ANGLICA

An International Journal of English Studies

25/1 2016

UNIVERSITY OF WARSAW

Katrin Berndt
University of Bremen

"The Things We Are": Alasdair Gray's
Poor Things and the Science of Man

Abstract

The aim of this article is to examine the influence of Scottish Enlightenment philosophy on Alasdair Gray's novel *Poor Things* (1992) with a particular focus on its references to the natural and life sciences. The essay argues that the novel allegorizes two central themes of the eighteenth-century Science of Man: it stresses the social nature of human beings, and it aims for a comprehensive portrayal of human nature whose different aspects are depicted in explicit connection with one another. The article shows that Gray employs the emancipatory framework of Scottish Enlightenment philosophy in order to communicate an idealistic belief in the possibility of gradual improvement of society.

Since its publication in 1992, contemporary Scottish writer Alasdair Gray's novel *Poor Things* has been discussed by scholars as an example of historiographic metafiction that self-referentially examines Neo-Victorian (re)constructions of history. A semi-fantastic narrative set in the European *fin de siècle* period with references to historical figures from literature, politics, and science, the novel has been approached as a "postmodern narrative that explores the notion of selfhood [...] by literalizing the mind / body split" (Kaczvinsky 775); as a literary rendition of a "post-humanist cosmopolitanism" that overcomes the Kantian division of man into autonomous intelligence and automatic animal nature (Vardoulakis 137); and as an "authentic history" that confronts the ideological foundation and moral legacy of the British Empire (Baker 58). Last but not least, *Poor Things* has been understood as a postmodern rewriting of the Frankenstein myth, including characters modelled on the historical members of the Wollstonecraft-Godwin-Shelley circle (see Tiitinen). These analyses have shed light on the text's literary, political, historical, and philosophical dimensions, emphasizing Gray's interest in debating different forms of knowledge in the pursuit of understanding human nature. The references to the history of science in his novel, however, have received little attention in literary scholarship so far, while their significance for the text's manifestation of values of the Scottish Enlightenment has not been considered at all. This paper attends to these lacunae by discussing the inclusion of sciences such as

medicine, physics, and biology in *Poor Things* as a manifestation of a philosophy of the Scottish Enlightenment, the so-called Science of Man, which will also be identified in the novel's story and discursive features. Inspired by this intellectual tradition, *Poor Things* will be shown to draw on aesthetic, political, social, and scientific knowledge in its exploration of the achievements and drawbacks of what was considered 'progress' in Victorian and Edwardian Britain.

Before discussing how its representation of science complements the novel's comprehensive approach to historical notions of progress, it is important to outline briefly the eighteenth-century philosophy of the Science of Man. The Scottish Enlightenment included such formidable thinkers as Adam Ferguson, David Hume, and Adam Smith, who conceived of humans as naturally social beings, and believed in the possibility of improving society through the application of common sense and inductive reasoning. Proceeding from their empirical observation of human nature, these philosophers sought to uncover the principles that determined history, economy, social interactions and society, and political organization. Committed to "the study of human life" in all of its forms and aspects, the philosophers engaged in developing a Science of Man and "stimulated a range of new disciplinary frameworks built on an evolutionary model, from developmental psychology to literary history and comparative literature" (Manning 10). They were concerned with encouraging civil engagement, the promotion of a moral philosophy based on other-regarding sympathy as a guiding force in human conduct and interactions, and they debated the idea of progress itself. The natural and life sciences were understood as an integral part of their intellectual exploration, and as conducive to the improvement of society; the involvement of scholars and researchers from medicine, geology, chemistry, and mathematics in the Science of Man demonstrates the philosophy's all-encompassing character and objective. The guiding principle of all their research was its presumed usefulness, and while the applicability of the so-called abstract and speculative sciences (which, in the eighteenth century, included physics and mathematics) was sometimes in question, there was no doubt that theoretical enquiries at least served to "improve the mind" (Hume 54). In their attempt to develop a shared methodology for all branches of science and intellectual enquiry, philosophers of the Science of Man sought to overcome the Cartesian separation of mind and body by approaching these as engaged in dialogue, rather than as opposed to one another (see Stewart 225). Likewise, sentiment and emotion were not perceived as conflicting with reason, but as inspiring a form of sympathy that was guided by reasonable judgement, and believed to further moral conduct, social progress, and the common good (see Keymer 578).

The aim of this article is to examine the influence of Scottish Enlightenment philosophy on Alasdair Gray's *Poor Things* with a particular focus on its references to the natural and life sciences. Indeed, the novel allegorizes two central themes of the eighteenth-century Science of Man: it stresses the social nature of man, and it aims for a comprehensive portrayal of human nature whose different aspects

are depicted as inherently connected with one another. These philosophical ideas are realized in the novel both implicitly and explicitly with regard to the history of science. Moreover, *Poor Things* reflects the conceptual approach of Scottish Enlightenment philosophy when it correlates scientific knowledge and its history with moral considerations, the discussion of political ideologies, and an emphasis on humans' emotional and social needs in addition to their material and physical wants. As the article will show, Gray positions what Burton described as his "plea for a kinder, gentler century" (n.p.) in the emancipatory and optimistic framework of Scottish Enlightenment philosophy in order to communicate an idealistic belief in the possibility of gradual improvement of human society.

