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'The Human Animal: Biological Tropes in Interwar Poetry'

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World of young living language! Fold
On vivid fold of changing green
In sapient shoot and lyric leaf,
Exact, appropriate, unseen!

It is full summer, fertile earth
Fulfils her rhythm: line on line
In seas of light and liquid gold,
Grey-silver olive, changing vine . . .[1]

Michael Roberts's 'Earth, Impact' has become something of an anchor point for those interested in relations between science and poetry in the 1930s. Alongside the poem's engagement with physics and geology, there is the biological imaginary represented by these lines, in which language has the fine structure of organic life, and reading is a kind of parasitic investment in that life ('Where commentary ivy clings / In deep interstices of mind'). These metaphors put into practice the aesthetics articulated in Robert's preface to *New Signatures* (1932), which compared scientific and poetic knowledge and technique. An interest in biology is something that Roberts shares with a circle of young writers in Cambridge and London, many of them significantly allied to Surrealism, and informed about recent developments either by their education or by the popular scientific writings which are such a feature of the inter-war period.[2] In this essay I will explore how three of these writers, Herbert Read, William Empson and W. H. Auden, as well as one predecessor, John Rodker,

built on three developments in particular which seemed to have a bearing on the understanding of the human as animal: the emergence of endocrinology or the study of hormones; a fascination with the social life of insects; and the new concept of neoteny within evolutionary biology.

The period after 1900 saw major advances in the science of biological systems. Two things stand out in the shifting understanding of life in the period. Firstly, a greater emphasis on the interactions of the biochemical and neurological systems, derived from the study of hormones, proteins and their role. Secondly, a shift from a strictly mechanist sense of bodily engineering (associated with Loeb, Beard and others) to a more holistic approach which stresses the interaction of the organism's genetic makeup and environment within an evolutionary, homeostatic perspective (the idea of homeostasis was developed by Walter B. Cannon and popularized by J. B. S. Haldane and others). The new mathematical genetics linked to the rediscovery of Mendel was also part of these developments. So too was the beginning of modern ecology, with Sir Arthur Tansley developing the notion of 'ecosystem' in the 1930s and Jakob von Uexküll that of 'umwelt' in Germany in the same period.

The discoveries of biology were quickly applied to notions of the human in a range of popular writing. One example is H. S. Jennings's *The Biological Basis of Human Nature*, published by Faber in 1930. Jennings' work was, Katy Price suggests, influential in Cambridge, which led the field in biology in England; and this provides a route into the work of William Empson and Hugh Sykes Davies, both discussed below.[3] As well as a survey of current research, Jennings – a pioneering American geneticist whose first names, 'Herbert Spencer', suggest he was raised to the task – provides a chapter on 'Biology and Selves' in which he reflects on the way that genetics dissolves the self:

> Thus any individual – you or I – is a knot of strands, of genes, that extend backward into the remote past, there forming other individuals, and that will extend forward into the future, forming still others. Every knot, every individual, is a new combination of strands, diverse from the combination forming any other, but containing strands that have been part of many earlier individuals. (290)

But even as the self is dissolved, it is expanded:

> As a feeling, experiencing, knowing self, I, the ego, am identified with only one of the great number of knots into which the living strands are tied; my experiences cling to one of these exclusively. This fact arouses questions. Why should my experience not embrace the entire network, the entire organism, instead of one knot merely in its interlaced strands? (291)

Jennings also meditates on the wastefulness of nature, the near infinite combinations of genes discarded in each generation, and contrasts the accident of selfhood (*this* unlikely combination of genes) with the centrality of self in Cartesian thinking (295-6). The self is networked, relational, and contingent. Within this framework, earlier studies of the organization of insect life took on a new cogency, with the self-organizing and long-lasting colony a model for social life.

The result of such thinking is a 'biological style' that one might identify in inter-war writing, born out of a mix of biology, sexology and medicine, writings by Bergson, Gourmont and other vitalists, as well as older ideas. Modernists were involved in the dissemination of some of this material, notably Pound in his translation of Gourmont's *The Natural Philosophy of Love*, with his preface drawing out an embodied and sexual poetics. Evolutionary thinking might also be applied to genre, in the wake of the work of Taine and Ferdinand Brunetière. Eden and Cedar Paul, translators of sexological works among other scientific and literary writings, wrote of kinds of images in *The Appreciation of Poetry* (1920): 'As with all classifications that concern the world of organic life, the boundaries are ill-defined, the types merge into one another at the edges'.[4] Equally, it could inform a theory of poetic production. Mina Loy wrote that 'Poetic rhythm . . . is the chart of a temperament', 'the spontaneous tempo of their response to life', produced by a combination of inheritance and environment (the 'recent fertilizer' of the American language).[5] Hence Loy's 'The Dead' (published in the 1919 *Others* anthology), with its sense of the boundary between organism and environment:

> We have flowed out of ourselves
> Beginning on the outside
> That shrivable skin
> Where you leave off[6]

The declaration that 'We are turned inside out / Your cities lie digesting in our stomachs' might even derive its sense of externality from the image of the Hydra which, as biological writers noted in the period, can be turned inside-out and survive.

