385</sup> 8<sup>th</sup> Duke of Argyll., 1867. *The Reign of Law*. London: Alexander Strahan. pp.126-127



govern their ability to fly. Argyll articulated his aims for the chapter based upon his understanding of the relationship between the mind of God and the mind of man. For Argyll, God had created birds in nature to fly, but this was a height that Argyll believed man could also ascend to if only we could come to understand the correct principles of flight that God had embedded in nature because He had made these laws accessible to man.<sup>386</sup>

Argyll's chapter on flight is broken up into various sections that delve into the mechanism of bird flight. He first speaks of the apparent contradiction of a bird's sustained flight in the face of the effects of gravity. It is here where one of the most foundational principles of flight is stated and expanded upon. How can birds fly with gravity constantly acting to pull them down? Argyll argued contrary to common perception that gravity

...is the very Force which is the principle one concerned in flight, and without which flight would be impossible.... Birds are not lighter than the air, but immensely heavier. If they were lighter than the air they might float, but they could not fly. This is the difference with a bird and a balloon. A balloon rises because it is lighter than air, and floats upon it. Consequently it is incapable of being directed ... no bird is even for an instant of time lighter than the air in which it flies; but being, on the contrary, always greatly heavier, it keeps possession of a Force capable of supplying momentum.<sup>387</sup>

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<sup>386</sup> *Ibid.*, pp.128-131

<sup>387</sup> *Ibid.*, p.133

Here, Argyll made a case for how ornithology offered a more promising basis for the emerging science of aerial navigation than ballooning, given the latter's lack of susceptibility to control in the air. He continued by describing other key features of bird flight, such as the precise construction of a wing which is broken up into three parts—primaries, secondaries, tertiaries (Figure 4)

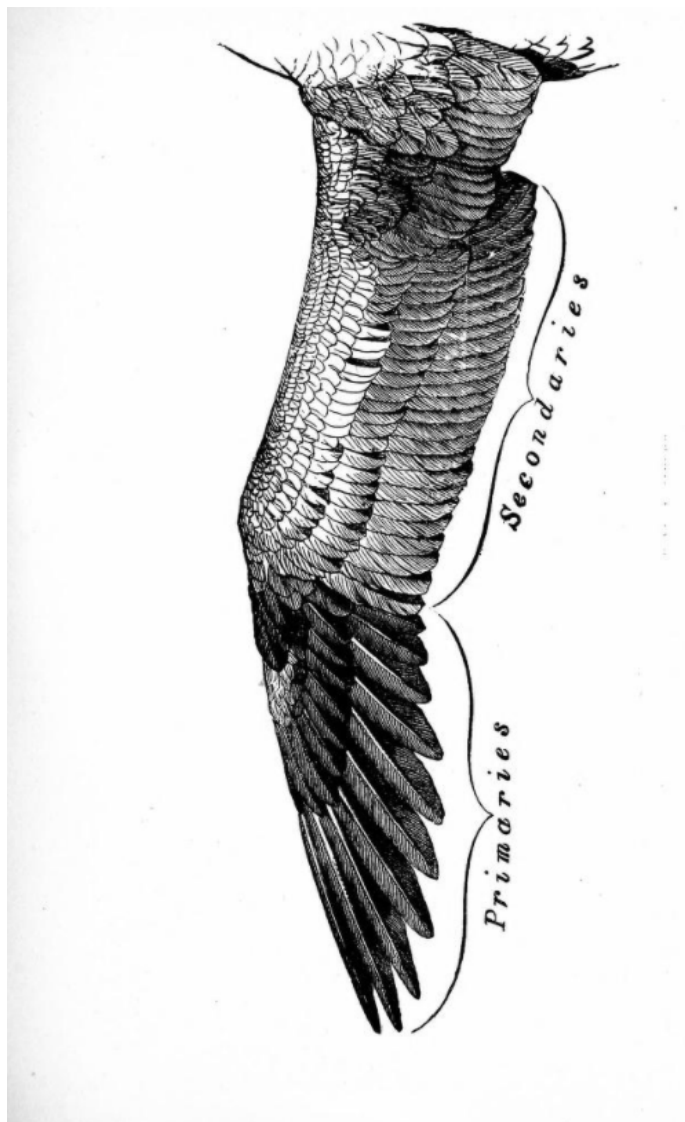


Figure 4. Drawing detailing the three sections of a bird's wing. The tertiary section is not labelled in this picture, but it is described in the book as the part of the wing closest to the

body, by Mr J. Wolf, found in the 8<sup>th</sup> Duke of Argyll, *The Reign of Law*, 5<sup>th</sup> ed. pp.156-157.

—and the elasticity of air, and how that enabled a bird to manipulate airflow in a certain direction to aid its upward lift and sustained flight. In one section of the book, Argyll employed a useful human analogy discussing the effect of wind on an umbrella. He raised a seemingly difficult problem, that is, when a bird flaps downwards to raise its body upwards in the air, it has to inevitably flap upwards again in order to position its wings for the next downward flap. This being the case, why does not the upstroke neutralise the effect of the downstroke, effectively rendering the bird unable to gain any lift at all? Argyll’s answer is two-fold. The first part lies in the convex structure of a bird’s wings. To better understand this Argyll asks us to think about what happens when strong winds flow against an umbrella, “the air which is struck by a concave or hollow surface is gathered up, and prevented from escaping, whereas the air struck by a convex or building surface escapes readily on all sides.” This is the same with a bird wing; a wing is designed with a convex shape to allow the wind over the top to escape with “comparatively trifling injury to the force gained in the downward blow”.<sup>388</sup> The second part of the answer has to do with the nature of feathers. According to Argyll, on the downstroke the design of feathers enables them to seal shut like a membrane enabling the wings to push down on the air underneath which in turn raises the bird up. However, on the upstroke, because the feathers are such that they are not bound

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<sup>388</sup> *Ibid.*, p.140.

together, they will open converting them into separate valves to which air can rush through. This means that the upstroke will not cancel the downstroke.<sup>389</sup>

Argyll tackled a number of other mysteries. One was the question of how a bird moves horizontally and not vertically? Argyll explained that this was achieved through (1) the horizontal angle of the bird in flight; (2) the narrowness of the bird when in forward motion actively allowing it to cut through the wind; and (3) the ability of the bird to periodically strike the air below its wings in order to keep effective balance between gravity and the force of the air.<sup>390</sup> Another mystery was about how some birds could soar in the air. Argyll, taking seagulls and the larger species of hawks as his examples, suggested that soaring “can only be done when there is a breeze of sufficient strength.” Because gravity is always pulling the bird down, a counterbalancing force—the flapping of a bird’s wings—is needed. “In order to bring these two forces to nearly a perfect balance, and so to ‘soar’, the bird must expand or contract its wings exactly to the right size, and hold them exactly at the right angle.”<sup>391</sup> A final example taken from the chapter is on the function of a bird’s tail—Argyll, in opposing the prevailing view that tails assisted primarily in steering, argued that based on his observations on such birds like the kestrel, tails were used by birds instead primarily for general balancing and stopping.<sup>392</sup> He also considered the different wing shapes and sizes and their varying purposes for specific types of birds, such as birds who spend most of their time flying (e.g., the

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<sup>389</sup> *Ibid.*, p.141.

<sup>390</sup> *Ibid.*, p.135.

<sup>391</sup> *Ibid.*, p.149.

<sup>392</sup> *Ibid.*, pp.170-171.

wandering albatross) and other birds who spend relatively small amounts of time flying (e.g., the woodcock). Argyll neatly synthesised his thoughts in the conclusion to this ornithological chapter. After proclaiming balloons to be but “mere toys,” his semi-prophetic vision for heavier-than-air flight—i.e., aerial navigation based on the laws ordained by God—is expressed with all the clarity of a formidable political orator:

When Science shall have discovered some moving power greatly lighter than any we yet know, in all probability the problem will be solved. But of one thing we may be sure—that if Man is ever destined to navigate the air, it will be in machines formed in strict obedience to the mechanical laws which have been employed by the Creator for the same purpose in flying animals<sup>393</sup>

As discussed above the ASGB had established a mutual friendship with the aeronautical savants in France so that a year after the release of his book, Argyll was commissioned to publish five articles in the *L'Aéronaute: Bulletin Mensuel International de la Navigation Aérienne* based on his ornithological chapter in *The Reign of Law*. Each article dealt with one of five aspects of bird flight: the relation of gravity to birds in flight, how birds direct themselves forward in flight, the muscular force for various types of birds, the structure of bird wings, and the ability of some birds to suspend themselves in the air without moving forward (i.e.

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<sup>393</sup> *Ibid.*, p.180.

hovering).<sup>394</sup> The publication of Argyll's works outside Britain within the context of aerial navigation studies demonstrates both the international reach of his ideas as well as the recognition of the relevance of ornithology—in this case, based on country house science—to the question of mechanical flight. But national debates often remained a point of contestation as theorists tried their best to determine the principles of flight. These debates could reveal more about Victorian society than about Victorian ornithology as we shall come to see.

#### Debating flight: the amateur-professional distinction

Based on my reading of the ASGB's annual reports it seems that Argyll's work on bird flight received the most attention by the Society between 1875 and 1882, although there are earlier and later mentions. A number of disagreements inevitably fomented in a polite, gentlemanly fashion to better understand the correct principles of bird flight. In general, from 1860s to the 1890s the sheer number of papers on the principles of bird flight that circulated through the society is astonishing. These debates over the details of bird flight implied an ongoing hope in apprehending the correct principles that governed both muscular and mechanical flight. Paradoxically however, whilst Argyll was rarely present at ASGB meetings to take part in the continuing discussions and debates after the 1860s, he remained ever-present outside of the ASGB in discussions and debates about ornithology and the science

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<sup>394</sup> National Aerospace Archive. *L'aeronute, Bulltin Mensuel International de la Navigation Aérienne*. Paris: *Rédaction et Bureaux*.; National Aerospace Archive. *L'aeronute, Bulltin Mensuel International de la Navigation Aérienne*. Paris: *Rédaction et Bureaux*. March 1869; The French society began publishing their monthly bulletin in 1868 after they heard about the success of the first Exhibition of the ASGB at the Crystal Palace on the twenty-fifth of June that same year. Brearey spoke of this at the 1877 aeronautical society meeting.

of bird flight. Throughout the second half of the nineteenth century Argyll engaged with and contested the theories of numerous men of science on what Argyll considered to be his topic of expertise. One specific debate between Argyll and Francis Guthrie provides us with a particularly illuminating case study revealing the ways in which tensions between the middle and aristocratic classes could arise within late-Victorian scientific society in relation to what counted as ‘proper’ professional scientific training and knowledge. Although I argue in my overall thesis that the aristocratic class often worked alongside the middle-class in the promotion of science and technology (as this chapter itself evinces), this is not to say that there was *never* any notion of conflict between the classes. Conflict could arise at multiple levels whether scientific, religious or political, however, 1) tensions were much more nuanced than has commonly been recognised, and 2) as the following case study will highlight, the aristocratic class did not always inescapably find themselves defeated.

Francis Guthrie (1831 - 1899) was a mathematician and naturalist who, after attaining an degree in law at University College London, earned a living as a London barrister for a number of years before eventually switching careers to take up the chair of Mathematics at the Graaf-Reinet College at the University of the Cape of Good Hope in South Africa between 1861 and 1875. Guthrie had already made himself known when in 1852 he first posed the four-colour problem,<sup>395</sup> and

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<sup>395</sup> The four colour problem was simple in essence but a difficult challenge practically. Guthrie was trying to colour a map of the English countries and as part of this he wondered how many colours were needed. He eventually concluded that four would be sufficient after which he wondered if four colours could be used for any map of the globe. This proved to be an immense mathematical challenge to which it took over one hundred years for a map of this nature to be successfully produced. Numberphile., 2017. *The Four Colour Map Theorem – Numberphile*.

whilst working at the Cape, Guthrie was able to continue investigations into various areas of natural history. In particular during 1874 and 1875 he debated with Argyll on the specific question of the mechanics of bird hovering. The debate began on the 25<sup>th</sup> of June 1874 when Guthrie wrote a piece in the scientific journal *Nature* arguing that no current theory to date – including the upward air slant theory, and Argyll’s minimal muscle exertion theory in the *Reign of Law* - could explain how birds hovered in the air. In his final remarks Guthrie stated that

The author [Argyll] obviously thinks that, by a proper arrangement of its wings and tail and the position of its body, a bird can without muscular exertion remain suspended in a horizontal air current, provided the latter be of sufficient velocity...the whole of the chapter in which it occurs may be read with interest as illustrating the curious mistakes a clever and earnest amateur will fall into in writing on even the most elementary scientific subjects in which he has had no exact training.<sup>396</sup>

Argyll, confident in his knowledge of bird flight, sought to reverse the flow of criticism and as a result, two months later on the 6<sup>th</sup> of August he responded not only by attempting to correct Guthrie, but also by criticising his lack of scientific expertise in the science of bird flight. He did so by stating that Guthrie had misrepresented his wording in the *Reign of Law*; in his response Argyll observed that

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[video online] Available at: < <https://www.youtube.com/watch?v=NgbK43jB4rQ> > [Accessed 17 June 2022]

<sup>396</sup> Guthrie, F., 1874. Flight of Birds. *Nature*, [e-journal] 10, 147.  
<https://doi.org/10.1038/010147a0>



Mr Guthrie omits the word “visible,” and probably has no idea of its force and meaning in the sentence referred to...It is evident...that Mr. Guthrie is still ignorant of the facts which have to be explained. In the passage which he misquotes [p170 from the Reign of Law] I am not stating any theory; I am stating a fact which I have seen over and over again. It is a fact beyond all question that a kestrel can maintain itself hovering in a strong horizontal air-current, with no other muscular exertion than that which is required to keep its wings and body at th[e] right angle.<sup>397</sup>

Argyll would not receive a response until almost a year later, but after reading it he would have been pleasantly surprised by Guthrie’s final words. On the 11<sup>th</sup> of March 1875 Guthrie published his response in *Nature* where he seemed to concede Argyll’s argument, at least partially. After again going through some of the difficulties of trying to understand the mechanics of bird hovering, Guthrie closed his section noting that “The Duke of Argyll’s testimony to the fact that birds hover apparently without motion in horizontal air currents is valuable, and no doubts increases the difficulty of accounting for the phenomena on the hypothesis of upwards currents.”<sup>398</sup>

If we look at the broader social implications of this short but fierce debate it is clear that this was more than just a back and forth regarding how birds hovered. In

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<sup>397</sup> 8<sup>th</sup> Duke of Argyll., 1874. Flight of Birds. *Nature*, [e-journal] 10, 262-263.  
<https://doi.org/10.1038/010262b0>

<sup>398</sup> Guthrie, F., 1875. Flight of Bords. *Nature*, [e-journal], 11, 364.  
<https://doi.org/10.1038/011364a0>

Guthrie's eyes Argyll was likely seen as the typical gentleman aristocrat born into immense wealth and with no formal education to speak of bar an amateur experience, at best, in the department of science. This was in contrast to Guthrie's own view of himself as a rising middle-class figure with a university level education, not to mention his position as a mathematician at Graaf-Reinet College during the period of the exchange. Argyll on the other hand clearly saw the distinction in a very different light, viewing himself as an authority figure on the science of bird flight as a result of years of strict personal studies regardless of his lack of formal education. To Argyll, Guthrie's training counted for nothing if he was still ignorant about the basic principles of flight - which Argyll thought he certainly was! In this context, I would suggest that this brief dispute centred around the broader themes of class, education, and scientific authority. During this period in late-Victorian Britain it is certainly evident that the rising middle-class presence was beginning to cause noticeable shifts in the hierarchical structures which had for many centuries qualified the dominance of the aristocratic class.<sup>399</sup> However, through Argyll we can see an unambiguous illustration of the ways in which these aristocrats not only retained their scientific authority, but sometimes even outperformed members of the middle class in particular areas of scientific expertise and experience.

Turning here from deliberations relating to specific areas of bird flight to the grander issue of attempting to apply the principles of bird flight to machine flight,

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<sup>399</sup> Cannadine, D., 1990. *The Decline and Fall of the British Aristocracy*. London: The Penguin Group. p.26; Lightman, B., 2007. *Victorian Popularizers of Science*. Chicago and London: UCP. p.40

the section below will demonstrate how the field of aeronautics was very much in a state of ambiguity, at least from a regional perspective, towards the end of the nineteenth century. In sum, although more and more British figures were working on the science of flight (bird and machine) there was a clear underlying sense of frustration which hinged on the fact that for thirty years since the 1860s no one had yet successfully developed a navigable flying machine. This frustration coincided with a decline in the ASGB's membership during the last quarter of the century. However, as we shall see, this internal frustration in Britain was not mirrored internationally, and in places such as Germany, the United States, and France aeronautical enthusiasts would continue to work actively towards the final goal, the developments to which we now turn.

#### The state of aeronautics from 1890 to 1903

The last decade of the century was an awkwardly paradoxical period in British aeronautics. By the 1890s the ASGB had lost a large number of members and the society was heavily in decline. The death of Brearey in 1896 as well as the sudden death, caused by a gliding accident, of the British aeronautical pioneer Percy Pilcher in 1899 had a drastically negative impact on aeronautical experimentation in Britain. There was also a sense of frustration by many of the members of the ASGB. Indeed, after thirty years of study and practical experimentation, no one had successfully manoeuvred through the air in a manned machine and safely landed, and the full principles of bird flight were still largely unknown. In the ASGB's 1893 annual report, Brearey noted that that the society could previously boast a membership of over 100, but as of recent years it had struggled to reach even

thirty.<sup>400</sup> To be sure, the society members did recognise that progress *had* certainly been made. In his concluding remarks to the 1890 annual report, Brearey observed that “We have got some distance from the speculative theories of the early days of this society”.<sup>401</sup> But in the end, this “distance” did not achieve the lengths hoped for at the society’s formation in 1866. If we now juxtapose this rather bleak outcome with the actual state of aerial navigation internationally – propelled, no doubt, by the efforts of the ASGB - aeronautics had made unprecedented progress and had effectively become a more respectable science whereas back in the 1860s it could scarcely hope to have claimed this recognition.

A few landmarks help to elucidate this. By the 1880s Horatio Philips (1845–1924) was able to build his own (updated) wind tunnel,<sup>402</sup> and leading German engineers such as Otto Lilienthal (1848–1896) had made promising flights on gliders, although like Pilcher he would also tragically fall victim to one of his own inventions. About the same time, Rayleigh had explained the dynamics of the soaring of the albatross—anticipated 400 years earlier by Leonardo da Vinci, according to one recent analysis.<sup>403</sup> Amidst the growing interest, Chicago was stage

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<sup>400</sup> National Aerospace Library. *Twenty-Fifth Annual Report of the Aëronautical society of Great Britain*. p.73.

<sup>401</sup> National Aerospace Library. *Twenty-Second Annual Report of the Aëronautical society of Great Britain*. p.96.

<sup>402</sup> Hallion, R. P., 2003. *Taking Flight: Inventing the Aerial age, from Antiquity Through the First World War*. New York: OUP. pp.116-117.

<sup>403</sup> Richardson, P. I., 2018. Leonardo da Vinci’s discovery of the dynamic soaring by birds in wind shear. *Notes and Records*, [e-journal] 73(2), pp.285-301. <https://doi.org/10.1098/rsnr.2018.0024>; Another interesting reference to Rayleigh is his lecture at the Royal Institution on 19<sup>th</sup> January 1900, where he speaks on a similar topic, this time explicitly relating his theories to the problems and possible solutions of artificial manned flight which he is confident will be achieved at a point in the not too distant future. See 3<sup>rd</sup> Baron Rayleigh., 1902. *Notices of the Proceedings of the*

to an international conference on aerial navigation in August 1893, and the American engineer Octave Chanute (1832–1910) published his *Progress in Flying Machines*, a key text in aeronautical development, in 1894. The Boston Aeronautical Society was established in 1895 with the aeronautical author and experimentalist James Means (1855–1920) as one of the founders. Lastly and most interestingly, although the membership of the ASGB had significantly decreased in quantity, the *quality* of membership and attendance by the 1890s was of a substantially high standard. Among the members were men like Harim Maxim (USA), Horatio Philips (UK), Percy Pilcher (UK—until his death in 1899) and Octave Chanute (USA). All of these savants made notable strides in aeronautical studies as engineers and/or theorists of flight, publicists, and experimentalists. In the same place that Brearey had commented on the decline of the ASGB membership (in the 1893 annual report), he nevertheless congratulated the society for its influence extended to all parts of the world where aeronautics was pursued. Ultimately, although British aerial enthusiasts might have been severely lacking in spirit, they had not yet given up, and because of this their persistence had a crucial impact on the wider study of aerial navigation.

In support of ASGB's international importance Means stated that

The best of the world's knowledge of aeronautics is to be found in the two thousand pages of these [ASGB annual] reports. The organization has never been a large one, and probably years will pass by before the

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*Meetings of the Members of the Royal Institution of Great Britain*. Vol XVI. London: William Clowes and Sons. pp.233-234.

importance of its twenty-nine years of work will be fully understood and appreciated. Even as the missal painters kept art alive during the Dark Ages, so has this band of men kept aeronautics alive during the years in which their branch of science has been by the many regarded almost as a pseudo-science. The editor wishes to make the fullest acknowledgement of the debt he owes to this society<sup>404</sup>

Notwithstanding the mythologising of the ASGB as a masculine club (“band of men,” overlooking the women Associates), Means’s retrospective appreciation of the society underlines its international reputation even amid its floundering status in the mid-1890s.

Victorian newspapers offered further observations on the progress of aeronautical developments. A story on “Ballooning” appearing in the *Daily News* in September 1875 critiqued the lack of progress made by the ASGB within the decade it had been established. Preferring balloon technology over the seemingly impractical attempts to establish aerial navigation (reasonably so given the comparably successful record of balloon technology) the story concluded, “... but, if there is to be a society for the navigation of the air, it would be just as well for its energies to be exerted in the only direction where any tangible results [i.e. ballooning], even the slightest, seem attainable.”<sup>405</sup> This pessimism contrasts sharply with another newspaper report on the 8<sup>th</sup> September 1893 which read

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<sup>404</sup> Means, J., 1895. *Aeronautical Annual*. Vol 1. Boston Massachusetts: W.B. Clarke & Co. pp.136-137.

<sup>405</sup> National Aerospace Library. *Daily News*. 1st September 1875.

The subject of transit through the air has emerged from the regions of fable and fancy, and is now being thoughtfully studied by the leading scientist. No less a savant than Professor Graham Bell said recently: “I have not the shadow of doubt, that the problem of aerial navigation will be solved within ten years. That means an entire revolution in the world’s methods of transportation and of making war....”<sup>406</sup>

These words by the Scottish born inventor Alexander Graham Bell, in stark contrast to the disparaging words of Lord Kelvin (quoted at the opening of this chapter), could not have been any more prophetic. Almost exactly ten years later the Wright brothers completed the first successfully controlled flight in the world for a length of twelve seconds on 17 December 1903 at Kill Devil Hills, North Carolina, USA.

The Wright brothers of course did not work in a vacuum. Their success was foundationally built upon the trial and error of nineteenth-century enthusiasts, and the brothers gave credit where it was due. In 1909, Wilbur Wright recognised Cayley’s pioneering work: “Cayley carried the science of flying to a point which it had never reached before and which it scarcely reached again during the last century”.<sup>407</sup> Fully steeped in the aeronautical literature, and as active correspondents with fellow engineers, the Wright brothers were fully aware of the

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<sup>406</sup> National Aerospace Library. September 1893 newspaper report on the progress of aeronautics.

<sup>407</sup> See Hallion, R. P., 2003. *Taking Flight: Inventing the Aerial age, from Antiquity Through the First World War*. New York: OUP. p.105.

UK debates, including Argyll's thoughts on flight. We know that Means's compendium *The Aeronautical Annual* (1895-97), directly inspired them. In a letter to Means on the 15<sup>th</sup> January 1908, the brothers cheerfully stated, "We are very glad to know that the Annual is to be continued. The old Annuals were largely responsible for the active interest which led us to begin experiments in aeronautics."<sup>408</sup> Means released his compendium in three volumes, starting from the historical roots and subsequent developments of aerial navigation, from the famed experiments of Leonardo da Vinci right through the latest aeronautical inventions of the late nineteenth century. This was and still is one of two of the most important works of this nature (the other being Octave Chanute's book mentioned above). As well as certain extracts from the ASGB meetings being featured in the book a modest number of extracts taken from Argyll's *Reign of Law* also featured in Means's first volume, under "The Problem of Man Flight". This was a chapter that detailed the theoretical problems in flight and the promising developments that had been made during the century. Means cited sections of Argyll's work, remarking that it was "a most notable chapter in which the flight of birds is analyzed," adding: "Every student of the subject of flight should read the interesting work [of Argyll] just mentioned. We may not agree with all the conclusions which are reached, yet the author gives most stimulating food for thought. The following chapters are the most striking, showing, as they do, advanced ideas".<sup>409</sup> As we see from the wider dissemination of Argyll's ideas, despite the waning status of the

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<sup>408</sup> General Correspondence: Means, James, 1906-1921, 1942. Wilbur and Orville Wright Papers, Manuscript Division, Library of Congress, Washington, D.C. 15<sup>th</sup> January 1908.

<sup>409</sup> Means, J., 1895. *The Aeronautical Annual*. Vol 1. Boston Massachusetts: W.B. Clark & Co. pp.146-147.



ASGB the influence of its members attracted an international readership which in turn undergirded the success of the Wright brothers.

### Conclusion

Argyll's vision for flight stemmed from his father's own infectious commitment to mechanics and aerial navigation. A perusal of the 7<sup>th</sup> Duke's activities suggest that in his own right he should be recognised by historians for his key role, as a nobleman, in the experimental pursuit of aerial navigation. In regular correspondence with Cayley, the 7<sup>th</sup> Duke investigated the principles of bird flight in an attempt to construct flying machines adapted to human beings at a time when aerial navigation was still seen as frivolous. Following in his father's footsteps the young George Campbell leveraged his various homes as his private laboratories, and, particularly during his early years, the influence of family in matters of both science and faith shaped his undertakings. All of this positioned him to becoming a founder and first president of the ASGB.

Empire was never far from Victorian British scientific pursuits. In the case of ornithology I have advanced an argument suggesting that European ornithology was fundamentally shaped by the constraints and opportunities that imperialism afforded. During the nineteenth century the British empire was extensive but due to the lack of diversity amongst British birds, ornithological enthusiasts had to seek empirical diversity by drawing on imperial networks and connections. This necessity to draw from imperial networks and connections meant that any limited opportunity to do so had to be prioritised. This prioritisation, therefore, influenced the types of information that ornithologists attempted to gather, primarily:

classification, anatomy, and natural history. Since the science of bird flight 1) didn't require imperial networks and connections, and 2) seemed like a completely unachievable goal to most savants, it lagged behind the other branches of ornithology for decades. To this end ornithologists, meteorologists and engineers such as Brearey, Wenham and Argyll were some of the key British figures to push the science of bird flight forward through dedicated institutional spaces such as the ASGB.

In summarising this chapter, I argue critically that if Brisson and Buffon can be seen as the progenitors of ornithology in the second half of the eighteenth century<sup>410</sup> the mid-nineteenth century work of Argyll (chapter three of the *Reign of Law*) and Wenham (his 1866 paper on superposed wings), underpinned by the establishment of the ASGB, can be seen as a critical turning point. This turning point was characterised by bird flight studies expanding dramatically in theoretical nature and likewise in popularity. Aside from a few individuals such as the 7<sup>th</sup> Duke of Argyll and Cayley, who had conducted some studies in this area, most ornithologists during the first half of the century did not focus much, if any, attention on theories of flight. If we compare this to the latter half of the Victorian period, we can see a steady increase of enthusiasm with many more studies on bird flight conducted, discussed, and debated. As I have stressed in this study, country and town house science, as a form of aristocratic, scientific practice, is the most salient theme traceable throughout Argyll's contributions. It becomes clear from an assessment

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<sup>410</sup> Farber, P. L., 1997. *Discovering birds: The Emergence of Ornithology as a Scientific Discipline, 1760-1850*. Baltimore and London: The John Hopkins University Press. pp.7-26.

of the noble class, that Argyll was part of a wider circle of theistic aristocrats who infused their own amateur style of research into wide ranging domains of professional science. Contrary to common perception, in many of these cases, the aristocrats were leading these initiatives. In conclusion, I not only argue that Argyll's aeronautical contributions existed as part of the larger Victorian tradition characterised by aristocratic domestic respectability motivated by a theistic agenda, but that Argyll's role in late-nineteenth-century science and technological innovation also proved significant to the success of aeronautical studies as a whole.

We have seen in this chapter how theological commitments underpinned Argyll's ornithological investigations. But Argyll's conception of the laws of nature and God's relationship to those laws went far beyond just uncovering the flight of birds. During a time in Britain when scientific naturalism was on the rise Argyll increasingly felt the need to demonstrate that continued belief in God and God's divine action within the universe in no way contradicted the laws of nature. To this end Argyll developed, promoted and defended his understanding of natural laws, miracles, and God's relation to them in an attempt to show that science remained fully compatible with a traditional theistic position. Thus, in the next chapter we explore Argyll's philosophy of nature through the construction of his neo-Newtonian position in the age of Tyndall and Huxley.

