

## Tavistock and Portman Staff Publications Online

### JOURNAL ARTICLE

Launer, John (2014) *Sex and sexuality: An evolutionary view*. *Psychoanalytic Inquiry: A Topical Journal for Mental Health Professionals*, 34 (8). pp. 831-846.

#### Original citation:

© John Launer, 2014

This version available at: <http://repository.tavistockandportman.ac.uk/>

Available in Tavistock and Portman Staff Publications Online

The Trust has developed the Repository so that users may access the clinical, academic and research work of the Trust.

Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in Tavistock and Portman Staff Publications Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain.

You may freely distribute the URL (<http://repository.tavistockandportman.ac.uk/>) of Tavistock and Portman Staff Publications Online.

This document is the author's accepted manuscript of '*Sex and sexuality: An evolutionary view*'. It is reproduced here in accordance with Green Route Open Access policies.

Published online: 03 Dec 2014

## Sex and sexuality: an evolutionary view

John Launer, M. D.

The aim of this paper is to present an evolutionary view of human sex and sexuality, and to suggest how this might enrich psychoanalysis. Firstly, I offer a summary of Darwin's main ideas, including those relating to sex, and examine how these have been developed by more recent evolutionary scholars. I then give an account of the divergence between psychoanalysis and classical Darwinian thought, and describe how one of the early psychoanalysts, Sabina Spielrein, touched upon themes that have resonances in modern evolutionary thought. Following a review of some contemporary attempts to bring psychoanalysis and evolutionary thought into harmony with each other, I make some suggestions regarding a view of sex and sexuality that might be helpful in psychoanalytic terms while being sound in evolutionary ones.

### INTRODUCTION

'I begin with the fundamental principle of evolutionary biology, that all living organisms have evolved to seek and use resources to enhance their reproductive success. They strive for matings, invest in children or help other genetic relatives, and build genetically profitable relationships. In biology, this is not a controversial proposition, and it follows that organisms will act as though they are able to calculate costs and benefits. Furthermore the currencies are, in the end, reproductive: that is, who survives and who

reproduces best? This principle seems so simple that it is hard to imagine that diverse and complicated behaviors could arise from it. Yet they do, because the ecological conditions that shape success vary so widely.’ From Low, *Why Sex Matters: A Darwinian Look at Human Behavior* [2000, p. xiii.]

Why should psychoanalysts, and others using psychodynamic ideas clinically, need an evolutionary understanding of sex and sexuality? There is certainly a case to be made that psychoanalysis has become a hermeneutic art that is now far distant from biological science, with practitioners looking for meaning through reference to their own interactions with patients, rather than according to any fixed external framework. In spite of this, psychoanalysis has never been an atheoretical field, nor has theory remained static. Trainees in several professions learn a complex body of theory derived from Freud and his successors, in order to make sense of how their patients’ minds work and of what happens in the consulting room. Harmonization with mainstream scientific ideas is already happening in relation to areas like neuroscience, cognitive psychology and evidence-based practice. There seems no reason why it should not happen in relation to evolution and sex as well. As I hope to show, much psychoanalytic thinking, although not all, could fit well within a modern evolutionary framework.

## DARWIN AND THE MODERN EVOLUTIONARY SYNTHESIS

Darwin’s ideas, like Einstein’s, are among the three or four interconnected systems of thought which underlie the contemporary scientific understanding of reality (Deutsch, 1997). His theory has remained robust enough to fit everything that

is currently known within his scientific field. However, while few non-physicists would claim to have a good working understanding of Einstein's theories, it is common for people to believe they have a good grasp of Darwin and evolutionary theory even when their understanding is only partial or distorted. This may be as common in the psychoanalytic world as anywhere else. To take the most obvious example, contrary to popular belief Darwin did not invent the phrase 'survival of the fittest' and rarely used it. When he did so, he was referring to how an organism 'fitted' its environment – not to 'fitness' in the modern everyday sense of muscular strength or athletic prowess. His view is more accurately expressed as 'preservation of the favored'.

Similarly, Darwin was not the first person to propose that every species including human beings must be descended from a preceding one rather than being created 'de novo'. Other scientists had already done so. Darwin's unique contribution was to work out the link between descent and the challenges of a changing environment (Darwin, 1859). This lay in the selective survival of whichever variations happened to be suited to changing circumstances: hence the survival of 'what fitted'. Darwin's use of the term adaptation did not refer to what happens during a single lifetime – although clearly adaptation in the colloquial sense does occur there – but to what results from selection over many generations. For Darwin, an adaptation was a variation that had proliferated because it had contributed to long term survival and reproduction. He argued that one could never predict which individuals or species would survive, but one could be certain that *random* variation would take place in a species and this would lead over long periods of time to *non-random* selection – or in some circumstances to extinction.