One final introductory point concerns the legacy of nineteenth-century vitalist thinking, which both clashed with and appropriated the new science of life. Despite the tide turning against what Joseph Needham called the 'Phoenix' of Vitalism, philosophical attempts to differentiate life from matter at a fundamental level continued.[7] As Peter Bowler shows, the Vitalism associated with J. Arthur Thompson was common at least up to 1930, for example that of Ronald Campbell MacFie in the *Harmondsworth Popular Science* series of 1911-12 and John McKendrick's *The Principles of Physiology* (Home University Library).[8] Various popular or mystical forms of Vitalism circulated under the heading of 'vibration'. A sense of the field is provided by the list of the publisher C. W. Daniel, which alongside tracts on Buddhism,

pacifism, herbalism, eugenics and psychoanalysis includes Maryla de Chrapowicki's *Spectro-Biology* (1938) and Edmond Szekely's *Cosmos, Man And Society - A Paneubiotic Synthesis* (1937). While distinct from science, such 'syntheses' reflect the direction of biology itself towards a more systemic understanding of life.

Endocrinology: John Rodker

My first area of consideration, endochrinology, is a product of the scientific medicine of the twentieth century. The origins of the investigation of the 'ductless glands' is in the nineteenth century, with the work of Johannes Mueller, Charles-Edouard Brown-Séquard and others on the adrenal glands, thyroid and testicular extracts. But it was the period after 1900 that saw a huge expansion of the field, including a closer understanding of the overall regulatory role of the pituitary gland. The first textbook, T. Swale Vincent's *Internal Secretions and the Ductless Glands*, was published in 1912. The Association for the Study of Internal Secretions (later the Endocrine Society) was founded in USA in 1917, and its journal *Endocrinology* the same year. W. M. Bayliss and E. H. Starling at University College London in 1902 demonstrated the role of chemical messengers in triggering pancreatic secretions in dogs. The term 'hormone' itself was first used by Starling (at the suggestion of W. B. Hardy at a dinner at Caius College) in his Croonian lectures in 1905:

> These chemical messengers … or 'hormones' (from *ὁρμάω* [ormao] = I excite or arouse), as we may call them, have to be carried from the organ where they are produced to the organ which they affect, by means of the blood stream, and the continually recurring physiological needs of the organism must determine their repeated production and circulation through the body.[9]

Thyroid hormone was isolated in 1914-15, insulin in 1921; the early 1920s saw investigations of oestrin and progesterone; androgens and testosterone were isolated a decade later.[10] Otto Loewi's famous 1921 experiments on the frog's heart which lead to the discovery of 'Vagusstoff' were a crucial step, establishing the existence of neurotransmitters (that is, a chemical component of nerve activity) in feedback systems. The result was a new understanding of a single integrated 'neurohormonal system' (or the 'neuro-endocrine system' proposed by Walter B. Cannon at Harvard in the 1920s) rather than two separate systems. W. Langdon-Brown's *The Integration of the Endocrine System* (1935) represents one culmination of this process.[11]

Scientific commentators were quick to apply these ideas to materialistic understandings of consciousness, now inflected by biochemistry and an understanding of the body as a homeostatic system. In a 1927 essay on 'Biochemistry and Mental Phenomena', for example, Joseph Needham – then a junior colleague of Langdon-Brown's at Cambridge – discussed proteins and hormones as message-carriers before concluding that 'the physio-chemical

expression of the emotions may originate in the varying percentage relationships of the hormones of the body'.[12] Popular books covering these topics included Richie Calder's *Birth of the Future*, which discussed chemicals and the brain; D. F. Fraser-Harris's *The ABC of Nerves* (1928); and Bryan H. C. Matthews's *Electricity in Our Bodies* (1931) – all representing versions of what Bowler calls 'the new materialism'.[13] The scientific understanding of hormones is not, however, inevitably linked to a strict materialism, since in some popular writings the work of glands remained linked to earlier notions of animal spirits.

These developments often enter the popular culture of the 1930s as threats to human agency. Charles Duff's satirical play *Mind Products Limited: A Melodrama of the Future* (1932), published in Eugene Jolas's *transition* series, invokes a future (the 1960s) in which social life has become manipulated by the endocrinologist in league with a ruthless businessman. Dr Zabuka explains:

> My experiments dating back over twenty years have led me inevitably to conclude that man is simply so much matter acting under a mind which is a chemical composition governed up to a point by the inherited chemical parts, some of which are in the glands, then by past external stimuli …[14]

But the result of the mass-production of mood-changing chemicals is chaos as various striking workers and groups of soldiers get hold of the 'Ferocity Mixture' and other products, rather than the various Mind-Stupefying preparations manufactured to pacify the workers. Real-world anxieties are enacted: a German extremist group starts to make versions of the chemicals and manipulate the populace; the Spanish Cabinet has its memory wiped; Brazil has a revolution when sailors get hold of the Ingenuity Syrup. The UK descends into bloody chaos, leaving a few survivors to assert the possibility of freedom not at the mercy of chemicals. Huxley's *Brave New World*, published the same year, promotes a similar vision of pharmaceutical control, and Kapek's earlier *R.U.R.* (1921) references both biochemistry and genetics, since its 'robots' are in fact androids, simplified biological beings.