1. A Postmodern Anatomy of Fiction

To begin with an overview of the novel's main themes, plot, and discursive structure, *Poor Things* struggles with definitions of human nature and with cognitive processes of understanding, debating scientific research and the production of knowledge, the exclusion of emotional needs from medical care, and issues of sexual health and the body. These concerns are discussed in connection with politico-economic ideologies, from Fabian socialism to imperialism, and their potential to facilitate a good life in a just society. A paradigm of Alasdair Gray's idiosyncratic anatomy of literature, the novel is an entertaining combination of gothic plot elements, historical and intertextual references, and social realism. Set in late Victorian and Edwardian Britain, it tells the story of the fictitious Lady Blessington who, after committing suicide, is revived when a surgeon named Godwin Baxter replaces her brain with that of her unborn child. He subsequently 'raises' her as Bella Baxter, and trains her to experience the world unaffected by the conventions and sexual mores of Victorian socialization. After journeys geographical, sexual, and emotional, Bella marries Godwin's friend Archibald McCandless, and becomes a successful obstetrician, suffragist, and Fabian reformer. This story is told by Archibald, but it is not the only version of events, which are depicted in two embedded narratives. His memoir is complemented by a letter from his wife, in which she calls herself Victoria and offers a different account of her life (the discussion below will refer to their narratives as 'memoir' and 'letter,' respectively). Victoria denounces her husband's memoir as an "infernal parody of my life-story" for which Archibald had "plagiarized [...] G.B. Shaw's *Pygmalion* and the scientific romances of Herbert George Wells" as well as "stirring into it episodes and phrases to be found in Hogg's Suicide's Grave with additional ghouleries from the works of Mary Shelley and Edgar Allan Poe" (273, 272). She counters his version by describing in detail her destitute and emotionally deprived childhood and unhappy first marriage, from which Godwin Baxter saved her by giving her houseroom, political education, and professional training. Victoria's letter rejects the fantastic and romanticized ele-

ments of Archibald's memoir and offers a more realistic account of how she came to embark on a new and useful existence. Both accounts, however, emphasize her close relationship with Godwin, his influence on her pursuing a medical profession, her second marriage to Archibald, her successful career, and her public engagement for women's rights and social reform.

In spite of Alasdair Gray's "intense dislike of the label 'postmodern' when applied to his work" (Böhnke 53), the plethora of topics with which *Poor Things* deals inhabits a decidedly postmodern narrative edifice that features several overt and unreliable narrators, the embedded narratives of Archibald and Victoria, elements of historiographic metafiction, epistolary passages in different fonts and sizes, and an apparatus of paratexts, titled 'Notes Critical and Historical' (277–318). The 'Notes' are part of the frame narrative, which discursively mirrors the competing stories of memoir and letter by debating how to interpret them: the self-proclaimed "editor" Alasdair Gray – who is introduced as the narrator of the frame story – struggles with a "local historian" about whether the memoir and the letter they claim to have found and published constitute history or fiction (ix). Their controversy, which is fought with the help of paratextual notes and annotations that contain both factual and made-up information, represents a metafictional struggle for historical truth, in which it is the historian who denies the factual quality of Archibald's account, whereas the fiction writer claims to have found a primary historical source (see also Böhnke 191–192). To complicate matters further, the memoir and the frame narrative also include illustrations that seem to verify Archibald and the editor's claims to representing historical truth. While some images are drawn by the author Alasdair Gray, others are reprints from a nineteenth-century edition of the historical science textbook *Gray's Anatomy*, which was illustrated by the anatomical artist Henry Vandyke Carter. The editor Gray admits to having complemented "the chapter notes with some nineteenth-century engravings, but it was [the intradiegetic narrator Archibald] McCandless who filled spaces in his book with illustrations from the first edition of *Gray's Anatomy*: probably because he and his friend Baxter learned the kindly art of healing from it" (xvi). In contrast to her husband's memoir, Victoria's letter does not feature any images. Instead, it is entirely printed in italics, which gives her story a very personal and autobiographical quality. In typical postmodern fashion, it also renders her embedded narrative more ambiguous: while the style of print appears to confirm the letter's authenticity, it simultaneously undermines its factual claim and characterizes Victoria's story as subjective. The discursive strategy of the novel, which introduces competing versions of the characters' stories, has been criticized as "an account of possibility frustrated" (Bernstein 132) because it fails to suggest solutions to the problems it raises, instead leaving "the text unresolved" (March 338). Such criticism overlooks that social realism has never been a key concern of historiographic metafiction; *Poor Things* is more interested in exploring human knowledge production than in providing political instruction.