## **Chapter 5 - Scientific uniformity or “natural” divine action: shifting the boundaries of law**

By the nineteenth century the topic of miracles had become a thorny subject for many Victorians. Due to the rise of the historical and natural sciences traditional belief in miraculous acts of God were coming under increasing scrutiny. For example, just within the intellectual theistic worldview in 1865 the liberal Protestant historian William E. H. Lecky noted at least three different interpretational schools of thought regarding miracles. Firstly, he noted the “Christian evidences” (or evidentialist) school consisting of traditionalists who readily acknowledged miracles as possible such as J. B. Mozley. Secondly, liberal (or rationalist) intellectuals such as Baden Powell who, although Christian, were highly sceptical toward supernatural intervention. They argued that miracles in fact could not occur due to the laws of nature which were fixed and unalterable. And thirdly, a school of thought that sat somewhere between the evidentialists and rationalists which I have referred to as the “neo-Newtonians”.<sup>411</sup> The neo-Newtonian school of thought developed in the 1860s as a response to numerous issues they perceived as inherent within both the evidentialist and rationalist schools of thought. Argyll’s philosophically attuned mind meant that he was

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<sup>411</sup> Bossoh, N., 2021. Scientific Uniformity or “Natural” Divine Action: Shifting the Boundaries of Law in the Nineteenth Century. *Zygon Journal of Religion & Science*, [e-journal] 56(1), 234-253. <https://doi.org/10.1111/zygo.12678>. p.235.

quickly drawn to these discussions soon becoming a leading voice on the subject of miracles, firmly cementing himself in the neo-Newtonian camp.<sup>412</sup>

In order for us to better understand why I have labelled Argyll's position as neo-Newtonian, we must briefly venture into the seventeenth century to understand Newton's own conception of a miracle. Newton and his followers constructed the basis for what would come to be the neo-Newtonian position on miracles that Argyll later took up. Yet what is perhaps most interesting about the seventeenth century is that the origins of the Newtonian position itself did not rest with Newton but can be traced back to the fourth-century North African Church father, Augustine of Hippo. Thus, in this chapter alongside my focus on Argyll's engagement with the miracles debate, I will also show that the varying intellectual positions on divine action that emerged in the nineteenth century are in fact part of a longer historical tradition in the West that dates back to at least the fourth century and continues today.

#### Newtonians and the middle position

Isaac Newton is often regarded as the emblem of science, reason, and rationality and so it is worth noting that Newton did far more work on theology than he ever did on science.<sup>413</sup> One area where we can see Newton engaging in both science and theology is on the subject of miracles. After the English Civil War and

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<sup>412</sup> Lecky, W., 1865. *History of the Rise and Influence of the Spirit of Rationalism in Europe*. London: Longmans, Green, and Co. pp.194-196; A fourth nontheistic group, namely agnostics and atheists, also existed and were largely in agreement with the liberal position that miracles could not and did not occur.

<sup>413</sup> Robertson, J., 2015. *The Enlightenment: A very Short Introduction*. Oxford: OUP; Iliffe, R., 2017. *Priests of Nature: The Religious Worlds of Isaac Newton*. Oxford: OUP. pp.3, 23.

Commonwealth, the establishment of a new learned society, the Royal Society of London, followed swiftly. Members of the new Society were pioneers of the experimental approach to natural philosophy were mostly Anglicans with latitudinarian leanings and tended to view contemporary miracles as possible, given enough reliable evidence. In their estimation, any confirmed miracle was God violating or superseding the laws of nature, but this was not problematic since God created those laws. Following Lecky's categorisation, Royal Society members, such as Robert Boyle and Thomas Sprat, represented the evidentialist position. Soon, however, a number of contemporaries, such as Newton, Thomas Burnet, Samuel Clarke, and William Whiston, mostly liberal or unorthodox Anglicans,<sup>414</sup> would begin to challenge this understanding. In anticipation of the logical difficulties that this view posed (brought to fruition by the deistic critiques on miracles that developed from the late seventeenth century onward in the writings of Matthew Tindal, Thomas Chubb, Thomas Woolston, and others), the Newtonians opted to redefine the meaning of a miracle. Peter Harrison points out that for the Newtonians, adopting an Augustinian framework, miracles had an epistemological rather than ontological status. This is to say that for the Newtonians, miracles were not violations of the laws of nature because there was no well-defined "course of nature." Every occurrence was via the hand of God and

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<sup>414</sup> For example Newton was an anti-trinitarian and so from the perspective of the Anglican Church he would have been considered a heretic. Newton thus spent his life hiding his radical views from others. See Iliffe, R., *Newton: A Very Short Introduction*. Oxford: OUP. pp.72-73.

so in some sense “miraculous” - even the law of gravity.<sup>415</sup> For example, in a 1705 lecture Samuel Clarke, one of the foremost supporters of Newton, stated that

But if by the *Course of Nature*, be meant only (as it truly signifies) the *constant and uniform manner* of God’s acting either immediately or mediately in preserving and continuing the Order of the World; then, in That Sense, indeed a Miracle may be rightly defined to be an Effect produced contrary to the usual Course or Order of Nature, by the usual Interpositions of some Intelligent Being Superior to Men...<sup>416</sup>

On this view then, miracles were only miracles because of our subjective perception, that is, their unusualness *to us*. In reality, a “miracle” was simply an infinite God utilising higher natural laws that finite humans could not grasp.<sup>417</sup>

In the nineteenth century Argyll and a number of other Christian thinkers adopted this same position (thus revealing the emerging historical position once again). However, their intellectual context differed greatly from their early modern predecessors due in part to the widespread critical works of influential Enlightenment thinkers such as Conyers Middleton, Edward Gibbon, and David

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<sup>415</sup> This perspective is discussed in Newton’s original letter to Richard Bentley dated to 25<sup>th</sup> of February 1692/3. See The Newton Project., n.d. Original letter from Isaac Newton to Richard Bentley. [online] Available at: < <https://www.newtonproject.ox.ac.uk/view/texts/normalized/THEM00258> > [Accessed 17 June 2022].

<sup>416</sup> Anon., 1738. *The Works of Samuel Clarke*. London: John and Paul Knapton. p.698.

<sup>417</sup> Harrison, P., 1995. Newtonian Science, Miracles, and the Laws of Nature. *Journal of the History of Ideas*, [e-journal] 56(4), 531-553. <https://doi.org/10.2307/2709991>. p.535.

Hume. In addition, by the nineteenth century, the advances in geology, physics, biology and chemistry had radically alter perceptions of the physical world (in varying ways).<sup>418</sup> Finally, and most crucially, biblical criticism (or German historical criticism) also drastically changed how the bible itself was read. These novel factors, then, constituted difficult challenges not faced by the seventeenth- and eighteenth-century Newtonians.

### Higher criticism: From Germany to Britain

The rise of the historical sciences, widely known as German historical criticism, was crucial to the changing perception and increasing rejection of traditional miracles. In what ways did German historical criticism achieve this? To get at a clearer picture we must take a look at the state of liberal Protestant theology by the second half of the nineteenth century. In an 1899 article published in *The Nineteenth Century* entitled “The New Reformation” The British novelist Mary A. Ward contended that the “Christianity which has shaken itself free of miracles, and allied itself with modern philosophy for the creation of a new dogma, has the support of ‘German criticism.’” Ward was responding to an orthodox commentator who had suggested that German criticism actually assisted in proving the traditional dating and authorship of the gospel accounts. Ward proceeded to demonstrate the rift that German criticism had caused between orthodox and liberal minded Christians, first in Germany since the eighteenth century and then in Britain in the following.

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<sup>418</sup> See Harrison, P., Roberts, J., 2019. *Science Without God?: Rethinking the History of Scientific Naturalism*. Oxford: OUP for a discussion of the various branches of science and how they shaped and reshaped perceptions about the physical world in the early modern and modern period.



Finally, she shifted focus to her own assessment of three major doctrines in the New Testament showing how each was fraught with error and contradiction.<sup>419</sup> As the historian Stuart Mathieson has argued in his own recent work, if there was any immediate obstacle to orthodox belief in Christ's divine nature and the place of miracles, higher criticism was for many far more of a threat than the advances of modern science.<sup>420</sup> Indeed, by the mid-eighteenth century, German theologians had adopted highly critical approaches to the bible. At Göttingen, Halle, Altdorf, and Tübingen, pioneering theologians—including Johann Eichhorn, Friedrich Schleiermacher, Johann Semler, and Johann P. Gabler—had begun to question the plain reading of scripture, asking why, if the bible was put together by humans, should it not be read like any other ancient document? Although biblical miracles were not as fundamental a concern for German critics as they had been in England, a by-product of this new method *was* the questioning of traditionally accepted miracle claims in scripture. Theologians and historians now felt they had the responsibility to try to understand the cultural context behind the miraculous reports. That is to say, the world *behind* the explicit words. In sum, during the late eighteenth century, German scholarly interest in the biblical texts would provide the impetus for what came to be the modernisation of Western theology. Miracles

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<sup>419</sup> Ward, M., 1899. The New Reformation. *The Nineteenth Century*, [e-journal], 46(272), Available through: Pro Quest website  
 <<https://www.proquest.com/docview/2646751/A096F7BAD1C2437CPQ/5?accountid=14511&imgSeq=1&parentSessionId=fircvAlj5raKCeYTOSbcaZwYsWYdbrIGfUt3BnmrEPw%3D&forcedoI=true>> [Accessed 10 June 2022].

<sup>420</sup> Mathieson, S., 2020. *Evangelicals and the Philosophy of Science. The Victoria Institute 1865-1939*. Abingdon: Routledge.

too would be modernised and this process ultimately equated to the dispossessing of their supernatural underpinnings.<sup>421</sup>

#### Traditional miracles, higher criticism and the birth of the neo-Newtonians

In 1794, William Paley, the Anglican divine best known for his *Natural Theology* (1802), published *A view of the Evidences of Christianity*. In the first chapter Paley stated his two main objectives. First, in line with the standard British evidentialists, he sought to establish that there was satisfactory evidence to support early Christian miracles. This, he said, could be known for certain by the willingness of those early witnesses to labour and suffer for their belief in those miraculous events. Second, he sought to establish that in comparison to Christian miracle claims, there was insufficient evidence to reinforce all other religious miracle claims. Paley's second objective was a consequence of the Protestant reformation and its subsequent redefinition of the term "religio" (religion). It had now become mandatory to show why biblical miracles could be trusted over and above the miraculous claims of other religions.<sup>422</sup> Books such as *Evidences of Christianity* and later John Henry Newman's *An Essay on the Miracles Recorded in the Ecclesiastical History of the Early Ages* both stuck to the traditional English evidentialist logic with not much concern for German criticism - although Newman was critical of Paley for not extending miracles beyond scripture to the Early

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<sup>421</sup> Frei, H., 1794. *The Eclipse of Biblical Narrative*. New Haven: Yale University Press. pp.1-16.

<sup>422</sup> William, P., 1794. *A View of the Evidences of Christianity*. Vol 1. 2<sup>nd</sup> New Edition. London: R. Faulder. pp.17-18; Harrison, P., 2015. *The territories of Science and Religion*. Chicago: University of Chicago Press. pp.92-103.

Church period.<sup>423</sup> Yet, German critical works, such as David Strauss's *Life of Jesus* and Ludwig Feuerbach's *The Essence of Christianity* (translated into English by Mary Anne Evans – writing under the pseudonym George Elliot - in 1846 and 1854, respectively), continued to seep into British religious life. These works produced scathing criticisms of traditional biblical miracles, instead offering their own naturalistic alternatives that rested on understanding the cultural context and mindset behind the biblical authors' miraculous reports. Although, again, conclusions differed in the details Strauss's *Life of Jesus* (which opted for a “mythical” interpretation of miracles against Feuerbach's “feelings” interpretation), encapsulated the position that was widely held by German theologians, liberals, deists, and agnostics. Strauss summarised that whenever we find narratives of miracles, prophecies, divine apparitions, angels, and demons, “such an account is *in so far* to be considered not historical” because they are “irreconcilable with the known and universal laws which govern the course of events”.<sup>424</sup>

Just two years after his book, Newman converted to Roman Catholicism, remaining a powerful intellectual force. Yet, the Anglican dissatisfaction that had slowly been growing among liberal theologians and other groups attempting to promote German criticism in Britain would climax with the massively controversial publication *Essays and Reviews* (1860) edited by John W. Parker.<sup>425</sup> The seven

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<sup>423</sup> Newman, J. H., 1843. *An Essay on the Miracles Recorded in the Ecclesiastical History of the Early Ages*. Oxford: John Henry Parker. pp.cxxii, lxvi-lxvii.

<sup>424</sup> Strauss, D., 1892. *The Life of Jesus*. Translated by Mary Anne Evans. 4<sup>th</sup> ed. New York: Calvin Blanchard. p.88; Wheeler, M., 2012. *St John and the Victorians*. Cambridge: CUP.

<sup>425</sup> Parker, J. ed., 1860. *Essays and Reviews*. London: John W. Parker and Son.

contributors to this book were Frederick Temple (Rugby School), Rowland Williams (Cambridge University), Baden Powell, Henry Bristow Wilson, Mark Pattison, and Benjamin Jowett (all Oxford University). For Victorians, the true shock factor here was that six of the essayists were ordained Anglicans who had previously subscribed to the Thirty-Nine Articles—the last essayist, Williams, being a Cambridge-educated layman. In fact the publication was so controversial that the Church historian Ieuan Ellis has famously said that the story of *Essays and Reviews* is the story of the “greatest religious crisis of the Victorian age”.<sup>426</sup> Following the German higher critical method the contributors argued for a revisionist understanding of the bible in which it was to be seen as any other historical document and that miracles were no longer credible. Moreover, orthodox beliefs and doctrines needed to be reinterpreted or completely nullified. Within two years, the book had sold 22,000 copies. Many High churchmen and evangelicals simply could not accept its conclusions; petitions amassing thousands of clerical signatures were circulated, and, following the efforts of powerful men like the Bishop of Oxford, Samuel Wilberforce, the work was soon condemned as heretical. Three of the authors were placed on trial - Jowett in Oxford, Williams and Wilson in the Court of Arches - and Williams and Wilson were found guilty of violating the Thirty-Nine Articles, although to their relief their case was overturned by a Privy Council Committee ruling under Lord Chancellor Westbury in 1864.<sup>427</sup>

In the “heretical” publication, each essayist took on a different topic, from the Mosaic cosmogony to the proper interpretation of scripture. The essayist who

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<sup>426</sup> Ellis, I., 1980. *Seven Against Christ: A study of 'Essays and Reviews'*. Leiden: Brill. p.IX.

<sup>427</sup> *Ibid.*, pp.124, 173-177.

dealt directly with the question of miracles was Baden Powell (1796–1860), priest and professor of geometry at Oxford from 1827 until 1860. His chapter was titled “On the Study of the Evidences of Christianity.” Troubled by the fact that German criticism had been ignored in Britain for so long, Powell set out to investigate the evidentialist approach. For many, however, this chapter was simply read as a direct assault on the British evidentialist school in favour of liberal theology. There were two key points to Powell’s overall argument. First, he wanted to expose the evidentialist method of trying to prove the truth of scripture through miracles as fundamentally flawed. Second, he wanted to provide readers with what he thought was the correct way to embrace Christianity—by suggesting a distinction between internal and external methods of faith. Powell noted that the field of Christian evidences had occupied a “considerable space in the field of theological literature” especially in England, but that its use had declined in recent years. Indeed, Lecky made the same analysis in his own historical work on rationalism in 1865. Many theologians had produced evidentialist works, but for Powell, this approach was not central to Christian belief. Rather, it was an error in which—heightened by the work of Paley—theologians were attempting to claim knowledge about Christianity through the physical world.<sup>428</sup> One of Powell’s key distinctions was between internal and external evidence “...when a reference is made to matters of *external fact*...it is obvious that reason and intellect alone can be the proper judges of the evidences of such facts. When, on the other hand, the question may be as to points of moral or religious doctrine, it is equally clear, other and higher grounds of

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<sup>428</sup> Powell, B., 1860. On the Study of the Evidences of Christianity. In: Parker, J, ed. 1860. *Essays and Reviews*. London. John W. Parker and Son. Chapter three. p.94.

judgement and conviction must be appealed to”.<sup>429</sup> Powell declared that the use of external evidence (such as miracles) to try to prove Christianity was a category mistake. Christianity at its heart was a morally based religion and therefore ought to be judged on moral grounds.<sup>430</sup> What were evidentialists to do, asked Powell, with the miraculous claims of other religions? He also argued that if evidentialists could stop treating the New Testament miracles as an “exceptional case” and instead apply historical critical methods, they would immediately realise how problematic the accounts were. In Powell’s eyes, both history and the inductive philosophy made clear that no events ever occurred outside the standard course of nature.<sup>431</sup> Furthermore, the more science uncovered, the less miraculous currently unexplainable phenomena would seem. In effect, science could explain everything seemingly supernatural given enough time and therefore, those who claimed the reality of supernatural miracles did so on the basis of a presuppositional bias toward miracles. “What is alleged is a case of the supernatural; but no testimony can reach to the supernatural; testimony can apply only to apparent sensible facts; testimony can only prove an extraordinary and perhaps inexplicable occurrence or phenomenon: that it is due to supernatural causes is entirely dependent on the previous beliefs and assumptions of the parties”.<sup>432</sup> But some thinkers could not accept this *nor* the classical evidentialist position, and among a number of Victorian

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<sup>429</sup> *Ibid.*, p.97.

<sup>430</sup> *Ibid.*, p.127.

<sup>431</sup> *Ibid.*, pp.104, 108.

<sup>432</sup> *Ibid.*, p.107.

intellectuals, Argyll would instead propose an alternative that sought middle ground between these two contending stances.

A philosophico-theological compromise? Argyll's neo-Newtonian apologetic

From the 1850s onward, both liberal theologians and freethinkers of both the agnostic and atheistic branches increasingly claimed that scientific and historical critical advances had made belief in divine intervention impossible. As Argyll saw it, these groups were increasingly becoming a source of difficulty for Christians trying to square traditional belief in God's immanent activity with modern philosophy. The huge stir caused by *Essays and Reviews* provoked many to respond. Argyll's own response was published (anonymously although his authorship soon became widely known) in October 1862 in the *Edinburgh Review*. His article, entitled "The Supernatural" argued that despite the claims of theologians, such as Powell, miracles were indeed possible.<sup>433</sup> Like the Newtonians, Argyll's position lay somewhere between the evidentialist and rationalist frameworks by claiming that, even if the uniformity of nature was accepted and the "supernatural" rejected, miracles - properly understood - were not a violation of the laws of nature.

During the process of specialisation in the nineteenth century, expertise in a particular field served as a sort of warrant enabling one to assert the authority to "properly" examine a specific area. For Argyll, one of the primary issues was

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<sup>433</sup> 8<sup>th</sup> Duke of Argyll., 1862. The Supernatural. *Edinburgh Review*, [e-journal] 116(236) Available through: Pro Quest website < <https://www.proquest.com/docview/6502904?accountid=14511&forcedol=true> > [Accessed 10 June 2022].

confusion of language, and thus a philosophical approach was warranted. He suggested that because theologians had not properly taken the time to define what miracles were, they had fooled themselves into thinking that there was an inherent conflict between the laws of nature and a miracle. Argyll acknowledged that Hume's definition of a miracle had become the most common in theological discourse. However, other neo-Newtonians, such as his friend the Scottish philosopher James McCosh and the English theologian Henry Mansel, had wisely bypassed this Humean barrier. Argyll cited McCosh's own work on this area in his 1862 book *The Supernatural in Relation to The Natural*. McCosh—who had joined the Scottish Free Church movement in 1843—provided two conditions for miraculous occurrences. First, they were wrought by a divine power for a divine purpose. Second, they were of such a nature that even with increasing scientific knowledge, no human could ever bring about these events. For Argyll then, a miracle was “superhuman” but not “supernatural.” This second condition was one of a number of crucial distinguishing factors between the neo-Newtonians and liberals.<sup>434</sup> While Powell argued that everything that seemed miraculous in the past and/or future could one day be explained through science, the neo-Newtonians objected. For them, there would always be things which seemed miraculous but which no amount of scientific knowledge could ever hope to fully uncover, such as the immediate healing of an ill person, witnessing a talking animal, or the resurrection of a dead person.<sup>435</sup> Merged with divine purpose, these two conditions

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<sup>434</sup> *Ibid.*, p.384.

<sup>435</sup> *Ibid.*, pp.115-116.



provided the true criteria for a miracle.<sup>436</sup> This did not yet settle the argument over how miracles could be considered credible, but by redefining the purpose and nature of a miracle, it was now possible to defend their continuation in the present.

How should “laws” be understood? What is included in “nature”? These questions were central to a proper understanding of miracles. Powell had explicitly claimed in his essay that the boundaries of nature stopped where our present knowledge stopped. Since our knowledge was always increasing, however, this boundary too would slowly increase.<sup>437</sup> Argyll, by contrast, noted that (1) humans had no issue with events happening within the physical laws of nature, yet (2) objections were readily levelled as soon as “supernatural” explanations were introduced. Therefore, as he saw it, “The reign of law in nature” was not limited to human knowledge but instead it was “universal”.<sup>438</sup> He continued:

The law in obedience to which a wonderful thing happened may not be known; but this would not give it a supernatural character, so long as we assuredly believe that it did happen according to some law...[To] a man thoroughly possessed of the idea of natural law as universal, nothing ever could be admitted as supernatural; because on seeing any fact, however new, marvellous, or incomprehensible, he might escape into the

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<sup>436</sup> *Ibid.*, p.384.

<sup>437</sup> Powell, B., 1860. On the Study of the Evidences of Christianity. In: Parker, J, ed. 1860. *Essays and Reviews*. London. John W. Parker and Son. Chapter three. p.109.

<sup>438</sup> 8<sup>th</sup> Duke of Argyll., 1862. The Supernatural. *Edinburgh Review*, [e-journal] 116(236) Available through: Pro Quest website < <https://www.proquest.com/docview/6502904?accountid=14511&forcedol=true> > [Accessed 10 June 2022] pp.380, 397.

conclusion that it was the result of some natural law of which he had before been ignorant.<sup>439</sup>

A miracle then, as Augustine had first defined it in the fourth century, was simply an occurrence “contrary to human experience of the course of nature.” But in the end, “God, the Author and Creator of all natures, does nothing contrary to nature”.<sup>440</sup> The Dean of St Paul’s, Henry Mansel—whose theology was somewhat controversial—expressed the same view in his section “On Miracles” in *Aids to Faith* (1862), a book published in direct response to *Essays and Reviews*. In it Mansel summarised that “A miracle is *not* ‘a violation of the laws of nature’...It is simply the introduction of a new agent, possessing new powers, and therefore not included under the rules generalised from a previous experience”.<sup>441</sup> Similarly, the presbyterian Church of Scotland minister John Tulloch had come to a similar conclusion in his own book *Beginning Life* (1862) when he stated that “...the idea of law is so far from being contravened by the Christian miracles, that it is taken up by them and made their very basis. [Miracles] are the expression of a higher Law working out its wise ends among the lower and ordinary sequences of life and history”.<sup>442</sup> How was this conclusion arrived at? Utilising the German critical method of understanding the context behind the authorial accounts, Argyll and

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<sup>439</sup> *Ibid.*, p.380.

<sup>440</sup> New Advent, n.d. *Contra Faustum, Book XXVI*. [online] Available at: < <https://www.newadvent.org/fathers/140626.htm> > [Accessed 6 July 2022]. p.3.

<sup>441</sup> Mansel, H., 1861. On Miracles as Evidences of Christianity. In: Thomson, W, ed. 1861. *Aids to Faith*. New York: D. Appleton and Company. p.16.

<sup>442</sup> Tulloch, J., 1863. *Beginning Life*. London: Alexander Strahan. p.38.

Tulloch drew linguistic support from the biblical notion of God's involvement within the ancient world. They noted that in scripture, there was no clear distinction between the natural and the supernatural. Argyll appealed to readers to remember "...that the language of scripture nowhere draws, or seems even conscious of, the distinctions which modern philosophy draws so sharply between the 'natural' and 'supernatural.'" Instead, "All the operations of nature are spoken of as operations of the divine mind".<sup>443</sup> Within the bible, the words that in modern times were likely to be translated as miracles were "signs" (*semeia*) "wonders" (*terata*), and "mighty works" (*dunameis*). The regularity of these three words throughout the Old and New Testament provided strong evidence that the biblical authors envisaged God's interaction within their world very differently from modern conceptions. This, then, was the basis of the neo-Newtonian position. Yet, in one sense, it was inherently paradoxical; on the one hand, there was the complete acceptance of the modern notion of uniformity in nature, but on the other hand, there was a complete rejection of the modern notion of uniformity in nature in favour of an ancient Judeo-Christian understanding of nature. This paradox is only apparent, however; the neo-Newtonians certainly agreed with uniformity, they simply disagreed with how intellectuals, such as Powell, had characterised it.

The neo-Newtonians could also employ scientific explanations beneficially. For example, when trying to understand how God created Adam and Eve in Genesis, Argyll claimed that the "dust of the ground" in Genesis 2:7 could in fact have

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<sup>443</sup> 8<sup>th</sup> Duke of Argyll., 1862. The Supernatural. *Edinburgh Review*, [e-journal] 116(236) Available through: Pro Quest website < <https://www.proquest.com/docview/6502904?accountid=14511&forcedol=true> > [Accessed 10 June 2022] . p.389.

constituted some sort of Darwinian evolutionary process that was simply unknown to man.<sup>444</sup> This could then be classified as a miracle, not because it went against the laws of nature but rather because of its origins in the divine mind.<sup>445</sup> A final and important redefinition that the neo-Newtonians stressed was the idea that natural laws were not static, but instead *elastic*. They argued that it was this elasticity of laws which enabled humans to interfere in what would otherwise be natural occurrences without destroying the chain of uniformity. For example, whenever anyone threw a rock in the air and stopped it from falling to the ground, they had interrupted the natural law of gravity yet not broken uniformity.<sup>446</sup> Working with this novel reconstruction of the definition of miracle, Argyll summed up the neo-Newtonian position by concluding that, “The truth is, that there is no such distinction between what we find in nature, and what we are called to believe in religion, as that which men pretend to draw between the natural and the supernatural. It is a distinction purely artificial, arbitrary, unreal”.<sup>447</sup>

Argyll’s *Edinburgh Review* article had a mixed reception. However, despite these views, including a particularly negative review from Henry Parker<sup>448</sup> in the

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<sup>444</sup> Argyll’s views on Darwinian evolution will be discussed in more detail in chapter seven.

<sup>445</sup> 8<sup>th</sup> Duke of Argyll., 1862. The Supernatural. *Edinburgh Review*, [e-journal] 116(236) Available through: Pro Quest website < <https://www.proquest.com/docview/6502904?accountid=14511&forcedol=true> > [Accessed 10 June 2022]. p.388.

<sup>446</sup> Mansel, H., 1861. On Miracles as Evidences of Christianity. In: Thomson, W. ed. 1861. *Aids to Faith*. New York: D. Appleton and Company. pp.19-20.

<sup>447</sup> 8<sup>th</sup> Duke of Argyll., 1862. The Supernatural. *Edinburgh Review*, [e-journal] 116(236) Available through: Pro Quest website < <https://www.proquest.com/docview/6502904?accountid=14511&forcedol=true> > [Accessed 10 June 2022]. p.395.

<sup>448</sup> Henry Parker was Darwin’s cousin and also a freethinker.

*Saturday Review* of the 5<sup>th</sup> of October the same year, Argyll was undeterred. Five years later this article became the first chapter (with little modification) to his most widely-read book, *The Reign of Law* (1867). Certainly, the more positive depiction of Argyll's position depicted by Lecky in his successful 1865 publication *History of the Rise and Influence of the Spirit of Rationalism in Europe* spurred Argyll to press on with his primary argument unaltered. In his chapter on the decline of miracles, Lecky noted that a new breed of evidentialists had risen who had a "tendency to meet the rationalists, as it were, halfway".<sup>449</sup> Lecky referenced Argyll's article stating that "For an exposition of this view I cannot do better than to refer to an article on 'The Supernatural' in the *Edinburgh Review* for October 1862, and to the works there noted".<sup>450</sup> Argyll was exultant about this positive reference.<sup>451</sup> Aware of the range of other authors who had also elucidated this position, Lecky's positive words were a considerable source of encouragement. However, the issue of miracles was not settled yet. By the early 1870s, the debate would shift from general miracles to the specific subject of prayer and Argyll's newly developed neo-Newtonian argument would see him once again at the forefront of these theological contentions.

#### John Tyndall, the law of conservation and the Declaration of 1864

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<sup>449</sup> Lecky, W., 1865. *History of the Rise and Influence of the Spirit of Rationalism in Europe*. London: Longmans, Green, and Co. p.194.

<sup>450</sup> *Ibid.*, p.195.

<sup>451</sup> 8<sup>th</sup> Duke of Argyll., 1868. *The Reign of Law*. London: Strahan and Co. p.16.

In 1862, John Tyndall published a small book called *Mountaineering in 1861 A Vacation Tour*. Tyndall was born in Ireland to educated but poor parents who instilled in him a deep Protestant faith. Through much dedication and work, eventually leading to a doctorate from Marburg in 1850, Tyndall, with the support of Michael Faraday, advanced to become Professor of Natural Philosophy at the Royal Institution. Following a crisis of faith early in life which led him to adopt a more Carlylean based emotional religious belief, Tyndall would become one of the most vocal scientific naturalists of the century. Aside from science, Tyndall was an avid mountaineer and his book described his trip to the Alps the year before. Yet the fifth chapter of the book had a slightly different theme discussing science, prayer, and miracles. In this chapter, Tyndall expressed his thoughts on the problem of prayer in light of science and in particular the conservation of energy. He began by taking an anthropological approach noting that before the laws of nature were well understood, every natural event was ascribed to a personal agency: “the savage saw in the fall of a cataract the leap of a spirit, and the echoed thunder-peal was to him the hammer-clang of an exasperated god”.<sup>452</sup> However, no longer did people tend to propitiate the powers of nature, and prayer to God to intercede in the natural world had declined. Rather than present a well-refined argument against prayer, Tyndall’s goal was simply to mark out a particular viewpoint, which was that in Protestant countries, the age of miracles was considered to have passed.<sup>453</sup> If there was one thing that Tyndall wanted readers to take away, it was that the discovery

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<sup>452</sup> Tyndall, J., 1862. *Mountaineering in 1861. A Victorian Tour*. London: Longman, Green Longman, and Roberts. p.33.