As Darwin progressed in his thinking, he came to place an increasing emphasis on the way that competition for mates, and choice among different mates, played an important part in evolution – so called sexual selection (Darwin, 1871). He also became interested in how animals behaved, as well as in their physical characteristics. He proposed that, just as certain anatomical features would give an individual or species an increased chance of prevailing, so might a particular pattern of activity, including such sex-related activities as competition between males, and courtship between males and females. He traced much human emotional expression to its evolutionary roots, for example pointing out how the facial changes brought about during sneering reproduce the way that all carnivorous mammals expose their canine teeth to deter rivals (Darwin, 1872). In a famous statement, he anticipated the day when ‘psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation’ (Darwin, 1859, p. 222).

Darwin’s key ideas of *variation*, *competition*, *adaptation*, and *natural and sexual selection* have stood the test of time remarkably well, although his ideas have become subject to some modification as well as a vast amount of elaboration. This mainly took place in the second half of the twentieth century, in what is sometimes described as the post-Darwinian synthesis, or neo-Darwinism. Much of this has focused on genes as the unit of survival and reproduction (Williams, 1966). In this respect, genes are commonly termed ‘selfish’, although this term can lead to as much confusion as the term ‘fitness’ (Dawkins, 1976). Genes are not selfish in the sense of deciding how to behave, or by operating through competition alone. They simply do what they do, which is to replicate. Genes also have to co-operate in order to form cells and

organisms. Organisms in their turn have to co-operate in order to promote collective interests (Nesse, 2006). In many species including humans, co-operation both between the two sexes and among individuals of the same sex is crucial for raising offspring and for social functioning generally (Hamilton 1996, 2002; Trivers, 2002). Selection can therefore be understood as a process that involves a number different of levels from the gene and the cell, to the individual, couple, family, group, and the community: this is sometimes described as *multi-level selection* (Wilson and Sober, 1994). Selection also shapes very many mechanisms that allow organisms to adapt their behavior according to their circumstances, with a remarkable degree of plasticity.

One idea that can help to make sense of much evolutionary theory is the distinction between *ultimate* or *distal* purposes, and *proximate* ones (Tinbergen, 1963; Mayr, 1988). These are not entirely watertight categories, but they are a helpful heuristic for understanding evolutionary explanations. Distal explanations always seek to answer the question: how has this feature or behavior contributed to this type of organism prevailing in the long run rather than becoming extinct? Proximate purposes and the explanations that go with them, by contrast, relate to the mechanisms that help organisms achieve this objective. The best known example of this in mammals is probably the *attachment system*, which patterns mother-infant interaction, and contributes to long term survival and hence reproduction (Ainsworth, 1967; Bowlby, 1969.) Explanations of such proximate processes examine them as *strategies*, and look at the *tradeoffs* they involve – for example, a mother staying close to her infant is less able to forage, and if she breast-feeds as opposed to weaning she is less likely to become pregnant (Stearns, 1989). These strategies, and the tradeoffs that

go with them, appear to have a genetic substrate and also plasticity in response to environmental pressures and demands.

Probably the central concept within the modern evolutionary synthesis is that of *reproductive fitness* (Hamilton, 1964; Maynard Smith, 1989). Reproductive fitness is not an intrinsic state, but a retrospective judgment based on the number of progeny at a given time afterwards. It is therefore neither a moral or social judgment but an arithmetical and teleological one, helping us to make sense of how we got to be the way we are rather than some other way. The related term, *inclusive fitness* recognizes indirect contributions from near kin as well. Those of us who are now alive are by definition the descendants of those who were reproductively fit, as well as being the beneficiaries of those who assisted them socially. Our ancestors form a long and unbroken line of individuals who prevailed in each generation because of physical and behavioral characteristics, sexual choices and communal interactions that led to reproductive success. They extracted sufficient resources from the environment to survive and reproduce, through both competition and collaboration with others (Low, 2001).