With this set of fears in mind, we can turn to the work of John Rodker. As Andrew Crozier reports, Rodker studied science for entry to Imperial College in his early life, dissecting plants and animals. A biological mode of thinking permeates his work, but in a way which directs the topic towards satire rather than dystopia.[15] Rodker persistently referred to the body in biological and indeed hormonal terms; in the 1930s he was to translate, from a French version, the German sexologist Magnus Hirschfeld's *Sex in Human Relationships* (1935), with its declaration that 'For every individual, love is determined by the interactions of his psycho-glandular constitution'.[16] His theatre manifesto, published in the *Egoist* in 1914, argues for a theatre of 'primitive emotions': 'words are a waste product of emotion and do not concern it' (*PA* 177) – articulating the epiphenomenal view associated with James and Lang which sees emotions as interpretations of bodily changes. Later his *Memoirs of Other*

Fronts comments on the absence of young men in the towns in the year 1916 in these terms: 'their absence the starvation of the psyche like the gland deficiency it was. That period, like a man "gelded" carried on, aware its most essential member lacked it . . .'[17] Rodker's 'Hymn to Love' (1920) begins with a world gone sexological, in contrast to the nuns evoked in the opening line:

> Ave Maria, Stella Maris
> Ah Paris
> Yet even in London,
> Brantôme, Whitman,
> Vatsyayana.
>
> Even so
> can it be merely
> a matter of (quoting De Gourmont)
> mucous surfaces?
>
> O impossible virginity
> of ductless glands!
> The agony! (*PA* 71)

The sexual memoirs of Brantôme, the candour of Whitman, and the supposed author of the *Kama Sutra* form an extravagant list, alongside Gourmont. The poem goes on to depict love as an unstoppable series of encounters culminating in cynicism and the decline of lust into 'play'. The final image of 'yellow and wrinkled' lovers compared to 'Ascidians' (sea squirts) rising 'to the surface of our / velleities' in the full moon (*PA* 72) is biologically inaccurate – sea squirts are fixed creatures, unlike squids, for example – but nicely evokes the idea of a hardened exoskeleton. Moreover a feature of the Ascidians is 'retrogressive metamorphosis', the fact that the larvae are more complex than the mature creature. That and the resemblance between sea squirts and genitalia suggest an ageing of the human towards the animal – a thematics pursued later in this essay.

In Rodker's poems, desire flows around the body like animal spirits; it takes on electrical properties, but always within the context of the bloodstream and glandular life. Emotion 'floods' the self; it 'wells up', as in the 'clear / White flood of passion' of 'Because Some Lover' (*PA* 94); it seeps into and permeates the body. This is from "'The Pale Hysterical Ecstasy'" (the brackets are Rodker's):

> White face puffs out – cobra's hood,
> age wrinkles at lip corner –
> glands flash open [though ductless]

a black draught for blood stream
the spate boils on the dams. (*PA* 85)

There is a hypothetical intertext here – possibly direct, but equally a matter of a well-trodden pathway linking Mesmerism and hormones – signalled by the 'flashing open' of glands. The text in question is *Swedenborg on the Ductless Glands, with Modern Confirmations*, a lecture prepared for the 1910 International Swedenborg Congress in London by David Goyder, a consultant at the Bradford Royal Infirmary whose father had been a Swedenborgian minister. Goyder sees Swedenborg, as some medical historians have since, as a pioneer in the study of the ductless glands; he derives from Swedenborg's Mesmerism an account of the 'flash' of the animal spirits in what is a 'dynamic, penetrative power; he speaks of it as "flashing through the nerves" (*PA* 3).[18] Goyder explains that, in his anatomy, Swedenborg noted the ductless glands' influence in foetal life, and saw them as having 'a larger amount of animal spirit than is conveyed to the other organs' (6) and as rejuvenating red blood cells. This is a version of the anti-toxic theory of hormones popular at the turn of the century: as physiologists noted, if you remove the ductless glands the body breaks down – thus they are *health-giving* glands. Goyder argues that for Swedenborg 'life is molecular as well as somatic. Every bodily organ has a special quality of life of its own') and each cell of the gland has 'the office of the complete organ' within it (13) – an argument one might link to the human-become-genital of 'Hymn to Love', 'Married' and other poems.

