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Life, Evolution, Social Union
and the 'Great Transition'**

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Geddes' Grand Theory: Life, Evolution, Social Union and the 'Great Transition'

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Abstract

We argue here that Patrick Geddes had a consistent and integrated 'grand theory' which underpinned his ideas on biology, sociology and town planning. This 'grand theory' combined a theory of life with a neo-vitalistic interpretation of evolution, which emphasised co-operation and social union, and implied the idea of a 'Great Transition' that Geddes believed would ultimately transform human society, the latest in a line of transitions over evolutionary history. This theory, however, is not well understood: partly because Geddes worked in an undisciplined manner, rarely synthesising his ideas and communicating them to others in coherent printed form but also because his view of life was essentially practical and experiential, and because his interpretation of evolution did not fit with mainstream biology. In this paper, we suggest that the theory can be much better understood by revisiting Geddes' biological work, in particular, his book *The Evolution of Sex* and subsequent works written with J. Arthur Thomson, his former student and life-long collaborator on matters biological. Interpreted in terms of this 'grand theory', Geddes' career was not merely a case of his moving on from biology to sociology and town planning, but part of a more coherent mission to understand life and evolution in its totality, a quest for theory and action that underpinned all his activities to the end of his life.

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1. INTRODUCTION

Evolution has provided one of the great unifying theories of science, not only integrating the various sub-disciplines of biology, but also extending its influence to the social sciences and humanities. Since the publication of his breakthrough work *Origin of Species* in 1859, Charles Darwin has retrospectively been accorded much of the credit for enabling this unification. However, before Darwinian thinking laid claim to influence the social and environmental sciences, early applications from evolutionary biology were being forged by Herbert Spencer and then by Patrick Geddes¹.

Geddes is well known as a pioneer of sociology and town planning, who also practiced as a biologist and made contributions to regional geography, environmentalism and education. Such a range of disciplinary interests has invited the interpretation that Geddes was a ‘polymath’, but more unkindly he is sometimes considered as a ‘jack of all trades’. However, as we argue in this paper, at the core of Geddes’ work was an integrated ‘grand theory’ that happened to inform all of these fields. This theory was based on Geddes’ understanding of life; its evolutionary history; the relationships between organisms and their environment; and by extension, the way individuals cooperated with one another in building human society and developing their built environment; and in which town planning could be seen as an instrument of evolution. Geddes’ worldview led to his belief that the world was undergoing a ‘Great Transition’ in society that he himself threw his energies into trying to precipitate, right up until the end of his life.

While many aspects of Geddes’ ideas have been picked up and applied in various fields, the nature of his overall ‘grand theory’ is not widely recognised and only partially understood. This is partly because the theory only sporadically surfaced in the various disciplines that Geddes turned his hand to, and then not necessarily explicitly or intelligibly. Moreover, the core biological basis of the theory was somewhat obscure, partly because Geddes had a distinct interpretation of biological evolution departed from that of Darwinian orthodoxy.

¹ Geddes was influenced heavily by Huxley and then Spencer in his formative years when he studied in London in the mid 1870s, see Renwick (2009)

Geddes' biological works have tended to be somewhat overlooked both by social scientists and town planners as well as by mainstream biologists. But it is worthwhile revisiting Geddes' biological works as these can help inform us about the theoretical basis of his other works in the humanities and town planning. In particular, it is informative to revisit the series of books Geddes wrote with his long-term collaborator (and former student) J. Arthur Thomson, namely, *The Evolution of Sex* (1889), *Evolution* (1911), *Biology* (1925), and finally, *Life: Outlines of General Biology* (1931). Through study of these works, we aim to rediscover the biological thinking which we believe provides a coherent unifying 'grand theory' that underpinned Geddes' social and urban philosophies. This allows us both a deeper appreciation of these philosophies and his life's work in general.

Broadly speaking, our thesis is that Geddes' biological ideas expressed in *The Evolution of Sex* and subsequent biological works indicate a prevailing assertion of an integrated theory of life – plant, animal and human – based on a neo-vitalistic theory of evolution that departs from Darwinian evolution, in the wider context of an interpretation of 'major transitions' in evolution. In doing so, we suggest that Geddes' social and town planning ideas are rather directly related to how he believed organic evolution actually took place – in a literal rather than metaphorical sense. We refer to this as a 'grand theory' because of its sweeping scope and its ability to unify what were (and are) often regarded as separate topics – from the origin of species through sociology to town planning – and because it combined an explanatory theory of how the world came to be the way it is, and a normative theory of how we should organise and plan society in the future.

In this paper, we explore how Geddes' biological work can help us understand somewhat more clearly this grand theory. We first outline existing discussions of Geddes' views of life and the Great Transition, and then study the biological books in which he sets out the theory of evolution that underpins these. From here, it is possible to suggest a revised interpretation and articulation of his wider theory of life, and the significance of the Great Transition. Finally, we can draw conclusions on the significance of these to his career and overall contribution.

2. GEDDES, LIFE AND THE ‘GREAT TRANSITION’

Patrick Geddes, widely regarded as one of the founding fathers of British town planning, was born in 1854, spending his childhood and early adult years near Perth in Scotland. He then spent the first 20 years of his adult life, learning, research and commenting on the biology of the late 19th century, while implementing an innovative programme of community renewal in the Old Town of his adopted city Edinburgh under the auspices of the Edinburgh Social Union. His activities were set against a backcloth of much wider speculation and discussion of ideas as diverse as the structure of statistics and economics, the role of nature in society, and the origins of sociology and civics, forerunners of his interest in town planning which dominated the later years of his life.²

Geddes had an unconventional education by any standards. He was largely self taught at home, having had some training in carpentry and banking, and a detailed observational knowledge of botany before he left for London to sit at the feet of his mentor Thomas Huxley, the populariser of Darwin, who was teaching at the Royal School of Mines in the 1870s. There he learnt his biology, despite never registering for a degree, and thence he went to University College to work in Sanderson-Burnett’s Physiology Lab where he met Darwin. After sojourns in France at the marine biological station in Roscoff, then the Sorbonne, and with a trip to Mexico where he continued to learn about dissection, collection and classification, he arrived back in Edinburgh in 1880 where he took various peripatetic jobs as assistant and demonstrator to Professors in the university. In those early years, he was continually frustrated by his inability to achieve a permanent appointment despite a growing portfolio of biological research and writings and some impressive testimonials by biologists of achievement, amongst them Darwin and Wallace.

His growing interest in matters non-biological despite a fair number of research papers up until the mid-1880s, may well have contributed to his failure at securing a permanent appointment and he may have aimed too high too early. But by the late

² For a range of perspectives on Geddes’ life and work over the decades, see Defries (1927), Boardman (1944), Mairet (1957), Stanley (1972), Meller (1990), Welter (2002).

1880s, he was spending much more time in his community work than in biology, perhaps because of his purported difficulties with laboratory work due to his reportedly poor vision at microscopic scales. Moreover there is little doubt that his support for the writings of the positivists like Comte and those imbued with ideas about social evolution such as Spencer and then Bergson, led him away from Darwin's emphasis on evolution's association with the struggle for existence in contrast to social evolution which he saw as being a matter of cooperation rather than competition.