<sup>453</sup> *Ibid.*, p.34.

of the conservation of energy had major implications for the possibility of all miracles. Because of this law, no new power in nature could come about without expending some other power. For Tyndall, this effectively meant that nothing, not even a deity, could intervene in nature; even the smallest interference in nature by a deity would equate to the complete breakdown of the law of conservation. Turning to prayer, Tyndall claimed that no act of individual (or national devotion to) prayer could cause one “shower from heaven” or deflect toward man “a single beam of the sun”.<sup>454</sup>

That the age of miracles had passed in the Western world was a common trope for many orthodox Protestants. Retaining the Calvinistic approach, however, the power of prayer remained unaltered. Prayer could still affect the course of the natural world, but not in the same way that miracles did. Instead, a prayer to change things in the physical world could be seen as an act of providence. The difference between a miracle and an act of providence was subtle but important (although often blurred). Both were divine acts but whereas a miracle might be immediate and easily equated with divinity, an act of providence was done *through* the course of nature in such a way that, to someone who did not believe, it might not appear unusual at all. To a believer, however, the hand of God could be discerned in the event. As an ardent critic of the power of prayer, Tyndall would capitalise on an opportunity to advance his unbelief years later on the tenth anniversary of Prince Albert’s death.

However, almost a decade before the controversy over prayer occurred, conservative Christians began to push back against the rising tide of theological

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<sup>454</sup> *Ibid.*, p.39.

liberalism. After the publication of *Essays and Reviews* a number of Christian scientific practitioners felt the need to represent the positive alliance between orthodoxy and modern science in a formal way. In 1864 ‘The Declaration of Students of the Natural and Physical Sciences’ was drawn up. This Declaration, circulated widely, claimed that “it is impossible for the Word of God, as written in the book of nature, and God’s Word Written in Holy Scriptures, to contradict one another”.<sup>455</sup> The main instigators of this document were a range of young men involved in the Royal College of Chemistry, the leading figure being Herbert McLeod who, as we saw in chapter 3, with the help of Argyll, took on the role of professor of Chemistry at the Royal Indian Engineering College. Contemporary historians such as Hannah Gay and Ruth Barton have now studied the declaration in much more details than previous historians. Crucially they have emphasised the youthfulness of the Declaration’s progenitors. For example, McLeod himself was only twenty-three at the time and the other instigators were also relatively young.<sup>456</sup> This is of importance to note because as Barton suggests, it was perhaps due to their inexperience that “the proponents of the declaration sought numbers rather than weight.”<sup>457</sup> It is certainly evident that the Declaration racked up noteworthy numbers with a total of 717 signatures by the end. However, noticeably absent were the names of senior men of science and rank. Eminent figures such as Michael Faraday, George G. Stokes, Richard Owen and John Herschel all declined to sign

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<sup>455</sup> McLeod, H., 1865. *The Declaration of Students of the Natural and Physical Sciences*. London: Simpkin, Marshall, & Co.

<sup>456</sup> Barton, R., 2018. *The X Club*. Chicago: University of Chicago Press. p.194.

<sup>457</sup> *Ibid.*, p.194.



the statement. Why did these more eminent figures reject the Declaration? Personal reasons are certainly part of the equation, but more generally their view was simply that the Declaration did more harm than good. In their eyes there was no discord between science and religion, and as a result, the existence of this Declaration rather *generated* a rupture that was not previously there. For example, when Herschel went public about his opposition to the statement he asserted in the *Athenaeum* that the Declaration was a “mischievous” work designed to forge discord between believers.<sup>458</sup>

Argyll fell into the camp of decliners when he decided not to sign the declaration himself. This seems makes sense of his situation on the surface. By 1864 Argyll, now in his 40s, was also an established man of science who was known for his geology,<sup>459</sup> election into the Royal Society as a Fellow, and election as president of the BAAS in 1855.<sup>460</sup> But we can also get at a deeper understanding of why Argyll declined to sign the Declaration by looking at his response. On the 29<sup>th</sup> of April 1864 McLeod sent a copy of the statement to Argyll along with a letter asking him

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<sup>458</sup> *Ibid.*,

<sup>459</sup> See chapters two and seven for discussions on Argyll’s geology.

<sup>460</sup> It is also significant to point out that four years after the events of the ‘Declaration’ Argyll was asked by Walter White, Assistant Secretary of the Royal Society, if he would take on the role of president of the Royal Society. This was because Edward Sabine, the astronomer and ornithologist, had planned to step down as the current president. White notes that Argyll declined this offer and so Sabine remained president until 1871. Argyll’s decline of the role could have been for a number of reasons. He had just published his *Reign of Law* and was currently busy with the *Education Commission (Scotland) Reports*. And in 1866 he had helped to establish the Aëronautical Society of Great Britain of which he was president (see chapter four). Hence, Argyll may have felt as though he had too many commitments at the time to take on the presidency of the Royal Society. Whatever the case may have been, the offer to become president provides us with more evidence of Argyll’s high standing as a man of science by this period, see Anon., 1898. *The Journals of Walter White*. London: Chapman and Hall. p.210

to add his name to the statement. The following day McLeod received Argyll's reply. Unlike figures such as Herschel, Argyll approved of the general statement of the Declaration. His stated reason for not signing, however, was to do with the fact that he did not approve of its links with the Convocation of the Church of England. This sits in line with Argyll's general position of conscious abstinence (when possible) from general Anglican political matters, a point which he mentioned to Gladstone in 1874.<sup>461</sup> Although evidently averse to *Essay's and Reviews* and the surrounding controversies, it seems that Argyll ultimately chose to fight the battle on his own terms.

How did Argyll fare a few years later when it came to the subject of prayer? As we might now come to expect, when Tyndall offered his challenge against the reliability of prayer Argyll did not remain silent but instead offered critical objections towards Tyndall and his contemporaries. The section below explores Argyll's role in the prayer debates of the 1870s onwards.

#### Does prayer work? Tyndall's challenge and Argyll's response

In her autobiography, Argyll's daughter, Lady Frances Balfour, recalled the morning habits of her father. He would come into the library five minutes before nine in the morning to find the section of scripture he intended to read at family prayers. Lateness was not an option as she recollected, "not to be late was one of the rules which we kept carefully, for a reproof for our absence was no light

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<sup>461</sup> Dated to Saturday 30<sup>th</sup> April 1864. See, Frank A.J.L. James, *Chemistry and Theology in mid-Victorian London: The Diary of Herbert McLeod, 1860-1870*, (London, Mansell microfiche, 1987), 30<sup>th</sup> April 1864 ; As a Christian from the Sandemanian sect Faraday similarly declined to sign the Declaration. ; Argyll, *Autobiography*, II: 316

matter.”<sup>462</sup> Indeed, Argyll was a man who believed in the power of prayer as a petition which could enact not just spiritual change but also physical. As we have seen above, the role of prayer and miracles had since the 1860s become a topic of discussion for many and in the 1870s, Tyndall would again raise these questions. Ten years after the publication of *Mountaineering*, another discussion, far more extensive and critical in nature, began. In July 1872, Tyndall published a paper, “The Prayer for the Sick: Hints towards a Serious Attempt to estimate its value” in *London Contemporary Review*. Over the next few months, this publication would be the cause of yet another great religious controversy extending across the Atlantic. What would come to be called the “prayer-gauge debate,” instigated by Tyndall, would raise profound questions about the nature of prayer, acts of providence, and miracles in light of modern science and biblical criticism.

In 1871, the Prince of Wales, Albert Edward, contracted typhoid fever, the same disease that was believed at the time to have taken the life of his father. Wanting to avoid this potential tragedy, the Queen requested that the British clergy pray for his recovery. The historian Robert Mullen notes that “amazingly, the prince began to feel better exactly on the tenth anniversary of the death of Prince Albert” and at the passing of this dreadful illness, a celebration of thanks giving was held at Westminster Abbey.<sup>463</sup> This was clearly an example of divine providence in action for many Victorians and this made it abundantly clear to Tyndall that action was needed to show once and for all that belief in divine intervention was fundamentally

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<sup>462</sup> Balfour, F., 1930. *Ne Obliviscaris Dinna Forget*. Vol 1. London: Hodder and Stoughton. p.14.

<sup>463</sup> Mullen, R. B., 2003. Science, Miracles, and the Prayer-Gauge Debate. In: Lindberg, D. C., Numbers, R. L., eds. 2003. *When Science and Christianity Meet*. Chicago: University of Chicago Press. 203-224. pp.208-211.

misplaced. In July 1872, Tyndall published his article in the *London Contemporary Review* which called for a scientific test to establish the reality or falsity of divine providence. In it, Tyndall took advantage of an anonymous letter (which in fact turned out to be from the surgeon Sir Henry Thompson) that suggested a possible scientific method of testing the effect of prayer

I ask that one single ward, or hospital...counting certain numbers of patients afflicted with those diseases which have been best studied, and of which the mortality-rates are best known...should be, during a period of no less, say, than three or five years, made the object of special prayer by the whole body of the faithful, and that, at the end of that time, the mortality-rates should be compared with the past rates, and also with that of other leading hospitals similarly well managed during the same period.<sup>464</sup>

In October 1872, Tyndall published a second article in the *Contemporary Review* as an expansion on some of the arguments in his primary article. In an attempt to show how science had displaced the bible throughout the ages, he briefly recapped the story of Galileo's "affair" with the Church before swiftly moving onto the new geological science which had displaced the traditional Mosaic account of a 6000-year-old creation. Tyndall finally ended on the most recent scientific

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<sup>464</sup> Tyndall, J., 1872. The "Prayer for the Sick": Hints Towards a Serious Attempt to Estimate its Value. In: Means, J. O, ed., 1876. *The Prayer-Gauge Debate*. Boston: Congregational Publishing Society. 9-19 p.18.

upheaval in the form of Darwinian evolution. Darwin, Tyndall argued, had shown that once again, the biblical account was in conflict with modern science.<sup>465</sup> Tyndall declared that

from the earliest times to the present, religion has been undergoing a process of purification, freeing itself slowly and painfully from the physical errors which the busy and uninformed intellect mingled with the aspiration of the soul, and which ignorance sought to perpetuate. Some of us think a final act of purification remains to be performed while others oppose this notion with the confidence and the warmth of ancient times. The bones of contention, at present, is *the physical value of prayer* [Tyndall's emphasis].<sup>466</sup>

In fact, this act of purification was part of a tradition stretching back to the Protestant Reformation. For scientific naturalists, such as Tyndall, Thomas H. Huxley (also from a poorish background), and liberal theologians, such as Powell, their intentions were never to get rid of religion but rather to “purify” it from doctrinal assertions, dogmatic theology, and what was conceived as evidently false teaching about the physical world. In this respect, far from wanting to rid the world of Protestantism, scientific naturalists alongside the liberal Protestants saw themselves as continuing in line with the Reformation tradition bringing about a

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<sup>465</sup> *Ibid.*, pp.109-110.

<sup>466</sup> *Ibid.*, pp.110-111.

“New Reformation.”<sup>467</sup> This aim was drastically different from the aims of the atheists of the nineteenth century such as Charles Bradlaugh, Joseph McCabe and Annie Besant who intended to get *rid* of all forms of religion across the world in favour of science and human rationality.<sup>468</sup> Tyndall’s own key point was that, just as previous parts of scripture had been subjected to scientific assessment and found wanting, prayer would be next. Although prayer seemed to be culturally useful as well as a tool for strengthening the heart during life’s hardships, there was no justification for claiming that prayer had any physical effect until science could affirm or discredit it.

While more orthodox theologians were critical of Tyndall, liberal theologians were in agreement. Influenced by Tyndall and Huxley in his work, one such contributor to the prayer-gauge debate was the Scottish theologian and professor of Moral Philosophy at St Andrews University, William Knight. In an 1873 article entitled “The Function of Prayer in the Economy of the Universe,” Knight offered his own views. His main argument centred on the claim that there were indeed two spheres in the universe, the physical and the spiritual. It was simply mistaken to think that acts within the spiritual sphere could affect the course of the physical sphere: “...a spiritual antecedent will not produce a physical consequent. The exercise of the religious function of prayer cannot directly affect any material change.” Unlike the Baconian method of discovering God through the two books of nature and scripture, Knight, like Powell, felt that Christianity was not something

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<sup>467</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP. p.440; Ungureanu, J., 2019. *Science, Religion, and the Protestant Tradition*. Pittsburgh: University of Pittsburgh Press. pp.133-144.

<sup>468</sup> Royle, E., 1980. *Radicals, Secularists and Republicans: Popular freethought in Britain, 1866-1915*. Manchester: Manchester University Press. pp.167-170.

to be proven, but rather experienced through an inner intuition. Furthermore, God did not act in the physical world because He was not a God who broke his own laws once established.<sup>469</sup>

Although Tyndall's challenge was the principle reason why Argyll entered the debate, his response was initially directed at Knight. Unimpressed with Knight's exposition, he branded it "self-contradictory" and "confusing." For Argyll, this distinction between the two spheres was a grave error, and Argyll's title "The Two Spheres: Are They Two?" reflected his thoughts. This 1873 article, relatively short, was framed as a direct response to Knight's article, reserving a fuller treatment of prayer for his 1896 book *The Philosophy of belief; or Law in Christian theology*. In his 1873 article, Knight had suggested that prayer was removed from the physical world altogether. To this, Argyll replied that, since human beings did not know what exactly was included in the "sphere of physical causation," there was no way to know where this boundary lay. Furthermore, if there were well-defined "boundaries" between the physical and spiritual, they were inseparable such that it was impossible to tell where one ended and one began.<sup>470</sup> Argyll used the human being as an example. Where Knight had suggested that a spiritual antecedent will not cause a physical consequence due to the known physical laws, Argyll countered by suggesting that humans contradicted this idea. If human beings have a moral and intellectual nature separate from mere physical nature, it was quite certain that these antecedents did produce physical consequents in the body. For example, by willing

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<sup>469</sup> Knight, W., 1873. The Function of Prayer in the Economy of the Universe. In: Means, J. O, ed., 1876. *The Prayer-Gauge Debate*. Boston: Congregational Publishing Society. 221-251. p.225.

<sup>470</sup> 8<sup>th</sup> Duke of Argyll., 1873. The Two Spheres; Are They two?. In: Means, J. O., ed, 1876. *The Prayer-Gauge Debate*. Boston: Congregational Publishing Society. 253-269. pp.254-255.

one's own arm to move, one was able to physically move their arm, but left to nature's own devices, one's arm would remain stationary.<sup>471</sup> This then was the same with prayer; although God was a spiritual being, it was still possible for him to act providentially within the world to bring about physical change in response to a prayer request as long as the request was in line with His will. In *The Philosophy of Belief*, the same line of reasoning was taken up. Argyll first articulated what had become a common view for theologians, such as Powell and Knight, attempting to reconcile science and theology which sought "an attempt to draw a fixed line of distinction between spiritual and physical effects".<sup>472</sup> As he had done in "The Supernatural," Argyll returned to the biblical authors to support his position. He argued that none of the apostles drew any sharp distinction between the physical and spiritual. When John said, "Whatsoever we ask, we receive of Him, because we keep his commandments, and do those things that are pleasing in his sight," (1 John 3:22) this naturally encompassed spiritual and physical requests with no sharp divide.<sup>473</sup> Equally, when Jesus taught his disciples the Lord's prayer, some elements could almost certainly be seen as physical requests. Asking for God's will to be done "on earth as it is in heaven" would necessarily mean that both physical and spiritual change would need to occur at the hand of God.<sup>474</sup> Considering the writings of St. Paul, Argyll explained to his readers that

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<sup>471</sup> *Ibid.*, pp.257.

<sup>472</sup> 8<sup>th</sup> Duke of Argyll., 1896. *The Philosophy of Belief: Or, Law in Christian Theology*. London: John Murray. pp.467.

<sup>473</sup> *Ibid.*, p.473.

<sup>474</sup> *Ibid.*, p.469.



St. Paul urged men to be ‘instant in prayer’ and he did not pretend to draw any dividing line of definition between legitimate, and illegitimate petitions. Leaving that to the conscience of men, in so far as moral elements can determine it, he encouraged them ‘in all things to make their request known to God.’ He associated himself with the humblest of those whom he addressed in saying that ‘we do not know what we should pray for as we ought to.’ But he added, with absolute conviction, that the God with whom we have to do, is not only accessible to supplication, but desires it on the part of those who love, and seek, Him.<sup>475</sup>

As with the discussion on miracles, Argyll was by no means alone. McCosh again took to the defence of prayer against Tyndall and the liberal theological contemporaries. McCosh raised an important philosophical point, arguing that Tyndall had mischaracterised prayer altogether. McCosh insisted that there were two ways of producing evidence, the scientific method and the Christian method, but the two were not the same. Tyndall’s fundamental mistake was in claiming that prayer had to be tested scientifically. For McCosh, God was not a being who would conform to scientific rules, and crucially, prayer worked on the basis of faith rather than any arbitrary test. In scripture, for example, Jesus would not work a miracle where there was unbelief (Mark 6: 1–6 NIV).<sup>476</sup> McCosh’s final statement efficaciously summed up his stance “I believe that the time has come when the

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<sup>475</sup> *Ibid.*, p.489.

<sup>476</sup> McCosh, J., 1872. By James McCosh, D.D., President of Princeton College, United States. In: Means, J. O., ed, 1876. *The Prayer-Gauge Debate*. Boston: Congregational Publishing Society. 135-144. pp.136-138.

intelligent public must intimate pretty decisively that those who have excelled in physical experiments are not, *therefore*, fitted to discuss philosophical or religious questions. Persons who do not follow the appropriate method in physical science will not be rewarded by discoveries”.<sup>477</sup>

#### Freethinkers and the different uses of miracles

The discussion on miracles that developed from the 1860s onwards never reached a peaceable end, and in many respects the same debates that took place in the nineteenth century are the same debates that permeate current society. It is perhaps most accurate to say that the nineteenth-century discourse on miracles laid the ground for the various modes of thought in relation to the possibility or impossibility of miracles today. Although it is perhaps difficult to declare any winning side on the miracles question, there are numerous examples one *can* draw upon to show just how complicated and even unexpected certain positions were. Although historians of Victorian science tend not to focus on the works of atheists, the atheist presence was noticed and their views were increasingly known in the nineteenth century. For example, in a section of *The Freethinkers Magazine* (edited by H.L. Green) called “Miracles”, one Mr Henry M. Taber simply listed a plethora of European and American theologians including Rev. W. S. Crowe, Rev. R. Heber Newton, and also Baden Powell who had all independently argued that any past reports of miracles, biblical or otherwise, could not have occurred due to the

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<sup>477</sup> *Ibid.*, p.144.

impossibility of miracle.<sup>478</sup> Like the agnostics such as Huxley and Tyndall, atheists drew on the works of liberal theologians to further their cause. However, even though the agnostics and atheists shared the same aims in trying to dispose of orthodox Christian beliefs, agnostics - who were a controversial yet still respectable class of gentlemen and ladies - distanced themselves from atheists for fear of being associated with the lower-middle-class radicalism of atheism.<sup>479</sup>

Another interesting, and this time unexpected, example comes from Shadworth Hodgson. Hodgson was an agnostic philosopher who can be placed in the same camp as the scientific naturalists such as Huxley and Tyndall. We might therefore naturally expect him to share the same view about miracles as the scientific naturalists, atheists and liberal theologians. However, in a strange turn of events, Hodgson's views mirrored the neo-Newtonians more than anyone else's. This is best seen in his 1876 lecture at the Metaphysical Society (1869-1880) of which Argyll was a member (although there seems to be no record of Argyll ever giving a lecture though he was regularly present at meetings.)<sup>480</sup> In his lecture Hodgson, utilising his philosophical expertise, claimed that

In this position of the question, unless the scientists are prepared to maintain that the world accessible to our faculties of feeling is the whole

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<sup>478</sup> Green, H. L. ed., 1893. *The Freethinkers' Magazine*. Vol XI, 293. January to December. New York: No. 383 eagle Street. pp.18-25.

<sup>479</sup> Rectenwald, M., 2013. Secularism and the cultures of nineteenth-century scientific naturalism. *The British Journal for the History of Science*, [e-journal] 46(2), 231-254. <https://doi.org/10.1017/S0007087412000738>[Opens in a new window]. p247.

<sup>480</sup> Marshall, C., Lightman, B., England, R. eds., 2015. *The Papers of the Metaphysical Society, 1869-1880*. Oxford: OUP.

of existence, they must admit that there is an unseen world which may conceivably work abnormal effects in the seen world. A law of nature is a constant sequence of antecedent and consequent. If, then, while the consequents are visible, the antecedents are invisible, then in that case, the consequent will be a phenomena which are not reducible to law...It is clear then that the imagination of an unseen world...is an imagination which in no way contravenes the philosophical axiom of uniformity.<sup>481</sup>

Hodgson's mention of an unseen world might seem like an unsophisticated argument for theism, but in fact it was quite the opposite. Hodgson's full lecture was extremely sophisticated and it is more than likely that some of the members listening who, not so familiar with philosophical ideas, were left behind in the details. However, any listener at this meeting would have easily recognised that Hodgson was not articulating a theistic position and that rather he was articulating a philosophically agnostic one. One in which an unseen world was a part of nature and therefore subject to the principles of the uniformity of nature just as in the seen world.

### Conclusion

The second half of the nineteenth century saw a permanent change in Victorian ideas and beliefs about miracles on an intellectual level. From the 1860s onward,

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<sup>481</sup> Hodgson's paper entitled 'The Pre-suppositions of Miracles' was published as Paper no. 60 on the 14<sup>th</sup> March 1867 and can be found in Marshall, C., Lightman, B., England, R. eds., 2015. *The Papers of the Metaphysical Society, 1869-1880*. Oxford: OUP. p382.

liberal theologians, agnostics and atheists increasingly claimed to possess cultural and theological authority, and with this came the reinterpretation or nullification of traditional Christian doctrines. As I have shown, these debates were highly complex, and the boundaries were often blurred. Theists could be found at various points on the continuum agreeing with and disagreeing with the agnostics and each other, while agnostics could sympathise with many of the theists on certain points whilst disagreeing with atheists on others. The main aim of this chapter has been to explore how a small yet prominent network of intellectuals, such as Argyll, Tulloch, Mansel, and McCosh, responded to the problem of miracles through a philosophico-theological explication of divine action. The result was an updated, Augustinian-informed notion of a miracle as an act of God which was not contrary to nature, but simply contrary to our human experience of nature. By the mid-eighteenth century, Hume's ideas alongside the onset of German higher criticism constituted a pivotal point in philosophical and rational discourse. And in the nineteenth century, major scientific discoveries in fields such as geology and evolution would provide yet more ammunition for liberals, agnostics and atheists in their fight against orthodoxy. Within this context, the neo-Newtonians had to construct an intellectually robust position that could account for all of these modern augmentations while somehow not themselves being counted as heterodox.

As I explored at the start of this chapter, scholarly discussions on divine action today in the West exist as part of a historical continuum pushing back to at least the Early Church period. In each instance, the varying positions that have emerged have usually done so within a specific context. In the fourth century, Augustine was involved in a theological dispute against Faustus on the nature of life and death. In

the late seventeenth century, the contention was the new experimental philosophy and the laws of nature. In the eighteenth and nineteenth centuries, German higher criticism and the differing understandings of the laws of conservation shaped the intellectual background. And last, in contemporary culture, interpretations of quantum mechanics have informed much modern discourse. Whilst any grand diachronic history of miracles itself presents a mammoth challenge, this chapter has served to connect Argyll's own perspective into a wider arena of perspectives which can be coherently mapped out in Western Christian history.

Scientifically, Argyll was probably most active in the 1860s and 70s. We have already looked at his involvement in the establishment of the aeronautical society in the previous chapter. And chapter three as well as this chapter have revealed his engagements in matters of colonial scientific education and Victorian debates about the nature of miracles. These events all provide us with strong evidence of Argyll's polymathic status; however, his work did not end there. Beyond the role of miracles - but keeping in line with his theological commitments - Argyll also found himself involved in further contentions surrounding another area of science. By the 1860s and 70s in Victorian Britain the science of anthropology, which had developed in the late eighteenth century under a theological framework, began to shift from theological grounds to naturalistic grounds with the work of figures like Edward B. Tylor. Argyll would not stand by and let this shift take place and, just as with the miracles debate, he made his voice known as a vocal critic of what would come to be known as Tylorian anthropology. The next chapter will explore this subject in detail and its connection to key central themes such as race and slavery.

## **Chapter 6: Slavery, race, ‘degradation’ and the philosophy of anthropology**

For both anthropologists and historians of anthropology the year 1871 is often regarded as a landmark in the making of modern anthropology. During that year the biologist and scientific naturalist Thomas H. Huxley alongside others aided in the founding of the Anthropological Institute of Great Britain and Ireland, of which Huxley’s fellow scientific naturalist, John Lubbock, became the first President. In the same year Charles Darwin published his *Descent of Man*. And finally, and perhaps most importantly, Edward Burnett Tylor – who did much to shape cultural anthropology - published his monumental *Primitive Culture* in which he defined the term ‘culture’ to encompass human knowledge, belief, art, morals, law, customs, norms and values. Tylor’s *Primitive Culture* was a key publication within the wider transition that was taking place shifting from a biblically based Prichardian monogenetic<sup>482</sup> framework (the idea that all humans have one origin) towards a more secular Tylorian anthropological framework which understood human progression as a law developed through (three) stages. Under this Tylorian framework anthropologists continued to be upholders of human racial unity. Yet Tylorians shifted away from older models of anthropology which primarily focused on physical features (such as the work of James Cowles Prichard and Johann F. Blumenbach whom I discuss below) to a focus on the ‘cultural’ development of humans over time.

The historian of anthropology George Stocking has pointed to the fact that during the 1850s and 60s anthropology as a concept was understood in a plurality

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<sup>482</sup> See section of this chapter entitled ‘From Equiano to Argyll, and the new degradation argument’ for more details on James Cowles Prichard and his ethnological work.

of ways.<sup>483</sup> This is primarily because there were numerous actively-competing monogenetic and polygenetic visions (or frameworks).<sup>484</sup> Thus, it is precisely in this period before 1871 when Argyll joined the debate. Through an analysis of Argyll's anthropological engagement – most firmly anchored to the monogenist camp - we are able to explore the ways in which the science of anthropology served as a mediator for larger societal matters. These matters included the politics of slavery (both for and against), justifications of racial inferiority and superiority, and the place of religion within what was seen as a scientifically and technologically advancing society. Argyll is also particularly interesting to study because his anthropological work was effectively a merger of the Prichardian and Tylorian models. As a devout believer in the bible Argyll's anthropology was theological in tone. Yet in line with the newer focus on culture that the Tylorians promoted, Argyll's work also moved in the direction of cultural anthropology and away from the older physical anthropology which characterised the first half of the Victorian period. Thirdly, Argyll's work is important in the historiography of anthropology because he was one of the first to systematically critique the racial and hierarchical assumptions that underpinned the work of Tylorians (such as John Lubbock), a practice which has become much more common in anthropological discourse since the 1970s.<sup>485</sup>

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<sup>483</sup> Stocking, G., 1987. *Victorian Anthropology*. New York: The Free Press. pp.111-185.

<sup>484</sup> The terms 'polygenist' and 'monogenist' were first coined in Josiah Nott and George Gliddon's *Indigenous Races* (1857). However, in this paper I will be utilising the terms for the periods before and after their invention.

<sup>485</sup> See for example, Blakey, M. L., 2022. Understanding racism in physical (biological) anthropology. *American Journal of Biological Anthropology*, [e-journal] 175(2), 316-325. <https://doi.org/10.1002/ajpa.24208>. And, Clarke, C., 2019. Anthropology and Original Sin:



Argyll's anthropological work was never extensive and he did not devote nearly as much time to anthropology as he did to areas such as ornithology. However, during the 1860s he was without a doubt a well-known name in anthropological circles. Unfortunately, after the 1860s Argyll's reputation in the world of anthropology severely declined for reasons both within and beyond his control. As a result, historians have not always included Argyll's contributions to this area of knowledge despite the fact that some of his views have actually informed core aspects of anthropology today. Furthermore, the early-life experiences and influences that served to shape Argyll's more mature views on race – such as the issue of slavery – have been understudied by historians. In this chapter therefore, we will explore Argyll's life experiences surrounding both the issue of slavery and the science of anthropology to 1) examine their connections, and 2) to better understand Argyll's specific role and impact in both areas - particularly during the 1850s and 1860s. Finally, I will briefly examine the reason for his declining status in anthropology despite the fact that he continued to write on the subject well into the 1880s.

#### Preliminary issue of terminology

Today it is quite accepted for academics to use the term 'anthropology' when discussing eighteenth and early-nineteenth-century ethnology (prior to the term anthropology becoming more widely used from the 1860s). This is partly because

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Naturalizing religion, Theorizing the Primitive. In: Harrison, P., Roberts, J. H., eds. 2019. *Science Without God: Rethinking the History of Scientific Naturalism*. Oxford: OUP. Chapter twelve. ; also see, Teslow, T., 2014. *Constructing Race: The Science of Bodies and Cultures in American Anthropology*. Oxford: OUP.

in the nineteenth century the distinction between ethnology and anthropology was not necessarily clear-cut although some historical actors did attempt to drive a wedge between the two terms for various reasons. For example, during the first lecture at the newly established Anthropological Society of London (ASL) in 1863, when attempting to distinguish anthropology as a more exact and wide-ranging science compared to ethnology, James Hunt (who was a founder, President, and polygenist) claimed that anthropology was the “science of the whole nature of Man”. He then remarked that whilst ethnology “treats of the history or science of nations or races, we [anthropologists] have to deal with the origin and development of humanity...it is our business to investigate the laws regulating the distribution of mankind.”<sup>486</sup> Two years later Huxley wrote a piece in the *Fortnightly Review* in which his definition of ethnology differed little from Hunt’s own:

Ethnology, as thus defined, is...the great science which unravels the complexities of human structure; traces out the relations of man to other animals; studies all that is especially human in the mode in which man’s complex functions are performed; and searches after the conditions which have determined his presence in the world.<sup>487</sup>

Despite the continued ambiguities during the nineteenth century a clear distinction was beginning to form and by the early twentieth century

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<sup>486</sup> Hunt, J., 1863. *Introductory Address on the Study of Anthropology*. London: Trübner & co. Paternoster Row. p.,2.