Any attempt to align psychoanalytic thinking with evolutionary ideas must address potential allegations of *genetic or biological determinism*. In spite of the misconceptions held by some practitioners of talking therapies, explanations of human behavior based on our genetic or biological inheritance do *not* deprive people of the opportunity to make choices, nor do they exclude looking for complementary explanations at other levels of context including infancy, family relationships or society. Nor do the vast majority of modern evolutionary scholars subscribe to the

kinds of beliefs that have sometimes brought evolutionary thinking into disrepute. In a book entitled *Sense and Nonsense: Evolutionary Perspectives on Human Behavior*, Laland and Brown (2011) point out the following:

Using evolutionary theory is not the same as taking a genetic determinist viewpoint. Genetic determinism is the belief that our genes contain blueprints for our behavior that will always be followed and that constitute our destiny. Such a belief would run contrary to much that is known about how human behavior develops. Where researchers talk about genetic influences on human behavior, they do not mean that the behavior is completely determined by genetic effects, that no other factors play a part in our development, or that a single gene is responsible for each behavior. Although most evolutionary biologists focus exclusively on genetic inheritance, it does not follow that genes are the sole determinant of human behavior, and the vast majority take it for granted that multiple environmental influences will play a part throughout development. [p. 11]

Like any other accounts of how we feel and behave the way we do, evolutionary explanations add an extra dimension to our understanding of ourselves. While poor evolutionary explanations may fit the category of 'Just-So Stories', good evolutionary ones can be turned into hypotheses that can be tested against observable phenomena in biology, psychology and culture (Barkow, Cosmides and Tooby, 1992; Stearns, Allal and Mace, 2007; Muehlenbein and Flinn, 2011; Flinn, 2012). The world of evolutionary scholarship is no more monolithic than the psychoanalytic one, with different writers taking a variety of positions in relation to such things as the co-



evolution of genes and culture, or the plasticity of human learning (Bolhuis et al, 2011). At the same time, all would subscribe to the view expressed by the literary scholar Brian Boyd (2009): ‘Some of the answers proposed in an evolutionary explanation of human nature may be premature, but they will be tested, sifted, and refined in due course. But incorporating deep time into our knowledge of the species adds a dimension whose absence had distorted all our thinking.’ (p. 41)

#### EVOLUTION AND PSYCHOANALYSIS: GOING THEIR SEPARATE WAYS

The relationship between Freud and evolutionary theory is complex (Hartmann 1958; Ritvo, 1974; Sulloway, 1979), and there is not enough space here to analyze this in detail. However it would be reasonable to characterize Freud in the earlier years of his career as a neuroscientist who worked within mainstream biology and under the immediate and recent influence of Darwin. He did so in an era and within an academic environment that had taken on the Darwinian project with passion, so that many of the great biologists of the generation that followed Darwin came from the German-speaking world (Magner, 1994). These included August Weismann who discovered the difference between the sex cells that determined inheritance and the somatic cells that did not. They also included Oskar Hertwig who first described how a sperm penetrates an egg, Friedrich Miescher who identified the substance he called nuclein and we now call DNA, as well as sexologists like Krafft-Ebing who tried, with very limited success, to relate human sexual psychology to biological and evolutionary theory (Krafft-Ebing, 1886).

Nevertheless, it seems that by mid-career Freud saw his metapsychological project as something entirely independent from the science of biology. While remaining

committed in general terms to the idea that mental functions must have emerged through evolution, some of his thinking diverged from classical evolutionary ideas. This was true particularly in relation to his belief that acquired characteristics, including those that resulted from traumatic experiences in childhood, could be passed on genetically – the so-called Lamarckian fallacy. Whereas Weismann had, in biological terms, conclusively knocked this fallacy on the head, Freud was happy to claim (E. Freud, 1960): ‘Lamarck’s theory of evolution coincides with the final outcome of psychoanalytic thinking’ (p. 317). It is worth making the point here that the modern field of epigenetics, showing how some genes can be switched on or off by the environment, has not vindicated Lamarck, since no-one has shown that the environment can alter genes themselves, in a way that directly advantages the descendants of such individuals (Haig, 2007; Dickins and Rachman, 2012). Freud’s ideas on some issues – most specifically the perversions – were shot through with another popular fallacy of the time, deriving from the recapitulation theory of Ernst Haeckel (1899), namely the notion that pathological states of mind could be regressions to earlier evolutionary stages of mammalian and reptilian development. Taken overall, there seems no reason to dissent from the view of psychoanalysts Kriegman and Slavin (1992) when they write that Freud’s view of the evolutionary process was ‘in some ways quite crude and quaint’ (p. 35).