His interests in urban regeneration in Edinburgh however clearly helped influence the emergence of town planning as a modern professional discipline, and he was slowly drawn into this domain, working first on a plan for Dunfermline and subsequently on various town planning projects in India and Palestine. His most famous and influential work is not in biology but is probably his book *Cities in Evolution*, published in 1915. Geddes continued to pour out increasingly difficult essays on sociology, civics and planning through the 1920s from his base in Montpellier where he finally settled, founding a 'Scots College', one of his long held dreams. He died in 1932 just after accepting a knighthood, after having rejected such an honour some 30 years before.

Towards the end of his book *Biopolis*, Volker Welter suggests that *Cities in Evolution* is not Geddes' *opus magnum* (claiming he did not have one) and explains that "...the book assembles earlier published papers without managing to present in a coherent manner the larger meta-narrative that informed all of the individual essays."³ This meta-narrative, we suggest, is identifiable with what we refer to herein as Geddes' grand theory: of life, evolution, social union and the 'Great Transition'. Here, we briefly introduce examples of Geddes' crucial interest in 'Life' and in the 'Great Transition' as they crop up in existing interpretations of Geddes' life and work, before going on to explore their biological basis and significance, linking these ideas via evolution and social union.

Geddes' Meta-Narrative of Life

Running through almost all of Geddes' projects and undertakings is his interest in 'life' in its various aspects – from the biological science of life to the pragmatic daily business of 'everyday life', social life and urban 'vitality'. Towards the end of his life, Geddes reflected "Everything I have done has been bio-centric: for and in terms of life, both individual and collective..."⁴. Taken out of a Geddesian context, this could be stated as a superficially glib and somewhat quotidian assertion: after all, what does any sociologist or planner do, if it is not to do with people's lives? Yet this clear sense of relating his career to life is surely not incidental. Philip Boardman – who, significantly, knew Geddes personally – asserted that "Geddes' essential doctrine was a doctrine of *life*: its inception, its growth, its crises, its insurgence, its self-transcendence."⁵ This suggests the argument that Geddes was not just an 'ex biologist' applying insights from biology and town planning, but was a theorist of life in all its formations, from single-celled organisms to complex human societies. This, we believe, is the essential message that Geddes was attempting to impart.

'Life' comes up again when we examine his relationship to Lewis Mumford – one of Geddes' closest (if not uncritical) followers. Mumford is reported as saying that his greatest debt to Geddes was giving him "... 'a sense of the wonder of life' – of life as the so far ultimate manifestation of cosmic evolution."⁶ Here, life seems to connote something much more significant than merely the business of everyday life, but something more 'cosmic' in significance. Geddes' life's work must be seen not as being just about biology or sociology or town planning, nor a succession of individual disciplines strung together over a long career, but was about something deeper that underpinned them all – the phenomenon of life. And this fascination with life was not just about studying the science of life, but also about anticipating and precipitating its onward evolution, through the phenomena that Geddes and his immediate disciples such as Boardman called the 'Great Transition'.

³ Welter (2002:251).

⁴ Boardman (1944:477).

⁵ Boardman (1944:viii).

The 'Great Transition'

At the end of his life after his somewhat surprising period in India which in effect was an emigration from Edinburgh and London in 1914 when he was 60⁷, Geddes moved to the south of France (partly for health reasons). But this was no restful retirement: as his earliest biographer Amelia Defries put it, Geddes consciously opted to continue the struggle.⁸ But what was this struggle? Arguably it was related to what Boardman calls the 'Great Transition', something that Geddes can be seen trying to articulate in a series of papers in *The Sociological Review*, and in a series of letters to Lewis Mumford.

This is the idea that Geddes was anticipating and straining to precipitate – a great transition from what he saw as the prevailing mechanical-militarist-pecuniary world order to a new bio-evolutionary-eusocial world order. It is echoed in his long standing distinction between his definitions of the paleotechnic age of the industrial revolution and the neotechnic age which he argued was about to be thrust upon us, and he set out these ideas in detail in his paper on 'The Interpretation of Current Events' in *The Sociological Review* of 1929.⁹ Boardman, in fact, refers to this as the 'Great Transition'; Geddes himself refers to the 'Transition'. Whatever the reality or significance of the Transition to the world, it seemed to matter to Geddes, indeed it seems to be at the heart of his writings in his latter years, perhaps being most centred on his socio-political writings, but also overlapping with his work on biology and town planning.

Geddes refers to the transition several times in his letters to Lewis Mumford. Perhaps most forcefully he sets it out in a letter dated February 29th, 1930 where he says:

“All you younger American critics are more or less moving that way – but I don't think even you & they realize sufficiently that we have to move

⁶ Novak (1995:26).

⁷ It is quite likely that his move to India was occasioned by the fact that he had no pension to speak of and he needed to continue working. India offered him varied employment in preparing town planning schemes and always impulsive and active, he grasped this new challenge in 1914 even at the outbreak of war.

⁸ Defries (1928).

⁹ Geddes (1929a).

from this whole Industrial plan of civilisation (Mechanistic-Pecuniary Culture) to the Biotechnical & Evolutionary – as different as (say) from decadent Rome to New Christianity – or any other great world change...”¹⁰

What, then, was this ‘Great Transition’? Philip Boardman – whose biography of Geddes is packed with sympathetic, articulate and accessible interpretations of Geddes’ work – attempts to summarise it as follows:

“One valid summary of his life work, however, can be made: he was a ‘Maker of the Future’, a student of social evolution who more than anyone else has analysed the Great Transition in progress and who has indicated the means of hastening it. The Great Transition – from wardom to militant peacedom, from paleotechnic waste to neotechnic efficiency, to biotechnical conservation of life and to geotechnical rebuilding of the world into tangible Eutopias.” (p476)

Boardman goes on to describe the Great Transition (perhaps knowingly) in almost messianic terms:

“After about 1925 Geddes emphasized more and more the need for a re-education of individuals if the Great Transition were to be brought about on earth.” (p477)

Even from these explanations, it is not immediately obvious what this Great Transition is, nor its significance. Could it be referring to a gradual transition already happening anyway or was it a revolutionary discontinuity? To better understand this, we need to understand the larger context of Geddes’ grand theory; but to understand that, we first need to turn to the evolutionary theory that underpins it.