<sup>487</sup> Sera-Shriar, E., 2016. *The making of British Anthropology, 1813-1871*. [e-book] Pittsburgh: University of Pittsburgh Press. p.,132 [Accessed 3 June 2022].

anthropologists did forge a more exact distinction between ethnology and anthropology. Through this distinction ‘anthropology’ has become the accepted modern term to denote the broad study of man in various contexts to which ethnography i.e. fieldwork (studying people groups and their cultures first-hand whether locally or across the world) plays a key role in the anthropological method.<sup>488</sup>

Thus, the linguistic development alone of modern anthropology is an intricate study which is beyond the scope of this chapter’s focus. As such, to mitigate major linguistic confusion, in this chapter I will understand both ethnology and anthropology to mean ‘the scientific study of humans and human difference’ broadly conceived. This will be the way in which I employ both terms unless otherwise stated or clarified.

#### Anthropology as a tool against slavery in the late eighteenth century

The late eighteenth century saw the rise of ethnological science which arose as an attempt to understand human variety across the world in a manner that was more naturalised as compared to the traditional theological biblical account of humans. Naturalists such as Comte de Buffon (who we have already seen in chapter four), and in particular, Johann F. Blumenbach, were key figures in eighteenth-century ethnological science. In his *Histoire Naturelle* Buffon dedicated volumes four to fifteen to the specific study of quadrupeds. In volume four specifically we find chapter nine entitled ‘On the Varieties in the Human

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<sup>488</sup> Stocking, G., 1995. *After Tylor: British Social Anthropology 1888 – 1951*. Wisconsin: The University of Wisconsin Press. pp.115-123.

Species' which focused on the study of human variation across the globe. While he mainly commented on physical differences, mentions of wider cultural differences are commonly scattered - although unsystematically - throughout his work. Despite the ambiguity surrounding Buffon's racial conscience to which the historian Andrew Curran has written about,<sup>489</sup> scholars are clear on a number of key aspects regarding his ethnological work. It is clear that Buffon was a monogenist and although he spent little time openly discussing it, it is evident that he opposed the transatlantic slave trade. Due to his belief in monogenism (which stemmed from the theological doctrine of a single origin of all humans) Buffon favoured a climate-based reason (as opposed to anatomical or physiological) for the difference between white-skinned people and dark-skinned people. Towards the end of his chapter Buffon summarised that

of the blackness of the skin, the principal cause is the heat of the climate.

When the heat is excessive, as at Senegal, and in Guinea, the inhabitants are entirely black; when it is less violent, as on the eastern coasts of Africa, they are of a shade more light; when it becomes somewhat temperate, as in Barbary, Mogul, Arabia, &c. they are only brown...when it is altogether temperate, as in Europe and in Asia, they are white...<sup>490</sup>

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<sup>489</sup> Curran, A. S., 2011. *The Anatomy of Blackness: Science & Slavery in an age of Enlightenment*. Baltimore: The John Hopkins University. pp.109-113.

<sup>490</sup> *Ibid.*, pp.348-349.

This style of argumentation was one version of ‘degradation’ theorising and part of the rationale behind this degradation explanation was to show that since all humans were of one origin slavery was simply a cruel practice that inflicted devastating damage on fellow human beings.<sup>491</sup> As hinted Buffon’s answer to the question of human origins and difference, monogenetic ethnology was useful as an intellectual tool in combatting pro-slavery arguments. The German enlightenment figure, Johann F. Blumenbach, whose name became much more associated with British anthropology, utilised monogenism to push back against the justification of slavery, albeit indirectly. Blumenbach (1752 – 1840), who obtained his M.D. from Göttingen University in 1775, was one of the most prominent natural historians of his time and played a key role in the development of physical anthropology. He is best-known for his seminal publication *On the Natural Variety of Mankind* - the published version of his doctoral thesis. In this work Blumenbach contended for a monogenetic framework of which blackness was also a result of climate as opposed to an original condition of Africans.<sup>492</sup> During the first half of the nineteenth century popular scientific works such as *Vestiges of the Natural History of Creation* (1844) - described as a “Victorian Sensation” by the historian James Secord<sup>493</sup> – continued to promote a

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<sup>491</sup> For a modern digitised translation of Buffon’s work see, Buffon, G. L., 2014. *Buffon’s Natural History*. [e-book] London: H.D. Symonds, Paternoster-Row. Available through Gutenberg Library Website <<https://www.gutenberg.org/files/45729/45729-h/45729-h.htm>> .pp.291-292 [Accessed 3 June 2022].

<sup>492</sup> Bendyshe, T., 1865. *The Anthropological Treatise of Johann Friedrich Blumenbach*. London: Longman, Green, Longman, Roberts, & Green. p.,110.

<sup>493</sup> Secord, J., 2000. *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation*. Chicago and London: UCP.

Blumenbachian view of humanity in direct opposition to the ills of slavery. Towards the final pages of his book the author, Robert Chambers (who remained anonymous until 1884), declared that

if one set of men keep others in the condition of slaves – this being a gross injustice to the subjected party, the mental manifestations of that party to the master will be such as to mar the comfort of their lives; the minds of the masters will be degraded by the association with beings so degraded; and thus with some immediate or apparent benefit from keeping slaves, there will be in a far greater degree an experience of evil.<sup>494</sup>

Thus, with the operation of slavery which saw the European subjection of Africans to inhumane working and living conditions monogenetic ethnologists attempted to answer a political and economic issue with a scientific response. In this way we can begin to see how ethnology and anthropology were connected to slavery. Yet it is not necessarily the case that anti-slavery proponents were also anti-racist during the early years of ethnology. For us to better understand why anti-slavery monogenetic anthropologists could often retain a racist outlook, and how Argyll's own monogenetic and anti-racist stance fits in here, we must first briefly look at how Christian liberal theology influenced ethnology. Historians of anthropology have spent much time studying eighteenth- and nineteenth-century natural historians such as Buffon and Blumenbach, however,

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<sup>494</sup> Chambers, R., 1844. *Vestiges of the Natural History of Creation*. London: John Churchill, Princes Street, Soho. p.,382.

they have spent less time addressing the ways in which liberal Christian theology, which was a product of German eighteenth-century enlightenment thought, influenced the substructures of ethnology and anthropology.

#### An emerging racial framework: enlightenment theology and ethnology

In his short 1784 publication *What is Enlightenment* the German philosopher Immanuel Kant (1724 - 1804) defined enlightenment as “man’s emergence from his self-imposed immaturity.” Further clarifying that “Immaturity is the inability to use one’s understanding without guidance from another.”<sup>495</sup> Four years prior to Kant’s *What Is Enlightenment* the well-known German playwright and social critic Gotthold Lessing (1729 - 1781), published a book entitled *The Education of the Human Race* which explored Kant’s theme of “emergence from self-imposed immaturity” through a theologico-anthropological analysis. Taking the world of the Old-Testament Hebrews as his starting point and the contemporary world as his endpoint, Lessing essentially argued for a progressive theology of revelation in which, since the time of the Hebrews till the present, humans had gone through three primary stages of education: the child stage, the youth stage, and the adult stage. In short, the Old Testament Hebrews represented the child stage of humanity; humanity from Jesus’s time onwards until the start of the eighteenth century represented the youth stage. And finally, within his century humans had reached a level of maturity in which the bible was required less and

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<sup>495</sup> Schmidt, J., ed., 1996. *What is Enlightenment?: Eighteenth-Century Answers and Twentieth-Century Questions*. [e-book] California: University of California Press. p.,58.

less as a guide because enlightened humans (in the Kantian sense) could determine the morally correct way to live.<sup>496</sup>

Explicit and implicit in the thinking of figures like Kant and Lessing was an obvious bias towards the idea of European superiority. And through figures like Kant, Lessing and Blumenbach we can see how this idea of European superiority manifested itself in divergent but connected ways. Although Lessing's work for example was not racist in itself (unlike Kant's which was)<sup>497</sup> it is safe to say that Tylor's concept of a fixed three stages of humanity, which embedded assumptions about the lesser progress of extra-Europeans as compared to Europeans, can be read as a secularised rendition of Lessing's work which had held to somewhat of a traditional biblical framework. Despite this, as we will see below - at least by Victorian standards of racism - Tylor was a moderate liberal who frequently fought against the more overt polygenetic racism of anthropologists like James Hunt.

Aside from the liberal theological and philosophical wing, natural historians such as Blumenbach bear much of the responsibility for sustaining the links between theology and racial anthropology. As the historian Terrence Keel has demonstrated in his recent book *Divine Variations* (2018) Blumenbach was not

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<sup>496</sup> Lessing, G. E., 1896. *The Education of the Human Race*. 4<sup>th</sup> ed. Translated by Robertson, F. London: Kegan Paul, Trench, Trübner & Co.

<sup>497</sup> In the wake of the 2020 Black Lives Matter protests following the death of George Floyd, Peter Harrison wrote an article entitled "Enlightened racism?" which looked at the racial views of some of the leading Enlightenment figures. Harrison noted that in a 1775 Essay Kant stated that humanity was at its greatest perfection in the white race, going on to contrast this race with the supposed lowness of Indians, Negroes and Americans. See ABC News, 2020. *Enlightened racism?*. [online] Available at: < <https://www.abc.net.au/religion/peter-harrison-enlightened-racism/12341988> > [Accessed 3 June 2022].



just a liberal enlightenment thinker but in fact remained anchored to certain traditional biblical beliefs - predominantly the recency of man's existence on earth.<sup>498</sup> Keel has contended that Blumenbach's book *On the Natural Variety of Mankind* was heavily influenced by Martin Luther's Bible of 1534, albeit it slightly more secularised.<sup>499</sup> In this work Luther had depicted Adam, Eve and God as whites with European features (Figure 5).



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<sup>498</sup> Keel, T., 2018. *Divine Variations: How Christian Thought Became Racial Science*. Stanford, California: Stanford University Press. p.,17.

<sup>499</sup> *Ibid.*, p.,39.

Figure. 5. Depiction of God, Adam and Eve from the cover of Luther's 1534 Bible with European features, by Lucas Cranach. Coloured version from Martin Luther's 1534 translation of the Bible. 1<sup>st</sup> January 1534, Weimar. CC licence from Wikimedia.

Some two centuries later in concluding his own work on human variation Blumenbach remarked that “it is white in colour, which we may fairly assume to have been the primeval colour of mankind, since, as we have shown above...it is very easy to degenerate into brown, but very much more difficult for dark to become white.”<sup>500</sup> In addition to all this, Blumenbach is credited as the first person to place humans into five distinct categories: black, white, red, brown and yellow. And although Blumenbach's intention, as he claimed, was to show that “all [humans] do so run into one another, and one...variety of mankind does so sensibly pass into the other, that you cannot mark out the limits between them”,<sup>501</sup> by the nineteenth century and in the hands of anthropologists Blumenbach was transformed into the father of physical anthropology “whose work on human varieties legitimized racism and, according to some, the politics of segregation and slavery.”<sup>502</sup> Thus for example in his 1863 lecture to the ASL James Hunt stated:

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<sup>500</sup> Bendyshe, T., 1865. *The Anthropological Treatise of Johann Friedrich Blumenbach*. London: Longman, Green, Longman, Roberts, & Green. p.,269.

<sup>501</sup> *Ibid.*, pp.98-99.

<sup>502</sup> Rupke, N., Lauer, G., 2019. Introduction: A brief history of Blumenbach representation. In: Rupke, N., Lauer, G., eds. 2019. *Johann Friedrich Blumenbach: Race and Natural History, 1750-1850*. London and New York: Routledge. p.,6.

We have hitherto devoted our attention almost exclusively to physical Anthropology, which Blumenbach first founded...The difference between the European and the African is not so great physically as it is mentally and morally.<sup>503</sup>

We even see racially inclined thinking present in the works of the science populariser Robert Chambers who, as we noted earlier, openly spoke out against the system of slavery. In his chapter on ‘The Early History of Mankind’ which discussed the latest monogenetic ethnological research, Chambers asserts that blacks were a “deteriorated offshoot” of the original white human stock - a common thread of thought throughout eighteenth-century Europe.<sup>504</sup>

Thus, as anthropology entered into the Victorian era it had already inherited a plethora of contradicting perspectives. The result was that although a monogenetic ethnological framework - most associated with Prichard - would come to characterise the first half of the nineteenth century, from the 1870s onwards a monogenetic anthropological framework - most associated with Tylor and much more removed from its biblical roots - would come to overshadow the Prichardian model with relative ease.<sup>505</sup> Argyll lived through this Victorian

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<sup>503</sup> *Ibid.*

<sup>504</sup> Chambers, R., 1844. *Vestiges of the Natural History of Creation*. London: John Churchill, Princes Street, Soho. p.,296.

<sup>505</sup> This makes sense in the wider context of the Victorian transition from ‘theistic science’ to ‘naturalistic science’ to which Matthew Stanley writes about. Stanley argues that during the course of the nineteenth century “the most common justifications for the principles of science shifted from theistic to naturalistic”. But adds that “the principles themselves remained remarkably stable”, Stanley, M., 2015. *Huxley’s Church & Maxwell’s Demon: From Theistic Science to Naturalistic Science*. Chicago and London: UCP. p.,264. Therefore, the smooth shift away from

transition and although as a young boy he was completely detached from the issues of slavery and racism, by the end of his life he would prove to be a prominent anti-slavery and anti-racist proponent. Nevertheless, Argyll found himself in a peculiar anthropological position. He could agree with the Tylorians about the falsity of polygenesis and the associated ills of slavery, but he could not agree with the Tylorian secularisation of anthropology. Argyll's self-understanding was that of a Christian philosopher, and as a result, his anthropological output during the 1860s is best understood as an early philosophical explication of the assumptions underpinning the newly emerging Tylorian framework.

The following sections of this chapter will chart Argyll's experiences from a disinterested boy, to an actively involved promoter of the cause of abolition and philosopher of anthropology. I continue until the period in which his reputation within the anthropological community began to decline. Along the way I will demonstrate how Argyll's earlier experiences surrounding the institution of slavery influenced his later philosophical output within the context of the rising Tylorian anthropology.

#### Wealth, slavery and the Scottish connection: the Argyll family

From the time of his childhood into his teenage years Argyll's position on slavery was one of indifference. His father's less-than-favourable view of blacks certainly played a key role in this. Late in life Argyll recalled a particular

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Prichardian anthropology can be seen as part of this larger transition to naturalistic science which was pushed by leading scientific naturalists including Tylor, Lubbock and Huxley.

situation during his childhood which exacerbated his father's hostility towards Africans. The 7<sup>th</sup> Duke had cultivated friendships with numerous owners of West Indian plantations, and one of his closest friends was Matthew G. Lewis, the English novelist and owner of an estate in Jamaica. During the 1810s Lewis had promised the black people that he had enslaved that upon his death they should be freed, yet not long after this intimation Lewis died suddenly. On hearing about his death, the 7<sup>th</sup> Duke suspected that Lewis was poisoned by those he had enslaved.<sup>506</sup> This scepticism towards Africans likely remained until the 7<sup>th</sup> Duke's own death in 1847 since it was not until the 1850s that the 8<sup>th</sup> Duke's own views dramatically shifted.

In recent decades there has been a burgeoning growth in historical studies related to the connections between Scottish slavery and the Caribbean. Books such as *Scotland, the Caribbean and the Atlantic world, 1750-1820* (2010) by Douglas Hamilton, *The Glasgow Sugar Aristocracy* (forthcoming, late 2022) by Stephen Mullen and other publications on this topic by historians such as Frank James are some of the first works to devote serious attention to the intricate links between the economics and politics of slavery in the Scottish context.<sup>507</sup> Whilst an in-depth overview of those works falls outside of the remit of this chapter, historical scholarship has revealed some of the ways in which the Argyll family

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<sup>506</sup> Argyll, *Autobiography*, II: 54

<sup>507</sup> Hamilton, D., 2010. *Scotland, the Caribbean and the Atlantic world, 1750-1820*. Manchester: Manchester University Press; Mullen, S., 2022. *The Glasgow Sugar Aristocracy: Scotland and Caribbean Slavery, 1775-1838*. London: University of London Press; James, F. A. J. L., 2021. Making Money from the Royal Navy in the Late Eighteenth Century: Charles Kerr on Antigua 'breathing the True Spirit of a West India agent'. *The Mariner's Mirror*, [e-journal] 107(4), 402-419. <https://doi.org/10.1080/00253359.2021.1978257>.

themselves (particularly the 7<sup>th</sup> Duke) are known to have acquired wealth through plantation slavery.

According to recent work on plantation slavery and landownership in the Western Highlands and Islands carried out by Ian MacKinnon and Andrew Mackillop, it is now known that the families of the second and third wives of the 7<sup>th</sup> Duke were intimately involved in slavery.<sup>508</sup> According to their findings the second wife of the 7<sup>th</sup> Duke (mother of the 8<sup>th</sup> Duke) was the daughter of John Glassell a Scotsman who emigrated to Virginia to become a powerful figure in the tobacco economy as both a merchant and plantation owner. When Joan Glassell married the 7<sup>th</sup> Duke, she gifted her new husband with a lump sum of £50,000. Moreover, following her death, the 7<sup>th</sup> Duke married Anne C. Cunningham the daughter of John Cunninghame [13<sup>th</sup> Laird of Craigends]<sup>509</sup> who had enslaved more than 170 Africans on his plantation in Westmoreland, Jamaica.<sup>510</sup> From their findings Mackinnock and Mackillop summarise that in these ways “wealth linked to slavery played a role in the steadying and recovery of the social, political and economic power of the House of Argyll in the second half of the nineteenth century” the period to which the 8<sup>th</sup> Duke himself oversaw the “House of Argyll”.

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<sup>508</sup> MacKinnon, I., Mackillop, A, 2020. *Plantation slavery and landownership in the west Highlands and Islands: legacies and lessons*. [pdf]: Community Land Scotland. Available at: <<https://www.communitylandscotland.org.uk/wp-content/uploads/2020/11/Plantation-slavery-and-landownership-in-the-west-Highlands-and-Islands-legacies-and-lessons.pdf>> [Accessed 3 June 2022]. p.,14.

<sup>509</sup> Mackinnock and Mackillop mistakenly note John Cunningham as the 14<sup>th</sup> Laird of Craigends, however, he was in fact the 13<sup>th</sup> Laird.

<sup>510</sup> *Ibid.*, p.,14.

The slave legacy of wealthy country-house owners is yet another area of research that is only just beginning to open up - in particular through the engaging work of Corrine Fowler and National Trust projects such as the Colonial Countryside Project which investigates the connections between country houses, empire, and slavery.<sup>511</sup> The types of complexities displayed in Argyll's case demonstrate the continued importance of micro-historical studies on figures of immense wealth and inheritance because these studies provide rich and in-depth detail essential for both politicians and the general public to be able to make informed judgements about the past, present and future of their legacies.

Returning to the 8<sup>th</sup> Duke and his engagement with slavery, although during the 1840s we can trace the beginnings of a shifting frame of mind on the topic of race and slavery, it was not until the 1850s when we see a much more radical transformation. The continuation or abolition of slavery - particularly in the Confederacy - had become a ubiquitous topic in Britain by the second quarter of the nineteenth century.<sup>512</sup> The Mansfield judgement of 1772, although never actually ratified in British law, was often highlighted by abolitionists to make the case that enslaved persons who stepped on English soil could not be forcibly removed and sent to the West Indies. And with the Slave Trade Act of 1807 British ship captains who continued to participate in the trade could be fined up to £100 per enslaved African. In 1833 slavery was eventually abolished across the entire British empire. Thus, in a post-slavery society the moral gaze had

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<sup>511</sup> National Trust. n.d. *Colonial Countryside project*. [online] Available at: <<https://www.nationaltrust.org.uk/features/colonial-countryside-project>> [Accessed 3 June 2022].

<sup>512</sup> Moore, J., Desmond, A., 2009. *Darwin's Sacred Cause*. Boston & New York: Houghton Mifflin Harcourt. pp.134-135.

turned towards America. The burning question for many could be summarised: *would the American South abolish its practice of slavery, and if so, when would this be?*

Argyll witnessed aspects of slavery first-hand during his early years - albeit in a very limited Islamic context – when, as part of his European tour in the early 1840s, he briefly stopped in Morocco. In chapter one we already documented Argyll's sympathetic view towards Morocco's current situation and saw an informal expression of what would later come to be his scientific position on anthropological 'degradation'.<sup>513</sup> However, undoubtedly there is one event in Argyll's life which sparked his transition from a gentleman aristocratic somewhat interested and engaged in the topic of slavery and race, into a gentleman aristocratic fully invested in the topic of slavery and race. This particular event was the release of Harriet Beecher Stowe's acclaimed 1852 novel *Uncle Tom's Cabin*.

#### The Stowe effect: a "blockbuster" novel and the British anti-slavery resurgence

Born in Litchfield, Connecticut, Harriet Beecher Stowe (1811 - 1896) was an American author and abolitionist whose genius and talent for writing had been recognised at a young age.<sup>514</sup> By the 1840s, having studied at the Hartford Female Seminary and married the biblical scholar and Professor Calvin Ellis Stowe, Stowe had already established herself as a skilful literary figure with noted publications

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<sup>513</sup> See section of this chapter entitled 'From Equiano to Argyll and the new degradation argument' for an explanation of anthropological degradation.

<sup>514</sup> ANB, 2000. *Stowe, Harriet Beecher*. [online] Available at: < <https://www.anb.org/view/10.1093/anb/9780198606697.001.0001/anb-9780198606697-e-1601582> > [Accessed 3 June 2022].



and whose career trajectory was on the rise. Despite this, the release of *Uncle Tom's Cabin* – the book sometimes mentioned as helping to lay the groundwork for the America Civil War<sup>515</sup> – came from a much more personal place although Stowe's refined literary talents would go a long way in underpinning its unprecedented success.

Raised under the guidance of a Presbyterian father and Episcopalian mother, Stowe's faith in Christ as a figure who identified with the suffering was reborn when in 1843 her brother George committed suicide. Seven years later her eight-month-old son died in a cholera epidemic and it was at this point at her son's grave when she first learnt "what a poor slave mother may feel when her child is torn away from her."<sup>516</sup> Over the next few years Stowe worked on her new novel which would follow the life of a enslaved person called Tom from the time he was first taken from his family and sold into slavery through his torturous, yet sometimes hopeful life, to his eventual death from beating under his last brutal owner Simon Legree on a plantation in Louisiana.<sup>517</sup> Published in 1852 in two volumes the book was an instant success selling over 300,000 copies in the United States alone within a year and was eventually translated into over twenty different languages.<sup>518</sup> James Moore and Adrian Desmond have called the book a "blockbuster" stating that although it was indeed full of white stereotypes and caricatures of blacks "No

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<sup>515</sup> See, Kaufman, W., 2006. *The Civil War in American Culture*. Edinburgh: Edinburgh University Press. pp.18-19.

<sup>516</sup> *Ibid.*

<sup>517</sup> Stowe, H. B., 1852. *Uncle Tom's Cabin*. II Vols. Boston: John P. Jewett & Company.

<sup>518</sup> Moore, J., Desmond, A., 2009. *Darwin's Sacred Cause*. Boston & New York: Houghton Mifflin Harcourt. p.245.

political tract save the Communist Manifesto ever had such as reception.”<sup>519</sup> The transatlantic impact of Stowe’s “blockbuster” is also evidenced by that fact that in Britain it sold over a million copies leading to a huge revival in the anti-slavery movement.<sup>520</sup> What is particularly worthy of attention in this context is that when the book was due to appear in the European market Stowe personally sent the first copies in Britain to four specific individuals, namely His Royal Highness Prince Albert, Lord Shaftesbury, Lord Carlisle, and the 8<sup>th</sup> Duke of Argyll.<sup>521</sup>

It isn’t exactly clear why Argyll was one of the first to receive a copy of the novel, especially since a March 1852 letter sent by Stowe to the educational reformer Horace Mann shows that Argyll’s name was not initially part listed to be the among first in Britain to receive a copy.<sup>522</sup> Nevertheless, we can suggest likely reasons as to why he ended up in this initial cohort. It is evident that Stowe sent the book to men of power and influence. Although Argyll’s reputation at this point was still on the rise, his family was one of the most well-known aristocratic families in Scotland and indeed the whole of Britain. Furthermore, Argyll was one of the wealthiest landowners in Britain, and his wife Elizabeth and her mother (of the Sutherland family) had established Stafford House as a prominent anti-slavery

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<sup>519</sup> *Ibid.*

<sup>520</sup> *Ibid.*

<sup>521</sup> Balfour, F., 1930. *Ne Obliviscaris: Dinna Forget*. Vol II. London: Hodder & Stoughton. pp.88-90.

<sup>522</sup> Letter located on the Massachusetts Historical Society website, from the Horace Mann papers III, see Massachusetts Historical Society, n.d. *Letter from Harriet Beecher Stowe to Horace Mann, 2 March 1852*. [online] Available at: < <https://www.masshist.org/database/10> > [Accessed 28 July 2022]

location.<sup>523</sup> In fact as Argyll's daughter tells us in her own autobiography, one of her father's earlier influences towards abolitionism was his wife and the exposure to her wider circle when they first got married.<sup>524</sup> These few factors help to provide an answer as to Stowe's inclusion of Argyll amongst the four. Argyll's own description of 1852 is worth quoting in full as it gives us a clear sense of his shifting moral stance on the topic of slavery. Prior to 1852 Argyll had not written or spoken a line in public on the subject and even as Lord Privy Seal he felt it not judicious to do so

Such was the state of matters, when suddenly there burst upon the world a book, written by a woman, which at once preyed upon all hearts, and commanded attention in every country, and in every class and rank. It was 'Uncle Tom's Cabin' – a picture of negro slavery in the Southern states of the American Union. Exhibiting the utmost grace and facility of style and power of literary composition, in expressing the most powerful emotions of the mind and heart, that wonderful book had run through numerous editions in the Old and New World. I confess that I was entirely engrossed by it. It was exactly what was wanted. It made men see and feel what before they had only heard of at a distance. It was the occasion of a compliment to me which I greatly valued. When Mrs. Stowe, the illustrious author of this wonderful book, received the first copies to be sent to Europe, she selected a few men in England, to each of whom she

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<sup>523</sup> Lee, J. S-j., 2010. *The American Slave Narrative and the Victorian Novel*. Oxford: OUP. p.,79.

<sup>524</sup> Balfour, F., 1930. *Ne Obliviscaris: Dinna Forget*. Vol I. London: Hodder & Stoughton. p.,88.

sent a copy, with a short dedicatory note. One was sent to Prince Albert, another to Lord Shaftesbury, a third to Lord Carlisle, and the fourth was sent to me.<sup>525</sup>

At this point Stowe had not yet travelled to Britain and so Argyll had not actually met the “illustrious author”. However, the trailblazing success of her novel across the Atlantic seemingly overnight provided the impetus for her to travel to Europe to promote her work. Considering that photography was still in its infancy in the 1850s,<sup>526</sup> most people outside of the United States had no sense of what Stowe looked like, thus, many were eager to put a face to the author of the book that had so palpably opened their eyes to the injustices of slavery. Argyll and Elizabeth themselves first met Stowe on the 2<sup>nd</sup> of May when she came to England in 1853. At this gathering the Argylls dined with Stowe and a number of other chosen guests at the London residence of George Howard, 7<sup>th</sup> Earl of Carlisle.

It was at this meeting and also a second larger gathering at Stafford House five days later (which received much more press attention) where the bond between the Argylls and Stowes deepened as well as Stowe’s general recognition among the immediate circle of gentlemen and gentlewomen surrounding and facilitating her visit. On Saturday the seventh at the gathering in Stafford House over fifty guests of eminent reputation were present including the Earl and Countess of Shaftesbury,

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<sup>525</sup> Argyll, *Autobiography*, II: 55-56.

<sup>526</sup> Brusius, M., Schaaf, L. J, et al. eds., 2013. *William Henry Fox Talbot: Beyond Photography*. New Haven, CT and London: Yale University Press.

Lord John Russell, Lord Palmerston, the Earl of Carlisle, and William Gladstone,<sup>527</sup> During the gathering Stowe, the Duchess of Sutherland, and Argyll found themselves engaged in conversation across various topics. It was also at this gathering where a petition was presented to her containing over half a million signatures from British women (including the Duchess of Sutherland and Duchess of Argyll who had helped organise the petition).<sup>528</sup> This had been drafted by Lord Shaftesbury, one of Stowe's four primary selected figures in Britain, who upon reading the novel late in 1852 had remarked that he was "touched to the heart's core by 'Uncle Tom's Cabin'".<sup>529</sup> In response to the petition - in comparing the women of Britain and America - she said that:

You in England are happily ignorant of slavery; yet that address has shown your sympathy, and sympathy is very sweet. There is no bitter feeling really between the ladies of the two countries, but the ladies of

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<sup>527</sup> Gladstone is an interesting case here because he had benefitted from slavery due to his father's role as a sugar plantation owner and enslaver in the West Indies as late as the 1830s, see *Hansard* HC Deb. vol.18 cols.308-60, 03 June 1833. [Online]. [Accessed 24 May 2022]. Available from: <https://api.parliament.uk/historic-hansard/commons/1833/jun/03/ministerial-plan-for-the-abolition-of>. col.335. Furthermore, during a speech in Newcastle 1862, Gladstone seemed to suggest that he recognised the South as a nation, a sentiment to which Lord Palmerston, the Duke of Argyll, and many others were highly critical of as they did not want a Union restoration with the current state of the civil war. In the 1890s Gladstone attempted to clarify his position and admitted that his statement was misjudged. However, during the 1860s Argyll could not find it in himself to agree with Gladstone of the view he had proposed when it came Gladstone's seeming Southern sympathies. See Argyll, *Autobiography*, II: 193; and also see Morley, J., 1903. *The Life of William Ewart Gladstone*. London: Macmillan and Co. pp.79-83

<sup>528</sup> Stowe, H. B., 1854. *Sunny Memories of Foreign Lands*. Vol I. Boston: Philips, Sampson, and Company. p.,290.