The reference to 'flashing' glands in Rodker and the evocation of toxicity hint of a link. Rodker would have been exposed to Swendenborg via his wife: Mary Butts's great-grandfather Captain Thomas Butts had been one of Blake's most active patrons (the family's paintings form the core of the Tate collection), and she described him as a keen Swedenborgian.[19] She had an intense interest in the mystical tradition herself, and Rodker was later engaged with alchemy and the occult as a publisher. Even if there is no direct link to Goyder's pamphlet, the word 'flash' recurs in his poetry describing the body and emotions: the 'flash' of desire in 'The Dancer Dancing'; or 'Chryselephantine', with its depiction of the osmosis associated with cellular life and automatic responses to hormonal messages:

And fire thrills, floods –
wavers through you,
in subtle osmoses;
and though you did not know me yesterday
yet you have yielded in a flash (*PA* 81)

The word seems to have been catching: Ford wrote to Rodker of the 'amazing flashes of psychological projections' in *Montagnes Russes*, the novel he published in French translation in Paris.[20]

Rodker's biologism is of course overlaid with his Baudelairian scorn and desire to shock – the 'alchemical vagina' of 'Hymn to Heat', the mutilated bodily parts of 'War Museum – Royal College of Surgeons' – and with his fascination with the love-death of the males of certain species of worm and insect (a preoccupation that links him to the Surrealists). Most fundamentally, his work registers a fear of the dissolving of the human into tissue and death, – the 'mush / jelly that sweats and shuddering / speaks with a voice like madness // and dies' of 'Out of the Water' (*PA* 127); the 'Body linings' which 'peel / from the deep core in siroccos of Alkali' in 'Wild West Remittance Man' (*PA* 86). The pervasive references to rotting leaves, trees and fern in his poetry – often as a background to sex – suggest the ends of the biological in death, just as regression is always a possibility. The 'systole and diastole' of embryonic life\described in his prose poem 'Chanson on Petit Hypertropique' (*PA* 62) subject the individual to the 'continuous and singing buzz of life', a flux of impulses rising and falling away from moments of organization.

Social Entomology : Read and Empson

My second topic is one raised on occasion by Rodker, the social life of insects – a topic which receives a rich vein of commentary in scientific and popular writing between 1880 and 1940, focusing in particular on ants, termites and bees. The origins of this work are in the nineteenth-century Swiss and French investigations of insect intelligence and insect society by Félix Dujardin and Jean Henri Fabre, and in Maurice Maeterlinck's *The Life of the Bee* (1901), *The Glass Spider* (1923), and *The Life of the White Ant* (1926, remained a popular presence in English translation in the twentieth century; his work was followed up by Auguste Forel in *The Social World of the Ants Compared to that of Man*, translated by C. K. Ogden in 1928, and by W. M. Wheeler in *Social Life Among the Insects* (1923).

As Charlotte Sleigh has recently shown, studies of ants life were quickly applied to human societies, influencing such fields as linguistics (via Ogden's Basic English) and the development of cybernetics.[21] Fabre, Wheeler and others reinforced the notion that human life was organized along lines with deep sources in evolutionary history. Expressing his suspicion of Darwin's grand theory, Fabre nevertheless grounds his own observations in the continuity of nature:

> The *laudator temperis acti* is out of favour just now: the world is on the move. Yes, but sometimes it moves backwards. When I was a boy, our twopenny textbooks told us that man was a reasoning animal; nowadays, there are learned volumes to prove to us that human reason is but a higher rung in the ladder whose foot reaches down to the bottommost depths of animal life… It begins with zero in the glair of a cell and ascends until we come to the mighty brain of a Newton. The noble faculty of which we were so proud is a zoological attribute. All have a larger or smaller share of it, from the live atom to the anthropoid ape, that hideous caricature of man.[22]

In all these texts, there is an implicit comparison with human societies, and the suggestion that the instinctual behavior of insect societies might tell us something of our own blind actions and closeness to the earth: for Forel lessons about co-operation and work; for Wheeler darker lessons about cast and subordination. W. Langdon-Brown, the endocrinologist cited earlier, in his 1936 Maudsley lecture on 'The Biology of Social Life' follows Forel in making biological organization a parallel to social life: cancer is 'cell anarchy'; ants and bees represent a new, co-operative ideal; the sense of the 'tribe' and finally 'internationalism' are indications of an evolutionary drive towards the larger unit, underpinned by the 'nervous system' of modern communication. But he also flags the possibility of regression, with an implicit eye to Nazi Germany: 'Whole nations which apparently feel unable to maintain the ideals that we regard as the higher ones actually seem to gain a new hope and a new faith by departing from them. … Depreciation of ideals, like depreciation of currency, seems to give them a new stability'.[23]

The result of such thinking is a reformulation of human actions and mind towards notions of a latent evolutionary pragmatics rather than rational action. As Wheeler commented in a review of *The Social World of the Ants*, '"intelligence" is used by Forel in its modern sense of "behavioristic adaptability" and not in the scholastic sense as a synonym for "ratiocination"'.[24] Wheeler's work was focused on the notions of a 'hive mind' or 'super-organism' in which the individual is subsumed. Central to his thinking, Sleigh argues, is what he called *tropallexis*, the economics of mutual feeding: between worker and queen; between worker and the larvae which exude an oily substance; and the parasitism between different species. This is a topic, she suggests, reflected in Aldous Huxley's depiction of soma in *Brave New World*, via his brother Julian's book on ants.[25] It is also a topic taken up by a number of poets.