¹⁰ Letters to Mumford in Novak (1995). Elsewhere Geddes refers to ‘*this Transition*’ and ‘the transition from IX to the better life system of 9’ (6-5-1930). Geddes’ last ever letter to Mumford (2-4-1932) once again refers to ‘striving towards synthesis of IX-9 – as per *Sociological Review*’, referring to the ‘IX’ and ‘9’ diagrams of his ‘Current Events’ paper. From these sorts of exchanges, it is hard not to think

3. THE ‘MISSING LINK’: EVOLUTION

Four key books that Geddes wrote with J. Arthur Thomson present a consistent view of life, evolution and biology.¹¹ Here, we review the first of these – *The Evolution of Sex* (1889) – in some detail, then discuss, albeit more briefly, the subsequent three books *Evolution* (1915), *Biology* (1925) and *Life* (1931). We do not attempt here to review the content of these books from a dedicated biological point of view, but from an analysis of key passages in the text, we can note several salient points that build up an impression of Geddes’ overall point of view. This suggests that Geddes’ theory of evolution is a ‘missing link’ between his biological work and the wider theory that informed his work in social sciences and town planning. While Geddes’ use of evolutionary interpretations and imagery is well known, the particular nature of his brand of biological evolution, and its significance in underpinning his ideas across all his other fields of enquiry, has not been fully developed.

The Evolution of Sex

The Evolution of Sex was written by Patrick Geddes and J. Arthur Thomson, and published in 1889, shortly after Geddes took up a part-time position as Professor of Botany at the University College of Dundee.¹² *The Evolution of Sex* could be regarded as Geddes’ most important biological monograph and it perhaps marks the zenith of his career as a professional biologist.¹³ The book contains key themes that permeate Geddes’ later writing – both biological and sociological – which he was to follow through for the rest of his career. It is perhaps no coincidence that the topic of this opus is a cross-cutting one – ranging across both of the great kingdoms of plants and animals, in marine and terrestrial environments, and transcending the conventionally

that he was influenced in some way by the mysticism of India. Indeed, he was probably his own mystic.

¹¹ These books in particular are useful and significant to study, since they were to a large extent written with a popular audience in mind, and gave a certain freedom to the authors to expound views that could venture beyond the orthodox discipline expected of scientific papers.

¹² As Meller points out, he had written it “...after nearly a decade of intense activity exploring the nature of evolution and social evolution in the natural and social sciences.” (1990:84).

¹³ Meller (1990:7) describes the *Evolution of Sex* as “...Geddes’ first and most influential monograph...” (page 2) ... which established Geddes’ reputation.” At the same time, the review of the book in *Nature* (P. C. M., 1890) makes it clear that, at least up to this point, the authors’ views

separate spheres of natural history and the humanities. On one level, it can be read as a straightforward exposition of the authors' scientific work on botany and zoology which is particularly focused on the manifestation and evolution of sex and reproduction in organisms. On another level, however, it is used by the authors to set up a platform for launching their own theory of evolution that departs substantially from the Darwinian orthodoxy of the day.¹⁴ A running theme through the book has to do with co-operation and union between cells, between the different parts of compound organisms, and co-operation, union, empathy and altruism between individuals in a species. This has a clear echo in Geddes' later mantra 'Synergy, Sympathy, Synthesis' which he promoted continuously throughout his middle and later years.

The authors are disdainful of the idea of self-interest and have a general antipathy towards competitive struggle.¹⁵ This pointedly negative treatment of self-interest seems to imply a distaste for the economics of Adam Smith which was also reflected in Abercrombie's later interpretation of Geddes' thinking¹⁶. Geddes is also distancing himself from Darwinian evolution through natural selection, as being associated with militarism and competitive struggle. To be sure we have not missed the point, Geddes

deserved serious attention; but the same review criticised the authors for misunderstanding Darwin, and controversially departing from the mainstream.

¹⁴ We could be justified in referring it to Geddes' theory of evolution, since it is expressly stated as building on Geddes' own paper 'A Restatement of the Theory of Organic Evolution' (cited in terms of a 'Summary in the **Proceedings of the Royal Society of Edinburgh**, 1888-89, still unpublished'). While Geddes is recorded in the Proceedings as having presented such a paper, it is not clear if a write-up of the complete work ever existed. Nevertheless, a summary of Geddes' 'Restatement' paper was published in *Nature* (Anon., 1889:287).

¹⁵ Geddes and Thomson (1889:269-270). This follows Geddes' own earlier published work, where he disdainfully inveighs against self-interest (1884:19), the 'iron law of competition' (1885:36) and 'our grim modern doctrine of the "Struggle for Existence"' (1884:19).

¹⁶ Abercrombie himself, echoing Geddes, was horrified by the wider implications of Darwinian evolution for human affairs. In his inaugural lecture to University College, London in 1935, he said "I would like to remark that we are (it is assumed) agreed upon certain fundamentals such as: the necessity of planning as compared with a reliance upon the evolutionary chaos, with Adam Smith's invisible guiding hand behind the clouds – an ancient fallacy his, which still has its votaries. (Abercrombie, 1937:16).

and Thomson later argue against the ‘economist and biologist’ for stressing competition.¹⁷

The last part of the book (Book 4) comprises three chapters which are of most significance to us here. While the rest of the book could be regarded as being largely concerned with biology, in the last part the authors set out a more general view of life and evolution, what is in effect their own theory and distinct contribution to the field. Setting theories of evolution in their historical context, the authors make clear that they accept the ‘empirical fact of evolution’; but they claim that the mechanism of evolution is ‘still the subject of searching inquiry and keen debate.’¹⁸ In professing to differ from Darwin on the point of mechanism, Geddes and Thomson are, arguably, intending to put as much distance between themselves and Darwin as Darwin similarly did from his own predecessors.¹⁹

In essence, Geddes and Thomson downplay the role of competitive struggle and the influence of the environment, through natural selection, acting upon variation, in driving evolution. Rather, they lay emphasis on the organism’s own wilful, insurgent, positive role in evolving. This is interpreted by critics – and later by Geddes himself – as a neo-Lamarckian or neo-vitalistic position.²⁰ Geddes and Thomson emphasise that the nature of the positive impulse of the organism is not one of selfish self-interest, but one of co-operation, of union, in the forming of greater wholes. This, they interpret, can be seen as a process resounding back through evolutionary history to the simplest organisms. In the context of discussion of multi-cellular organisms, Geddes and Thomson assert that:

¹⁷ Geddes and Thomson (1889:312). Geddes later repeats his association of Darwinism with militarism, in his ‘final lecture at Dundee’ (reproduced in Defries, 1927, and in the 1949 edition of *Cities in Evolution*).

¹⁸ Geddes and Thomson (1889:300).

¹⁹ Darwin included a historical sketch at the outset of *Origin of Species*, commenting on the work of earlier evolutionary thinkers including Lamarck (1995 [1859]:54). In departing from Darwin, Geddes and Thomson are also consciously keeping company with Herbert Spencer (Geddes and Thomson, 1889:304, Renwick, 2009).

²⁰ The *Nature* review of *Evolution of Sex* associates Geddes and Thomson with the neo-Lamarckian position; later, Geddes reveals himself as holding a ‘neo-Lamarckian’ position, in *Life* (Thomson and Geddes, 1931:ix).

“...this greatest of morphological steps was directly due, not to any struggle, but rather to an organic sociality, or at any rate to a process which is not interpretable in terms of individual advantage.”²¹

The authors downplay the role of ‘internecine struggle... at the margin of subsistence’ and instead draw attention to the importance of co-operation:

“Each of the greater steps of progress is in fact associated with an increased measure of subordination of individual competition to reproductive or social ends, and of interspecific competition to co-operative association.”²²

This is a clear and pointed departure from Darwinian natural selection. And they continue, with a remarkable further elaboration:

“The corresponding progress in the historic and individual world, from sex and family up to tribe or city, nation and race, and ultimately to the conception of humanity itself, also becomes increasingly apparent.”