<sup>529</sup> Extract from Lord Shaftesbury's diary dated to 6<sup>th</sup> Nov 1852. Acquired via email through personal communication from Professor David Brown who is editing the diary.

America cannot, because of their husbands' personal and political feeling, stand forth and say what they feel on that subject. Some have said that 'Uncle Tom's Cabin' is now forgotten; but it should be mentioned that 60,000 copies of the 'Key to Uncle Tom's Cabin' were sold in three days. The practical question is, what can be done to forward this great work? I look first to God; but man also can do something, remembering that after all, the issue is in the hands of Him who ordereth all things.<sup>530</sup>

Through her visit to Britain and the rest of Europe in 1853 Stowe developed a strong friendship with the Argylls and she kept up correspondence with them and was always a welcome guest at Inveraray Castle.<sup>531</sup> In 1854 the Duchess of Argyll wrote to her daughter that “Mrs. Stowe wrote to Lorne. She is in a state about some new abominable Bill pending in congress, which will throw territory now free, into possible slavery. They [America] will have a split or civil war if they go on urging this odious subject farther and farther.”<sup>532</sup> A civil war was perhaps closer to reality than the Duchess could have known and less than a year after Abraham Lincoln had been elected as president the first exchange of fire signalled its onset in April 1861. Throughout the period of the Civil War Argyll engaged in constant correspondence with numerous individuals both in Britain and in America all in support of the North, including Gladstone, Stowe and Stowe’s husband. In 1862 he wrote a letter

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<sup>530</sup> *Evening Mail*, 1853. Mrs. H. B. Stowe at Stafford-House. *Evening Mail*, 9 May. p.,8e.

<sup>531</sup> For example, Stowe visited the Argylls again in 1856, see Argyll, *Autobiography* I: 60.

<sup>532</sup> Balfour, F., 1930. *Ne Obliviscaris: Dinna Forget*. Vol II. London: Hodder & Stoughton. pp.89-90.

to the Duchess of Sutherland June 1862 explaining that “As to America I still wish success to those who are *in the right*. But if you ask me whether I expect the Union to be restored, I can only say, I do not. But somehow...I feel assured that this war, whether by separation or otherwise will be the deathblow of slavery as a system and that ‘good will be the final goal of ill’.<sup>533</sup> Argyll also gave a range of talks on the topic of slavery and Christianity in Edinburgh. For example, on 24<sup>th</sup> of January 1863 at a meeting of the National Bible Society of Scotland in Edinburgh, Argyll, as president, gave a speech in which he ended expressing that

There are thousands of men in the United States who have a keen sense of the moral iniquity of the slave system, and whose opinions and views on what they call humanity and natural justice are views which are really founded, although they know it not, on the principles which Christianity has laid down...What opinion are those men likely to have of the Bible...when they see its appointed guardians announcing that to doubt the divine institution of negro slavery...is an infidel opinion in view of a great Christian Church?<sup>534</sup>

In contrast to his younger days when his indifference about slavery made him prone to view it simply as a “necessary institution” no worse than “the old feudal or

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<sup>533</sup> Balfour, F., 1930. *Ne Obliviscaris: Dinna Forget*. Vol I. London: Hodder & Stoughton. p.,90; here we can see that Argyll felt that the war meant the end of any attempt to restore a Union, but for him the cost of losing the Union was not as great as the benefit of the eradication of slavery.

<sup>534</sup> *Bell's Weekly*, 1863. The Duke of Argyll on Slavery and Free Discussion. *Bell's Weekly Messenger*. 24 Jan. p.,3f.

military servitudes”,<sup>535</sup> Argyll’s perspective on the entire topic had shifted to one of an active abolitionist. Numerous factors had contributed to this including his own travels abroad, his wife’s influence and her wider circle, and most critically the publication of *Uncle Tom’s Cabin* by Stowe and her subsequent visit to Britain. Evidently, Argyll was delighted and relieved when the North eventually won and the Thirteenth Amendment to the United States Constitution was passed. Friends in America were also appreciative of the support that Argyll had shown. In a letter dated the sixth of April 1871 the Quaker and poet John G. Whittier urged Argyll to consider visiting America, writing that “Our people would welcome thee as their friend in the great struggle for Union and liberty...”<sup>536</sup> Less than ten years after Whittier’s letter, Argyll would indeed make his first trip to America, however, during the period of the American fight for abolition into the early 1870s Argyll had in fact been actively engaged in another war much closer to home - the war on the future of anthropological science and it is to this intellectual civil war that we now turn our attention.

#### From Equiano to Argyll, and the new degradation argument

We have looked at some of the ways in which eighteenth-century naturalists utilised ethnology to combat slavery above. In essence figures like Blumenbach responded to a political issue with a scientific answer centred around the idea that if all humans are of the same original stock, then Europeans and Americans have no right to

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<sup>535</sup> Balfour, F., 1930. *Ne Obliviscaris: Dinna Forget*. Vol II. London: Hodder & Stoughton. p.,88; Argyll, *Autobiography* II: 55.

<sup>536</sup> Argyll, *Autobiography* II: 198.



enslave their brothers and sisters no matter how different they may appear. Although polygenist views coming from figures such as Voltaire were somewhat suppressed by the far more dominant monogenist position, polygenism itself did play a key role in providing a justification for the continuation of slavery. Although it is not completely true to say that polygenism inherently supported slavery. For example Voltaire was an ardent polygenist, yet, in his work he spoke out against the practice of slavery.<sup>537</sup> However, as pro-slavery arguments shifted from a theological base to a scientific one, support for the polygenist position slowly gained as the nineteenth century commenced.

It is also in the second half of the eighteenth century where we witness the rise of a resistance movement against not only explicitly racist polygenism, but also implicitly racist arguments about black skin based on climate. Towards the late eighteenth century France and England were becoming major players in the business of slavery<sup>538</sup> yet numerous Europeans took issue with the entire trade. These Europeans sought to provide a new type of degradation argument which could combat slavery by shifting the focus of African degradation away from climate and/or separate origins and towards being a direct result of slavery. Most people in Europe did not have first-hand experience of the true horrors of slavery taking place across the Americas or the Caribbean, however, certain works could periodically bring its truth into the light. In 1766 the English Quaker Anthony Benezet (1713 - 1784) published his *A Caution to Great Britain and Her Colonies*

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<sup>537</sup> Curran, A. S., 2011. *The Anatomy of Blackness: Science & Slavery in an age of Enlightenment*. Baltimore: The John Hopkins University. p.,138.

<sup>538</sup> *Ibid.*, pp.199-200.

a short book in which Benezet exposed the cruel torturous practices of slavery and the hardship that Africans had to endure often to the point of death. Benezet had a comprehensive knowledge of Caribbean and African travelogues which he utilised to his advantage. After exhibiting the brutal ways in which Africans were treated from the time of being shipped across the Atlantic to their days in the West Indies, Benezet laid out his position as to why Africans seem so degenerate:

Some who have only seen Negros in an abject state of slavery...may apprehend, that they are naturally insensible of the benefits of Liberty, being destitute and miserable in every respect, and that our suffering them to live amongst us (as the Gibeonites of old were permitted to live with the Israelites) though even on oppressive terms, is to them a favour; but these are certainly erroneous opinions, with respect to [by] far the greatest part of them...[however]...from the most authentic accounts, the inhabitants of Guinea appear, generally speaking, to be an industrious, humane, sociable people, whose capacities are naturally as enlarged and as open to improvement, as those of the European; and that their Country is fruitful, and in many places well improved, abounding in cattle, grain and fruits<sup>539</sup>

Furthermore, beyond European intellectuals pushing for a new type of degradation argument purely based on contingent social circumstances, African Europeans (a

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<sup>539</sup> Benezet, A., 1784. *A Caution to Great Britain and her Colonies*. London: James Phillips. pp.15-16.

term recently popularised by the Cameroonian historian Olivette Otele) themselves also did a great deal to promote this novel degradation argument. Olaudah Equiano (1745 - 1797) the West African intellectual and activist is perhaps the best known. Equiano was born in Essaka (now south-eastern Nigeria) where at the age of eleven he was kidnapped and transported to the Caribbean. Through a series of events which provided him with the chance to educate himself and earn some money Equiano bought his freedom and travelled to London in the 1760s. In 1789 he published his book *The Interesting Narrative of the Life of Olaudah Equiano or Gustava Vassa, the African* which became a best seller going into nine editions during his lifetime. In responding to the common claim that Africans were naturally inferior to Europeans Equiano replied that

are there not causes enough to which the apparent inferiority of an African may be ascribed, without limiting the goodness of God... Might it not naturally be ascribed to their situation? When they come among Europeans, they are ignorant of their language, religion, manners, and customs. Are any pains taken to teach them these? Are they treated as men? Does not slavery itself depress the mind, and extinguish all its fire and every noble sentiment? But, above all, what advantages do not a refined people possess, over those who are rude and uncultivated. Let the polished and haughty European recollect that his ancestors were once, like the Africans, uncivilized, and even barbarous. Did Nature make them

inferior to their sons? and should they too have been made slaves? Every rational mind answers, No.<sup>540</sup>

Equiano's work began a trend that would continue well into the twentieth century in which African Europeans such as Frederick Douglass, Africanus Horton and Charles V. Roman would counter the biologically deterministic arguments of Europeans by arguing for a socially contingent cause of degradation which, given the right conditions, could be reversed. For our purposes here it is simply enough to summarise that during the second half of the eighteenth-century pioneering names such as Buffon, Blumenbach, Voltaire, Benezet and Equiano set the general trend for ethnology and anthropology moving into the next century. Yet because, taken together, this cohort constructed various competing ethnological frameworks, nineteenth-century ethnologists and anthropologists would continue this trend competing to position their frameworks as the 'dominant discourse'.<sup>541</sup>

Popular nineteenth-century works of science such as Chamber's *Vestiges* upheld a monogenist framework along the lines of Blumenbach. But on a more rigorously grounded level it was the ethnological work of James Cowles Prichard that secured the place of monogenism as the dominant discourse during the first half of the nineteenth century. Born in Hertfordshire in 1786 Prichard became the leading ethnological figure until his death in 1848. A Quaker who studied medicine at

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<sup>540</sup> Equiano, O., 1837. *The Life of Olaudah Equiano or Gustavus Vassa, the African. Written by Himself*. Boston: Isaac Knapp. p.,29.

<sup>541</sup> My use of the term 'dominant discourse' can be understood in a Foucauldian sense to mean that the various promoters of certain anthropological positions tried to position their anthropological framework as the overarching framework for all anthropologists.

Edinburgh before shifting to study numerous languages including Arabic, Hebrew and Sanskrit between 1805 and 1810, Prichard published what would become his life's work *Researches into the Physical History of Man* in 1813, a book that built on but moved beyond Blumenbach's *Variations of Mankind*. Yet although *Researches* served to uphold the 'unity of races' within ethnological circles across the Atlantic, his legacy hardly outlasted his death.

Despite the fact that the Ethnological Society of London was established in 1843 by supporters of racial unity, polygenetic anthropology came back onto the scene in British circles with the racist publication *Races of Men* in 1850 by the Edinburgh anatomical lecturer Robert Knox.<sup>542</sup> As one would expect, Knox himself attacked figures like Prichard claiming that the monogenist position was false.<sup>543</sup> If this wasn't already problematic enough in Britain, America saw the publication *Types of Mankind* just four years later. Unlike Britain which had abolished slavery by the 1830s many more Americans who supported slavery looked for ways of justifying their belief in African inferiority. The authors of *Types of Mankind* Josiah Nott, an American surgeon, and George Gliddon, an American Egyptologist, had become the leading critics of monogenism in physical anthropology and their 700-page book which laid out their argument became a best seller.<sup>544</sup> Although Nott and Gliddon's work primarily took effect in America, and Knox's in Britain, in their

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<sup>542</sup> After being caught up in the West Port Murders Knox's reputation declined. See Sera-Shriar, E., 2016. *The Making of British Anthropology, 1813-1871*. [e-book] Pittsburgh: University of Pittsburgh Press. p.,90 [24 June 2022].

<sup>543</sup> Knox, R., 1850. *The Races of Men*. Philadelphia: Lea & Blanchard. pp.7, 10-11, 25.

<sup>544</sup> Moore, J., Desmond, A., 2009. *Darwin's Sacred Cause*. Boston & New York: Houghton Mifflin Harcourt. p.,263.

introduction Nott and Gliddon referred to Prichard stating that in relation to monogenism “Dr James Cowles Prichard, for the last half century, has been the grand orthodox authority with the advocates of a common origin for the races of men”, however, his authority had waned of late and a new emerging theoretical structure was ripe for the taking. Within the new paradigm the origin of humans was one of plurality instead of unity, “The Africans of the Tropic, the Aborigines of America, the Mongols of Asia, the inhabitants of Polynesia, have remained for thousands of years where history first found them; and nothing but absolute want, or self-preservation, can drive them from the countries where the Creator first placed them”<sup>545</sup> This reference thus signifies how well known Prichard’s work had become across the Atlantic during the nineteenth century.

There were of course British figures like Thomas Carlyle, the Scottish historian, critic and deist, who continued to support slavery.<sup>546</sup> However, other scientific figures were enraged with Knox as well as Nott and Gliddon and in due course responded with their own scientific works. In 1859 Darwin published his seminal *The Origin of Species*, a book which argued for common biological descent and attempted to answer the question of phenotypical variety through novel mechanisms such as natural and sexual selection. As historians have noted Darwin’s book was instrumental in reining in the spread of polygenism, although it was actually Alfred Russel Wallace who would apply natural selection to humans (before Darwin in 1871) in his 1864 essay entitled “The Origin of Human Races

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<sup>545</sup> Nott, J. C., Gliddon, G. R., 1854. *Types of Mankind*. Philadelphia: Lippincott, Grambo & co. p.,6.8

<sup>546</sup> Carlyle, T., 1853. *Occasional Discourse on the Nigger Question*. 2<sup>nd</sup> ed. London: Thomas Bosworth.

and the Antiquity of man Deduced from the Theory of “Natural Selection”.”<sup>547</sup> Nevertheless it was always possible to locate figures such as Charles Bradlaugh, the activist and first atheist MP in Britain, who continued to support polygenism after the release of *Origin*.<sup>548</sup> On the back of Darwin’s publication new anthropological works from scientific practitioners like Thomas H. Huxley’s *Evidence as to Man’s Place in Nature* (1863), and Edward Burnett Tylor’s *Researches Into the Early History of Mankind and the Development of Civilization* (1865), as well as his monumental *Primitive Culture* (1871) were also published. In their own various ways these works argued for the racial unity of all humankind. However, it was equally these works which proposed a more secularised view of humanity<sup>549</sup> which suggested that humans had unequally progressed from primitive to civilised - Europeans representing the most civilised of all cultures across the world.

Here is where Argyll steps back into the frame. Argyll acted primarily as a philosopher attempting to diagnose and circumvent this new monogenetic Tylorian position, which was further removed from the bible and which promoted a ‘primitive’ to ‘civilised’ progressionist view of man. In trying to push back on the explicit polygenesis ideas found in books like *Races of Man* and *Types of Mankind* Huxley, Darwin and Tylor had taken on the Prichardian framework of human racial

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<sup>547</sup> Wallace, A. R., 1864. *The Origin of Human Races and the Antiquity of man Deduced from the Theory of “Natural Selection”*. [pdf] Jstor. Available at: <<https://www.jstor.org/stable/pdf/3025211.pdf>> [Accessed 24 June 2022].

<sup>548</sup> Bradlaugh, C., 1888. *Were Adam and Eve our First Parents?*. London: Annie Besant and Charles Bradlaugh.

<sup>549</sup> This is particularly interesting because even in *Types of mankind* Nott and Gliddon openly stated their belief in God as the creator of man.

unity. And although their approaches to human development differed (a focus on culture in the case of Tylor whereas a focus on biological processes in the case of Huxley and Darwin) the assumption that Europe represented the most advanced and civilised culture was present. Furthermore, Huxley, Darwin, and Tylor were a part of a growing group of scientific naturalists who were at best “agnostic”<sup>550</sup> about the existence of God. From the perspective of Argyll, not only were these naturalists advancing a mistaken view of extra-Europeans, but they were also advancing a mistaken view of reality based on scientific naturalism in opposition to the tenets of Christianity. Argyll felt an increasing need to contribute to this intellectual space and specific events during the 1850s and 60s would eventually push him to come to the aid of a fellow theist who had been attacked by the naturalist John Lubbock.

#### The mid-nineteenth-century degradationist and progressionist debate

The origins of Argyll’s eventual engagement in anthropological debate lay in the 1850s, roughly the same time when he became alive to the issue of slavery. In 1854 the Archbishop of Dublin, Dr Richard Whatley (1787 - 1863), argued for a theistic degradation. His overall position was that humans today had degraded since the time of Genesis because man in general could not advance himself towards civilisation, therefore, primitive man must have been *created* in a civilised state,

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<sup>550</sup> The term “agnostic” was coined by Thomas Huxley in 1869 to distinguish himself and his rising middle-class profile from that of atheism which was often associated with the working class. It is also perhaps best to say that Darwin was actually a deist as opposed to an agnostic. See, Padin, K., 2009. Ten Myths about Charles Darwin. *BioScience*, [e-Journal] 59(9), pp.800-804. <https://doi.org/10.1525/bio.2009.59.9.11>. p.,803



and since then, degraded.<sup>551</sup> During the BAAS meeting at Dundee in 1867, the banker and polymath John Lubbock (1834 - 1913), who was later elevated to the peerage and as Baron Avebury, countered Whatley by arguing on the contrary that uncivilised cultures could and did develop themselves into civilised ones.<sup>552</sup>

Lubbock himself was a scientific naturalist in line with the emerging Tylorian camp. Although in his own works he held to the position of racial unity Lubbock also believed that Africans were inferior and that, in practice, they could never develop to the level of the European.<sup>553</sup> Argyll would not stand for this and in 1869 just a few months after becoming Secretary of State for India, he responded with his own publication *Primeval Man: An examination on some recent speculations*. Argyll's position was clearly within the Benezetian degradation camp and with the passing of Whatley in 1863 Argyll became one of the leading British degradationists along-side African Europeans such as Frederick Douglas and Africanus Horton (names usually marginalised in the historiography). Summarised, Argyll's position was similar to Whatley's and also Benezet's in relation to human degradation in the present except Argyll disagreed with the idea that man could not raise himself unaided. Instead (in agreement with Lubbock) Argyll thought that man could raise himself to civilisation unaided because (in disagreement with Lubbock) in his primeval stage man had natural cognitive abilities and morality

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<sup>551</sup> Beasley, E., 2010. *The Victorian Reinvention of Race*. New York & London: Routledge. p.,112.

<sup>552</sup> Lubbock, J., 1870. *The Origin of Civilisation and the Primitive Condition of Man*. London: Longmans, Green, And Co.

<sup>553</sup> Moore, J., Desmond, A., 2009. *Darwin's Sacred Cause*. Boston & New York: Houghton Mifflin Harcourt. p.,330.

which enabled him to cultivate them over time.<sup>554</sup> Argyll provided evidence as to early man's intelligence by pointing out early human inventions and discoveries which to him required a great deal of ingenuity such as bows, arrows, boomerangs, not to mention one of the greatest early human discoveries: fire. In fact for Argyll the early human discovery of the usage of fire made the modern discoveries of Michael Faraday look like "mere toys" in comparison.<sup>555</sup> Thus Argyll noted that assumption that early man had primitive knowledge and therefore a primitive sense of morality was unwarranted, "there is no necessary connection between a state of mere childhood in respect to knowledge, and a state of "utter barbarism" - words which, if they have any definite meaning at all, imply the lowest intellectual condition."<sup>556</sup> If this was the case, why did some cultures around the world seem so degraded? Argyll's answer took from Darwin's theory of natural selection and adapted it to human resilience, migration, competition, and environment. Primeval man began in a favourable region of the world where they could cultivate their mental abilities towards civilisation. However, (taking a Malthusian understanding of population) once man began to multiply and spread across the earth this led to increased war, less resources, and general competition in which "unfit" humans were forced to move towards unfavourable regions of the world. Thus, in assessing the current degraded state of Eskimos Argyll said that "The rigors of the region they now inhabit have reduced this people to the condition in which we now see them"<sup>557</sup>

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<sup>554</sup> 8<sup>th</sup> Duke of Argyll., 1869. *Primeval Man: An examination of some Recent Speculations*. London: Strahan & Co., Publishers. p.,13.

<sup>555</sup> *Ibid.*, p.,154.

<sup>556</sup> *Ibid.*, p.,132.

<sup>557</sup> *Ibid.*, p.,165.

The important point in Argyll's argument was that, in contrast to the progressive view of European development promoted by Lubbock, the state of currently degraded extra-Europeans was only due to environmental circumstances, therefore, better environmental circumstances would lead directly to more civilised cultures.

As a devout Christian, Argyll attempted to show how his degradation theory, which according to him was purely scientific (although it was in fact philosophical in nature), happened to bear a striking resemblance to the biblical narrative of Genesis.<sup>558</sup> Overall, however, Argyll tried to steer clear of making a strict comparison so as to ward off anyone from accusing him of simply advancing a dogmatic religious and unscientific theory.

Argyll's theory certainly drew support from influential naturalists. For example, Alfred Russel Wallace, the co-discoverer of natural selection, who had spent years living amongst the people of South America and the southern Malay Archipelago, was certainly convinced of Argyll's position and at the 1869 BAAS defended the Argyllian degradation argument.<sup>559</sup> Even a review of *Primeval Man* in the *Anthropological Review* remained relatively partial in tone but commended Argyll's general approach and effort.<sup>560</sup> However, Argyll's work had directly criticised Lubbock who would not take this silently. In the appendix to his *The Origin of Civilisation and the Primitive Condition of Man* (1870) Lubbock struck

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<sup>558</sup> *Ibid.*, pp.27-28

<sup>559</sup> Anon., 1869. Argyll on Archaic Anthropological Speculation. *The Anthropological Review*, [e-journal] 7(27), 414-432. Available through: Jstor Library website <  
<https://www.jstor.org/stable/3025047?seq=7> > [Accessed 3 June 2022]. pp.420-421.

<sup>560</sup> Anon., 1869. Argyll on Archaic Anthropological Speculation. *The Anthropological Review*, [e-journal] 7(27), 376-380. Available through: Jstor Library website <  
<https://www.jstor.org/stable/3025044?seq=1> > [Accessed 3 June 2022].

back stating that Argyll's position was simply Whatley's position with some alteration and more ambiguity. Whatley had used the term "instruction" to suggest that God had created primeval man with innate intellectual capabilities. Argyll had used the term "instinct" to suggest that the primeval man naturally had innate intellectual capabilities. To Lubbock this was just word play. He felt that both Whatley and Argyll were essentially saying the same thing, that is that God created primeval man civilised. Lubbock had (accurately) detected that unlike Whatley, Argyll was simply trying to avoid any explicit mentioning God.<sup>561</sup> Moreover, Lubbock argued that early man migrated to other parts of the world due to exploration and hope, rather than competition and war. And that the great continents were already occupied when man was still savage, thus, since then, what we have witnessed is the general progression of races (although none had progressed as much as Europeans) not a general trend *towards* degradation *from* civilisation.<sup>562</sup> Finally, Neal Gillespie has pointed out that Lubbock's response in 1870 had misrepresented and outright avoided a number of Argyll's weightier points, thus creating a false image of Argyll as incompetent in the face of the Tylorian progressionists.<sup>563</sup>

The timing of Argyll's book was somewhat unfortunate. For just two years later in 1871 *Primitive Culture* was published by Tylor which was a watershed moment

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<sup>561</sup> Lubbock, J., 1912. *The Origin of Civilisation and the Primitive Condition of Man*. London: Longmans, Green, And Co. p.,384.

<sup>562</sup> *Ibid.*, pp.388-391.

<sup>563</sup> Gillespie, N. C., 1977. The Duke of Argyll, Evolutionary Anthropology, and the Art of Scientific Controversy. *ISIS*. [e-journal] 68(1). Available through Jstor Library Website: <<https://www.jstor.org/stable/230372>> [Accessed 3 June 2022]. pp.47-49.

(aided by Darwin's *Descent of Man*<sup>564</sup> although Darwin's effect on anthropology is far less significant than Tylor's overall) and the founding of the Anthropological Institute of Great Britain and Ireland, of which Lubbock became first President. Against such powerful scientific forces, Argyll's own argument would not last long and after 1871 the Argyllian degradation framework, which still retained a theological outlook, was overlooked in favour of the Tylorian progressionist framework which was naturalistic. Besides the Tylorian camp, the author of the extremely popular *History of the Warfare of Science and Theology in Christendom* (1896) Andrew Dickson White, also portrayed Whatley and Argyll as religious apologists trying to retain a biblical anthropology, thus significantly reducing their reputation moving into the next century.<sup>565</sup>

As noted earlier, this is not to say that degradation arguments ended after Argyll. But it is to say that 1871 was a turning point away from Argyll's attempted position and towards Tylor. Argyll was partly to blame for his own decline. His book was very short in comparison to the massive publications of Lubbock, Tylor and Darwin (Lubbock wrote two separate books on the subject. Darwin's *Descent of Man* came in two volumes. And Tylor's book was over 400 pages long). For a topic such as anthropology of which new ethnographic information was continuously pouring in through imperial, travel, and missionary networks, an in-depth analysis was needed in every respect and Argyll's less than 200-page book would not suffice. Furthermore, Argyll's work was more philosophical in nature than scientific. Argyll

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<sup>564</sup> In *Descent of Man* Darwin sided firmly with Lubbock and Tylor against Argyll and Whatley, see Darwin, C., 1871. *The Descent of Man*. Vol 1. London: John Murray. pp.52-53, 181-182

was not himself an anthropologist and his work centred more around exposing and critiquing the embedded assumptions of the Tylorians: such as a hierarchy that placed Europeans at the top through a progressive law, and the idea that ‘primitive’ automatically equated to ‘less moral’ or ‘less intelligent’. Whilst in the long run, as we will see, many of Argyll’s philosophical critiques would win out over the racial and/or hierarchical assumptions of the Tylorians, during the second half of the nineteenth century Argyll was fighting a losing battle at a time when the British empire and British racism was on the increase.

Although George Stocking has correctly identified that in Whatley and Argyll the “degenerationist assumptions of biblical anthropology surfaced to become, perhaps, for the last time in the realm of serious scientific discourse, central issues of debate”<sup>566</sup> before Tylor, Argyll did publish again on anthropology in 1884. This time with some much-needed extensions to his earlier work. His 1884 work, entitled *The Unity of Nature*, was his second major book which essentially argued that the unity found across the universe (in the organic and inorganic realms) implied design, which implied foresight, which implied a mind, which implied a divine designer. In 1869 Argyll (somewhat surprisingly) had not properly defined what he meant by the term ‘civilisation’.<sup>567</sup> However, in *Unity* he defined a ‘civilised culture’ as one in which they had an extended knowledge of the useful

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<sup>566</sup> Stocking, G., 1987. *Victorian Anthropology*. New York: The Free Press. p.,149.

<sup>567</sup> Although this is not unique to Argyll, it is somewhat surprising given that Argyll considered himself a philosopher who was precise about language. Argyll often criticised others for not defining their terms properly. See chapters five and seven for more of an explanation on Argyll’s position on philosophy, language and definitions.

arts and a settled system of law and government.<sup>568</sup> Furthermore Argyll added a novel argument, not present in 1869, based on free will. He suggested that because humans are endowed with free will we could degrade ourselves, often without realising it. This was, for example, why within certain religious groups which believed that the smell of blood was delightful to their god it was rational to “appease [that god] with hecatombs of human victims.”<sup>569</sup> Unfortunately, *The Unity of Nature* as a whole was met with mixed reviews and in comparison to the *Reign of Law* it did not sell or circulate nearly as much.

At the start of the twentieth century aspects of the Argyllian position would begin to see the light of day when the Tylorian framework eventually began to give way to a new framework much less racist and progressionist. Argyll would not live to see this transition as by the time that anthropologists such the American Franz Boas entered the scene in the early twentieth century he had died. Of course, not all of Argyll’s ideas were adopted. His theologically heavy anthropology was not found in the pages of twentieth century anthropology. Furthermore, Argyll did not carry out any major ethnographic research of his own and twentieth-century British anthropologists such as Alfred Cort Haddon were hugely critical of these earlier - and as he saw it - “armchair” anthropological figures (like Argyll) who did not engage directly with “natives”.<sup>570</sup> Despite these specific differences, in relation to his anthropology Haddon was much more aware (compared to Lubbock or Tylor)

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<sup>568</sup> 8<sup>th</sup> Duke of Argyll., 1884. *The Unity of Nature*. London: G. P Putnam’s Sons. P.,382.

<sup>569</sup> *Ibid.*, p.,442.