2. Cognitive Sensations and the Development of Knowledge

As suggested above, the novel's agenda must be understood as philosophical rather than factual-historical, for *Poor Things* epitomizes one of the most significant dictums of the Scottish Enlightenment: the belief in the social nature of man. In rejection of Hobbes' view of human nature, according to which individuals' fear of one another and their thirst for power are the dominating forces of social interaction, adherents of the Science of Man emphasized that human beings need company, and thrive in relations defined by sympathy and mutual regard. In the words of Adam Smith, "[s]ociety and conversation [...] are the most powerful remedies for restoring the mind to its tranquillity, [...] as well as the best preservatives of that equal and happy temper, which is so necessary to self-satisfaction and enjoyment" (Smith 28). Adam Ferguson concurred by pointing out that "[t]o act in the view of his fellow-creatures, to produce his mind in public, to give it all the exercise of sentiment and thought, which pertain to man as a member of society, [...] seems to be the principal calling and occupation of his nature" (Ferguson 33). *Poor Things* manifests these philosophers' reasoning in a number of story elements and character attributes, while two of the novel's repeated themes, 'nursing' and 'cuddling,' assign scientific and political relevance to the human need for kindness and intimate relations.

 The character who is the strongest embodiment of the social nature of man is Bella/Victoria Baxter, whose story begins with her unfulfilled longing for intimacy and companionship, and ends with her practicing a form of obstetrics that takes into account both the physical and social needs of her patients. In both embedded narratives, she suffers from loneliness and depression because of her first husband's emotional and physical neglect. Trapped in a marriage that typifies bourgeois Victorian gender conventions, which expect her to subordinate her physical desires as well as intellectual ambitions to the pleasing of her husband, Lady Blessington's yearning for closeness to another human being is pathologized in the memoir: she is diagnosed with erotomania, excessive sexual desire, and it is recommended she undergo a clitoridectomy that is supposed to cure her (217, 218).[1] The advice illustrates a misogynistic and anti-sensualist tenet of nineteenth-century medical science, which claimed that "decent women seldom desired sexual gratification for themselves, [and were] submitting to their husbands' demands only in order to achieve motherhood and for conjugal harmony" (Porter and Hall 142). The text has character Godwin Baxter attribute the popularity of this belief to the "increase in the size and number of boys' boarding-schools [that] has bred up a professional class who are strangers to female reality" (218), linking the production of scientific knowledge to Britain's educational and class systems. His opinion stands in contrast to the views of the majority of Victorian gynaecologists, who argued that women and men both experienced sexual desires as natural, and recommended marriage as "a locus for sexual fulfilment, [for there was] no doubt that marriage was commonly

looked to by both parties as an opportunity for very rewarding sexual pleasures" (Mason 219, 218). In its presentation of the Blessingtons' marital problems, the novel relates to a minority opinion in nineteenth-century British medical science that corresponds with the literary commonplace of the domestic middle-class woman, who evolves above desires of the flesh and dedicates her existence to her husband and children.[2]

The reason for the textual reference to Victorian anxieties about sexuality is that they inversely serve to emphasize Lady Blessington's emotional suffering (the exposure of General Blessington's sexual preferences – he prefers to be spanked by prostitutes – later in the story recast him as the partner who himself failed to live up to the Victorian ideal of a husband). The story of her neglect explains that longing for human contact and physical interaction must neither be pathologized nor understood exclusively as an erotic desire. Gray goes to considerable lengths to give what he calls our "careful kindly social part" (68) a broader significance, connecting it with cognitive development, the healing powers of kindness, and social progress. And he explores the quest for understanding man's social nature by employing Archibald and Bella as representatives of Scottish Enlightenment philosophers' differing attitudes towards human affections. Archibald functions as an epitome of Adam Smith's suspicion towards passionate feelings, which Smith accepted only in moderation, whereas Bella illustrates David Hume's embrace of "wild sympathy – spontaneous, passionate, embodied," which Ian Duncan identified as "the disciplinary target of [Smith's] *The Theory of Moral Sentiments*" (Duncan 269). In the memoir, Bella's gradually developing mind persistently demands what Lady Blessington had died wanting: affection and sensually fulfilling relations with others. Interestingly, Bella's unrestrained expression of her desires encourages a like response in the sober Archibald, who describes himself ironically as a "thoroughly rational Scot" (220). During their first encounter, Bella flings "both arms out straight toward me and kept them there," to which he responded by "taking Bella's fingers in mine and kissing them" (29). Not yet aware of her condition, Archibald instinctively mirrors her approach and gives in to his own impulses for physical sensation. Afterwards, he seeks to gloss over the momentary failure of his self-possession by affecting to have analysed Bella's excitement as a mental problem: "A bad case of brain damage [...] Only idiots and infants [...] are capable of such radiant happiness, such frank glee and friendship on meeting someone new" (30). Godwin confirms that Bella's infant brain is indeed still developing, but argues that her "response [to Archibald's kissing her fingers] showed that her body was recalling carnal sensations from its earlier life, and the sensations excited her brain into new thoughts and word forms" (36). The novel alludes here to an important influence on David Hume, which is the belief of Anglo-Irish philosopher George Berkeley that all knowledge is derived from our sensation of things. Berkeley further developed John Locke's empiricism and emphasized the power of the human mind to produce ideas: "By sight I have the ideas of light and colours with their

several degrees and variations. By touch I perceive, for example, hard and soft, heat and cold, motion and resistance, and of all these more and less either as to quantity or degree. Smelling furnishes me with odours; the palate with tastes, and hearing conveys sounds to the mind in all their variety of tone and composition" (Berkeley 24; see also Berman 118). The novel allegorizes Berkeley's ideas in defining Bella's sensations as cognitive: sensual stimulation derived from social contact enables her to develop ideas and language, which subsequently inform her knowledge of her own self, and her understanding of others.