This represents a synoptic view of humankind’s place in evolutionary history – an evolutionary history based on co-operation at ever-larger scales – and one that explicitly and significantly includes the city. Around this point in the book appears a picture of a female possum carrying her young on her back. The apparently gratuitous inclusion of this – which is not directly referred to in the text – as the last image in the book is surely no accident, but could be interpreted as a visual signification of the spirit of the authors’ key message, which now builds to a climax:

“For we see that it is possible to interpret the ideals of ethical progress, through love and sociality, co-operation and sacrifice, *not as mere utopias* contradicted by experience, but as the *highest expressions of the central evolutionary process* of the natural world. The idea of evolution is indeed an Eden;... “creation’s final law” is *not struggle but love.*”²³ [*emphases added*]

²¹ Geddes and Thomson (1889:311).

²² Geddes and Thomson (1889:311).

To leave no doubt in the reader's mind that theirs is a conscious departure from orthodox opinion, but is almost like the opening shot in a much more significant theory of their own, the authors continue:

“The fuller working out of this thesis, however, would lead us far beyond our present limits, towards a *restatement of the entire theory of organic evolution*.”²⁴

The authors state explicitly that they see natural selection as “more frequently a retarding force than an accelerant of evolution.”²⁵ In a crowning admission, the authors themselves suggest that the book presents an ‘altered and unconventional view’, particularly regarding evolution.²⁶

A Libel Projected on Nature

This contradiction between evolution as revealed in society and nature is in some respects our keystone to understanding Geddes. His writings which we have so far reviewed tend to downplay what was clearly a major tension in his thinking about evolution from the very time he read Huxley's popularisation of Darwin's theory and his almost simultaneous exposure to Spencer's development of social evolution which lead to ever more fanciful polemics on the evolutionary idea as, for example, embodied in Bergson's creative evolutionism. In his writings it is as if he, Geddes, was never able to overcome his reverence to Darwin, despite his clear belief that cooperation was the dominant human attribute in forming social bonds and progressing society to a more equitable state.

This dilemma surfaces in many events and writings that Geddes was associated with from the time when he left biological research, which some may date from the time he

²³ Geddes and Thomson (1889:312/313).

²⁴ Geddes and Thomson refer here to Geddes' earlier paper ‘A Restatement of the Theory of Organic Evolution’ (see note 14). The fact that the authors refer to Geddes' earlier (solo-authored) work in this crucial closing part of their book seems significant as it could reasonably suggest that Geddes himself was indeed the primary originator of this theory, and that the theory was expressly about evolution as a whole, not just the evolution of sex.

²⁵ Geddes and Thomson (1889:315).

²⁶ Geddes and Thomson (1889:v).

left London at the end of his student days. It is not clear whether he ever really continued his laboratory work in Edinburgh and if he did, this must only have been in the early 1880s. His work with the Edinburgh Social Union preoccupied him from that time, and even in this, the tension over differing views of evolution surfaced. The cornerstone of his work in the Old Town in Edinburgh was, in fact, the rehabilitation of Ramsey Gardens where he and his family lived and which was named after a Scottish poet Allan Ramsey who had had the houses rebuilt a century or so before Geddes began his reconstruction. Geddes' projects in the Old Town were always in trouble financially and to raise more monies in 1895, he published a magazine of the arts, called *Evergreen* after Ramsey's own earlier publication, devoted to portraying nature, society and the arts in ways that reflected the imperative for a return to the natural world.

In this journal, his colleague and collaborator on biological textbooks, which so far was just *The Evolution of Sex*, J. Arthur Thomson, in a rather tepid piece on social organisation, writes "...the conception of the Struggle for Existence as Nature's sole method of progresswas sure to be a libel projected on nature, but it had enough truth in it to be mischievous for a while...". He continued: "... how false to natural fact the theory was how love, not egotism, is the motive which the final history of every species justifies". The publication was criticised in *Nature* by H. G. Wells, who fumed that there was "... absolutely no justification for these sweeping assertions.... this attempt to belittle the giants of the Natural Selection period of biological history".²⁷

In fact, it is commentary such as this that provides some sense that by the time Geddes had been working actively 10 or 15 years, he was already regarded as someone whose views were well out of the mainstream and it is also clear that his

²⁷ Geddes and his colleagues privately published *The Evergreen: A Northern Seasonal*, in 1895, essentially as an arts magazine. His influence must have been such at this time that H. G. Wells was asked to review it in *Nature* magazine which he did, with the overall verdict that "it is bad from cover to cover; and even the covers are bad" (Wells, 1895). Geddes later attacked Wells in 1904 at the newly formed Sociological Society in a seminar entitled 'What is wrong with H. G. Wells'. Boardman (1978:209) citing Mairé (1957) says that Wells himself attended part of this lecture and when Geddes saw him in the audience, he was greatly unnerved, and lost his flow and style. Wells apparently stood up, grinned, and promptly left the room.

many social crusades detracted from his reputation as a serious scholar of biology. In fact, his inability to secure a permanent professorial appointment in biology must have been no small part due to the fact that his divergent views on evolution, his inability to pursue laboratory research and his immersion in what the scientific establishment regarded as extramural activities no matter how relevant to his broad view of life and evolution. These were all activities that were regarded as evidence that his biology was no longer a serious pursuit.

'Evolution', 'Biology' and 'Life'

Nonetheless, Geddes and Thomson wrote a series of subsequent books on these subjects that could be seen to successors or descendants to *The Evolution of Sex*. The most important of these, in terms of shedding light on Geddes' fundamental theory, are *Evolution* (1911), *Biology* (1922), and finally *Life: Outlines of General Biology* (1931).²⁸ In this succession we see a broadening of the compass from the evolution of sex to evolution generally, then to biology and life generally. We can treat these works together here, albeit briefly, since they more or less are restatements of what is presented in the *Evolution of Sex*, at least insofar as they treat Geddes' biological and evolutionary theories.

Evolution (1911) offers no 'new' theory, but is a general treatment of the topic, which pays homage to Darwin up to a point, then respectfully but pointedly departs from him, quipping that 'The true Darwinian is thus not he who longest swears by the word of the master...'²⁹ Geddes and Thomson then restate the concluding thesis of *Evolution of Sex*, this restatement being worth quoting in full since it represents what they must consider key conclusions to their own work of twenty-two years previous:

"It is that the general progress both of the plant and the animal world, and notably the *great uplifts*, must be viewed not simply as individual but very largely in terms of sex and parenthood, of family and association; and hence the gregarious flocks and herds, of co-operative packs, of evolving tribes, and thus ultimately of civilized societies – *above all, therefore, of the city.*" [*emphasis added*]³⁰

²⁸ A further book they wrote together, *Sex* (1917), is not of such direct concern here.