<sup>570</sup> Sera-Shriar, E., 2016. *The making of British Anthropology, 1813-1871*. [e-book] Pittsburgh: University of Pittsburgh Press. [Accessed date 24 June 2022]. p.,177

of the issue of Eurocentrism and the associated advantage that the British empire provided over and against other cultures in other parts of the world. Not dissimilar to Argyll, at one point Haddon even suggested that “civilization” didn’t necessarily equate to modern technologies such as railways, telegraphs and so on which is the argument that Lubbock had put forward about technology and civilisation.<sup>571</sup> In *The Mind of Primitive Man* (1911) Boas – taking an Argyllian approach - more systematically laid out the position against the Tylorians claiming that “we must investigate in how far we are justified in assuming that achievement is primarily due to exceptional aptitude, and how far we are justified in assuming the European type...represents the highest development of mankind.”<sup>572</sup> With far more updated anthropological research to draw from Boas’s conclusion, very similar to Argyll’s, was that “In short, historical events appear to have much more potent in leading races to civilisation than their faculty, and it follows that achievement of races do not warrant us in assuming that one race is more highly gifted than the other.”<sup>573</sup>

Over the course of the twentieth century American and European anthropologists such as Haddon and Boas as well as those of the African diaspora such as the medical doctor Charles Roman, pushed back on both polygenesis and Tylorian Eurocentric anthropological assumptions. Aided by the ending of World War II and its exposing of the dangers of European racial thinking exemplified in the mass acts of genocide under Hitler’s racist Arian ideology, the field of

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<sup>571</sup> Stocking, G., 1995. *After Tylor: British Social Anthropology 1888 – 1951*. Wisconsin: The University of Wisconsin Press. p.,102.

<sup>572</sup> Boas, F., 1911. *The Mind of Primitive Man*. New York: The Macmillan Company. p.,5.

<sup>573</sup> *Ibid.*, p.,17.



anthropology today is far more self-aware and reflective about its own practices, biases, and “original sin”.<sup>574</sup> Although often forgotten in the literature, Argyll was one of the earliest figures to philosophically expose the problematic biases and assumptions of post 1860s anthropology in Britain, and since Argyll’s time the frameworks that underpin anthropology have become far less Eurocentric - although as contemporary anthropologists routinely point out, there are still many blind spots and biases that they refuse to confront.<sup>575</sup>

### Conclusion

As a child Argyll was indifferent about the issues of slavery and racism. His father had a direct impact on this attitude, and we may now state that his mother also had an indirect impact on his attitude. Yet as an adult Argyll was actively involved in both regards. This shift took place beginning from the 1840s through the influence of his first wife and her wider anti-slavery circle. Next with the release of Stowe’s *Uncle Tom’s Cabin* in the 1850s. And finally with the emergence of the Whatley-Lubbock debate during the 1850s and 60s. Although the end of the American Civil War saw the termination of slavery in the USA by 1865, the intellectual civil war was just brewing on local turf and Argyll would find himself at the centre of this war on anthropology to which his response to progressionism was the theory of degradation. Alongside his degradation theory Argyll’s primary

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<sup>574</sup> Clarke, C., 2019. Anthropology and Original Sin: Naturalizing religion, Theorizing the Primitive. In: Harrison, P., Roberts, J. H., eds. 2019. *Science Without God: Rethinking the History of Scientific Naturalism*. Oxford: OUP. Chapter twelve.

<sup>575</sup> Blakey, M. L., 2022. Understanding racism in physical (biological) anthropology. *American Journal of Biological Anthropology*, [e-journal] 175(2), 316-325.  
<https://doi.org/10.1002/ajpa.24208>. p.,321.

contribution to anthropology was in the philosophical approach he took towards critiquing core Eurocentric and (in the case of Lubbock) racial assumptions that lay at the foundation of the newly emerging Tylorian cultural anthropology. In tracing Argyll's shifting position from indifference to an active proponent we have explored wider themes surrounding the complex cultural and social factors at play in relation to aristocratic wealth and status and its corresponding relation to slavery, racism and society. Through our micro-historical study of Argyll it becomes clear that there is no homogenous claim that can be made about aristocracy, slavery and racism - each aristocratic family and individual has to be judged on their own accord.

In Argyll's case although he did not directly refer to slavery in his anthropological work, the two were intimately linked. Firstly, his active engagement in abolition and anti-racial anthropology date to around a similar period of time, and secondly numerous comments from Argyll inform us about his general thinking on degradation, slavery and the potential for a remedy. For example, Argyll did not just think that certain Africans were degraded due to slavery or environmental conditions, instead he extended this principle of degradation to the American South who, through the practice of slavey, had degraded themselves actively "rotting" their own hearts and conscience.<sup>576</sup> Yet whereas the case of the America South was voluntary degradation, for the people of the Hebrides and India degradation was less optional.<sup>577</sup> In chapter two we have

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<sup>576</sup> Beasley, E., 2010. *The Victorian Reinvention of Race*. New York & London: Routledge. p.,127; this is a similar argument to that which Robert Chambers made in *Vestiges*.

<sup>577</sup> See chapters two and three for a detailed discussion on the Hebrides and Indian context.

seen how Argyll believed that the nature of the rugged terrain and inaccessibility to proper education degraded the people of the Hebrides. This is why Argyll could say that “Geographic isolation has kept the Hebrides behind the rest of Scotland in the progress of civilization”<sup>578</sup> Similarly, years before becoming Secretary of State, Argyll had already expressed the idea that India could rise from involuntary degradation if only given a “proper” (by which he meant Western) education.<sup>579</sup> Finally in relation to Sub-Saharan Africans Argyll could state that “we do not find that the predominant native races of Southern Africa rank low in the scale of humanity...”<sup>580</sup> Thus, for Argyll degradation was in no sense related to skin colour. The American, Scottish, Indian, and African could *all* degrade, but each could also rise from degradation towards higher civilisation.

This chapter has shown that, although often missing from the literature, Argyll’s intellectual contribution to Victorian anthropology was central to the function of anthropological discourse in contemporary practice. Argyll’s work is therefore important in the historiography of anthropology because although his degradation theory never caught on, he was one of the first to systematically critique the racial (Lubbock) and hierarchical (Tylor) assumptions that underpinned the newly emerging Tylorian framework which dominated the second half of the nineteenth century; Argyll’s practice has become common in anthropological discourse since the 1970s.

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<sup>578</sup> Beasley, E., 2010. *The Victorian Reinvention of Race*. New York & London: Routledge. p.,125.

<sup>579</sup> This point is also detailed in chapter three in reference to Argyll’s 1865 book *India Under Dalhousie and Canning*.

<sup>580</sup> 8<sup>th</sup> Duke of Argyll., 1884. *The Unity of Nature*. London: G. P Putnam’s Sons. p.,413.

Argyll was indeed an anti-racist and anti-slavery proponent but this does not negate the fact that he was heavily imperialist as chapter three documented in detail. As such, Argyll leaves behind a mixed legacy. Yet, it is precisely this mixed legacy that makes Argyll such a useful case study in to explore the complexities regarding the ways in which race, slavery, wealth and empire intersected with science.

Unfortunately, simplified and partial narratives seem to be the bane of Argyll's life. Remembered primarily as a geologist and theistic evolutionist, the vast majority of Argyll's other engagements have been almost completely neglected by historians of science. Previous chapters have addressed a range of these omissions but they have focused on one particular theme each. The next chapter will break from this method by focusing not on one theme but three: evolution, cultural authority and debate, and geography. There we will see how, due to the common focus on evolution, geology and debates about scientific authority, historians of science have continued to overlook other aspects of Argyll's scientific career. Perhaps most surprisingly his sustained involvement in pioneering British geographical expeditions during the latter half of the nineteenth century until his death.

## **Chapter 7: Debate, authority, and legitimacy: Argyll's legacy as religious apologist and scientific patron**

There is perhaps no other area where Argyll's name is more known than when it comes to his apologetic defence of 'theistic' science in opposition to 'naturalistic' science.<sup>581</sup> In chapter one we saw that Argyll's 2004 Oxford National Dictionary of Biography entry positioned his post-1850 works on science and society as primarily about "point scoring" instead of useful scientific knowledge. In relation to evolutionary theory James Moore has called Argyll a "Christian Darwinist" who argued against the naturalistic tenants of Darwinian evolution in favour of a theistic understanding of Darwinian evolution.<sup>582</sup> More recently, taking Argyll's 1869 and 1884 responses to Tylorian anthropology, Ruth Barton has noted that Argyll's "defenses of design in nature often stirred Huxley and Hooker to indignation."<sup>583</sup> Thus Argyll's status remains to the present as one who regularly engaged in wide scientific debate and controversy against the rising tide of scientific naturalism. But whilst the analyses from the above scholars certainly shouldn't be denied, we should question to what extent they provide an accurate representation of Argyll's undertakings. Throughout my thesis chapters I have shown how Argyll's reputation in fact moves far beyond that of simply a combatant against naturalism and that instead it encompasses a complex but lasting legacy in science, technology,

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<sup>581</sup> Stanley, M., 2015. *Huxley's Church & Maxwell's Demon: From Theistic Science to Naturalistic Science*. Chicago and London: UCP.

<sup>582</sup> Moore, J., 1979. *The Post-Darwinian Controversies*. Cambridge: CUP. pp.218-221.

<sup>583</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP. p.381.

education, empire, and society.<sup>584</sup> In line with this new understanding, this chapter will take a much broader approach as compared to the previous chapters in assessing Argyll's scientific impact in relation to the themes: *debate*, *authority*, and *legitimacy*. My central argument is that historians of science have placed too much emphasis on Argyll's role in the arena of debate and cultural authority, and as such, have overlooked the fact that Argyll continued to engage in legitimate and pioneering scientific work, particularly in the area of geography in the decades after 1850.

The structure of this chapter will consist of three main parts. Firstly, I will look at Argyll's role in Victorian evolutionary debates after the publication of Darwin's *Origin* to assess his general impact. In this section I will seek to show that even though Argyll was engaged in much debate, he always intended to maintain a friendship with his interlocutors, such as Darwin and Spencer. Moreover, revisions to Darwin's theory of evolution were directly influenced by Argyll and on one particular occasion Darwin admitted feeling the force of Argyll's theistic evolutionary argument.

Secondly, I will look at Argyll's role in the area of Victorian cultural authority - a subject on which both Bernard Lightman and Ruth Barton have spent much time working in the context of the scientific naturalists. As such this will primarily be within the context of Argyll's engagement with Thomas H. Huxley, the leading scientific naturalist. I will look at what was at stake for Argyll in his contest with Huxley especially in relation to their opposing metaphysical starting points which

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<sup>584</sup> Of course the moral footprint left by this legacy is an ambiguous and complicated one and this will be explored further in the conclusion.

Argyll attempted to expose, similarly to what Arthur Balfour later did in *The Foundations of Belief* (1894).

In the final section I will focus on a specific area of scientific engagement to which Argyll's role has been completely ignored by historians of science. This is his undertakings as one of the main initiators and supporters of Britain's first major 'Discovery' expedition to Antarctica between 1901 and 1904 led by Captain Robert F. Scott. Unlike the first two sections Argyll's geographical involvement was largely devoid of the controversy usually highlighted by historians of science. In fact we shall see that both Argyll and the scientific naturalist Joseph Hooker worked seamlessly together to lobby support from both the government and the scientific community to facilitate the eventual success of the expedition to Antarctica.

#### The onset of Darwinian evolution

Some years before the *Origin of Species* was published Argyll had already expressed doubts about proposed systems of science that advocated for gradual processes of change. Prior to Darwin's theory of evolution, Charles Lyell's *Principles of Geology* (1830-33) which, as the title plainly suggested, attempted to 'Explain the Former Changes of the Earth's Surface by Reference to Causes Now in Operation', had already challenged the previously dominant 'catastrophism' position in geology. Lyell had argued for a 'uniformitarian' view of earth's geology but as a life-long committed catastrophist Argyll took the chance during his 1855 Glasgow BAAS presidential address to imbed his rejection of Lyell's position. In discussing the progress of science Argyll claimed that there was a "natural disposition" for people to look back at a few great names (such as Newton) as

beings of superior intellect. He then continued by saying that “It is true, indeed, there have been a few such men; just as there have been periods of sudden geological operations, which have upheaved at once stupendous and enduring monuments” but that secret of their intellectual power lay in virtues “more common than unfortunately they are found to be.”<sup>585</sup> Although Argyll had praised Lyell’s overall skill as a geologist, this brief statement marked his first publicly expressed disagreement with Lyell and it also symbolised the future of the Argyllian perspective on both geological and biological evolution.

Yet Argyll’s disagreement with Lyell at the BAAS did not signal the end of their friendship which had been cultivated during Argyll’s younger years with his father around the London scientific community.<sup>586</sup> When Darwin published his *Origin of Species* during October 1859 Lyell was one of the first to receive a letter from Argyll discussing the publication. Argyll had read the *Origin* by February of 1860 and on the 29<sup>th</sup> sent Lyell a letter expressing that although the *Origin* was a “most delightful” book suggesting endless subjects for enquiry, it failed fundamentally in two cardinal points. Firstly, it failed in “showing that in the existing or contemporary world breeding does effect any changes such as tend to the formation of new species.” And, secondly, it failed in showing “that in the past worlds there is any proof or clear evidence of such gradations of change as his theory

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<sup>585</sup> Anon., 1856. *Report of the Twenty-Fifth Meeting of the British Association for the Advancement of Science. Held at Glasgow in September 1855*. London: John Murray. pp.lxxxiii-lxxxiv; It is not exactly clear what Argyll’s point is here, but one interpretation is that the seeming genius of figures like Newton is a product of intellectual abilities and practices that most people in fact have the capacity to develop. Figures like Newton may be the ones to cultivate these abilities to a greater extent as compared to most others but this does not mean that they are unique to Newton or Darwin.

<sup>586</sup> See chapter one section titled ‘The BAAS, marriage, and crofting issues in the 1840s’



requires.”<sup>587</sup> Argyll’s latter disagreement with Darwin was similar to his disagreement with Lyell, a dislike of evolutionary change through purely gradual processes.

Charles Darwin’s core argument in *Origin of Species* was that owing to the struggle for life, “any variation, however slight and from whatever cause proceeding, if it be in any degree profitable to an individual of any species...will tend to the preservation of that individual, and will generally be inherited by its offspring.”<sup>588</sup> This principle he called ‘natural selection’. Of course, it is well known by historians that natural selection was not solely Darwin’s own. Alfred Russel Wallace had independently developed the theory of natural selection through his own observations of nature across South America and the East Indies and their idea was jointly presented at the Linnean Society a year before the *Origin* was published.<sup>589</sup> But after Darwin’s publication his name became associated with the development of the theory of evolution via natural selection and that perception has remained ever since.

Though a full exploration of the *Origin of Species* is not the aim of this section, it is worth pointing out a number of significant things which Darwin argued or suggested in this work. Darwin’s theory of natural selection developed as an intellectual attempt to explain biological phenotypical variation across the world.<sup>590</sup>

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<sup>587</sup> Argyll, *Autobiography*, II: 482.

<sup>588</sup> Darwin, C., 1859. *On the Origin of Species*. London: John Murray. p.61.

<sup>589</sup> *Ibid.*, p.2.

<sup>590</sup> This was not primarily for anti-religious reasons as is commonly assumed by contemporary figures like Richard Dawkins, but rather, as Moore and Desmond have suggested, primarily for moral reasons as a way to combat the institution of slavery and its scientific justification located in the notion of polygenism.

After years of observation, correspondence throughout the empire and beyond, and direct biological experimentation, Darwin adopted the concept of selective breeding as practiced by humans and applied it to nature. Essentially what humans could do to animals over the course of a few generations, nature could - and did do - to animals *and* humans over the course of millions of years.<sup>591</sup> Darwin proposed other ideas and theories to compliment natural selection such as sexual selection, which was the idea of competition between males for mating priorities with females.<sup>592</sup> And also the principle of utility, which was the idea that modifications via natural selection had to have an advantageous purpose for the species; in other words, biological and phenotypical variation couldn't occur purely for aesthetic reason alone.<sup>593</sup>

#### The 'Eclipse of Darwinism' and the development of Argyll's 'theistic evolution'

As Peter Bowler has discussed in depth, although over the course of the next few decades Darwin would revise and update his work many times, in due course his emphasis on natural selection as the primary mechanism in evolutionary development would be 'eclipsed' by numerous other competing ideas. It was not that the idea of evolution was rejected outright by the scientific and religious community, rather it was that many on both sides were sceptical about Darwin's emphasis on the ability of natural selection to bear the weight of biological

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<sup>591</sup> Darwin, C., 1859. *On the Origin of Species*. London: John Murray. p.467.

<sup>592</sup> And the controversial idea in the Victorian period of female autonomy i.e. the ability for the female to choose which male is allowed to mate with her.

<sup>593</sup> Darwin, C., 1859. *On the Origin of Species*. London: John Murray. p.87.

variation. Even Thomas H. Huxley - Darwin's bulldog - was sceptical of the mechanism of natural selection to account for the diversity across the world.<sup>594</sup> And thus Bowler concluded that in the latter decades of the nineteenth century those who were "opposed to the selection mechanism had no doubt about the overall trend. Darwinism was on the decline and would soon be eliminated altogether..."<sup>595</sup> Additions, critiques, and complete replacements for natural selection sprung up in many quarters including, Lamarckian inheritance and the idea of use and disuse, William Thomson's limit of the age of the sun (capped at 100,000,000 years in 1862),<sup>596</sup> Wallace's critique of the principle of utility, and the alternative to Darwin's naturalistic form of evolution - theistic evolution. Argyll's most engaged and effective critiques of the *Origin* were along the lines of the latter two points and his position became widely known after the publication of his own book *The Reign of Law* in 1867. The core premise of this book was centred around three key arguments. Firstly, there is no such thing as the 'supernatural' because all of God's acts are 'natural'. Secondly, God uses the laws of nature to carry out his will, always manipulating them to a specific end but never violating them. (See chapter five for an in-depth discussion of these positions). And thirdly, Argyll argued that the process of natural selection is not random but instead guided. For Argyll natural selection could only select from pre-ordained laws of variation – those laws being

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<sup>594</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP. p.172.

<sup>595</sup> Bowler, P., 1983. *The Eclipse of Darwinism*. Baltimore and London: John Hopkins University. p.4.

<sup>596</sup> This was Thomson's position in 1862, but as Joe Burchfield has noted Thomson by the 1870s had reduced his limit on the age of the sun to as low as ten million years. See Burchfield, J. D., 1990. *Lord Kelvin and the Age of the Earth*. Chicago and London: UCP. p.109.

the product of a mind – whereas for Darwin the ‘Laws of Variation’ were understood in purely natural terms.<sup>597</sup>

When the *Reign of Law* was published Darwin’s circle of scientific naturalists were (unsurprisingly) quick to pour scorn over the work. The botanist Joseph Hooker wrote a letter to Darwin saying that he had finished the book with “utter disgust-&uncontrollable indignation” further stating that “considering his birth education & position, I regard him as lower than Owen.”<sup>598</sup> Darwin himself had been contemplating writing a chapter on man during the mid-1860s since there had lately been “so much said on nat. selection in relation to man.” Indeed, by the 1860s Argyll, as with numerous others, had queried the place of man in relation to natural selection. In a letter to Huxley (in January 1867) who had remarked that Argyll was “down on both of us”, Darwin, not yet having read the *Reign of Law*, agreed with Huxley stating that “as you say he attacks us”.<sup>599</sup>

Darwin had used the term “us” for a specific reason. In 1863 Huxley had made his critical appearance on the stage with the publication of his own book in support of Darwinian evolution (despite his earlier reservations). His short book entitled *Evidence as to man’s place in nature* was the first book, before Darwin’s own attempt, to address the relatedness of man to animals directly by locating potential

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<sup>597</sup> Darwin, C., 1859. *On the Origin of Species*. London: John Murray. p.87; 8<sup>th</sup> Duke of Argyll., 1867. *The Reign of Law*. London: Alexander Strahan. p.230

<sup>598</sup> Letter from Hooker to Darwin on the 20<sup>th</sup> of May 1868, Darwin Correspondence Project, “Letter no.6189,” accessed 10 June 2022, <https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-6189.xml>.

<sup>599</sup> Letter from Darwin to Huxley on the 7<sup>th</sup> January 1867, Darwin Correspondence Project, “Letter no.5348,” accessed on 10 June 2022, <https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-5348.xml>.

missing links. In this work Huxley attempted to show from anatomical studies - and in opposition to Richard Owen - that man could not be distinguished as a different 'order' from 'man like apes' (such as gibbons chimpanzees, gorillas) based on anatomical or brain differences alone.<sup>600</sup> Argyll was a keen supporter of Owen who was the leading British anatomist, and would often attend his lectures whenever time permitted.<sup>601</sup> In *Reign of Law* Argyll went to the defence of Owen against Huxley arguing that the homologous nature of "all Vertebrate skeletons" was evidence not of common descent but instead of an intelligent designer. In other words, homology implied a unity of "Plan" not a unity of descent.<sup>602</sup>

It is not simply the case however, that Darwin only opposed Argyll's work. In fact Darwin said in another letter to Hooker in 1870 that he had always thought of Argyll as "wonderfully clever."<sup>603</sup> Moreover, Argyll was directly responsible for Darwin's loosening position on the principle of utility which Darwin admitted in *Descent of Man* (1871). In *Origin* Darwin had avoided discussion of man's relatedness to animals and the process of natural selection but in 1871 Darwin put his position out in the open. Of course, anyone who knew about *Origin* knew very well of Darwin's implications for man. Yet the time between 1859 and 1871 gave Darwin the chance to think further through his work plus assess valid critiques. In 1859 Darwin had argued that any biological changes that occurred had to have a

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<sup>600</sup> Huxley, T. H., 1863. *Evidence as to Man's Place in Nature*. London: William and Norgate. p.123.

<sup>601</sup> Inveraray Castle archives, Bundle 1619.

<sup>602</sup> 8<sup>th</sup> Duke of Argyll, 1867. *The Reign of Law*. London: Alexander Strahan. p.33.

<sup>603</sup> Letter from Darwin to Hooker on the 12<sup>th</sup> July 1870, Darwin Correspondence Project, "Letter no.7273," accessed on 10 June 2022, [tps://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-7273.xml](https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-7273.xml).

corresponding utility for the creature. In an 1868 article Argyll used the example of various birds who lived in very similar habitats yet still featured stark physical differences to argue that mere variety “must be admitted to be an object and aim in Nature” and that “neither any reason of utility” nor physical cause could serve as a sound answer to this type of variety.<sup>604</sup> By the time *Descent* was published, Darwin had accepted Argyll’s position stating that he was glad to have the unusual satisfaction of following in Argyll’s footsteps, even if only for a short while. Darwin had been convinced that in relation to sexual selection “mere novelty, or change for the sake of change” did sometimes act like a charm on female birds in the same manner as changes of fashion with humans.<sup>605</sup> Argyll and Darwin certainly disagreed on why purely aesthetic change occurred in the first place. For Argyll it occurred because it was the purpose of the Creator in his creative work - Darwin would never accept such an answer. Nevertheless, Darwin’s position had shifted and Argyll had been a principal cause.

Over the course of the second half of the nineteenth century debates about evolution raged on and Argyll kept abreast of the matters making his contribution and defence where he felt it was needed. Argyll’s writings on the topic are extensive and we could draw from a pool of abounding examples to investigate his thoughts. However, one particular case during the 1890s provides us with a useful overview not only of Argyll’s position, but the complicated reality of Victorian discussions on evolution. Although ‘science’ and ‘religion’ were an underpinning aspect of

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<sup>604</sup> Murray, A, ed., 1868. *The Journal of Travel and Natural History*. Vol 1. London: Williams & Norgate and Edward Stanford. p.286.

<sup>605</sup> Darwin, C., 1871. *The Descent of Man, and Selection in Relation to Sex*. Vol 2. London: John Murray. p.230.

Darwinism, Darwinian evolution was never simply about science versus religion. Rather it encapsulated much wider and weightier societal concerns, such as morality, race, and the nature of human progress.<sup>606</sup> In the case below, to which Argyll and the philosopher and scientific naturalist Herbert Spencer engaged in critical dialogue, it becomes evident that the lines between support and disapproval for evolution were often blurred. At points one could mistake Spencer for being the attacker and Argyll for being the supporter of Darwinian evolution and this serves to highlight the endless complexities present in early debates surrounding Darwinian evolution.

#### Spencer's philosophy of evolution

Herbert Spencer (1820 – 1903) was a philosopher, social theorist and sociologist well known for his promotion of both social Darwinism and Jean-Baptiste Lamarck's theory of use and disuse in Britain and across the Atlantic. Spencer was also one of the original members of the X Club which was formed in 1864 which included scientific naturalists such as Huxley, Joseph Hooker, and John Tyndall. Despite his affiliation with the X Club his position was almost always tentative. For example, during the early 1860s, Hooker, who Barton has argued played the central role in formalising the X Club, admitted to Darwin that he had little respect for Spencer's philosophical work.<sup>607</sup> By the late 1880s Huxley followed Hooker in beginning to critique Spencer's philosophical works and Barton has also argued

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<sup>606</sup> Brooke, J. H., 1991. *Science and Religion: Some Historical Perspectives*. Cambridge: CUP. pp.376-383.

<sup>607</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP. pp.214-219.

that this attack was the “greatest crisis in the Club’s life”.<sup>608</sup> By 1892 the X Club was no more, but this did not mean that Spencer would cease his philosophical thinking and writing.

Today Spencer is far less read than he was in his own time. Part of the reason for this is that, unlike Darwin, many of his ideas were less translatable to future generations of biologists.<sup>609</sup> But we can pick out a few key points which are clear in relation to his thinking and writing. Spencer was not a self-proclaimed atheist. Like Huxley, Spencer was an agnostic who did not see science and religion in conflict but rather, as he put it, they expressed “opposite sides of the same fact.”<sup>610</sup> In his *First Principles* (1862) a work that treated his religious views, Spencer summarised his position that the ultimate principles in religion and science were unknowable. As the historian James Ungureanu has pointed out, Spencer’s notion of this ‘unknowable’ force or deity behind the universe was particularly well received amongst liberal Protestants because this vision contributed to a liberal Christian view of the universe that had an evolutionary purpose guided by God.<sup>611</sup> For Spencer evolution was not just a principle limited to the biological world as Darwin had framed it, rather evolution worked across the entire universe. It began with the physical formation of the solar system and continued to guide the development of organic life. Spencer, saw the final state of the universe as sort of

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<sup>608</sup> *Ibid.*, p.452.

<sup>609</sup> Bowler, P. J., 1988. *The Non-Darwinian Revolution*. Baltimore and London: The John Hopkins University Press. p.157.

<sup>610</sup> Spencer, H., 1862. *First Principles*. London: Williams and Norgate. p.22.

<sup>611</sup> Ungureanu, J., 2019. *Science, Religion, and the Protestant Tradition*. Pittsburgh: University of Pittsburgh Press. p.197.



evolutionary equilibrium utopia, yet not being a physicist he was flabbergasted when Tyndall revealed to him that his idea of evolutionary universal equilibrium equated to universal death according to the laws of thermodynamics.<sup>612</sup> Spencer was a well-known promoter of Lamarckian inheritance and although Darwin had also entertained the idea in the first edition of his *Origin*,<sup>613</sup> its promotion was much more equated with Spencer. For example, in his *Principles of Biology* (1864) he argued that the “musical faculty” in human beings could not be accounted for without admitting “the inheritance of acquired characteristics”.<sup>614</sup>

Though brief, this overview of Spencer’s thoughts and writings provides us with the background to consider the debate that took place between himself and Argyll during the 1890s after the X Club had ceased to exist.

#### The Salisbury BAAS address, Spencer’s response and Argyll’s defence

Alongside the North British men of science, popularisers of science, and spiritualist movement, the theistic aristocratic class served as a powerful counter-force against the rising tide of agnosticism and atheism in Britain towards the end of the nineteenth century. One place where we can see the continued influence of the aristocracy in particular is in the continued role they played within the BAAS. In previous chapters I have noted that Argyll was elected president in 1855 to which he gave his address; and in chapter four I also noted that Lord Rayleigh had given

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<sup>612</sup> Lightman, B., 2019. The Theology of Victorian Scientific Naturalists. In: Harrison, P., Roberts, J. H., eds. 2019. *Science Without God: Rethinking the History of Scientific Naturalism*. Oxford: OUP. Chapter thirteen. p.249.

<sup>613</sup> Darwin, C., 1859. *On the Origin of Species*. London: John Murray. p.134.

<sup>614</sup> Spencer, H., 1864. *The Principles of Biology*. London: William and Norgate. p.249.

his own address overseas in Montreal in 1884. Ten years after Lord Rayleigh, Lord Salisbury was elected president for the 1894 Oxford BAAS meeting. Somewhat befittingly for Spencer, as opposed to talking about the history or current understanding of science, Salisbury's theme centred around what was still 'unknown' in the world of science. Despite this, Spencer did not take kindly to Salisbury's overall address. Coming towards the end of his talk, and confidently drawing on the calculations of William Thomson (who he himself had ennobled as a life peer as Lord Kelvin in 1892), Salisbury argued that Darwin's theory of natural selection had major problems. This was because Kelvin's limit on the age of the earth meant that the further back we went in time the higher the levels of heat transmitted from the sun to the earth would render it impossible for any sort of biological life to emerge.<sup>615</sup> Salisbury's challenge did not end there, he next went on to deal with what he saw as the most pressing issue. He declared that the most damaging objection was the fact that we cannot "demonstrate the process of natural selection in detail; we cannot even, with more or less ease, imagine it. It is purely hypothetical."<sup>616</sup>

Indeed, Spencer did not take kindly to this aristocratic charge against evolution and he quickly responded in a November 1895 article in the *Nineteenth Century* titled 'Lord Salisbury on Evolution'. Although one might assume that Spencer went

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<sup>615</sup> Thomson, W., 1862. On the Age of the Sun's Heat. *Macmillan's Magazine*, [e-journal] 5(29), pp.388-393. Available through: Pro Quest Library website < <https://www.proquest.com/docview/6038705/fulltextPDF/3A4453C668D44DD8PQ/1?accountid=14511> > [Accessed 13 June 2022]. p.,393. ; Salisbury's address was called "Address by the Most Hon. The Marquis of Salisbury", see Lord Salisbury., 1894. *Report of the Sixty-Fourth Meeting of the British Association for the Advancement of Science Held at Oxford in August 1894*. London: John Murray. p.12.