Herbert Read's autobiography notes the decisive influence of Bergson and Freud on his thinking, pushing his writings on art towards an understanding of it as a form of life: what he calls 'genetic criticism' involves 'a complete analysis of the circumstances in which [the artwork] came into existence'.[26] Read's only novel *The Green Child* (1934), incorporated into Surrealism in the *Bulletin* of the 1936 London exhibition (which Read co-organized), is notable for its radical split between the realistic middle section, dealing with its hero Olivero's career as a politician in South America, and the fabulous outer sections, dealing with the mysterious Green Child. Olivero returns his English village and frees the Green Child from the cruel miller. Together they follow an uphill-flowing stream to its source, sinking into the underground world from which the Green Child comes – a series of caves not unlike an ant colony. Her people's lives are predicated on an ascent up the levels in colony, in which they explore a hierarchy of actions: the pleasures of play and sensuality; work and leadership; and finally solitary thought in caves where they are feed by worker-assistants, who at their death remove them to be mineralized in the 'petrifying-trough'. As

they move into the final stage they chose a small animal companion, a reptile or an insect (Olivero selects a jewel-like beetle), and spend their time contemplating crystals, emblems of timelessness: 'When the last vital element had received its crystalline form, then the sense of time would disappear'. The soul is stilled, leaving a body which has achieved 'a state of crystalline purity'.[27] The movement is away from the human, via the perceived selflessness of insect life, to the object-world.

Read's poetry registers a similar tendency to dissolve the human into other categories. 'The Retreat' refers to the instinctive life of the youth as a kind of dragonfly's flight 'on quivering wings', supplanted by the self-consciousness of maturity. The poem depicts dualism dissolving into a universal energy:

> Not mind and matter, co-distinct
> In man alone, or alone in living things,
> But a tympanum for the rhythms of ether,
> An element
> Incarnate in everything. Life is but a lesser lesion
> Of this extensive energy, and so life is less
> A thing to wonder at and worship –
> Is but one mechanism more to manifest the force
> Active even in the gulfs of uncreated space.[28]

The result of this cosmic vision is to render human 'agonies … / Perspectively doomed and wrought / To the little loudness of an insect's cry' (141-2). Like *The Green Child*, 'The Retreat' enjoins the reader to attend to the 'rhythm' and 'structure' of the universe and ultimately equates understanding with death.

A reduction of pain to 'an insect's cry' is, more reductively, what happens in Read's satire 'Lepidoptera', which compares its urban subjects to moths: 'These pink chrysalis faces' are torpid in daylight,

> Until night finally falls,
> When, stript of their drab or tinsel sheaths,
> They ape Narcissus in mildewed mirrors,
> Display their graces to the sick glare of gas-jets,
> And on rococo quilts
> Get corybantic for a while. (80)

The insect thus signals in Read's work a discomfort with the human. His work registers the Surrealist pull back towards the insect and beyond that to matter itself – as in Roger Caillois's fascination with the praying mantis as the confluence of *eros*, *thanatos*, and a

mimicry which both evokes the human through prayer and erect posture and approximates the organism to the object-world.[29] For Callois, 'the mimicry of mantises illustrates, sometimes hauntingly, the human desire to recover its original insensate condition' (79); 'the insect loses its identity and returns to the plant kingdom' (80). The mantis thus becomes an 'objective ideogram' for our biological condition, an illustration of the rootedness of myth in biological history.

But arguably the poet who responds most avidly to writings on the insect worlds is William Empson, who was an admirer of J. B. S. Haldane, reviewed texts on biology and eugenics, and published J. O. Giršavičius on 'Biochemistry' – an article which stressed the 'dynamic mechanism' of the organism – in *Experiment*, the small magazine he founded at Cambridge with Bronowski and others.[30] His poems intersect at times with the issues discussed above: 'Missing Dates', for example, with its play on blood toxicity and experiments with rejuvenating transfusions. Empson reviewed Maeterlinck's *The Life of the White Ant* in Granta in 1927 and was clearly familiar with Fabre and Wheeler.[31] In a range of his early work, from 'The Ants' (where the London underground becomes an ant-nest) through 'Value is an Activity' (earlier called 'Inhabitants'), which has fungus-growing termites or white ants, to the scorpion ringed with fire in 'Plenum and Vacuum' to 'Arachne', 'High Dive' (the 'termite city' again), 'Letter IV' (the cicada), and 'UFA Nightmare' (the weevil), Empson uses insect societies to reflect on human automaticity, blindness and enclosure, and notions of hierarchy – though in a manner less fixated on the flight from the human than was the case in Read, and more fascinated by the way that the comparisons he deploys intimate collective forms of life organized by their environment, like that of the Tube or the city as seen by *Metropolis*. As John Haffenden points out, Haldane's essay 'On Being the Right Size' in *Possible Worlds* (1927) is one source of Empson' sense of the chain of being as a series of bold poetic comparisons across organisms whose conditions of life were radically different.[32] In *Possible Worlds* Haldane stresses Wheeler's finding that ant colonies work on an economic principle, rather than needing the postulate of complicated instinctual routines: workers are rewarded directly with food for what they bring to the larvae. In Empson's poem, this automatic exchange is analogous to the woman/tree's blindness and indifference to masculine/ant love: 'We ants may tap your aphids for your dew. / You may not wish their sucking of our care' (10). This 'all-but freedom' becomes a metaphor for the love sonnet itself and its proposed exchanges of honeyed words; its tunnel vision and its parasitism; and ultimately even for its status, Empson later thought, as an avoidance of actual sexual encounter. Empson also seems to have been fascinated by the fact that termites happily eat and build from their excrement, an image for his resolutely non-transcendental world-view.