²⁹ Geddes and Thomson (1911:227).

³⁰ Geddes and Thomson then (1911:175/176).

Here, indeed even more firmly than in *Evolution of Sex*, the city is seen as an ultimate culmination of evolutionary history over all time. This, it must be remembered, is in a book ostensibly about (biological) evolution, and before the publication of Geddes' *Cities in Evolution*, which popularised, albeit to a select audience, the notion that cities could be interpreted in evolutionary terms. That there is a seamless link from the theme of *Evolution* to *Cities in Evolution* is, of course, not accidental.

Lest the reader miss the implication, the authors repeatedly assert that evolution is primarily driven from within the organism – as opposed to external environmental influences – for example, in neo-Lamarckian phrases such as ‘originative impetus within the organism’; ‘creative effort and endeavour’, a ‘new *unity* created *from within...*’; and “Thus *from within* are spun and woven and shaped the manifold garments of Life.” [*emphases added*]³¹. And they recapitulate the point that they see natural selection as “simply accelerating, retarding or terminating the process of otherwise determined change.” And: “...instead of guiding the ramifications of the tree of life, it would, in Mivart’s excellent phrase, do little more than apply the pruning-knife to them.”³² In other words, Geddes and Thomson see the evolutionary ‘Tree of Life’ growing like an actual tree by its own impulse, and while its ultimate form may be ‘pruned’ or otherwise influenced by outside agencies (accidental or intentional), the implication is that it – life itself – has an innate propensity to evolve, that would happen in the absence of selection, artificial or natural.

Eleven years on from *Evolution*, Geddes and Thomson produce another small popular book, this time broadening to cover *Biology*. Although nominally a general text on biology for the general reader, it contains the authors’ distinct slant on the topic, making reference to the typical Geddesian concepts of ‘pageant of life’ and ‘Bio-drama’, and musings on the organism and society, biotechnics and ‘eutechnics’. The last paragraph refers to ‘life’s insurgence... ever seeking and finding its way’ which

³¹ Geddes and Thomson (1911: 203; 203; 244; 245).

³² Geddes and Thomson (1911:248).

ostensibly could be a lyricism but in the context of other writings seems a deliberate signal of the authors' continuing belief that evolution is driven from within.³³

In a remarkable further recapitulation, a further nine years on, the two authors produce another general text – *Life: Outlines of General Biology*. This time, it is a massive two-volume textbook, rather than a slim 'home library' volume. This time, Thomson is the lead author, with Geddes' contribution perhaps even more limited proportionately to the speculative Geddesian philosophies of life, rather than straight biological science. But in common with their earlier books, *Life* combines a 'straight' compilation of generally established facts about biology with a partisan 'spin' on the authors' own take on evolution.³⁴ In a sense, it is hard not to think of this book as being Geddes' last gasp of trying to outline his grand theory, notwithstanding it is being promoted under the idea of a general biology. This is not what many have imagined Geddes really wanted to do, that is to write a treatise of wide reaching influence on his sociology of life rather than only its biology. There is always room for dispute here but we believe that Geddes was sufficiently aware of his domain and the specialists of biology to realize that this book could not possibly have been his magnum opus. More likely, he did not consider it would be his last.

Remarkably here, over forty years after their original exposition, the authors are still promoting their own theory set out in *The Evolution of Sex*:

“As regards the evolution of sex, *we still firmly maintain* the general theses of the volume so named in 1889, and of its further developments in *Sex* (1914).”³⁵

³³ Geddes and Thomson (1922: v, 245–247).

³⁴ Meller suggests that Geddes' work was 'appended' to Thomson's 'own mammoth effort at writing a complete biological textbook...Textural evidence suggests Geddes was responsible mainly for the last 300 pages' (1990:309). According to Meller, Geddes admitted to Thomson that he had not kept up with natural sciences, and has become reliant on him (1990:315). In letters between Lewis Mumford and Geddes, in the 1920s, Mumford informs Geddes of his own task of trying to keep up with the latest biological findings; Geddes does not remark on these but keeps reworking his own theories (Novak, 1995).

³⁵ Thomson and Geddes (1931:541).

Thomson and Geddes claim their theses are ‘still maintained’, ‘and now frequently confirmed’ yet ‘the fact remains that after more than a whole generation these are still far short of general acceptance.’³⁶ Moreover, by the time this final work was published, modern biology had moved far away from the themes that pervade this work. Genetics, allometry, morphology and a strong analytical tradition was in the making, something that Geddes (and presumably Thomson) could never have been a part of given their lack of analytical training, their skepticism over what mathematics might provide for biology, and their late 19th century concern for taxonomies.

4. GEDDES’ GRAND THEORY

Our thesis here is that Geddes developed, at least to his own satisfaction it not to others, a consistent and coherent grand theory encompassing life, evolution, social union which pointed to the ‘great transition’. This theory incorporates the distinct biological theory of evolution set out by Geddes and Thomson³⁷, but is not ‘just’ a whole theory of evolution offered as an alternative to Darwinian evolution – significant and ground-breaking as that would be, if it were accepted as true. Rather, it is a wider theory grounded in a theory of the nature of life, and extending beyond evolutionary explanation to become a theory of society informing future human action.

The Theory and Critical Responses

What was this ‘grand theory’? We can attempt to summarise it by articulating it in the following four interlinked themes. The first is a kind of neo-vitalism: there is something special about life and living things; life is wilful and insurgent, possessing an inner impulse or creative drive. Second, it is this wilful, insurgent intrinsic nature of life that drives evolution. Hence, evolution proceeds intrinsically, inexorably and inextricably as part of the process of life, and happens despite, not primarily because

³⁶ Thomson and Geddes (1931:541).

³⁷ One could say that the biological component of Geddes’ grand theory was developed in conjunction with J. Arthur Thomson, who helped articulate and interpret the detail of the biological evidence and its evolutionary implications. But we suggest that the grand theory as a whole can be attributed to Geddes, as it originated in an interpretation of biology and evolution that predated Geddes’ collaboration with Thomson and extended well beyond the scope of his co-author’s biological work. See footnotes 14 and 24.

of, natural selection (hence Geddes pointedly departs from Darwin). The internal drive is nevertheless biochemical, not mystical (and here Geddes differs from Bergson³⁸). Third, Geddes downplays competitive struggle and rejects this as a dominant driver of evolution, again departing from Darwin in this respect. Fourth, the evolutionary history of life is a succession of unions, syntheses, co-operative associations, at increasing scales, from the first stuff of life-forming cells, to multi-cellular organisms, compound organisms, and through the invention of sex, to kinship groups, and hence societies, cities and nations. For Geddes, these four themes all fit together seamlessly in a coherent grand theory that transcends the human–nature divide and extends to social sciences and urbanism. However, it is immediately clear that the first three of these themes depart dramatically from Darwinism.