In addition to describing social interactions as necessary for the development of intellectual and emotional cognition, the novel defines them as essential for efficient medical care. This proposition is demonstrated with reference to the nineteenth-century introduction of nursing care, which was born out of a growing historical recognition of the need to align humans' physical and emotional wants. Godwin Baxter describes nurses as "the true practitioners of the healing art. If every Scottish, Welsh and English doctor and surgeon dropped suddenly dead, eighty per cent of those admitted to our hospitals would [still] recover if the nursing continued" (17–18). His ironic assessment of doctors' skills echoes a statement of Adam Smith, who was convinced that "[t]he medicines of the physician are often the greatest torment of the incurable patient" (175). The 'Notes' put Godwin's comment in the historical context of Florence Nightingale's attempts to reform patient treatment (280), while Archibald's memoir connects Godwin's esteem for nursing with the latter's socio-political philosophy: "[t]he loving kindness of people is what creates and supports us, keeps our society running and lets us move freely in it" (101). This statement is replete with the Scottish Enlightenment's appreciation of the civilizing impact of social virtues, and the sympathy with others the latter are supposed to generate.

3. Connecting Humane Knowledge and Scientific Thinking: the Scottish Tradition of the Science of Man

To continue with the second topic of the Science of Man that is allegorized in *Poor Things*, the novel emphasizes the importance of humane knowledge for scientific progress in medicine, biology, and physics. The historical setting of the novel is significant here, for it testifies to the legacy of the eighteenth-century Science of Man: the Scottish Enlightenment and its project of civilizing progress had laid the philosophical and educational foundation for Scotland's leading role in nineteenth-century technical innovations and the natural sciences (see Saunders 309).[3] In the Victorian era, Scottish scientists like James Clerk Maxwell, Sir William Thomson (later Lord Kelvin), and James Young Simpson further developed their disciplines not least because they remained open to humanistic contributions to the pursuit of knowledge. George Elder Davie has shown that

in consequence of their original grounding in the philosophy of common sense, the Scottish scientists, although devoted to observation and experiment, nevertheless were much more philosophically sophisticated about their subject than their English colleagues, and were in particular very suspicious of the easy-going empiricism which passed muster south of the border. [...] Scottish scientists] continued to look on the academical philosophers not as obscurantists but as allies. (20–21)

Set in the late nineteenth and early twentieth centuries, Gray's novel includes repeated references to scientific innovations of the time and establishes fictitious connections between its characters and historical scientists. The text also problematizes the increasing scientific specialization in these decades, which would eventually result in the establishment of separate disciplines. It questions this development as potentially preventing a form of progress that involves distinct humane benefits as well as scientific insights: "If medical practitioners wanted to save lives, [...] instead of making money out of them, they would *unite* to prevent diseases, not work *separately* to cure them" (23; emphasis mine). In addition, the novel highlights examples of a comprehensive approach to knowledge by referring to historical scientists like the physicists Maxwell and Kelvin, the physicians Simpson, Ignaz Semmelweis and Joseph Lister, and the biologist and town planner Sir Patrick Geddes, all of whom have contributed not only to the knowledge in their respective disciplines, but have changed notions of human nature. The following passages discuss one representative of each discipline – Geddes, Semmelweis, and Maxwell – chosen because they are incorporated into the novel's story, and because they all represent the Science of Man tradition that combines humane as well as scientific thinking.

In effect, the ideas of Sir Patrick Geddes (1854–1932) tie the previous discussion of the nursing motif with innovations in biology, architecture and sociology, for both his designs in urban construction and his scholarly work as a biologist call attention to the vital significance of social relations for the achievement of civilizing progress. Introduced in the novel as collaborator and correspondent of Victoria McCandless (305, 312), Geddes became known as "the sociological town planner" because he believed that the "well-being of society depended on a harmonious interaction of people with their environment" (Meller paragraph 11). His ideas owe much to Adam Ferguson's concept of an engaged citizenship, with which the philosopher hoped to reconcile the interests of individual and modern society, because "the most happy men [are those whose] hearts are engaged to a community, in which they find every object of generosity and zeal, and a scope to the exercise of every talent, and of every virtuous disposition" (Ferguson 59). Geddes developed a "theory of civics," which sought to teach young people about their communities' traditions in order to enable them to understand, and become engaged in, their environment (see Geddes 83–84). He was also known for his rejection of abstract ideologies from capitalism to socialism, which he found both