Neoteny and the Direction of Evolution: W. H. Auden

My third and final topic is from evolutionary biology. I mentioned Caillois's work on insect mimicry, which he came to see as the opposite of Bergson's *elan vital*: as a drive towards a

'diminished existence' in which 'life seems to lose ground, to blur the line between organism and environment'.[33] Another version of that drive is the return to the ape, a topic in fantasies of degeneration since Wells's *The Time Machine*. What we can consider here is a particular version of that reversion, one fixated on the idea that the ape is not buried deep within us, as it were, but rather *is* us. This is the theory of neoteny, developed by the Dutch anatomist Louis Bolk, Walter Garsang and others in the 1920s, in which man is a retarded ape, 'a primate fetus that has become sexually mature'.[34] In evolution as imagined by Bolk, the ape is not (or not only) the origin of the human, but also that which lies ahead of us, the terminus of an arrested development which we repress or delay. The best known literary representation of this theory is Aldous Huxley's *After Many a Summer*, which was indebted to his brother Julian's experiments on neoteny in the axolotl in its depiction of a millionaire who funds research into the secrets of extended life, only to discover the 200 year-old Earl of Gonister, who has grown into an ape.[35] .[36] In his essays on literature, Langdon-Brown applied neoteny rather directly to the extended childhood of J. M. Barrie in *Peter Pan*, to Swinburne and others.[37]

Surrealism also used these ideas. Hugh Sykes Davies's lecture on 'Biology and Surrealism' at the 1936 London exhibition argued that psychoanalysis was grounded in human 'physical and biological nature', and referred in particular (though this section of the record of the lecture was summarized rather than reproduced in the printed text of the London *Bulletin of Surrealism*) to the 'retardation theory as advanced by Bolk and others, and an explanation of its bearing on psychoanalysis, after [Géza] Róheim. The conclusions being that repressions are not only the result of education and social conditions, but also, in the first instance, of the physical nature of man'.[38] The idea of retardation suggested that maturity is delayed in humans, creating the space of uncertainty or latency we call the Oedipus. For Bolk, this is a function of the endocrine system, producing such effects as hairlessness, lack of pigmentation, the larger weight of the brain, labia majora etc. As a result, for Róheim 'The outstanding difference between man and his animal brethren consists in the infantile morphological characters of human beings, in the prolongation of infancy. This prolonged infancy explains the traumatic character of sexual experiences which do not produce the like effect in our simian bretheren'.[39] According to Róheim, the origin of civilization is in retardation; it is a structure erected to ritualistically protect the immature ego from the libidinal energies which it is not ready to deal with. As Paul A. Robinson comments, 'the paradox of civilization was that man became civilized only in order to remain an infant.'[40] For Surrealism, this suggests the possibility of a more integrative approach than that suggested by Freud's traumatized subject: a move forward to maturity in which id and ego are incorporated, in which instinctual life is integrated rather than hopelessly fended off. In Davies's later work the continuity of animal and human is asserted: 'Nine tenths, ninety nine hundredths of human behavior is purely animal', says his rat-obsessed zoologist Andrew Melmoth.[41]

We can also bring neoteny to bear on Auden's poem 'They' (originally called 'The Crisis'). Auden began his Oxford career in biology before switching to English; his journals meditate on man and insect, tools, organ-specialization and instinct in a way clearly informed contemporary debates, and later work was to incorporate learned footnotes to texts like Hans Spemann's *Embryonic Development*.[42] 'Psychology and Art To-day', his extended piece in *The Arts To-day* in 1935, takes its shape as much as anything else from the casebook, mixing general considerations and typologies of pathology with readings of dreams, summaries of Freud, commentaries on Lawrence.

'They' (dated April 1939) is usually read as a poem about the atavism of Europe, written in the shadow of war. In 'The Creatures' (1936), Auden had said of animals 'They are our past and our future: the poles between which our desire unceasingly is discharged'.[43] 'They' places the animal in the future: it speaks of the Sweeney-like emergence of the repressed, the 'terrible presences' that 'when the blond boy / Bites eagerly into the shining / apple, emerge in their shocking fury', causing us to realize that 'the sky / Nurses no one' – interrupting an infantile state (*EA* 243). This is in part the bourgeois dream of patrimony over a compliant and dependent society:

> But those who come are not even children with
> The big indiscriminate eyes we had lost,
> Occupying our narrow spaces
> With their anarchist vivid abandon. (*EA* 244)

The terror of adult sexuality which follows ('all our whiteness shrinks / from the hairy and clumsy bridegroom') culminates in a vision of the animal:

> O the striped and vigorous tiger can move
> With style through the borough of murder; the ape
> Is really at home in the parish
> Of grimacing and licking: but we have
> Failed as their pupils. Our tears well from a love
> We have never outgrown . . . .