Departing from Darwin was not unusual in Geddes' day³⁹ although their departures were not accepted by mainstream biology. The review of *The Evolution of Sex* in *Nature* magazine, while acknowledging the empirical content of the work, was critical of the authors' more speculative departures and specifically accused them of misinterpreting Darwin.⁴⁰ On the one hand, then, Geddes and Thomson, though departing from Darwin, were not amateurs or cranks; they were seen as scientists whose opinions were at least considered worthy of discussion in the scientific literature, even if those opinions were rejected. Yet, on the other hand, they were undeniably considered to be heading off in the wrong direction, and gained little support for their theories. And as noted earlier, Geddes and Thomson themselves acknowledged (in *Life*) that their theories had not gained general acceptance. In the longer term perspective, Geddes is hardly more than a proverbial footnote in the history of biology. The impression is left that Geddes' biological contribution was limited, and of its time, with no lasting significance.⁴¹

³⁸ Welter (2002:21).

³⁹ Bowler (1983:5).

⁴⁰ P.C.M. (1890). The review suggests that the authors are 'controversialists from the first page of their book till the last'. Elsewhere, Geddes was apparently considered an 'interloper' or 'antagonist' as opposed to an upholder of Darwinism (Lankester, 1889).

⁴¹ Geddes is typically absent from biographical dictionaries of scientists, or accounts of the history of science. He tends to feature only in biographical dictionaries that include his non-biological contribution, or, in one case, rather specialist works on 19th century British scientists (see for example Lightman, 2004).

Resonance with Modern Biology

Despite the apparent lack of a legacy in the history of biology, Geddes and Thomson's ideas do find some resonance with ideas discussed in modern biology. First, the idea that life is somehow intrinsic to natural phenomena is echoed by Stuart Kauffman, who in his book *The Origins of Order*, asserts emphatically "Life wants to happen"⁴² – as if life is a proactive force, not just an accidental by-product. Second, the relative significance of natural selection in driving evolution is an ongoing point for discussion and dispute by biologists today.⁴³ Kauffman suggests that order in organisms arises 'not *because* of selection but *despite* it'.⁴⁴ Meanwhile, Michael Lynch in *The Origin of Genomic Architecture* argues, from a population genetics perspective, for the significance of internal physical processes relative to natural selection.⁴⁵ This is not to claim that the specific detail of Geddes and Thomson's ideas – which, like Darwin's essentially predated modern genetics or ideas of self-organisation – are upheld by modern biology, but simply that their departure from orthodox Darwinism on these points was (and is) not of itself necessarily wrong-headed nor wholly 'beyond the pale'.

Of the distinctive biological themes espoused by Geddes and Thomson, perhaps the resonance with most significance is that relating to the importance of cooperative association in the evolutionary history of life. In *The Evolution of Sex*, for example, Geddes and Thomson authors refer to the 'greatest of morphological steps' and 'greater steps of progress' (i.e. from cells to multi-cellular organism to societies) and in *Evolution* they refer to the 'great uplifts'. This finds a direct parallel in the 'Major Transition Theory', suggested by John Maynard Smith⁴⁶, and later developed further with Eörs Szathmáry in *The Major Transitions in Evolution* and *The Origins of Life*.⁴⁷ These major transitions relate (roughly speaking) to the emergence, through various

⁴² Kauffman (1993:137).

⁴³ See for example Sterelny (2007).

⁴⁴ Kauffman (1993:24; 35).

⁴⁵ Lynch (2007:141).

⁴⁶ Maynard Smith (1994) claims to have taken the idea from Leon Buss.

⁴⁷ Maynard Smith and Szathmáry (1995); Maynard Smith and Szathmáry (1999). In the Preface to the latter work, the authors describe the theory, as presented in the former work, as a 'novel picture of evolution.'

kinds of synthesis or symbiosis, of replicating molecules, chromosomes, eukaryotes, sexual populations, multi-cellular organisms and complex societies.⁴⁸ This accords with what Geddes and Thomson are referring to as great uplifts or steps of progress, although they do not express the earliest of these transitions in such terms or in such detail; and they refer of course to cities rather than in the language associated with the latest tangible transitions.⁴⁹

In drawing attention to the parallel between Geddes and Thomson's views and Major Transition Theory, this is not to claim that Geddes and Thomson were being especially prescient here: the observation that the history of life has seen increasing steps in the synthesis of parts and the complexity of wholes could be offered even without a sophisticated working understanding of contemporary biology.⁵⁰ The point here is simply that Geddes and Thomson's idea of great uplifts is still a respectably held one in modern biology – it is not considered out-of-date or discredited, like some other ideas of Geddes. And what is more, this idea has a direct relevance to Geddes' other writing not only in biology but his applications to the future of society.

5. BEYOND BIOLOGY

Geddes' grand theory can be interpreted as a single philosophy transcending biology in its narrow sense but including all life, hence unifying biology, sociology and urbanism. The significance of this for Geddes is indicated when one of his biographers, Mairet, sums up his work as follows:

⁴⁸ In their latest work, Maynard Smith and Szathmary (1999:16–19) identify eight transitions as follows: (1) Replicating molecules → populations of molecules in compartments; (2) Independent replicators → chromosomes; (3) RNA as enzyme → DNA and protein; (4) Prokaryote → Eukaryote; (5) Asexual clones → Sexual populations; (6) Protists → Animals, plants and fungi; (7) Solitary individuals → Colonies; (8) Primate societies → Human societies, and the origin of language.

⁴⁹ It seems that neither Maynard Smith nor Szathmary were aware of Geddes nor his writing on this topic (Szathmary, personal communication, 2009). Indeed, Maynard Smith even wrote a book called *The Evolution of Sex*, apparently in ignorance of the previous work of that title by Geddes and Thomson. Maynard Smith states in the Preface to his own book that he might have called it *The Evolution of Genetic Systems*, 'were it not that a classic with that title already exists' (1978:ix).

⁵⁰ This is analogous to the way that philosophers of ancient Greece theorised that living things evolved over time (Geddes and Thomson themselves referred to Empedocles and Lucretius in *The Evolution of*

“Nearly all his literary output bears upon this theme [to do with co-operation and the common good] in one way or another – the co-operation of natural beings with one another, of man with man, and of man with nature; and his aim is to raise this to a higher power by co-ordination of the sciences.”⁵¹

This implies that *organismal co-operation* (and perhaps by extension, though Mairet does not mention it, co-operation between cells and other parts of organisms) is no less part of Geddes’ scheme than human societal co-operation.⁵² Conversely, the traditionally recognised Geddesian themes of social union and cooperative association and action, and civic design and town planning are not just the products of human culture, organisation and agency, set apart from nature, but are part of a seamless procession of organic evolution, of ever-higher-level union, ‘from cells to cities’ – and conurbations.

And so, Geddes’ celebration of the city is not just in the familiar general sense of the city as a physical entity (*‘urbs’*) being the ultimate *product* of society, like the latest and greatest in a lineage of human artefacts going back to the first tools and crude buildings. But it is in the sense of the city as a social organisation (*‘civitas’*) being the ultimate co-operative whole, and at the head of a spectrum of co-operative wholes going back beyond human history to pre-human evolutionary history and the very first organism. Similarly, we can also see how the term ‘social union’ (as appearing for example the Edinburgh Social Union) is not merely something relating to a city’s society, but has deeper resonance with evolutionary history. One could say it was no accident that Geddes was involved with civic activism; this was not merely an extra-curricular diversion from his biological work in Edinburgh, but both can be seen as part of the fulfilment of the grand theory.