short-sighted and impractical (see Meller paragraph 11). In the novel, Victoria expresses a similar critique of the reductionist take of political ideologies on modern society when she accuses orthodox communism of having "one simple answer to every question and believ[ing] (like the fascists) that they can forcibly simplify what they do not understand" (312). Furthermore, Godwin Baxter's philosophy of a medical science that includes kindness and care shows the philosophical influence of the biologist, whose influential journal *The Evergreen* decried "the pitiful creed of individualism" that promoted a reductionist scientific knowledge instead of emphasizing "how primordial, how organically imperative the social virtues are; how love, not egoism, is the motive which the final history of every species justifies; how fostering, not ravening, is the pioneer process in the ascent of life" (MacDonald and Thomson 11). Gray's novel has imbibed and propagates Geddes' teachings on civic values and social responsibility, which can be traced in several story elements, such as Archibald's support of his wife's political engagement, Godwin's philosophical statements, Bella's moral principles that have her question discrimination and social injustice, and the *Loving Economy* manifesto of Victoria, which promotes physical tenderness as an antidote to the psychological repercussions of war. With Sir Patrick Geddes, the novel includes a historical figure who managed to combine humane knowledge with political concerns and scientific insights, and whose 'theory of civics' realized the enlightened ambition to understand and improve society with regard to its material and immaterial aspects.

Another scientific reference points to the influence of class, gender, and ethnic conceptions on knowledge production: Godwin Baxter describes his father's admiration of Ignaz Semmelweis (1818–1865), a Hungarian obstetrician who was one of the first modern doctors to stress the importance of hygiene and disinfection in medical practice. While working in an obstetric clinic in Vienna in the 1840s, Semmelweis had noticed that women who were attended by doctors were three times more likely to die of childbed fever than women delivered by midwives (see Zoltan paragraph 3). His investigations suggested that the rampaging infections with puerperal fever, "the scourge of maternity hospitals" (Zoltan paragraph 2) in the nineteenth century, were caused by doctors who examined the women after having dissected corpses but without having washed their hands first. Semmelweis introduced the use of a solution of chlorinated lime before each examination, and the death rate in his hospital division dropped from eighteen to one per cent (see Zoltan paragraphs 3–4). However, his observations were met with hostility from colleagues who refused to accept that they themselves had been responsible for the spread of septicaemia. The physician and poet Oliver Wendell Holmes, Sr. (1809–1894), who made similar discoveries in the United States at that time, actually found himself confronted with the belief that "[d]octors were gentlemen, and gentlemen's hands were clean" (Kaufman 55).

Poor Things adapts the history of Semmelweis's discovery for its critique of the medical profession's pursuit of financial profit, mixing fact and interpreta-

tion in a convincing story of bravery and tragic defeat. Both in the narrative and in the paratextual 'Notes,' the emphasis of the Semmelweis reference lies on the ignorance of the medical practitioners, who refuse to question their methods, and on the tragic fate of the obstetrician. Godwin Baxter claims that his own father, an able physician, followed Semmelweis's example, but kept it to himself because "[n]o surgeons in the public eye dared admit that their filthy scalpels and blood-caked frock-coats had killed scores of patients a year" (17). He also maintains that Semmelweis had been driven "mad" by his colleagues' rejection and had "committed suicide through trying to broadcast the truth" (17). This allegation is supported by the information provided in the 'Notes,' which claim that Semmelweis "deliberately" infected himself with septicaemia and "died in a mental hospital of the disease he had spent his life combating" (279). While it is correct that Semmelweis ended his life in a lunatic asylum, and that he died of a sepsis, there are contradictory accounts of how he contracted it (see Nuland 167–168). The paratextual romanticization of Semmelweis's struggle against the medical establishment works in conjunction with Godwin Baxter's denunciation of the latter in the narrative, where he accuses doctors of ignorance towards humane concerns.

However, the historical background of the Semmelweis reference also deserves critical attention with regard to the novel's general emphasis on the correlation of science and its context, because it shows scientific, political, and personal circumstances intertwining in the rejection of the obstetrician's research. As a Hungarian citizen working in Vienna, Semmelweis was in a difficult position after the outbreak of the Revolution of 1848. And while he could present empirical data that confirmed the efficiency of the chlorinated lime solution, his hypothesis that decaying organic matter caused childbed fever lacked an acceptable scientific explanation, which would be provided by germ theory only years after his death. Moreover, Semmelweis's rudeness towards those who were willing to support him, and his open aggression towards those who would not (he called a colleague who rejected his theory a "murderer"), positively impeded the acceptance of his conclusions (Nuland 124, 161). To put it in the managerial idiom of a popular twenty-first century health journal, the dedicated physician "lacked change agent skills" (Best and Neuhauser 234) insofar as his behaviour actively discouraged colleagues from supporting him. Last but not least, his story illustrates the class distinctions in nineteenth-century Europe, for the majority of the women who gave birth in hospitals were poor. In contrast, most medical practitioners had a high socio-economic rank; they tended to consider their profession to be "divinely blessed," and, consequently, their individual repute and actions as beyond any doubt (Best and Neuhauser 234). It is this attitude of self-importance, which resists rather than welcomes innovative thinking because it potentially threatens the privileged position of those who have mastered the established knowledge, that is described today with the term "Semmelweis-Reflex" (see Zankl 138).