<sup>616</sup> *Ibid.*, pp.13-14.

to the defence of Darwinian evolution since Salisbury had attacked Darwin's theory, this is not necessarily the case and the encounter furnishes us with a clear example displaying the confusing legacy that Spencer left.

Spencer first made a separation between Darwin's natural selection and the "doctrine of organic evolution" stating that the former was a specific biological process which *could* be shown to be false. However, he then suggested that even if natural selection was shown to be false, organic evolution, which was simply general change over long stretches of time in the organic world, would not be disproven.<sup>617</sup> Spencer then went on to argue that the position of special creation, or creation *ex nihilo*, to which he believed that Salisbury adhered, had no direct observable evidence in the same way that the macro-transmutation of species had no direct observable evidence. Thus, Salisbury's argument was self-defeating. Rather if we took account of the indirect evidence from palaeontology, homology, distribution and embryology, an evolutionary view of man made the most sense of the data.<sup>618</sup> Spencer continued to lay out his position stating that he coined the term 'survival of the fittest' to replace 'natural selection' precisely to avoid the issue of figures like Salisbury assigning a "conscious process" to ideas of evolution and/or human origins.<sup>619</sup> Spencer tackled numerous points raised by Salisbury, but bypassed the point about the increased degrees of heat the further in time one went

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<sup>617</sup> Spencer, H., 1895. Lord Salisbury on Evolution. *The Nineteenth Century*, [e-journal] 38(225), 740-757. Available through: Pro Quest Library website  
<<https://www.proquest.com/docview/2651028/C9D194ED05BF4379PQ/5?&imgSeq=1> >  
[Accessed 13 June 2022]. p.741.

<sup>618</sup> *Ibid.*, pp.743-746.

<sup>619</sup> *Ibid.*, p.748.

back, opting instead to simply suggest that humans could evolve from a cell like structure given millions of years.<sup>620</sup>

By the 1890s Argyll was well into his 70s yet he seems to have remained almost as active as the 1860s and 1870s. During the 1890s he published numerous books including *What is Science* (1898) and *The Philosophy of Belief* (1896), the third instalment in his major trilogy, and continued to engage in the most heated scientific debates in late-Victorian Britain. Another book he published in 1898 was entitled *Organic Evolution-cross-examined; or, some suggestions on the great secret of biology* (1898). This work, as with many of his previous books, was initially a collection of articles he had published in the *Nineteenth Century* little altered before being compiled and published. It responded directly to Spencer's article against Salisbury but it also responded to Spencer's views more broadly as Argyll understood them, as well as some critiques that Spencer had levelled against Argyll himself. Spencer and Argyll's positions were not a clear-cut opposition when it came to evolution. This suggests once again that the lines between science and religion, and support for or rejection of Darwinian evolution were often blurred in late-Victorian Britain.

Argyll's book was split into three separate sections but I will only discuss the first two as they are the most relevant for our purposes here. In the first section of the book entitled 'A Great Confession' Argyll's first point of call was to congratulate Spencer on coining the term 'survival of the fittest'. He stated that from a scientific perspective the term survival of the fittest was a much more accurate statement than the term 'natural selection' because it "seems to tell us not

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<sup>620</sup> *Ibid.*, p.753.

only of that which is, but of that which must be”.<sup>621</sup> Somewhat confusingly however, Argyll also stated that his preference for Spencer’s terms was in part due to the fact that it got rid of the analogy of mind behind the process of natural selection and thus Spencer’s term was more “scientific”.<sup>622</sup> This seems to contradict Argyll’s previous position in the *Reign of Law* to which he argued that the process of natural selection was indeed divinely guided. However, Argyll later clarified his point. Although he thought of Spencer’s term as more accurate than Darwin’s own, he said that some scientific figures, such as Spencer, assume that all scientific terminology must avoid any connection to the concept of mind altogether, but this goal is in fact impossible. Argyll continued his argument saying that

the earnest endeavours of Mr. Spencer to get out of himself - to eliminate every conception which is “anthropocentric” – have very naturally come to grief. “Survival”? Does not this word derive its meaning from our own conception of life and death?...And then that other word “fittest,” does it not still more clearly belong to the rejected concepts? Does it not smell of the analogies derived from the mortified and discarded members of intelligence and will?<sup>623</sup>

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<sup>621</sup> 8<sup>th</sup> Duke of Argyll., 1898. *Organic Evolution Cross-examined: or Some Suggestions on the Great Secret of Biology*. London: John Murray. p.3.

<sup>622</sup> *Ibid.*, p.3.

<sup>623</sup> *Ibid.*, pp.26-27.

Thus coming back to the question of definitions and language which we have already looked at in chapters five and six, Argyll's final judgement on Spencer was that "He seeks to exclude mind. But he fails to do so. He seems to think that when he has found a collocation of words which do not expressly convey some particular idea, he has therein found words in which that idea is excluded. This is not so."<sup>624</sup>

The second chapter of the book simply entitled 'Discriminations' specifically targeted Spencer in relation to Lord Salisbury's 1894 address. Yet because Argyll considered Spencer to be a philosophical thinker like himself, he began the chapter on a positive note. Argyll commended Spencer's philosophical thought process in relation to evolution precisely because he felt that it penetrated beyond merely the biological aspect of evolution.<sup>625</sup> On this basis, Argyll could agree with Spencer that there was a distinction between organic evolution and Darwin's specific theory of evolution, such that, if natural selection were to be disproven organic evolution would remain true.<sup>626</sup> For Argyll, the general idea of organic development sat perfectly well with his philosophy, especially if it was an evolutionary progression which was guided by an intelligent designer. However, this was where Argyll's agreement with Spencer ended. At this point Argyll shifted gear and began his critique firstly by stating that Spencer had defined Darwinism (natural selection) but he had not defined what he meant by organic evolution. Rather Spencer had confounded organic evolution with general development which was fallacious.<sup>627</sup>

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<sup>624</sup> *Ibid.*, p.35.

<sup>625</sup> *Ibid.*, pp.66-67.

<sup>626</sup> *Ibid.*, p.68.

<sup>627</sup> *Ibid.*, p.76.

In addition to this Spencer had argued that natural selection and the inheritance of acquired characteristic constituted two very different methods of biological evolution.<sup>628</sup> For Argyll this was simply untrue. Spencer had added nothing new to the concept of evolution by promoting use and disuse because Darwin's 'natural selection' was so vague a term that on its own it essentially covered a myriad of biological explanations, including use and disuse.<sup>629</sup> Finally, Argyll argued that Spencer's understanding of special creation in relation to Salisbury was odd. He said that Spencer held to an idea of special creation in which animals appeared "suddenly, readymade, complete in all their parts", however this was not the way in which theists like Salisbury and himself understood special creation. Rather the core idea of special creation lay in the idea of stability of species. As Argyll summarised it "Species, if not absolutely immutable, have now undoubtedly, and always have had, a high degree of stability and endurance."<sup>630</sup>

This contest between Argyll and Spencer centring on Salisbury continued for the remainder of the 1890s, the entire debate having earlier origins. Yet this short discussion reveals just some of the complexities present in the views of theists and naturalists such as Argyll and Spencer. The debate was less about Darwin's scientific theory and more about a larger philosophical understanding of universal

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<sup>628</sup> Spencer, H., 1895. Lord Salisbury on Evolution. *The Nineteenth Century*, [e-journal] 38(225), 740-757. Available through: Pro Quest Library website  
<<https://www.proquest.com/docview/2651028/C9D194ED05BF4379PQ/5?&imgSeq=1> >  
[Accessed 13 June 2022]. pp.751-752.

<sup>629</sup> 8<sup>th</sup> Duke of Argyll., 1898. *Organic Evolution Cross-examined: or Some Suggestions on the Great Secret of Biology*. London: John Murray. pp.87-88.

<sup>630</sup> *Ibid.*, p.104; This was perhaps a reference to the issue of gaps in the fossil record and the problem of missing links which like Huxley in 1863 had unsuccessfully tried to address in *Evidence as to Man's Place in Nature*.

development and the proper language needed to understand and explain this. Furthermore, regardless of how heated debates between Argyll and Spencer became both men always retained a mutual respect for each other. In a letter to Spencer dated the 26<sup>th</sup> of September 1898, Argyll wrote of how kind it was of Spencer to send his latest volume (probably his *Principles of Ethics*) adding that “There is always in your writings much that I agree with, and often I feel as if – behind a screen on highly- specialized phraseology – there was a great more of the same coincidence of conceptions.”<sup>631</sup> This mutual respect extended to numerous other scientific naturalists. When Tyndall gave his controversial British Association presidential address in Belfast 1874, it was met with great disapproval. Tyndall had waged war against theology arguing that “we claim, and we shall wrest, from theology the entire domain of cosmological theory.”<sup>632</sup> Given the theme of Tyndall’s lecture – a historicisation of the development of materialistic science – it is perhaps not surprising that many accused him of atheism.<sup>633</sup> The tone of his address was far removed from the tone of standard British Association addresses. Despite this, a careful hearing (or reading) of Tyndall’s address reveals a striking lack of atheism, and Argyll was indeed aware of this. In a letter to Tyndall dated to the 23<sup>rd</sup> of April 1875 Argyll wrote that “I have taken no part in the outcry about y[ou]’ Belfast Address – because I thought it greatly misunderstood – and that its tendency is rather to spiritualise matter, than to materialise Thought.” Five days

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<sup>631</sup> Argyll, *Autobiography*, II: 497.

<sup>632</sup> Tyndall’s address was entitled “Address of John Tyndall, F.R.S.,. See, Tyndall, J., 1875. *Report of the Forty-Fourth Meeting of the British Association for the Advancement of Science; Held at Belfast in August 1874*. London: John Murray. p.xcv.

<sup>633</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP. pp.262-264.



later Tyndall's reply stated that "your kindness in writing to me demands a warmer acknowledgement on my part than this mere recognition of your justice. I will not overload my thanks with words – accept them – they are sincere."<sup>634</sup>

Cordial relations also existed between Darwin and Argyll. In 1898 Argyll recalled being invited to London by Darwin during the final years of Darwin's life. During the course of their conversation Darwin mentioned to Argyll an "extraordinary case of adaptation to special function" to which Argyll suggested that he could see no explanation for such facts apart from the working of mind. To this Darwin responded saying that that the thought often came upon him with overwhelming force, but then at other times it completely disappeared.<sup>635</sup>

Likewise when Darwin died on the 19<sup>th</sup> of April 1882 the ten selected pall bearers for his burial ceremony in Westminster Abbey did not include Spencer, but did include Argyll alongside the scientific naturalists John Lubbock, Joseph Hooker and William Spottiswood (Figure 6).

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<sup>634</sup> Letter from Argyll to Tyndall dated 23<sup>rd</sup> April 1875. And letter from Tyndall to Argyll dated 28<sup>th</sup> April 1875 found in Gowan Dawson, Matthew Stanley, and Matthew Wale, eds., *The Correspondence of John Tyndall, vol. 14: 1873-75* (Pittsburgh: University of Pittsburgh Press, forthcoming)

<sup>635</sup> 8<sup>th</sup> Duke of Argyll., 1898. *What is Science*. Edinburgh: David Douglas. p.63.



Figure 6. The funeral ceremony of Charles Darwin at Westminster Abbey, 26 April 1882. Wood engraving. Wellcome Collection. Wellcome Library no. 555412i. Argyll is the gentleman on the right closest to the front looking towards the left.

Also serving as a pall bearer was the ever-fiery Thomas Henry Huxley, and whilst Argyll could claim to have an amicable friendship with most of the other scientific naturalists this was perhaps somewhat of a stretch with Huxley. In a letter to Tyndall Argyll lamented Huxley's aggressive tone towards Christians complaining that "I wish Huxley would not write so offensively. I can understand the agnostic frame of mind perfectly, but I can't understand making it so aggressive. He writes as if every believer in Christianity were no better than the blackbeetle beneath his feet."<sup>636</sup> As with Spencer the tussle between Huxley and Argyll was continuous during the latter half of the century but this letter was most likely a reference to the ongoing contest

<sup>636</sup> Argyll, *Autobiography*, II: 526.

that took place between Argyll and Huxley from 1887 until 1894 also conducted within the pages of the *Nineteenth Century*.

### The Huxley-Argyll dispute and the question of cultural authority

The debate between Huxley and Argyll was of a different kind to that of Spencer and Argyll. Whereas the Spencer-Argyll debate centred around the philosophy of evolution and language, the Huxley-Argyll debate centred around scientific cultural authority. Undoubtedly, what fuelled this debate more than anything was the fact that both Huxley and Argyll were extremely confident (and in my personal view overconfident) men known for their almost unrivalled rhetorical skills. As Bernard Lightman summarises in relation to Huxley on the question of cultural authority during the second half of the nineteenth century, “men such as Huxley became passionately involved because a series of broader issues were at stake, including the nature of science, who had the authority to speak on behalf of science, and even who should be considered the cultural elite of a modern, industrialised British society.”<sup>637</sup> Huxley himself detested any form of clerical control over science as well as any hint of theological bias within the sciences. His vision of society, neatly encapsulated by his fellow scientific naturalist Thomas Hirst, was “Science, pure and free, untrammelled by religious dogma.”<sup>638</sup> The reason, therefore, why theistic scientific aristocrats, such as Argyll, were such a burden for Huxley was because they held immense social and cultural authority in relation to matters of science and

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<sup>637</sup> Lightman, B., 2001. Victorian Sciences and Religions: Discordant Harmonies. In: Brooke, J. H. et al. eds., 2001. *Science in Theistic Contexts: Cognitive Dimensions*. Chicago: UCP. pp.344-345.

<sup>638</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP. p.13.

religion. It was Huxley's aim to undo this. Between 1887 and 1894 Huxley and Argyll engaged in intellectual combat which ranged across a number of topics. But an analysis of some of their engagements reveals that each individual was attempting to discredit the authority of the other within the realm of science.

Huxley first published an article called 'Scientific and Pseudo Scientific Realism' in the *Nineteenth Century* in February 1887 in which he argued against the neo-Newtonian view of miracles of which Argyll was a leading proponent.<sup>639</sup> Although Huxley's article was not aimed at Argyll directly, it was aimed at the creed of the neo-Newtonian position and Argyll would not accept Huxley's verdict. Argyll interpreted Huxley's paper (which did not name any individual) as an attack against Cannon Liddon's St Paul's address which had taken place in 1885 and had defended the neo-Newtonian position. Argyll responded in March accusing Huxley of breaking custom by attacking the speaker at St Paul's to which the speaker could in no way defend himself.<sup>640</sup> Yet Argyll took this opportunity to provoke Huxley far beyond the issue of miracles bluntly claiming that his nature was one of controversy and that Huxley was "on the warpath".<sup>641</sup> Argyll then slightly shifted focus to the realm of biology, what he saw as Huxley's specialist area, and philosophy, what he saw as his specialist area, to denounce Huxley's metaphysics and philosophy as sub-par. Argyll claimed that

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<sup>639</sup> See chapter five for a detailed discussion of the history of neo-Newtonianism and Argyll's role in its popularisation.

<sup>640</sup> 8<sup>th</sup> Duke of Argyll., 1887. Professor Huxley on Cannon Liddon. *The Nineteenth Century*, [e-journal] 1(121), 321-339. Available through Pro Quest website: <  
<https://www.proquest.com/docview/2645146/DC7F38C7020F44C9PQ/1?accountid=14511&imgSeq=1> > [Accessed 4 June 2022]. p.321.

<sup>641</sup> *Ibid.*, p.327.

To dispute with Professor Huxley on any question of Biology, would, for most of us, be as presumptuous as to dispute with Sir Joshua Reynolds on a question of art, or with Sir Isaac Newton on a question of mathematics. But in problems of metaphysics or philosophy he speaks only with the authority which belongs to an acute and powerful mind when dealing with subjects in which other minds, equally powerful and equally acute, have differed, and now differ widely.”<sup>642</sup>

In this context Argyll’s core point was that within the realm of biology Huxley was a force to be reckoned with, however, within the realm of metaphysics and philosophy, Huxley had no more authority than Argyll because Argyll (as his self-confidence often revealed) believed himself to be a ‘force to be reckon with’. Huxley swiftly responded to this damning charge publishing ‘Science and Pseudo-Science’ within a month. In this paper Huxley first countered Argyll by stating that he had not mentioned Cannon Liddon anywhere in his first article, thus Argyll was simply playing off an unwarranted presumption.<sup>643</sup> After this rejoinder Huxley shifted to the meat of the discussion - the issue of cultural authority. He argued that the Establish Church, of which Argyll was a high standing member (in the Scottish context), enjoyed cultural and political advantageous that those outside of the

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<sup>642</sup> *Ibid.*, p.327.

<sup>643</sup> Huxley, T., 1887. Science and Pseudo-Science. *The Nineteenth Century*, [e-journal] 1(122), 481-498. Available through Pro Quest website < <https://www.proquest.com/docview/2642579/80F6A5681BD5473BPQ/1?accountid=14511&imgSeq=1> > [Accessed 4 June 2022]. p.481.

Established Church (English or Scottish) - like himself - did not. However, when a theologian stepped out of line and began to speak on scientific matters, especially in error, it was necessary that a man of science step in and correct that error. For Huxley, the very idea that a preacher should be immune from criticism was simply in worse taste and it made no sense to justify this on the basis of tradition as Argyll had done.<sup>644</sup> Coming back to the theme of his title, Huxley then equated Argyll's *Reign of Law* to the work of Chamber's *Vestiges* claiming that both works were similar in their pseudo-scientific nature ascribing power to law.<sup>645</sup> Argyll's responses to Huxley would not appear until the early 1890s, in two articles entitled 'Professor Huxley on the warpath' (1891) and 'Lord Bacon Vs Professor Huxley' (1894). But the clash of 1887 is enough to demonstrate the larger motives of both Huxley and Argyll as encapsulated throughout most of the second half of the nineteenth century.

As Matthew Stanley has noted, over the course of the twentieth and twenty-first centuries Huxley's vision effectively won out and mainstream science today is practiced under a naturalistic framework.<sup>646</sup> Although religious scientists still abound, it is uncommon to hear scientific discoveries being openly linked to theology or God. On the contrary, there is usually outrage within mainstream science at the slightest hint of theism.<sup>647</sup> Yet during the late nineteenth century,

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<sup>644</sup> *Ibid.*, p.482.

<sup>645</sup> *Ibid.*, p.490.

<sup>646</sup> Stanley, M., 2015. *Huxley's Church & Maxwell's Demon: From Theistic Science to Naturalistic Science*. Chicago and London: UCP. p.242.

<sup>647</sup> Bolton, D., 2016. *Scientific paper which says the human hand was designed by a 'Creator' sparks controversy*. [online] Available at: <  
<https://www.independent.co.uk/news/science/scientific-study-paper-creator-intelligent-design->

science and religion were still inseparable and it was still very much the norm to understand science within a theistic framework.

Furthermore, although usually portrayed as such, Argyll's late-nineteenth-century endeavours did not revolve solely around contests about evolution and/or cultural authority. Until his death Argyll remained centrally engaged in legitimate scientific pursuits which did eventually pay off - although Argyll would not live to see them. Perhaps the main two areas are 1) his central involvement in the legitimisation of the science of flight both in terms of bird flight and machine flight. And 2) his sustained involvement and advocacy of what became Britain's first expedition to Antarctica between 1901 and 1904. Since the first area has already been addressed in detail in chapter four, the next section of this chapter will deal with the second area by showing how Argyll was part of a core group of individuals who first began the push for what by 1901 became the 'Discovery' expedition, led by Captain Robert Scott into the depths of Southern regions of the earth.

#### The road to Antarctica – early rumblings and a select men of science

In July 1901 the 'Discovery' ship, which had been built in Dundee, left the London Docks and made its way South. By Christmas Eve the ship's crew waved goodbye to civilisation as the ship left its final stop in New Zealand and sailed towards the uninhabited continent - the mystery that was Antarctica. This expedition which

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plos-one-creatorgate-a6910171.html > [Accessed 13 June 2022]; Goodstein, L., 2005. *Judge Rejects Teaching Intelligent Design*. [online] Available at: < <https://www.nytimes.com/2005/12/21/education/judge-rejects-teaching-intelligent-design.html> > [Accessed 13 June 2022]; Hutchings, D., Ungureanu, J. C., 2022. *Of Popes & Unicorns: Science, Christianity, and How the Conflict Thesis Fooled the World*. Oxford: OUP. pp.18-19. ; Dawkins, R., 2006. *The God Delusion*. London: Bantam Press.

lasted from 1901 to 1904 had been many years in the making and it was to be the first expedition specifically appointed to explore this icy world. Unlike the many expeditions which had over the decades already explored the Arctic regions, Antarctica only opened up to Britain at the start of the twentieth century.

Today one is most likely to hear about Antarctica in relation to programmes on natural history or the pressing issue of climate change. Episode one of David Attenborough's *Seven Worlds One Planet* series is dedicated to revealing the beauty of the Antarctic region, whilst the Antarctic and South Ocean Coalition are unyielding in their vivid warnings about the imminent climate crisis caused by the melting of the polar region's ice shelves.<sup>648</sup> It is safe to presume that during the late nineteenth century polar enthusiasts were less concerned with climate crisis issues and more concerned with the exploration and documentation of Antarctica with the aim of uncovering its many secrets. There were also supposedly many scientific benefits to be gained and even some potential commercial benefits to be gleaned. Yet as I have discussed in chapter four in the case of aeronautical studies, the British government was not always keen to fund scientific and technological ventures which did not result in a foreseeable return, and they certainly were not about to release thousands from a budget for a ship which would go on a dangerous mission only to be lost to ice. Thus, although there was much interest throughout nineteenth-century Britain regarding the prospect of a mission to the South pole, the essential funding needed to take on such a mission remained out of reach. The 'Challenger'

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<sup>648</sup> BBC., 2019. *Seven Worlds, One Planet*. Series 1:1. Antarctica. [online], Available at: < <https://www.bbc.co.uk/iplayer/episode/m0009tt8/seven-worlds-one-planet-series-1-1-antarctica> > [Accessed 13 June 2022]; ASOC., n.d. *Protecting Antarctica*. [online] Available at: < <https://www.asoc.org/> > [Accessed 13 June 2022].



voyage of 1874, led by Sir George Nares, which had sailed close enough to take pictures of Antarctic icebergs had further highlighted the extent to which there was a lack of knowledge about the region. Reflecting back on the events that led up to the 1901 expedition, Captain Robert Scott, who led the 'Discovery', explained that the return of the 'Challenger' and its published findings marked the "revival of interest in the Far South which, fostered by a few eminent men, continued to spread and culminated in the despatch of the various expeditions which co-operated with the 'Discovery'." <sup>649</sup> Amongst these "few eminent men" were John Murray, Joseph Hooker, Sir George Nares and Argyll.

#### The push towards polar exploration and the scientific cause

The origins of sustained renewed interest in Southern exploration can be traced to a publication dated to January 1894 in the *Geographical Journal*. The publication reports that John Murray, the Canadian born British Oceanographer, marine biologist, and key figure in the 1874 Challenger expedition, had been asked by Mr Clements R. Markham, president of the London Geographical Society, to read a paper he had written on the topic. Present at this London meeting was Joseph Hooker, Argyll, George Nares, R. Vesey Hamilton, Captain Wharton, Charles Beresford, William Turner, William H. Flower, Alexander Buchan, W.S. Bruce, and Dr Neumayer. After Murray's paper Hooker <sup>650</sup> began the discussion remarking

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<sup>649</sup> Scott, R. F., 1907. *The Voyage of the 'Discovery'*. Vol I. New York: Charles Scribner's Sons. p.19.

<sup>650</sup> Between 1839 and 1843 Hooker served in an early British Antarctic voyage when he was appointed assistant surgeon on the HMS *Erebus* which, accompanied by its sister ship the *Terror*, explored the southern oceans.

that previous expeditions which happened to successfully pass by Antarctic had been due to accidental circumstances rather than forethought. A proper expedition thus required forethought and planning.<sup>651</sup> Hooker therefore proposed that the first year of an Antarctic expedition be spent coasting the outskirts of the ice laying down its position, looking out for open water, and taking observations on every possible occasion. He further suggested that on this basis it would be profitable to commission two ships towards the purposes laid out above proceeding from opposite meridians so that the gathering of data would be twice as fast.<sup>652</sup>

After Hooker, Argyll gave his own perspective and this is probably the first time to which Argyll shared his thoughts in a public setting on this matter. In agreement with Hooker, Argyll noted firstly that he could not stay silent on this topic given the paper read by Murray alongside the fact that at this time he himself was the current president of the Scottish Geological Society (a point to which we will return). Argyll noted that it was a shame that in this Christian era (probably referring to the spread of Christianity across the world through missionary and imperial efforts) humans still had not fully explored this small globe that we lived on, further remarking that humans knew more about Mars than about Antarctica.<sup>653</sup> (If alive today Argyll would be shocked to discover that oceanographers continue to make exactly the same comparisons about our lack of knowledge of the oceans compared

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<sup>651</sup> Hooker, J., et al., 1894. The Renewal of Antarctic Exploration: Discussion. *The Geographical Journal*, [e-journal] 3(1), 27-42. <https://doi.org/10.2307/1773600>. p.27.

<sup>652</sup> *Ibid.*, p.29; Hooker's suggestion here makes sense when we understand it as coming out of his own experience on the HMS *Erebus* which was accompanied by the *Terror*.

<sup>653</sup> Scott, R. F., 1907. *The Voyage of the 'Discovery'*. Vol I. New York: Charles Scribner's Sons. p.21.

to planets like Mars).<sup>654</sup>He then went on to reveal his own personal stake in an Antarctic exploration which hinged on his well know distrust of Louis Agassiz's glacial theory. For Argyll, knowledge of Antarctica was important because it would reveal the true nature of ice sheets which rested on a "table-land of comparatively level country" unlike in the Arctic region where the Greenland ice sheets were constantly falling down the slopes of mountains.<sup>655</sup>

Lobbying for government support was a priority task for the men at this meeting. Argyll himself stated that government funding was necessary for this type of expedition. But fully aware of the laissez faire governmental approach he qualified his remark saying that "I am not, however, clear that our Chancellors of the Exchequer at the present time are in a happy condition for disposing of considerable sums of money."<sup>656</sup> In line with his 1855 BAAS address and in disagreement with Murray, Argyll said that there would be economic return from an expedition of this sort to which the government would reap the benefit, if only they would contribute. George Nares agreed with Argyll about the current general ignorance with respect to Antarctica and also as to the positive commercial aspects of such an expedition. For Nares this potential "commercial aspect" was to be located in the vast amounts of sea life that Murray himself had reported. Fishing prospects could indeed yield a return.<sup>657</sup> With the closing of the discussion Markham, the president of the London

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<sup>654</sup> NASA., 2009. *Who are NASA's Earth Explorers?*. [online] Available at: < <https://www.nasa.gov/audience/forstudents/5-8/features/oceans-the-great-unknown-58.html> > [Accessed 21 June 2022].

<sup>655</sup> Hooker, J., Et al., 1894. The Renewal of Antarctic Exploration: Discussion. *The Geographical Journal*, [e-journal] 3(1), 27-42. <https://doi.org/10.2307/1773600>. p.31.

<sup>656</sup> *Ibid.*, p.30.

<sup>657</sup> *Ibid.*, p.31.

Geographical Society commented that “I consider that Dr. Murray’s paper and the important discussion which has followed it will form a new starting point in the advocacy of a renewal of Antarctic discovery.”<sup>658</sup> A new starting point it was indeed, but we must return to Argyll for a moment to better understand why he was interested in Antarctic studies in the first place.

#### Border-lands between geology and geography

Since 1851 Argyll had become well-known as an amateur geologist regularly attending meetings at the Geological Society of London and serving as president of the Edinburgh Geological Society from 1872 to 1874. Furthermore in 1883 at the Museum of Science and Arts in Edinburgh Argyll gave the address for the Societies’ fiftieth anniversary.<sup>659</sup> When it came to debates about the earth’s geological past Argyll was one of a number of sceptics in relation to Louis Agassiz’s glacial theory. Agassiz had argued in 1837 that at some point in its recent past the earth had been submerged in ice which had covered the northern hemisphere of the world.<sup>660</sup> Unimpressed by what he saw as the many problems within this theory Argyll stood firmly on side of catastrophism. Catastrophism was the dominant position of the early nineteenth century promoted by geologists such as William Buckland and Adam Sedgwick. The basic idea being that the earth had undergone not just one flood as the bible had spoken of but numerous floods that

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<sup>658</sup> *Ibid.*, p.37.

<sup>659</sup> 8<sup>th</sup> Duke of Argyll., 1885. Continuity and catastrophes in geology. *Transactions of the Edinburgh Geological Society*, [e-journal] 5(1), 1-27. <https://doi.org/10.1144/transed.5.1.1>.

<sup>660</sup> Rudwick, M. J. S., 2014. *Earth’s Deep History: how it was Discovered and Why it Matters*. Chicago and London: UCP. p.177.

likely predated the bible. Each new flood resulted in the extinction of biological life within that world followed by the birth of completely new species in the new post-flood world.<sup>661</sup> Humans were thus the result of the final and most recent flood which had taken place many thousands of years ago. In summary, the question separating Agassiz and Argyll centred on the nature of the earth's recent past. Was the earth subjected to an ice age or a flood? Argyll would retain his position to his death. But it did not hinder him from promoting Southern exploration; indeed it served as his core motivation for its promotion.