The divergence of Freud’s ideas from evolutionary thought can perhaps best be understood by examining a curious intellectual episode from 1911-12, associated with the person of Sabina Spielrein. Spielrein is best known on account of her affair with Carl Jung while she was his patient (Carotenuto, 1982; Kerr, 1993; Richbaecher, 2003; Launer, 2012). Freud played a major if questionable part in helping the two to disentangle without scandal, although the episode had a negative effect on his view of

Jung. Spielrein was also a notable thinker in her own right (Covington and Wharton, 2003). She anticipated ideas about child development that were later associated with Melanie Klein and Anna Freud. She worked alongside Jean Piaget, and later played a major role in introducing psychoanalysis in Russia (Ovcharenko, 1999).

In the early stage of her career Spielrein delivered a paper on sex and death to the Vienna Psychoanalytic Society, later published in the Society's *Jahrbuch* with the title 'Destruction as the Cause of Coming into Being' (Spielrein, 1912). The paper is a peculiar mixture of early Freudian psychology, Jungian mysticism and philosophical speculation, but it also has a distinct and consistent evolutionary theme to it. This theme also runs through Spielrein's diaries and correspondence. In the opening sections of the paper she appears to be making an explicit claim for a theory of sex that bridges psychoanalysis and evolution. Starting from an examination of why sex is accompanied by ambivalent feelings, she writes as follows:

During reproduction, a union of female and male cells occurs. The unity of each cell thus is destroyed and, from the product of this destruction, new life originates. Following production of a new generation, many lower creatures e.g. the mayfly, forfeit their lives, dying off. Creation for this organism is undertaken for survival and is simultaneously destructive to the adult. The individual must strongly hunger for this new creation in order to place its own destruction in creation's service.

The fusion of germ cells during copulation mimics the correspondingly intimate union of two individuals: a union in which one forces its way into the other.... The male component merges with the female component that becomes

reorganized and assumes a new form mediated by the unfamiliar intruder...It would be highly unlikely if the individual did not at least surmise, through corresponding feelings, these internal deconstructive-reconstructive events [pp. 156-7].

It is this passage that gave Freud the idea of the death instinct – although by his own admission he did not fully understand Spielrein's version of it, and he appears to have used similar language to describe something quite different (Freud, 1920, p. 55 n. 1). Spielrein never actually used the term death instinct in her paper, and it is clear that the apprehension of death that she described there is a biological one, and a component of the *reproductive instinct*. According to her argument, the reproductive drive is so powerful that it overrides absolutely everything else, even the drive to survive as an individual. This is amplified later in the same paper when she asks:

Do we not possess powerful drives that set our psychic contents in motion, untroubled by the welfare and misery of the ego?... I must dogmatically defend the viewpoint that the personal psyche is governed by unconscious impulses that lie deeper and, in their demands, are unconcerned with our feeling reactions. Pleasure is merely the affirmative reaction of the ego to these demands flowing from the depths [pp. 159-160].

Similarly, in a letter to Jung some years later, she wrote about the way children seek attachment in the interests of their survival and hence, ultimately, of reproduction (Carotenuto, 1982): 'Tranquility, freedom of movement, play with other children, favorite foods – everything is sacrificed in return for more attention from

those whose love one desires. To express my personal opinion, I would include the instinct for self-preservation in the instinct for preservation of the species' (p. 52).

Whatever limitations there were in Spielrein's arguments (Britton, 2003), it seems as if she was proposing a view of sex, emotions and the mind in terms of a single instinct, namely the reproductive one. Although her 1912 paper fell far short of being a coherent manifesto for an evolutionary understanding of sexual psychology, she did nevertheless touch there and elsewhere upon several themes that now preoccupy evolutionists. These include the imperative drive for reproduction, the importance of conflict between the sexes in this process, the proximal role of pleasure, the purpose of attachment, and the reciprocal relationship between sex and death. Paradoxically, it was her experiences as a vulnerable young woman, embroiled in a dangerous affair with her psychiatrist, which attuned her to these issues.

Freud and Jung's reaction to Spielrein's way of thinking was unfavorable, not just for personal reasons but for theoretical ones as well. 'What troubles me most', Freud wrote, is that Fräulein Spielrein wants to subordinate the psychological material to biological considerations; this dependency is no more acceptable than a dependency on philosophy, physiology or brain anatomy' (McGuire, 1974, p. 469). Jung agreed: 'I know, of course, that Spielrein operates too much with biology', he replied. 'But she didn't learn that from me, it is home-grown' (p. 470).