The textual presentation of Semmelweis as a heroic figure supports the novel's argument that humane knowledge and scientific insight are conducive to progress only when pursued in tandem. The more complex historical background of the obstetrician's struggle against the medical establishment confirms this contention by demonstrating that human concerns must not be ignored because they are inevitably part of the production of scientific knowledge. Moreover, it represents an ideological critique of scientific practices that Dietmar Böhnke has discussed with regard to Alasdair Gray's science fiction writing. At the heart of Gray's philosophical concern, he argues, is a "criticism of science – similar to his related social criticism – [that] is in fact a criticism of ideology (i.e. 'the destructive nature of monolithic explanation'), of political and social structures and their underlying (or missing) morality and ethics" (134). In like manner, *Poor Things* condemns a science that is developed purely for financial reasons, and in disregard of humane values: "Our vast new scientific skills are first used by the damnably greedy selfish impatient parts of our nature and nation, [while] the careful kindly social part always comes second" (68). The reference to Semmelweis allegorizes the impact of human nature on science both in its romanticized textual version, which gives credit to Semmelweis's personal struggle, and by implication to the historical sequence of events, in which his colleagues' unwillingness to consider their own fallibility, and to overlook the social flaws of Semmelweis, had thwarted medical progress.

The discussion so far has demonstrated the ways in which the novel connects social, moral, and political considerations with the history of science in its enlightened portrayal of human nature. The final paragraphs will show how extensively the text allegorizes the philosophy of the Science of Man by associating several realms of knowledge. This is manifest in the textual involvement of the Scottish physicist James Clerk Maxwell (1831–1879), whose mathematical equations were a groundbreaking development in nineteenth-century physics. His science explained the behaviour of electric and magnetic fields and "demonstrated that electricity and magnetism are not merely related, [...] they are one and the same. Maxwell showed that an oscillating electric charge produces an electromagnetic field" (McPhee 77). In its discussion of Maxwell, the novel relates medical with physical knowledge and the latter with the imaginary, and it conceives of the science of life in artistic terms. In the memoir, the beginning of Godwin and Archibald's friendship is linked with their attendance of a lecture by Maxwell in Glasgow, where Godwin Baxter celebrates the physicist's electromagnetic theory of light as just such a comprehensive approach to understanding nature that he would desire for medical science:

> [W]e had been the only members of the medical faculty to attend a lecture by Clerk Maxwell, and both thought it odd that students who must one day diagnose diseases of the eye cared nothing for the physical nature of light. Godwin said, "Medicine is as much an art as a science, but our science should be as broadly based as possible.

> Clerk Maxwell and Sir William Thomson are discovering the living quick of what
> illuminates our brains and thrills along our nerves. The medical faculty overestimate
> morbid anatomy." (16)

The alleged obsession of Victorian medicine with "morbid anatomy," i.e. the exclusive focus on the material reality of the body, is contrasted unfavourably here with Maxwell's then revolutionary theory of the nature of energy mediation. Maxwell's equations of the electromagnetic field changed "our conception of the nature of Physical Reality" from considering the processes of nature "as consisting in material particles" to them being "thought of as represented by continuous fields, and not capable of any mechanical interpretation" (Einstein 71). Godwin and Archibald find that their medical colleagues' lack of interest in the abstract, mathematical description of electromagnetic waves, which introduced a new perspective on nature's processes, renders them lesser doctors, for it has led them to neglect a significant observation about the constitution of life. In contrast to the previous examples discussed in this essay, which correlated social knowledge with scientific forms of knowledge production, the reference to James Clerk Maxwell highlights the vital importance of intellectual collaboration *between* the natural and life sciences.

Furthermore, the text builds on this referential combination when it introduces a comparison with the fine arts in order to explain why the art of healing – "the living art!" (23) – must be based on inclusive principles:

> Morbid anatomy is essential to training and research, but leads many doctors into
> thinking that life is an agitation in something essentially dead. They treat patients'
> bodies as if the minds, the *lives* were of no account. [...] But a portrait painter does
> not learn his art by scraping layers of varnish from a Rembrandt, then slicing off the
> impasto, dissolving the ground and finally separating the fibres of the canvas. (17)

Complementing the reference to Maxwell's electromagnetic field theory, the artistic analogy demands a medical science whose exploration of human nature takes into account both abstract and imaginative dimensions of life rather than dissecting only the body. And in addition to providing a referential interface for different realms of knowledge, the textual mention of James Clerk Maxwell invites a further consideration of his work. The historical background of the Semmelweis story had illustrated the conventions that affect the production of medical knowledge. The reference to Maxwell points to the intellectual impact of imaginative thinking in molecular physics, which adds yet another aspect to the comprehensive portrayal of human nature explicitly introduced, and discursively implied, in *Poor Things*. I am referring, of course, to Maxwell's famous 'demon paradox,' so named by William Thomson after the imaginary being that Maxwell had conceived (Harman paragraph 23). This thought experiment proved that the second law of thermodynamics,