We have already seen some of Argyll's reasoning from the 1894 meeting, however, if we go back to 1890 we can examine more. Argyll became president of the Geographical Society of Edinburgh in 1889 and in 1890 he presented his first paper which was entitled 'Border-Lands Between Geology and Geography'. The overall focus of this paper was firstly, about present knowledge of ice sheets gained from a series of Arctic explorations to Greenland. And secondly, his defence of a recent global flood in opposition to Agassiz's glacial theory. Argyll began by discussing the link between geology and geography suggesting that because time is always moving forward geography, which is about the present, is always becoming geology, which is about the past.<sup>662</sup> He then quickly moved to talk about the glacial theory and how it was now largely accepted though still questioned by a few. As one of those few, Argyll turned his attention to Greenland, and taking an ironically Lyellian approach to the past, suggested that the way that the glaciers of Greenland

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<sup>661</sup> *Ibid.*, p.106.

<sup>662</sup> 8<sup>th</sup> Duke of Argyll., 1890. Border-Lands Between Geology and Geography. *The Scottish geographical Magazine*, [e-journal], 169-181. <https://doi.org/10.1080/00369225.1890.10807337>. p.169.

act in the present seem to suggest that they could never do the work that Agassiz has assumed them to do in the past. “If ice in enormous masses could ever do the work which it is often supposed to have done in the glacial age, it ought to be seen doing that work now on each of the two sides of Greenland.”<sup>663</sup> Since this was not the case, the glacial theory according to Argyll must be a false interpretation. Argyll then laid out his own position based on his own private investigations arguing that there was no glaciated ice age, but there was a “glacial sea”

I shall content myself with saying, that a long study of, and a constant residing among, hill surfaces which exhibit every British form of glaciation, have convinced me that every one of these forms are to be accounted for, either by common small local glaciers following the contours of the existing hills and valleys, or else by floating ice grounding on our hilltops and lower ridges, during a submergence of the land under a glacial sea to the depth of at least 2000 feet.<sup>664</sup>

Of course the very possibility to conduct a long study due to residing among hill surfaces constitutes another example of the aristocratic domestic scientific space. Opportunities as such were certainly not afforded to the majority. As such, country-house science is shown to have persisted well into the late Victorian period. In concluding his paper Argyll, putting on his philosophical cap, positing that

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<sup>663</sup> *Ibid.*, p.171.

<sup>664</sup> *Ibid.*, p.177.

Above all, we must get rid of the prepossession that slowly operating causes can never produce sudden results...Molecular changes<sup>665</sup> of infinite fineness and of great slowness are constantly in our existing world, culminating at least in sudden changes of comparatively large extent, which we in our littleness may think of and speak of as catastrophes.<sup>666</sup>

This statement was in line with Argyll's larger science of philosophy which he held to throughout his adult life. In a very short book entitled *What is Science?* that he published two years before his death his main thesis contended that we should not exclude explanations from science which seem to be contrary to the laws of nature. "If once we realise the necessary fact that some other process must have started or begun the series, - then we must also realise the impossibility of limiting the number of times, or the varieties of method, under which that other process may have been repeated."<sup>667</sup> This argument can be further divided into two parts relating to biological and geological evolution. Firstly, as he had elucidated in the *Reign of Law* the laws of nature did not exclude God since all of God's acts were natural. Thus, since Darwin had no answer to the origin of first life, we must not rule out

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<sup>665</sup> Here Argyll could be directing his remark towards Tyndall who at one point in his 1874 British Association Belfast Address talked about the conservation of energy which brought every effect in nature into a law of causal connection ultimately underpinned by the active transfer of molecules. Argyll felt that this understanding of nature was too restrictive.

<sup>666</sup> 8<sup>th</sup> Duke of Argyll., 1890. Border-Lands Between Geology and Geography. *The Scottish geographical Magazine*, [e-journal], 169-181. <https://doi.org/10.1080/00369225.1890.10807337>. p.181.

<sup>667</sup> 8<sup>th</sup> Duke of Argyll., 1898. *What is Science*. Edinburgh: David Douglas. p.60.

the idea that the first life must itself have come from a source of life i.e. God. Secondly, we cannot rule out evidence of a recent flood if we see evidence of previous floods at specific periods in the history of the earth. In short, we can understand Argyll's philosophical argument as an attempt to resist the limiting nature of what is commonly today called 'methodological naturalism', the idea that science could only appeal to answers that existed within the bounds of the natural world. Argyll questioned where those boundaries were and explored what it would mean for science if it extended the boundaries of nature to include God.

Shifting back to the topic of geography, we can now hopefully better see how his paper of 1890 and the discussion of 1894 connect. Argyll was aware of the results of Greenland surveys, yet in comparison almost no surveys of the Southern region had been carried out. Since the ice sheets on Greenland held no promise in putting to rest the dispute surrounding 'glacial ice' or 'glacial sea', Antarctica now seemed to hold such a promise. Because of this an expedition to Antarctica was the best method of attaining the results which would finally put to rest the debate between Agassiz and Argyll.

Despite the renewed interest in Southern exploration repeated attempts for government funding failed between 1893 and 1896 and it soon became apparent that the Antarctic enthusiasts would need to obtain the funds through other means. They therefore turned to the members of the Royal Society of London.<sup>668</sup> John Murray, Argyll, Hooker and a number of other Antarctica enthusiasts contributed to an article in the in the *Philosophical Transactions of the Royal Society* dated 24<sup>th</sup>

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<sup>668</sup> Scott, R. F., 1907. *The Voyage of the 'Discovery'*. Vol I. New York: Charles Scribner's Sons. pp.21-22.



February 1898 entitled ‘The Scientific Advantages of an Antarctic Expedition’. Taking a similar approach to the 1894 meeting Murray, Argyll, Hooker and other members addressed the issue at hand with a specific focus on the scientific advantages. Murray argued that very little was currently known about Antarctica and what was known was largely “hypothetical” therefore “the results of a successful Antarctic expedition would mark a great advance in the philosophy - apart from the mere fact – of terrestrial science”.<sup>669</sup> Argyll’s contribution was much shorter in length, but as a man who had devoted his life to numerous areas of science he felt that the benefits of an Antarctic exploration were of obvious gain to the scientific community. For Argyll, Antarctic exploration had the potential to enhance many of the sciences from oceanic circulation, meteorology, magnetism, and geology, to flora and fauna studies, mineralogy, and volcanic action.<sup>670</sup> Of course Argyll took the opportunity to raise his query about Agassiz stating that with a successful Antarctic exploration we would finally be able to settle the vexing question at hand because the nature of the ice sheets in Antarctica would provide a more accurate representation of what exactly ice sheets were capable of doing.<sup>671</sup>

#### From a hope to a reality: the ‘Discovery’ comes to life

The year 1898 was crucial for what would be the eventual construction and sailing of the ‘Discovery’ in 1901. Whilst Murray, Argyll, Hooker and others were busy

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<sup>669</sup> Murray, J et al., 1898. The Scientific Advantages of an Antarctic Expedition. *Proceedings of the Royal Society of London*, [e-journal] 62, 424-451. Available through: Jstor Library website < <https://www.jstor.org/stable/115750> > [Accessed 5 June 2022]. p.434.

<sup>670</sup> *Ibid.*, p.435.

<sup>671</sup> *Ibid.*, p.436.

convincing members of the Royal Society to buy into this new maritime scheme, Clements Markham was simultaneously at work raising subscriptions from members of the Geographical Society to which he was able to leverage £5,000 - not much, but a start. A year later however, hopes were drastically raised when Mr. Llewellyn Longstaff, a wealthy industrialist, provided £25,000 for the expedition.<sup>672</sup> As well as a general increase in donations from 1899, the historian Ana Savours has argued that this large one-time donation of £25,000 served to shift the government's stance on the entire expedition. This is evidenced by the fact that when re-approached during this period the government offered to contribute £45,000 if the sum could be matched.<sup>673</sup> Indeed after continued appeals to private sources large and small were donated including £1,500 from Mrs Dawson Lambton and £5000 from Sir Alfred Harmsworth, the sum from private sources eventually reached £47,000; the government then provided another £47,000 making the total £94,000. Argyll must have been elated when he found out that the funds had been raised, and he must have felt further excitement when he received news that the Dundee Shipbuilding Company, under the direction of the Chief Naval Constructor W. E. Smith, had begun work on the new ship in March 1900.

Sadly for Argyll all his personal excitement would come to an end because a month later he passed away. Although Argyll was particularly strong and healthy

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<sup>672</sup> Scott, R. F., 1907. *The Voyage of the 'Discovery'*. Vol I. New York: Charles Scribner's Sons. p.23; Mr Longstaff who spent most of his time living in Wimbledon, descended from a wealthy coal mine owning family. The eldest son of George Dixon Longstaff, Llewellyn studied at the London Royal College of Chemistry and later became a Fellow of the Royal Geographical Society. He went on to have a successful seventeen-year business in Kingston Upon Hull as a large shareholder in the paint company Blundell Spence & Company.

<sup>673</sup> Savours, A., 2001. *The Voyage of the Discovery*. Barnsley: Seaforth Publishing. p.8.

during the autumn of 1899, he suffered a gout attack during December which resisted all forms of treatment. Over the next few months a speedy recovery was not forthcoming and on the 24<sup>th</sup> of April 1900 at 2:35 in the morning at the age of 77 Argyll passed away peacefully at Inveraray Castle surrounded by friends and family.<sup>674</sup> Argyll's family received countless letters of condolences from friends and acquaintance from all walks of life.<sup>675</sup> And a few days after his death he was buried in the mausoleum at Kilmun, South of Inveraray on the Holy Loch which had been built in 1795 to serve as a resting place for the Dukes and Duchesses of the Argyll family.

Argyll was never able to settle the debate about 'glacial ice' or 'glacial sea' and he went to his grave staunchly convinced of a recent global flood event. But regardless of whether he was wrong or right his conviction spurred him towards the undertaking a large-scale scientific project just as he had done with his similarly firm conviction in the possibility of flight. The 'Discovery' ship would go on to complete a successful mission between 1901 and 1904 and Captain Scott later published *The Voyage of the Discovery* (1907) to commemorate both the expedition itself and the individuals such as Murray, Markham, and Argyll who between 1894 and 1900 turned the expedition from a hope to a reality.

#### Debate, authority, and legitimacy and complexity

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<sup>674</sup> Edinburgh Evening News, 1900. Death of Duke of Argyll. *The Edinburgh Evening News*, 24 April. p.4d.

<sup>675</sup> Inveraray Castle archives, Bundles 316, 1633.

Argyll indeed was and is a complicated figure but historians of science have only picked up on one side of this complexity. In this chapter, I have endeavoured to provide a more balanced account of Argyll's post-1850 engagements by focusing on the three themes of debate, authority, and legitimacy. To reiterate what I said in the introduction, whilst it is true to say that Argyll was a man involved in a great deal of scientific controversy, he was certainly not only involved in scientific controversy. Argyll was indeed a Christian man of science who was always confident about his reasoning abilities and this characterised his entire life. As a result, he was not prone to easily back down from a fight no matter how intense. Argyll's theistic scientific stance could be a benefit or a hinderance to himself. For example, in the Huxley debate of 1887, Huxley was able to call out Argyll's unwarranted assumption about Cannon Liddon. On the other hand, Argyll's insistence that biological variety could arise for mere aesthetic purposes eventually persuaded Darwin into adopting this idea. As demonstrated in this chapter, beneath the pages of contest that littered periodicals such as the *Nineteenth Century* Argyll and his opponents always maintained a respectful friendship (even if some opponents made this more difficult than others.) Lastly, and most importantly I have shown that historians of science have neglected Argyll's role as one of the core initiators of the 'Discovery' expedition of 1901 to 1904 precisely because they have hitherto been able to access only limited accounts on Argyll and the topics of debate and cultural authority. In this chapter Argyll therefore finally emerges as a figure who was involved in global scientific maritime exploration working not against his usual opponents, but instead with them, in this case Joseph Hooker.

Yet it is rare to see or hear of an aristocrat actively engaged in matters of contemporary global science, technology and innovation. And so, with this in mind, we must ask and at least attempt to answer some imperative questions. What was Argyll's impact in the context of the wider network of Victorian scientific aristocrats? Why did the concept of the 'scientific aristocrat' slowly fade away by the twentieth century? And perhaps most importantly, what was Argyll's legacy, and what lessons can be learnt through Argyll about the expansion, institutionalisation, and professionalisation of science and technology throughout the late-Victorian British empire?

## **Chapter 8: Conclusion**

Argyll was a man of many talents. Whatever one may have thought of him during his time, and whatever one thinks of him today, it is undeniable that his breadth and depth of knowledge was vast. In many respects he was the quintessential Victorian polymath. Not only was his knowledge deep and wide, but he was also a part of the most elite social class with sums of money and acres of land which the average Victorian could only ever dream of attaining. Beyond his wealth and status however, one core reason as to why Argyll ends up being such a fascinating case study is simply the fact that his literary output was so extensive. In comparison to the other Victorian scientific aristocrats, Argyll's output easily overshadowed any of their own efforts – even that of Mary Ward who was known for her voluminous writings.

Argyll developed a love for science and philosophical thought from a young age, and as a result, he invested a tremendous amount of time participating in an array of scientific and technological endeavours including ornithology, aeronautics, geology, education, and geographical expedition. His Christian values - cultivated through his mother - shaped much of this engagement. His neo-Newtonian understanding of miracles was an overt product of his belief in the continuity of divine action amidst the tightening notion of uniformity in nature. As an adult, his abolitionist stance and theological anthropology (in the form of the degradation theory) were both motivated by Christian assumptions about the equal worth of all humans as creations of God. And finally, his pervasive, and often polemical, attack on scientific naturalism was rooted in the idea that if unchecked, naturalistic science would slowly erode, and eventually completely destroy, the foundations of theistic

science. Of course, Argyll was not alone in this fight and over the years historians have pointed out how powerful networks such as the popularisers of science, North British men of science and – less respectably - spiritualists, constantly frustrated the project of scientific naturalism.<sup>676</sup> Through the work of Donald Opitz and now this thesis, historians can certainly add the network of theistic scientific aristocrats to this list. One only needs to look at the continuous competition between Argyll and naturalists such as Darwin, Huxley and Spencer to view conspicuous examples of the ways in which the theistic scientific aristocrats could effectively combat naturalistic science.

Regardless of the seemingly eternal contest that ensued between theistic science and naturalistic science, the aim of this thesis has moved beyond the question of science-religion compatibility and has shifted towards science and religion as a part of wider themes including race, education, empire, and engineering. Another key theme in my thesis has been the institutionalisation of science in nineteenth-century Britain through an exploration of the various geographies of science that Argyll functioned within. From this perspective I have advanced an argument suggesting that aristocrats such as Argyll played a role in the history of the institutionalisation of science.

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<sup>676</sup> Various scholars have written on these groups. See Lightman, B., 2007. *Victorian Popularizers of Science*. Chicago and London: UCP for more on the popularisers of science; see Smith, C., 1998. *The Science of Energy: A cultural History of Energy Physics in Victorian Britain*. London: The Athlone Press, for more on the North British men of science; see Ferguson, C., Sera-Shriar, E., Merklings, E. n.d. *The Media of Mediumship*. [online] Available at: <https://mediaofmediumship.stir.ac.uk/> [Accessed 2 June 2022] for an ongoing project on Victorian spiritualism and mediumship.

One reason why I think that this argument has grounding is because scholars of science and technology have demonstrated that between the eighteenth and twentieth centuries, science effectively (at least in a European context) shifted from small scale to large scale. The leading historian of science Steven Shapin said that during the seventeenth and eighteenth centuries “The overwhelming majority of experimental trials, displays, and discussions that we know about occurred within private residence.”<sup>677</sup> In agreement, the early modernist Simon Werrett has said that “using the home and its furnishing for science was just a part of the history of domestic development.” Accordingly, it was not until the nineteenth century that laboratories begun to appear acting more and more as distinct spaces of science.<sup>678</sup> This, however, came at the cost of the domestic space which, over time, lost its association with the practice of science. In sum, during the nineteenth century science transitioned from the home to the laboratory, especially in the British context. Werrett points out numerous factors which account for this shift, <sup>679</sup> one being that as scientific instruments got bigger and more specialised, they needed a larger home. As he puts it “specialized instruments could increase in *scale*. While homely apparatus rarely expanded beyond a size convenient for a room or garden, dedicated laboratory apparatus could grow indefinitely.”<sup>680</sup>

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<sup>677</sup> Werrett, S., 2019. *Thrifty Science: Making the Most of Materials in the History of Experiment*. Chicago and London: UCP. p.42

*Ibid.*, p.46

<sup>678</sup> James, F. A. J. L., ed., 1989. *The Development of the Laboratory: Essays on the Place of Experiment in Industrial Civilization*. London: Macmillan Press

<sup>679</sup> Werrett, S., 2019. *Thrifty Science: Making the Most of Materials in the History of Experiment*. Chicago and London: UCP. pp.170-174

<sup>680</sup> *Ibid.*, p.174



The modern evolution of science in terms of scale and specialism sits neatly with my overall thesis because it contextualises the aristocratic position and contribution to Victorian science and technology. If the eighteenth century was the period of homely science, and the twentieth century was the period of Big Science, then the nineteenth century served as the transition period from homely science to Big Science.<sup>681</sup> This is precisely why country-house science remained core to the aristocratic tradition during the nineteenth century whilst those same aristocrats advocated for government support towards science. Victorian governments held to a largely laissez faire attitude when it came to science funding which meant that for most of the nineteenth century there were few secure scientific positions. Furthermore, there was a lack of state support towards research and development (R&D) initiatives.<sup>682</sup> Wealth thus played a central part in who could partake in scientific life. Since the aristocratic class were amongst some of the wealthiest people in the world, mainly through landownership and agriculture, they had both the time and means of engaging in science without needing to make a living from it. Within this context we can understand how aristocrats like Argyll were important within this transition. Argyll and the other aristocrats could push for the institutionalisation of science – thus, in some sense, facilitating the transition to Big Science - whilst themselves continuing to practice domestic science - which itself

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<sup>681</sup> It is important to note that this is not a universally homogenous narrative. If we look beyond the European and North American context then a slightly different story emerges. See for example Tilley, H., 2011. *Africa As a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870-1950*. Chicago and London: UCP; and also, Mavhunga, C. C., ed., 2017. *What Do Science, Technology, and Innovation Mean from Africa?*. Boston: Massachusetts Institute of Technology, for the ways in which the European empires shaped the African scientific knowledge, and African scientific knowledge shaped European empires.

<sup>682</sup> Barton, R., 2018. *The X Club*. Chicago and London: UCP. pp.292-297.

was indeed a form of scientific practice on a large scale (especially in the nineteenth century). Argyll expressly argued for more state support towards scientific and technological ends (for example in his 1855 British Association presidential address) whilst he himself conducted virtually all of his scientific experiments at home. The government would provide selective financial aid to a few more enterprises later in the century such as the £47,000 given towards the ‘Discovery’ expedition, but this meant ignoring other enterprises such as the Aëronautical Society of Great Britain. In the case of the latter, Argyll’s own home and wealth could serve almost as a government substitute for the purposes of knowledge facilitation, administration and R&D, for example early Aëronautical Society meetings. The RIEC holds an interesting place within this context because unlike the ‘Discovery’ expedition or Aëronautical Society, Argyll was in a high cabinet position as Secretary of State for India. In the case of the RIEC then, the government were directly involved from the start, yet even in this position of authority Argyll still could not simply direct state funds towards the college and so instead sought means by which he and other supporters of the college could set up the RIEC – a goal which succeeded in 1871 - without it leading to state financial loss - a goal which failed within a decade.

In spite of his numerous institutionalising efforts Argyll – alongside the other Victorian scientific aristocratic elites - lived at a precarious point in time and by the twentieth century the idea of the ‘scientific aristocrat’ slowly faded away. There are many reasons for this decline. The aristocratic class had already begun to notice a shift in power from aristocracy to democracy in the 1880s. As a member of the Conservatives Lord Salisbury wrote an anonymous article entitled ‘Disintegration’

(1883) in the *Quarterly Review* where he decried the loss of aristocratic influence in Westminster stating that “the control of the machine [Parliament] was largely shared by the Crown and aristocracy. Now it is entirely in the hands of democracy.” Despite this lamentation Salisbury grudgingly acknowledged that this shift had become inevitable.<sup>683</sup> Other crucial factors which the historian David Cannadine has aptly pointed out - such as the third Reform Act (1884-5), the agricultural depression beginning in the 1870s (despite Argyll’s early denial of the phenomena)<sup>684</sup>, and the 1911 Act of Parliament - all served to drastically reduce the power, control, and wealth of the aristocracy in relation to parliament, society, and land ownership.<sup>685</sup> These factors affected all British aristocrats, but in terms of the scientific aristocrats there are even more specific reasons for their decline. I would suggest that the lost and forgotten concept of the ‘scientific aristocrat’ arose in part from the paradoxical position that the Victorian aristocrats found themselves in as 1) seeking to modernise, industrialise, and institutionalise science and technology, yet 2) themselves inherently tied to an antiquated system that was increasingly falling out of favour. Argyll’s actions display this pattern very plainly in the way that he routinely established societies and institutions such as the ASGB and RIEC. Yet once established he left the running of those societies and institutions to

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<sup>683</sup> Smith, P., ed., 2010. *Lord Salisbury on Politics: A selection from his articles in the Quarterly Review, 1860-1883*. Cambridge: CUP. pp.346, 350.

<sup>684</sup> In 1882 Argyll published an article in the *Contemporary Review* where he argued that the current agricultural depression was nothing to worry about because it was simply a short-term occurrence due to an extraordinary succession of cold and wet seasons, thus British agriculture at large was not in any trouble.

<sup>685</sup> Cannadine, D., 1990. *The Decline and Fall of the British Aristocracy*. London: The Penguin Group. pp.1-53.

members of the rising scientific professional middle class. Thus, although aristocrats, like Argyll, were serious players in Victorian science and technology in a variety of ways there is no doubt that their declining influence was an unintended consequence of their own actions. On top of this, state funding for higher education - which in turn provided more funding for science - increased noticeably between the 1890s and the 1910s.<sup>686</sup> However, this meant that the British scientific aristocrats became less valuable assets since the government could begin to take over their historical role as patrons and providers of spaces (institutions) for the purposes of R&D.

#### Empire, race, and the domestic and institutional expansion of Victorian science

Yet the institutional expansion of late-Victorian science took place within a society that was steeped in racial thought and imperial expansion; over the past few decades historians of science have become much more aware of this fact.<sup>687</sup> In this light Argyll is perhaps one of the best Victorian aristocrats to study in terms of developing an understanding of the entangled nature of science, technology, race, empire and social status (as seen in chapters 3, 4 and 6).

One of the complications I have brought to light through my thesis is the tension between race, slavery and imperialism. In Victorian Britain racism and imperialism were deeply interconnected although individual views about these realities could

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<sup>686</sup> Bruland, K., Mowery, D. C., 2006. Innovation through Time. In Fagerberg, J., Mowery, D., eds. 2006. *The Oxford Handbook of Innovation*. Oxford: OUP. Chapter 13. p.361.

<sup>687</sup> See, Livingstone, D. N., 2008. *Adam's Ancestors: Race, Religion & the Politics of Human Origins*. Baltimore: The John Hopkins University Press; Goss, A., 2021. *The Routledge Handbook of Science and Empire*. Abingdon: Routledge.

and did exist on a spectrum. Whilst there were many imperialists who were also overtly racist and pro-slavery Argyll himself does not quite fit into this category. Indeed Argyll was a proud imperialist but he was an intellectual anti-racist who became an outspoken abolitionist. Yet, complexities arise since it is clear that much of the wealth that served to uphold the Argyll family in nineteenth-century Britain was derived through means of African enslavement - most notably through two of his fathers' wives. Thus an argument could be made that the domestic scientific practices of both the 7<sup>th</sup> and 8<sup>th</sup> Dukes of Argyll were sustained, at least in part, through wealth linked to slavery. Whether this argument can be applied to more or all of the scientific aristocrats involved in country house science is something very much open to investigation.

Shifting from domestic spaces of science to institutional spaces of science, the RIEC has provided an ideal establishment for this type of analysis. As a result, I have shown how Argyll not only utilised imperialism to advance science, but also science to advance imperialism. In my introduction one of my key arguments was that, prior to the twentieth century, scientific authority was a product of birth, status, wealth and ability. Over time, birth, status, (and to some degree, wealth), became less important. Ability became the primary means of securing scientific standing. As a result, the concept of the 'scientific aristocrat' slowly faded away. Alongside this transition from social status towards ability, imperialism, institutionalisation and racism became further intertwined as the British empire expanded into continents such as Africa.<sup>688</sup> In particular, my thesis has demonstrated how

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<sup>688</sup> McCaskie, T. C., 1999. Cultural Encounters: Britain and Africa in the Nineteenth Century. In: Porter, A. ed., 1999. *The Oxford History of the British Empire: The Nineteenth Century*. Oxford

ethnological and anthropological hierarchies of power - which had developed in the late eighteenth century - could and did function in Victorian Britain enabling many to justify the assumption of British (and wider European) intellectual and political dominance over places such as India and Africa. One such example of countless other middle-class figures in this light was Sir Henry Wellcome, (1853 – 1836), a pharmacist and collector who built a highly successful private pharmaceutical company (Burroughs Wellcome and Company in 1880), and later a Museum (the Wellcome Historical Medical Museum in 1913) to hold his global collection. Both his pharmaceutical enterprise and Museum benefitted directly from cultural and botanical artefacts and specimens which were gathered (often in ways that exoticised and exploited indigenous peoples) by the agents of Wellcome who searched throughout the British empire to fulfil his requests. The set up for Wellcome’s Medical Museum was based on a racist anthropological framework of ‘primitive’ medical knowledge (non-European) juxtaposed against ‘civilised’ medical knowledge (European).<sup>689</sup> By the end of his life, Wellcome had become known for three things: his wealth, his collection of over one million medically related items from all over the world, and his mission to improve health through research, yet it is only in recent years that his racist and imperial legacy is actively being added to this list and investigated.<sup>690</sup>

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and New York: OUP. Chapter twenty-nine; This is despite the efforts of people such as Haddon and Boas who did actively question racial and imperial assumptions about Western superiority.

<sup>689</sup> Larson, F., 2009. *An Infinity of Things: How Sir Henry Wellcome Collected the World*. Oxford: OUP. pp.146-; Wellcome Collection, 2021. *The colonial roots of our collections, and our response*. [online] Available at: <<https://wellcomecollection.org/pages/YLnsihAAACEAfsuu>> [Accessed 14 November 2022]

<sup>690</sup> *Ibid.*,

In many ways my thesis on Argyll has provided me with both the necessary tools and knowledge to undertake important future research in areas relating to museum collectors and collections. This may not at first seem like a natural leap, however, as Frances Larson - biographer of Henry Wellcome – argues, “The analysis of museum collectors and collections, and the practice of life writing have much in common. Both require a balancing act to keep their subject at the centre of the frame, while exploring the ways in which the subject is constituted through a peopled material world largely beyond their control.”<sup>691</sup> This has certainly been my experience with this thesis on Argyll, but accomplishing it has indeed provided me with expert knowledge regarding methods of approaching immensely complicated histories attached to institutions such as museums. This is because Western museums are often tied to an individual actor’s imperialist and racist collecting practices and organising principles. In my current position I have already taken up this task through my research on a historic African collection gathered during the late nineteenth and early twentieth centuries by Wellcome and his agents which was eventually transferred (on long-term loan) to the Science Museum in the 1980s. Thus, my future research activities have morphed into present research activities, however, there are numerous other areas of which I suggest future research could go - relative to where my thesis has left off.

#### Future research directions

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<sup>691</sup> Larson, F., 2009. *An Infinity of Things: How Sir Henry Wellcome Collected the World*. Oxford: OUP. p.6.

Taking cue from where my thesis ends, future research could go in a range of directions. Firstly, with the work of Opitz, Mulhern and now my own, a more coherent picture of Argyll is finally emerging. But there is certainly need for a project that can bring his life and work into one centralised location, perhaps in the form of a biography, or an edited collection of essays devoted to Argyll. Secondly, there is much room for individual articles on Argyll relating to some of the topics I have suggested in the limitations section of this thesis' introduction plus many more that I have not been able to mention. Thirdly, a future plan of research to which I would perhaps take up, given the opportunity, is to publish a book which builds upon my thesis. My thesis is limited in that although it discusses aristocracy and meritocracy the focus is on the former. This is necessary because my thesis had to concentrate primarily on Argyll. However, my overall argument is much larger than Argyll. The larger idea has the potential to be fleshed out in a book that looks at the nineteenth, twentieth and twenty-first centuries. Using a case-study approach this work could take Argyll as the nineteenth-century British representative, a figure like Charles Lindbergh or Frederick McKinley Jones as the twentieth-century America representative (though there are many options to select from), and Elon Musk as the twenty-first century representative. Through this case study on each figure one could show the discrete yet connected ways in which global science, technology, and innovation has developed and the many contingencies that have influenced this development. Fourthly, a sustained investigation of the role of the British aristocracy in relation to the development of science and empire would yield very interesting results. My thesis has only begun this through my study of Argyll but there are numerous interlocking ways in which the British aristocrats (both the



known and lesser known names) engaged in, as well as, laid some of the core foundations for imperial level scientific activity from the nineteenth into the twentieth centuries. Of course, all of this is not to say that global science, technology and innovation is solely a product of the West. Numerous works in recent years have sought to redress this idea that science, technology, and innovation only took place in the West.<sup>692</sup> But a project along the lines of what I have suggested is novel, and would bring a more nuanced understanding of the individuals who have significantly shaped the modern global scientific and technological landscape.

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<sup>692</sup> Mavhunga, C. C., ed., 2017. *What Do Science, Technology, and Innovation Mean from Africa?*. Massachusetts: Massachusetts Institute of Technology; Seow, V., 2022. *Carbon Technocracy: Energy Regimes in Modern East Asia*. Chicago: UCP; Qidwai, S. A., 2021. *Sir Syed (1817-1898) and Science: Popularization in Nineteenth Century India*. Ph.D. University of Toronto.

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