Freud's view about 'subordination' to biology at this stage in his career was more than a whim. It was a calculated intellectual and political act, and was seen as such. Indeed, on the day before Spielrein's lecture, Eugen Bleuler – the leading biological

psychiatrist of his time – had resigned from the International Psychoanalytic Association on the grounds that psychoanalysis had become a religious cult instead of a science (Alexander and Selesnick, 1965, p. 5; McGuire, 1977, p. 468). Bleuler was director of the hospital where Jung attended Spielrein, and may have been more instrumental in her treatment than Jung (Graf-Nold, 2003). It was Bleuler who encouraged her to study psychiatry, assisted her entry into medical school, and later became her supervisor. His resignation from the psychoanalytic movement, followed by his pupil's failure to make any impact, furthered a parting of the ways between psychoanalysis and mainstream biological thought.

## BUILDING BRIDGES

Although psychoanalysis and evolutionary studies have gone their separate ways in the century since Spielrein gave her lecture, there have also been attempts to build bridges. A number of scholars have put forward arguments that the distance between certain core ideas of psychoanalysis and evolution is not as great as they might appear. These include an evolutionary account of the Oedipus complex by Badcock (1990); the writings of evolutionary psychiatrist Randolph Nesse on psychodynamic mechanisms including the ego defenses (Nesse, 1990; Nesse and Lloyd, 1992); and the work of the philosopher Jim Hopkins on conscience and conflict (2003). All of these are attempts to link the phenomena that analysts discover inductively in the consulting room with the deductive premises of evolutionary theory. Another, far larger group of studies are related to the fields of attachment, mentalisation, and neuropsychology. These are essentially studies of proximate evolutionary

mechanisms, undertaken by psychoanalysts who acknowledge the need to restore connections with empirical science and, in particular, to relate mental phenomena to the biological imperative of infant survival (see for example Stern, 1985; Fonagy, 2001; Fonagy et al, 2002; Solms and Turnbull, 2002; Solms and Panksepp, 2012).

A number of pioneers in the past twenty years have taken a more fundamental approach. Rather than looking for points of convergence or important linkages between evolution and psychoanalysis, they have argued that it may be necessary to construct an entirely new paradigm: one that takes the central concepts of neo-Darwinian theory as a starting point and examines what holds up in psychoanalytic theory by comparison, and what needs rejection or modification. In 2000, a group of sixteen such writers published a collection of essays entitled *Genes on the Couch* (Gilbert and Bailey, 2000). Much of their work is based on ideas from the evolutionary psychologists Leda Cosmides and John Tooby (Barkow, Cosmides, and Tooby, 1992), and from Randolph Nesse (Nesse and Williams, 1995).

In their introduction, the editors of *Genes on the Couch* write of the psychological importance of rivalry between members of the same sex, and with the opposite sex. They recognize that our evolved strategies for survival and reproduction do not all necessarily follow the same pattern, and their aims may not always be compatible. They identify the function of all painful mental states as being to alert us to dangers, threats and losses. They argue that an objective of talking therapies should be to help people to understand the evolutionary nature of such states and why the distress caused by them can be so intense. The most striking contribution in the book comes from US psychoanalyst Daniel Kriegman. In a compelling metaphor he talks of the

need to rediscover the evolutionary baby in the bathwater of psychoanalysis (Kriegman, 2000). ‘Before we empty the enormous quantity of dirty bathwater’, he writes, ‘wouldn’t we be wise to make a search to see if there is a baby in it? Not only would I suggest that we will find a living baby, I would also suggest that the baby has nearly drowned and is in desperate need of evolutionary biological resuscitation’ (p. 71).

The most ambitious attempt at such resuscitation was in fact written some years earlier by Kriegman himself, along with his fellow psychoanalyst Malcolm Slavin (1992). In *The Adaptive Psyche*, they argue that Freud’s ‘flawed yet appropriate efforts to deal within an adaptive context is the task that requires further exploration in the light of contemporary evolutionary theory’ (p. 54). Slavin and Kriegman talk of the long, dismal history of attempts to distance human psychology from the rest of nature. They suggest that the emphasis on culture (or language, morality, religion, and so on) is a defensive way of separating humans from the rest of the animal world. They argue that a return to evolutionary thinking is essential to prevent psychoanalysis losing all point of reference in the real world, while still allowing it to retain its capacity to seek new meaning:

We believe that the evolutionary biological perspective ... enables us to navigate between the methodological Scylla of hermeneutics and constructivism that is only partially aware of its own basic assumptions about what is universal in the human condition, and the Charybdis of a ritualistic scientism that is as likely biased by its own assumptions about the human condition while naively assuming that its methods – suited to the study of



inanimate particles and forces – will generate an ‘objective picture of the psyche.’ [p. 276.]