Sex), or that matter was made up of indivisible ‘atoms’, even in the absence of what we would today call scientific evidence.

⁵¹ Mairet (1957:215).

⁵² And we can deduce from the above quotation that Geddes’ urban renewal schemes, town planning and garden creation must all be considered as part of an active participation in the grand ongoing, uplifting progress of evolution.

Seen this way, Geddes' pioneering work in sociology and town planning was not a separate phase, involving separate theories, but an application and fulfilment of those same theories. Sociology and civics and town planning are therefore seen as applied biology, or, as different facets of Geddes' grand theory. Since the organism is influenced by the environment, it is necessary for the social progress of humanity to intervene in the environment, whether the built environment through town planning, or providing gardens, or adorning with art, as well as there being a role to intervene in social evolution through education.⁵³

Application to Town Planning

By the time Patrick Geddes had become established as a pioneering town planner, it may have seemed that his biological career was behind him. But Geddes never relinquished his interest in life and evolution, nor his conviction that town planning could be an instrument for precipitating the onward evolution of human society. For most practical purposes, the scope and content of *Cities in Evolution* is perhaps better encapsulated by the book's subtitle: *An Introduction to the Town Planning Movement and to the Study of Civics*. But in the current context, we can revisit the book as being not merely tangential to Geddes' biological career, but seeing *Cities in Evolution* as a specialised, more applied subset of Geddes' wider project. Seen this way, indeed, the title itself is not just an alternative way of saying 'The Evolution of Cities'⁵⁴ but more pointedly is as much about the role of cities in the onward evolution of humanity, human society, and life.

In the Preface, Geddes refers to his purpose as expressing 'essential harmony' and precipitating 'further co-operation'.⁵⁵ Here, we can interpret 'essential harmony' as the harmony of life (i.e. the deep resonance between all living things, through evolutionary linkages, and an underlying vitalistic unity), and 'further co-operation' meaning going above and beyond the earlier instances of cooperation in evolutionary history, from cells to multi-cellular organisms to societies. Geddes goes on to state that the book's 'definite principle' is 'above all, [to] seek to enter into the spirit of our

⁵³ See, for example Geddes (1929b); see also commentary on art as a means of environmental influence to help assist this evolution (Studholme, 2007).

⁵⁴ 'The Evolution of Cities' was in fact Geddes' planned title for an earlier version of the book.

city, its historic essence and continuous life.’ This simultaneously glib yet opaque comment gains richness and more specific meaning if it is interpreted as referring to a vitalistic city that in some sense really possesses a spirit; whose past is somehow evolutionarily embodied in its present form; that has an identity and existence continuous with its past, this being a continuity of life, part of the great evolutionary Tree of Life that contains all living things. It seems reasonable to infer the equivalents of cities in ‘nature’ such as the societies and constructions of social insects.

Subsequently, on page 1 of chapter 1, Geddes, states:

“For it is surely of the very essence of the evolution concept... that it should not only inquire how this of to-day might have come out of that of yesterday, but be foreseeing and preparing for what the morrow is even now in its turn bringing towards birth.”

In alluding to gestation and birth, this might appear to be a vague muddling of developmental and evolutionary metaphors. And yet, it can be read as a statement concerning evolution after all – not Darwinian evolution, to be sure, but a specifically Geddesian evolution that implies the present is unfolding from the past.

The idea of the conurbation – surely one of Geddes’ most widely used concepts and perhaps his most successful neologism – could be read simply as an unremarkable agglomeration or spreading-together of urban areas. But seen in the vitalistic context of Geddesian evolution, the conurbation almost becomes seen as a new kind of organisation, a progression beyond cities themselves – equivalent to individual organisms coalescing to form a kind of super-organism. Geddes actively scrutinises the map and talks of ‘the coming conurbations’ as if these are not merely mundane extrapolations of ongoing urban expansion, but are part of humanity’s – and hence life’s – next synergistic step. Seen this way, it is no accident that Geddes crystallised the concept of conurbation. For Geddes, the recognition of the conurbation must have been more than just a timely interpretation of an increasingly significant

⁵⁵ Geddes (1915/1949, xxix)

contemporary phenomenon – as today we may recognise edge cities – but welcome evidence confirming his wider theory of evolution.

To the end of his active career in town planning, Geddes maintained his vitalistic consciousness. In what Meller describes as a confident statement of Geddes' understanding of town planning, Geddes rounds off his Madras reports with:

‘Here is the last word of town planning, so far as I know anything of it. [...] The promotion of Life: that is what must be constantly before us as our aim in planning.’⁵⁶

Here again, ‘promotion of Life’ surely does not just mean the prosaic goal of promoting what we might term ‘everyday life’, that is, planning in order to help people go about their daily business. Surely it has a deeper meaning something to do with the transmission and progress of evolving life. Overall, here we have the master of town planning, coming back again to the topic of Life, as being no more and no less than what town planning is *for*. In other words, for Geddes, town planning is an instrument for evolution.

The ‘Great Transition’ Revisited

The Great Transition bears directly on two of the themes identified earlier with Geddes' grand theory (section 5). On the one hand, Geddes saw the evolutionary history of life as a series of great uplifts or great steps of progress. Seen this way, the ‘Great Transition’ would not just be an event significant in the history of human society (like that from ‘decadent Rome to New Christianity’), but potentially a new great synthesis or further cooperative-synergistic step, the latest not only in the history of human society, but in the evolutionary history of all life. This view, insofar as it accords with modern Major Transition Theory, is quite compatible with (neo) Darwinism, although in speculating about the future direction of human society it clearly goes beyond it.

⁵⁶ Meller (1990:240-241)

On the other hand, the significance of the Great Transition is also rather directly related to Geddes' particular neo-vitalistic, non-Darwinian interpretation of evolution. Geddes' Great Transition, it will be recalled, was based on the recognition of a fundamental opposition between two world systems, the paleotechnic and the neotechnic, and the desirability of effecting a transition from one to the other. The fundamental opposition arranges a variety of constituent oppositions of a familiar nature: peace rather than war; social rather than pecuniary priorities; social cooperation rather than individualistic competition; humane rather than mechanistic approaches. It is easy enough to see how any observer could identify with any or all of these, although it might seem utopian, to imagine a world with no conflict, no competition, or the abandonment of money. Geddes however seems to have believed that this was *not* a 'mere Utopia'⁵⁷, but something attainable, extrapolating from processes observable in the natural world, concerning cooperation and altruism.