This is to asset a difference from the animal informed by neotony: a willed failure to enter a savage maturity, implicitly leaving the field to those animals in human form who stalk the 'borough of murder'. Writing in the anthology *I Believe* in 1939, the same year as 'They', Auden seemed to seek to abrogate 'The Creatures' and 'They' in rejecting the animal world as a metaphor for the state:

> Another false analogy is with the animal kingdom. Observed from the outside (how it appears to them no one knows), the individual animal seems

> to be sacrificed to the continuance of the species. This observation is used to deny the individual any rights against the state. But there is a fundamental difference between man and all other animals in that an animal which has reached maturity does not continue to evolve, but a man does. (*EA* 374)

The analogy between body and state is ruled out for similar reasons: the body is 'determined and fixed', where human generations throw up new possibilities; and this despite the fact that Auden is pessimistic about any ideas of moral progression.[44] But we have to read this as a willed rational counter, I think, to the anxieties of 'They' – anxieties which fixate on the idea of the childishness of hope and love, and the vulnerability of civilization in general in the face of the liberated desire of an animality which has been deferred and is all to likely to return.

* * *

It should be clear from the material considered here that the scientifically-inflected poetry of the interwar period resonates with developments in biology, though in a way which can be lose and opportunistic or more systematic. Many of these writers were in touch with the Cambridge biology of the interwar years – some, like Empson, swam in the river at the bottom of J. B. S. Haldane's garden – and others were part of or at least linked to the Surrealism of the 1936 London exhibition, and the Surrealist fascination with the biological grounding of the self. The deepest implication of biology, I would tentatively suggest, is a sense of the human as falling-away into the animal. The human is destabilized, whether by the chemicals flashing through the body; by a view of humans as insects; or by the sense of civilization as the tentative deferring of a savage maturity. At the same time, there is a comforting sense in which the discoveries of biology linked 'Man' to the world, dispelling the ghost of dualisms past and prompting a renewed fascination with the minutiae of human emotion and behaviour in an expanded chemical and environmental context.

[1] Michael Roberts, *Collected Poems: With an Introductory Memoir by Janet Roberts* (London: Faber & Faber, 1958), 62.
[2] See Peter J. Bowler, *Science for All: The Popularisation of Science in Early Twentieth-Century Britain* (Chicago: University of Chicago Press, 2009); also Brian Stableford, *Scientific Romance in Britain 1890-1950* (New York: St Martin's Press, 1985).
[3] H. S. Jennings, *The Biological Basis of Human Nature* (London: Faber & Faber,1930); Kate Price, 'Finite But Unbounded: *Experiment* Magazine, Cambridge, England, 1928–31', *Jacket* 20, n.p. [http://jacketmagazine.com/20/price-expe.html]
[4] Eden and Cedar Paul, *The Appreciation of Poetry* (London: C. W. Daniel, 1920), 9.
[5] Mina Loy, 'Modern Poetry', *The Lost Luna Baedeker*, ed. Roger L. Conover (New York: Farrar, Straus, Giroux, 1996),157-9.
[6] Ibid., 72.
[7] See e.g. Herbert Wildon Carr, 'Life and Matter', *The Realist* 2:2 (1929): 183-96. Needham's phrase is a chapter heading in his *The Sceptical Biologist: Ten Essays* (London: Chatto & Windus, 1929).
[8] Bowler, *Science for All* , 51.
[9] 'On the Chemical Correlation of the Functions of the Body', Croonian Lecture 20 June 1905, *The Lancet*, 2, 5 August 1905, 339-41. See John Henderson, 'Ernest Starling and "Hormones": A Historical Commentary', *Journal of Endocrinology* 2005 (1984): 5-10.
[10] See A. F. Hughes, 'A History of Endocrinology', *Journal of the History of Medicine and Allied Sciences*, 32 (1977), 292–313; more details are provided in V. C. Medvei *The History of Clinical Endocrinology: A Comprehensive Account of Endocrinology from Earliest Times to the Present Day*, rev. ed. (Carnforth: Parthenon Press, 1993).
[11] Medvei, 415. For a summary of developments in the period, see also A. P. Cawadias, 'The History of Endocrinology', *PRSM* 34 (Dec. 1940), 303-8.
[12] Charles E. Raven, *The Creator Spirit: A Survey of Christian Doctrine in the Light of Biology, Psychology and Mysticism*, with an Appendix on Biochemistry and Mental Phenomena by Joseph Needham (London: Martin Hopkinson, 1927), 296.
[13] Bowler, *Science for All*, 50.
[14] Charles Duff, *Mind Products Limited: A Melodrama of the Future* (The Hague: Servire Press, 1932), 17.
[15] John Rodker, *Poems and Adolphe 1920*, ed. Andrew Crozier (Manchester: Carcanet, 1996), ix. Subsequently *PA*.
[16] Magnus Hirschfeld, *Sex in Human Relationships,* trans. John Rodker and intro Norman Haire (London: John Lane, 1935), 5.
[17] Rodker, *Memoirs of Other Fronts*; cited *Poems and Adolphe*, xv.
[18] David Goyder, M. D., *Swedenborg on the Ductless Glands, with Modern Confirmations*, International Swedenborg Congress, London, July 4-8, 1910. The hint of a connection with Mesmerism and its modern inheritors is confirmed by the description of loadstone and radium and 'grosser' substances as examples of interpenetrating 'intermediates' akin to the hormones. Goyder (1829-1920) was the son of the Swedenborgian minister D. G. Goyder (obituary, *British Medical Journal, 7* February 1920, 204).
[19] Mary Butts, *The Crystal Cabinet: My Childhood at Salterns* (Manchester: Carcanet, 1988), 16, 164; *The Journals of Mary Butts*, ed. Nathalie Blondel (New Haven: Yale University Press, 2002), 3.