Drawing on the work of modern evolutionary theorists, they speak of the ample evidence that now exists that organisms, throughout nature, are adept at detecting kin and degrees of kinship, thus emphasizing our intuitive drive to replicate our own genes. In examining the relationship between parents and their offspring, they assert that conflict between parents and children is not just a matter of the children’s crude, untutored biology resisting the parents’ attempts to socialize them. Drawing on the genetic theory of parent-infant conflict first proposed by Trivers (1974), they argue that this can be viewed as a biological conflict between differing needs of the two generations. They point out that the design of the child psyche has been fashioned by hundreds of thousands of generations of such conflicts and the compromises they entail. On virtually every psychological issue in the course of human development, they argue, an evolutionarily successful way of being a parent entails a divided strategy: to treat any child both as an ally but also as a competitor.

Very much of the case laid out by Slavin and Kriegman depends on this idea of the conflict between one generation and the next. We are driven to replicate, but the children we have succeed in conceiving do not solely represent our own interests. ‘A self designed for the human relational world must be prepared to engage in an extraordinarily complex set of developmental strategies that serve, in part, to defend against having one’s interest usurped by others’ (p. 143). Interestingly, they focus almost entirely on the relationship between the generations and have relatively little to say about gender relations. This is a puzzling gap in their work. In the words of

Richard Dawkins (1976): ‘If there is conflict of interests between parents and children, who share fifty per cent of each other’s genes, how much more severe must be the conflict between mates, who are not related to each other?’ (p. 140). It would be a small step to apply ideas about the tensions between parent and child to those between parent and parent – and indeed, to return to where Freud originally started, namely with sex.

## SEX, EVOLUTION AND PSYCHOANALYSIS

Drawing together some of the themes above, I now want to propose a view of sex and sexuality that is sound in evolutionary terms and I hope might also be useful in psychoanalytic ones. The propositions that follow are in no way a comprehensive account of sex from an evolutionary point of view. They are meant as pointers, or invitations, for any practitioners who think it might be reasonable to take an evolutionary view of sex into the talking therapies, and who would like to consider how this could enrich psychoanalytic understanding.

*1. Sex is about reproduction.* Sex is central to human life, as indeed it is to all sexually reproductive species. There is not a single evolutionist who would disagree with Freud in placing sex at the centre of human psychology. What seems peculiar is that Freud moved the focus of his thinking from sex as a reproductive activity to sex as a source of pleasure. The subsequent displacement of sex from the psychoanalytic agenda in many places is even more puzzling. As Spielrein argued, the overriding imperative in life is for reproduction. The direct and intense pleasure of sex has evolved precisely so we will replicate. In the words of evolutionary anthropologist

James Chisholm (1999), 'People, like all organisms, are not evolved to maximize health, wealth, happiness, life span, vigor, power, prestige, beauty, love, sex, truth, honor, reason or anything else, but to have descendants, which is continuation' (p. 205).

2. *Sex and death are complementary.* Sex is necessary because of death. In the absence of death, sex would be not only redundant but also undesirable, since it would lead to rapid depletion of resources by an ever-increasing population. Genes for ageing and cell death appear to have evolved at around the same time as sexual reproduction (Clark, 1996), and embody this reciprocal relationship. Sex allows new variations to emerge, and – presumably for that reason – selection has favored genes that help us to reproduce, not to survive (Williams, 1957; Ridley, 1993). In evolutionary terms the idea of a death instinct, as such, makes no sense. There may be many evolutionary explanations for why human beings may at times feel, and behave, destructively or self-destructively, but that is another matter. Death is a given, to which the reproductive instinct is the only possible response, if we wish to avoid genetic extinction.

3. *Reproduction involves more than sex.* There are lively debates among evolutionists concerning how many aspects of human life are directed towards reproduction and how many are simply incidental consequences (see for example Gould and Lewontin, 1979; Hagen, 2005). However, there is a consensus that the structures and functions of all living creatures, including humans, have been selected for their adaptedness for reproduction, and remain directed towards it. Both the conscious and unconscious mind must be organized around the pursuit of

reproductive fitness, to achieve genetic continuation in the face of death. The most completely articulated account of this process, from a psychological perspective, is by Chisholm (1999). He proposes that survival, growth and development, together with maturation and learning, all serve the purposes of reproduction. His view encompasses emotional life as well. Drawing on neuro-scientific understanding (Le Doux, 1996; Damasio, 1994), he argues that our emotions are our best way – indeed our only way – of assessing our interactions with others and with the environment, and how far these are progressing our direct and indirect reproductive interests. Hence desire, affection, anxiety, envy and rage may each signal perceptions of opportunity or threat, and lead to concomitant action. By extension (although Chisholm does not propose this), fantasies could be seen as reproductive calculations, exploring the tradeoffs that need to be made between sex and survival, the level of commitment to partners and offspring, and so on. This overarching view of human endeavor, within a single purposive framework, in some ways echoes Freud, but substituting reproductive work for libido.