Crucially, Geddes places evolution on the preferred side of his two opposing forces, but what he means is his own, vitalistic interpretation of evolution. In contrast, he expressly identifies Darwinian evolution – or at least, its most extreme, selectionist interpretation – with the ills of competition, militarism, and so on: in a letter to Mumford, Geddes explicitly identifies 'Darwin's metaphysical phrase – "Natural Selection"' with 'futilitarians' and 'IX Philistines'. This vitalism is also echoed in *Life*. In the Preface, on the first page of text [proper], the authors state that the book: "seeks to justice between 'mechanistic' and 'vitalistic' doctrines..." They refer to turning from 'too simply mechanistic theories' to more social ones. In other words, Geddes is hereby still to the last applying biology and evolution to cities and societies, and this is *still* not through 'mechanistic', Darwinian-style natural selection.⁵⁸

The foregoing interpretations tell us four things that help clarify the significance of Geddes' grand theory in terms of the Great Transition. First, it is a reinforcement of Geddes' conviction that true organic evolution was not primarily about competitive struggle, thereby reinforcing the schism between his view and Darwin's. Second,

⁵⁷ Geddes and Thomson (1889:312/313).

without the understanding of what Geddesian evolution is, the dichotomy that the Great Transition is based on does not make sense. Hence, the lack of a general awareness and acceptance of Geddesian evolution must surely have hindered the understanding of the significance of the Great Transition. Third, if Geddesian evolution is wrong, then it undermines the whole theory, since if individual self-interest, competition and internecine struggle are inextricable with biological evolution, then Geddes' presumed dichotomy between Darwinism and true evolution is false, and the Great Transition becomes a chimera.

Fourth, however, to the extent that Geddes' interpretation of the major transitions in evolution is tenable, in that cooperation and subservience to larger wholes can arise through (or despite) natural selection, then there remains the possibility that peaceful synergy and cooperation of all humanity is not a vain hope contradicted by nature, but just a matter of scale, and time, and circumstance. In this sense, Geddes arguably had a point, in principle – though in practice the envisaged Transition would not seem to be something that any one man or one generation could hope to achieve.

Overall, the critical point here is that Geddes in the closing decade of his life was exhorting a series of transitions that may seem somewhat arbitrary and general and loosely connected, but that Geddes believed were fundamental and specific and inextricable. So, while any reader of Geddes' text could agree with advocacy for a more human rather than mechanistic approach, or peace rather than war, or cooperation rather than competition, one need not see them as being necessarily an inextricable nexus, in need of positive encouragement. But Geddes thought they were bound together by his theory. Hence Geddes believed the contrast as a fundamental conflict of the age (and also of evolutionary history), but one that he, and only a few others, frustratingly, were able to grasp. It seems on the one hand that Geddes' neo-vitalistic evolutionary ideas were not credible from the point of view of mainstream biology, but at least through understanding of their biological provenance, we can better understand the significance he placed on them. On the other hand, Geddes'

⁵⁸ Thomson and Geddes (1931:v and vii). Geddes was still railing against the mechanistic worldview Novak (1995:299) – as if this view of biology were a strong motivator for writing *Life* as much as sociology and unity of knowledge.

recognition of the major transitions in evolution have stood the test of time. Again, Geddes' belief that human deeds – through politics, civics and town planning – could help precipitate the next transition in social evolution to a new level of peaceful existence now seem at best optimistic, and at worst simply misguided.

6. CONCLUSIONS

Our core argument is that Patrick Geddes' biological works provide a key to understanding a coherent 'grand theory' of life and evolutionary transitions that underpinned the rest of his work, including ostensibly non-biological works on town planning, and the exhortations regarding what he called the Great Transition. This has allowed us to re-evaluate some of the significant points of Geddes' theories that may otherwise have remained obscure, and also to increase the significance of the biological content of his career, compared with existing biographical interpretations.

On the one hand, insofar as Geddes' biological ideas accorded with Darwinian evolution, we can interpret Geddes' application of evolutionary ideas to social science, ecology, environmentalism and town planning as natural, valid and in some ways prescient contributions. This includes the attempts to better integrate humanity and humanism in cities with nature and the environment, traditionally acknowledged by followers of Geddes, as well as Geddes' less remarked upon foreshadowing of Major Transition Theory. On the other hand, to the extent that Geddes' evolutionary ideas departed from Darwinism, and remain unvalidated by mainstream biology, Geddes' ideas to some extent remain historic curiosities, buried within his writing on sociology and town planning, and not well understood. Indeed, because his biological ideas were never fully accepted or appreciated, Geddes was not able to press his case in sociology and planning with such conviction as might otherwise have been possible. The general obscurity of Geddes' work in scientific circles also means that even where Geddes' ideas directly foreshadow modern ideas – whether major transition theory, socio-biology, evolutionary economics or 'biophilic' design⁵⁹ – these modern ideas are now more likely to be lumped in with the general (and expanding) legacy of Darwin, rather than being associated with Geddes.

While modern internationalism and environmentalism may give a fresh boost to Geddes' vision for increasing cooperation from the local to the global scale, there seems little prospect of a Great Transition occurring any time soon, based on a diminishing of war, competition or pecuniary priorities or individualism – far less that this would be seen as arising as a natural fulfilment of a vitalistic conception of evolution. And yet, neither does the reality of natural selection and Darwinian evolution deny the possibility for cooperation to sometimes prevail over competition, or love to prevail over struggle.

Our revisiting Geddesian biology also draws attention to the idea that for a significant proportion of Geddes' career (at least, in publications as early as 1889 and as late as 1931, a span of forty-two years) and while he was assumed to be predominantly a sociologist and town planner, Geddes maintained views on life and evolution with an undiminishing conviction. Biology was therefore not just a prelude to Geddes' main work, an early phase to skipped over before getting to his real vocation. Rather, Geddes' interest in life and evolution underpinned and motivated his work, right to the end. Geddes emerges more strongly as someone who applied a very particular interpretation of the world, an integrated theory that cut across an unusually large number of disciplines. This at once implies something more focused or limited than a polymath, but something rather more robust and coherent than a jack-of-all-trades. His failing was as much his inability to impose a discipline on his ideas while writing influential theses that would persuade a much larger following of his far sighted views.

Overall, we can see how Patrick Geddes was prescient in being one of the first to appreciate and exploit the cross-disciplinary unifying power of evolutionary theory, in its application across social sciences and humanities and indeed town planning. Indeed, we could even argue that Geddes' theory was in a way 'grander' than Darwin's, in terms of scope, albeit that Darwin's theory ultimately had much greater significance in the history of biology. Nevertheless, while Geddes' biology may remain obscure, today's social theorists and town planners can still learn from the way Geddes' work attempted to resolve fundamental tensions between cooperation and

⁵⁹ Kellert *et al.* (2008).

competition which underlie many ongoing problems faced by society and public policy. Modern social and urban theories are judiciously infused with an ecological and environmental awareness founded on recognising humanity's inextricable connection to nature that is conventionally associated with being founded on Darwin's crucial contribution. But even if preferring Darwin's over Geddes' biology, we need not take a too narrow Darwinian interpretation when extrapolating from biology to the extended spheres of human society and planning, that became Geddes' trademark territory. As Geddes understood, we are not simply the passive creatures of environmental change, but we can take positive action in shaping our built environments together for the betterment of our lives and society. This remains the prerogative of civic activism and town planning.

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