[20] Ian Patterson, 'Writing on Other Fronts: Translation and John Rodker', *Translation and Literature* 12:1, Modernism and Translation (2003), 88-113 (cited 97).
[21] Charlotte Sleigh, *Six Legs Better: A Cultural History of Myrmecology* (Baltimore: Johns Hopkins University Press, 2007).
[22] Jean- Henri Fabre, *The Mason-Bees*, trans. Alexander Teixeira De Mattos (London: Hodder & Stoughton, 1914), ch.7
[23] Sir Walter Langdon-Brown, 'The Biology of Social life', *Thus We are Men* (London: Kegan Paul, Trench, Trubner, 1938), 26.
[24] Wheeler, Review of Auguste Forel's *The Social World of the Ants Compared to that of Man, Journal of Social Psychology* 1 (1930), 170-77 (172).
[25] Sleigh, *Six Legs Better*, 87-89, 220.
[26] Herbert Read, *The Contrary Experience : Autobiographies* (London: Faber & Faber, 1963), 277, 179.
[27] Herbert Read, *The Green Child* (1935; London: Grey Walls Press, 1945), 126, 136.
[28] Herbert Read, *Poems 1914-1934* (London: Faber & Faber, 1935), 141.
[29] Roger Caillois, 'The Praying Mantis: From Biology to Psychoanalysis' and 'Mimicry and Legendary Psychasthenia', *The Edge of Surrealism: A Roger Caillois Reader*, ed. Claudine Frank (Durham, NC: Duke University Press, 2003), 69-81, 92-103. The essays were originally published in *Minotaure* in 1934 and 1935.
[30] John Haffenden, *William Empson: Among the Mandrins* (Oxford: Oxford University Press, 2005), 167-8, 376.
[31] John Haffenden, ed. *Complete Poems of William Empson* (London: Penguin, 2000), 156.
[32] Ibid., 158.
[33] *The Edge of Surrealism*, 102-3,
[34] Cited Stephen Jay Gould, *Ontogeny and Phylogeny* (Cambridge, MA: Belknap Press, 1977), 361, from Louis Bolk, *Das Problem der Menschwerdung* (1926). Paedomorphism was proposed by Walter Garstang, 'The Theory of Recapitulation: A Critical Re-statement of the Biogenetic Law', *Linnaean Society Journal of Zoology* 35 (1922), 81-101. These ideas were anticipated by E. Ray Lankester who noted 'super-lavation' [ie.neoteny] in the Axolotl in his *Degeneration: A Chapter in Darwinism* (London: Macmillan, 1880), 987. As Gould points out, Bolk was anti-Darwinian in attributing evolution primarily to an inner cause rather than pressure of environment.
[35] See Gould, *Ontogeny and Phylogeny*, 352-3.
[36] See Gould, *Ontogeny and Phylogeny*, 352-3.
[37] Langdon-Brown , 'Myth, Phantasy and Mary Rose', *Thus We are Men*, 123-51. Modernism itself has been depicted as essentially adolescent in its formation: see Geoff Gilbert, *Before Modernism Was: Writing History and the Constituency of Writing* (Basingstoke: Palgrave, 2004), ch.2.
[38] Hugh Sykes Davies, 'Biology and Surrealism', *International Surrealist Bulletin*, no. 4 (London, September 1936), 14.
[39] Géza Róheim, *The Origin and Function of Culture* (New York: Nervous and Mental Disease Monographs, 1943), 17, 20. Davis's references would have been to earlier papers by Róheim, especially 'The Evolution of Culture', *International Journal of Psycho-Analysis*, 15 (1934): 387-418. I have found little evidence that other Surrealists used Róheim, however.
[40] Paul A. Robinson, *The Freudian Left: Wilhelm Reich, Geza Roheim, Herbert Marcuse* (New York: Harper Colophon, 1969), 117.
[41] Hugh Sykes Davies, *The Papers of Andrew Melmoth* (London: Methuen, 1960), 40.
[42] W. H. Auden, *New Year Letter* (London: Faber & Faber, 1941), 85.

[43] W. H. Auden, *The English Auden: Poems, Essays and Dramatic Writings 1927-1939*, ed. Edward Mendelson (London: Faber & Faber, 1977). 158. Subsequently *EA*.

[44] One might consider the role of automaticity – metrical, stanzaic and narrative – in his satire: Victor, Miss Gee and others and their clockwork versification signal the human without evolution.