4. *Reproduction involves both conflict and collaboration*: Some evolutionary writers like Peterson and Wrangham (1996) have placed an emphasis on conflict and warfare as a selective force, including the murder of male rivals and the rape and abduction of females. More recently, scholars like Hrdy (2009), Nowak (2011) and Boehm (2012) have promoted the idea that collaboration is the main driver for selection, including shared parenting, and child care by wider kin. A measured evolutionary view probably sides with neither Hobbes nor Rousseau but sees all reproductive endeavors including sex itself as dependent upon maintaining a careful balance between conflict and collaboration (Hopkins, 2003; Seabright, 2012). The

psyche is constrained and defined by the necessity of pursuing selfish ends by selfless means. In the same way, cultural and legal norms, faith communities and educational traditions can be understood as collective compromises in pursuit of inclusive fitness. Each of these may of course break down at times when external pressures become intolerable or are perceived as such.

5. *The two sexes have different interests from each other.* Sex involves considerable risk for females. There are the dangers of pregnancy, followed by the prolonged demands of child-rearing. To compound matters, eggs are far more precious than sperm from an arithmetical point of view. A woman carries only a few hundred viable eggs at puberty, which must last her entire reproductive lifetime. By contrast, men will manufacture sperm by the billions, and sexual intercourse requires less investment or risk for them. There is evidence of a tension between these different interests at many biological levels. After intercourse, an overwhelming majority of sperm are destroyed in the vagina or cervix (Baker and Bellis, 1995). When a pregnancy is established, there is a fifty per cent chance that the woman's womb will reject the resulting combination of her own genes with the ones from the sperm as unsuitable. The same tension also appears at a social level. Across cultures, the two sexes appear to operate different strategies in keeping with these same differences (Buss, 2003). Broadly speaking, males give a higher priority to youth and beauty in mating, while women give more priority to status and commitment in their partners. Conflicts between the sexes commonly center on these issues, not least in the consulting room. Although humans are unique among primates in the involvement of fathers in child-rearing, commitment to a relationship and family still represents

quite different reproductive opportunities and limitations for the two partners involved.

6. *Conflicts over genetic interests are ubiquitous.* Kriegman and Slavin's thesis concerning parent-infant conflict can quite easily be extrapolated to relations between the sexes. Parents share virtually none of each others' genes, outside incestuous matings. Almost all of us are the embodied representation of two quite different sets of parental or dynastic interests. Divergent genetic interests are reflected at a physiological level in the conflicts that take place in the fetus and placenta, where genes from the two parents compete to suppress each other, in determining the size of the baby and the mother's blood pressure (Haig, 1993; Reik and Walter, 2001). Some parts of the fetal brain, such as the hypothalamus, are coded by the father's genes, while others including the cerebral cortex are maternally derived. Some writers have proposed that neurological conflicts between these different parts of the brain may be experienced subjectively as emotional conflicts within the fetus and perhaps subsequently in infantile life (Badcock, 2000; Haig, 2003; Burt and Trivers, 2008). The infant's aggressive determination to take possession of its mother and defy her to have more babies, as described by Melanie Klein (1957), may well represent its genetic interests in preventing others sharing her resources (Hopkins, 2003). Family conflicts resonate with evolutionary studies of how far close or distant relatives will go in support of each other (Hamilton, 1996). The echoes of competing genetic interests may resound as parents, step-parents, families and step-families fight for their respective positions over the resources that should be invested – sometimes literally – in child-rearing, schooling, shopping and other areas (Baker and Oram, 1998).

*7. Deceit and self-deception play a significant part in the pursuit of reproductive interests.* A number of evolutionists have addressed deception and self-deception in terms of the essential parts they play in reproductive strategies. Exaggeration and self-aggrandizement may be necessary both for intrasexual rivalry and intersexual courtship (Buss, 2003). The ability to conceal signals from others is enhanced by the ability to convince oneself as well: actors who believe their own performance are better than those who do not (Alexander, 1989; Trivers, 2011). Self-deception may be equally useful to conceal missteps and betrayals, in the service of preserving relationships (Nesse, 1990). Such views in some ways map onto psychoanalytic constructions like denial and projection, and supplement these by assigning them a central purpose in negotiating over investment in relationships, and hence in genetic continuation (Hopkins, 2003). The notion that wishful thinking has a central place in human psychology, particularly where sexual aspirations are concerned, is one that unites evolutionary and psychoanalytic thinking.