which claims that bodies of different temperatures will achieve equilibrium when brought into contact in an isolated system, has relevance only when the separate molecules of a body cannot be manipulated. In a theoretical scenario, Maxwell's 'demon' has the ability to effect such a manipulation, for he can "follow every molecule in its course, [including their] velocities [that are] by no means uniform," by opening and closing the valve of a door separating two gas chambers "so as to allow only the swifter molecules to pass from A to B, and only the slower ones from B to A. He will thus, without expenditure or work, raise the temperature of B and lower that of A, in contradiction of the second law of thermodynamics" (Maxwell 328–329). This 'demon' has gained popularity not only for being an imaginative intellectual challenge to one of the fundamental laws of physics. As a metaphor, the thought experiment also entered twentieth-century creative writing. A "perpetual motion machine" produced by a Maxwellian demon's manipulation features in US-American writer Thomas Pynchon's novel *The Crying of Lot 49* (1966) under the name Nefastis Machine (Schweighauser 153), while Polish science fiction author Stanisław Lem refers to a "thermodynamic demon" (156) modelled on Maxwell's being in *The Cyberiad* (1967).

In Maxwell's own day, his intellectual endeavours inspired Scottish writers of the later Victorian decades, like Robert Louis Stevenson and George MacDonald, who were fascinated by scientific ideas about the physical world as "consisting only of energy," and "set out to question [... that] the only reality was a social world defined by material circumstance and evolutionary conflict" (Craig 17, 24). Cairns Craig linked Scottish writers' interest in fantasy, myth, and psychic energy with their attempt to create a new form of realism, which would be different from "classic nineteenth-century fiction" because it would take into account that "material reality is an illusion concealing rather than revealing truth" (17). Alasdair Gray's novel commemorates these modernist endeavours that have refashioned literary realism. In the spirit of the historical period which it depicts, *Poor Things* insists on correlating the imaginary with the abstract and the social as a reminder "that only through the imaginary can one begin to grasp this new universe" (Craig 20).

To conclude, Alasdair Gray allegorizes the philosophy of the Science of Man by portraying humans as a natural union of material reality, social needs, cognitive enquiry, and imaginary exploration. *Poor Things* proceeds from this holistic understanding of man in its examination of knowledge production, arguing that the reduction of human beings to their physical existence fails to offer meaningful ways towards civilizing progress. The postmodern metahistorical novel includes historical examples of social and scientific advancement in the Victorian and Edwardian periods both to insist that civilizing progress must involve humane values, and to demonstrate that scientific knowledge is related to the circumstances of its production. The novel follows Scottish Enlightenment thinking in promoting individuals' engagement in their community, because "no single mind can know more than a fraction of past, present and future existence" (101). It champions an optimistic

belief in the ability of humans to develop their understanding of themselves, and their society, for "nothing we do not know [...] is more holy, sacred and wonderful than the things we know – the things we are!" (101). As has been shown, the references to the history of science complement the aesthetic, political and philosophical arguments of the novel, bridging the disciplinary gaps to highlight their shared epistemological and civilizing purpose.

Notes

1   A clitoridectomy was an advised medical procedure in the nineteenth and early twentieth century that was aimed at preventing female masturbation (see Mason 197).
2   The domestic ideal, a commonplace in Victorian literature, is most famously (and notoriously) identified with writer Coventry Patmore's (1823–1896) domestic epic *The Angel in the House* (1854–1962), which depicts a female "middle-class ideal" that is characterised by "purity and selflessness, strong moral and religious principles, coupled with a willingness to submit to the will of men"; it celebrated middle-class women as providers of "sanctuary" comfort for their men and "cherished" them for their "maternal role" (Thomas 64).
3   "The critical approach was indeed marked in the Scottish intellectual inheritance from the 18th-century enlightenment, and the philosophical tradition was now spreading out into exposition and research in the physical and natural sciences" (Saunders 309).

References

Baker, Timothy C. 2014. *Contemporary Scottish Gothic: Mourning, Authenticity, and Tradition*. Basingstoke: Palgrave.

Berkeley, George. 2009. "Principles of Human Knowledge. Part I." *Principles of Human Knowledge and Three Dialogues*. Ed. Howard Robinson. Oxford: Oxford University Press. 1–96.

Berman, David. 2004. "George Berkeley." *British Philosophy and the Age of Enlightenment*. Routledge History of Philosophy, Vol. 5. Ed. Stuart Brown. London: Routledge. 101–122.

Bernstein, Stephen. 1999. *Alasdair Gray*. Cranbury, NJ: Associated University Press.

Best, M. and D. Neuhauser. 2004. "Ignaz Semmelweis and the Birth of Infection Control." *Quality & Safety Health Care* 13: 233–234.

Böhnke, Dietmar. 2004. *Shades of Gray. Science Fiction, History and the Problem of Postmodernism in the Work of Alasdair Gray*. Glienicke/ Berlin: Galda + Wilch Verlag.

Burton, Douglas. 1993. "Plea for a Kinder, Gentler Century." *WorldandISchool. com*. n.p. Section Bookworld 5. http://www.worldandischool.com /public/1993/May/school-resource10898.asp.

Craig, Cairns. 2009. "Arcades – The Turning of the Nineteenth Century." *The Edinburgh Companion to Twentieth-Century Scottish Literature*. Ed. Ian Brown and Alan Riach. Edinburgh: Edinburgh University Press. 15–24.

Davie, George Elder. 1999. *The Democratic Intellect: Scotland and Her Universities in the Nineteenth Century*. Edinburgh: Edinburgh University Press.

Duncan, Ian. 2007. *Scott's Shadow. The Novel in Romantic Edinburgh*. Princeton, NJ: Princeton University Press.

Einstein, Albert. 2012. "Maxwell's Influence on the Development of the Conception of Physical Reality." *James Clerk Maxwell, A Commemoration Volume 1831–1931*. Ed. J. J. Thomson and Max Planck. Cambridge: Cambridge University Press. 66–73.

Geddes, Patrick. 2015. *Civics: As Applied Sociology*. The Perfect Library: Create Space. Independent Publishing Platform.

Gray, Alasdair. 2002. *Poor Things*. London: Bloomsbury.

Harman, P. M. 2009. "Maxwell, James Clerk (1831–1879)." *Oxford Dictionary of National Biography*. n.p.

Hume, David. 1987. *Essays Moral, Political and Literary*. Ed. Eugene F. Miller. Indianapolis: Liberty Classics.

Kaczvinsky, Donald P. 2001. "'Making up for Lost Time': Scotland, Stories, and the Self in Alasdair Gray's *Poor Things*." *Contemporary Literature* 42. 4: 775–799.

Kaufman, Jennie. 2009. "Scourges of the Nineteenth Century." *Ancestry* 27. 1: 52–57.

Keymer, Thomas. 2005. "Sentimental Fiction: Ethics, Social Critique and Philanthropy." *The Cambridge History of English Literature, 1660–1780*. Ed. John Richetti. Cambridge: Cambridge University Press. 572–601.

Lem, Stanisław. 1985. *The Cyberiad*. San Diego: Harvest.

MacDonald, W. and J. Arthur Thomson. 1895. "Proem." *The Evergreen. A Northern Seasonal*. Edinburgh: Patrick Geddes and Colleagues. 9–15.

Manning, Susan. 2013. *Poetics of Character. Transatlantic Encounters 1700–1900*. Cambridge: Cambridge University Press.

March, Cristie. 2002. "Bella and the Beast (and a Few Dragons, Too): Alasdair Gray and the Social Resistance of the Grotesque." *Critique* 43. 4: 323–346.

Mason, Michael. 2003. *The Making of Victorian Sexuality*. Oxford: Oxford University Press.

Maxwell, James Clerk. 2003. *Theory of Heat*. Mineola, NY: Dover Publications.

McPhee, Isaac. 2011. *The Bedside Book of Physics. From Electricity to Escape Velocities: The E=MC² of Everyday Life*. London: New Burlington Books.

Meller, Helen. 2008. "Geddes, Sir Patrick (1854–1932)." *Oxford Dictionary of National Biography*. n.p.

Nuland, Sherwin B. 2003. *The Doctors' Plague. Germs, Childbed Fever, and the Strange Story of Ignaz Semmelweis*. New York: W. W. Norton.

Porter, Roy and Lesley Hall. 1995. *The Facts of Life. The Creation of Sexual Knowledge in Britain, 1650–1950*. New Haven: Yale University Press.

Saunders, Laurance James. 1950. *Scottish Democracy, 1815–1840: The Social and Intellectual Background*. Edinburgh: Oliver and Boyd.

Schweighauser, Philipp. 2011. "Information theory." *The Routledge Companion to Literature and Science*. Ed. Bruce Clarke and Manuela Rossini. London: Routledge. 145–156.

Stewart, M.A. 2004. "The Scottish Enlightenment." *British Philosophy and the Age of Enlightenment*. Routledge History of Philosophy, Vol. 5. Ed. Stuart Brown. London: Routledge. 224–252.

Thomas, Jane, ed. 1994. *Victorian Literature. From 1830 to 1900*. Bloomsbury Guides to English Literature. London: Bloomsbury.

Tiitinen, Johanna. 1999. "Alasdair Gray's *Poor Things* and the Resurrection of the Frankenstein Monster." *Proceedings from the 7th Nordic Conference on English Studies*. Ed. Sana-Kaisa Tanskanen and B. Warvik. Anglicana Turkuensia 20. 315–326.

Vardoulakis, Dimitris. 2008. " 'The Poor Thing.' The Cosmopolitan in Alasdair Gray's *Poor Things*." *SubStance #117*, 37. 3: 137–151.

Zankl, Heinrich. 2010. *Kampfhähne der Wissenschaft: Kontroversen und Feindschaften*. Weinheim: Wiley-VCH Verlag.

Zoltan, Imre. 2014. "Ignaz Philipp Semmelweis." *Encyclopædia Britannica Online*. Encyclopædia Britannica Inc. n.p.