*8. Differences in sexual behavior represent different reproductive strategies.* Young adults have to make continual decisions about the trade-offs between seeking to procreate here and now, delaying it until later, or prioritizing investment in existing progeny (Chisholm, 1999). Human beings in conditions of relative deprivation, where life expectancy is low, commonly pursue sex soon after puberty and have many children. In more secure conditions, adults will tend to use contraception, wait longer before conceiving, and will invest their resources in a smaller number of children. They will also invest in their genes in other ways: through educating their children and leaving them large bequests, or by remaining childless and putting their energy

into their wider family or communities. Simpson and Belsky (2008) and others have proposed that different forms of mother-infant attachment behavior also reflect different environments, endowing children with emotional and behavioral strategies for reproductive success in the circumstances their own parents grew up in. Seen in these terms, the compulsion to repeat an apparently negative pattern of feelings and behavior might be understood as reasonable in evolutionary terms: an enactment of responses learned during an infancy that prepared offspring for an expected world of conflict and stress. One could then reframe therapy as an opportunity to test this enactment against the more neutral or nurturing environment of the consulting room.

*9. Differences in sexuality may also represent different reproductive strategies.*

Sexualities differ – and not only in humans (Zuk, 2003). Some evolutionary psychologists believe that preferences like homosexuality are not as ‘non-reproductive’ as they may seem (Sommers and Vasey, 2006). Many of those practicing gay or lesbian sex may have children through heterosexual encounters in the course of their lives, while some scholars have argued that bisexuality may confer advantages in terms of the signals it offers to the opposite sex (Buss, 2003). The psychoanalytic and psychiatric communities have learned caution in relation to judging same-sex preferences to be pathological or ‘non-biological’, but it is also possible to understand all sexual desires, fantasies and behavior as variations in sexual strategy. If homosexuality represents an evolutionary strategy, the same may be true of paraphilias including sadomasochism. Although in the view of most evolutionists there are probably mental conditions – just as there are illnesses – that represent non-adaptive variations, or ones that fitted past environments but not current ones, it is notoriously hard to judge the long term adaptiveness of something that appears



abnormal (Nesse, 2004; Nesse and Dawkins, 2010). It may be helpful to take a dual perspective on all sexualities, looking to see how they affect the individual and others around them, but also seeking to make sense of them (and the variety of reactions to them among social groups) in terms of reproductive fitness.

*10. Psychological distress may represent loss of reproductive resources.* Both males and females have evolved to compete with members of their own sex and with the opposite sex for reproductive resources. Competition leads inevitably to winners and losers. There are losers in direct reproductive terms, as some individuals never acquire partners or lose contact with all near kin. More commonly loss occurs in other ways. Loss of reproductive resources does not equate automatically with fewer children or relatives, although in some cases it may. It can also encompass a failure in relationships, or a decline in social role and wealth, reducing the prospects for descendants and kin. The practical and emotional consequences of being a loser, or seeing oneself as a loser, are immense. Some theorists have argued that depression may be response to losing expected reproductive resources, and a signal of a relative withdrawal from competition, while anxiety is a marker of anticipated defeat, rejection or loss (Gilbert, 1997; Nesse, 2005). In the same way, shame and guilt can be seen as evolved regulators of one's competitive status within or outside the family (Hopkins, in press).

We are at root sexually reproducing animals with an evolved unconscious. This is true in the consulting room as much as anywhere else. Clinical relationships both echo and represent parent-child conflict, and intersexual or intrasexual rivalry. In making sense of transference and counter-transference, practitioners may well need to

consider what pertains to them, not only in relation to their own personal traits, but also in terms of their own evolutionary interests. As Kriegman has pointed out (2000, p. 77.), this may demand especial insight from a male therapist seeing a female patient, especially if he might be tempted to berate her with interpretations arising from his own sexualized counter-transference. It may be scarcely less true, however, of any configuration of clinician and patient of either sex or any age, where reactions are likely to be infused with feelings – anything from strong rivalry, to a wish for a relationship, to parental solicitude – determined by the real life biological characteristics of the two parties.

When therapy is effective, it is likely to be because of a happy convergence of sense-making for the patient, together with a compassionate and restorative relationship with the therapist as a human being. It is a common experience that helping people to reassign troublesome emotions and behavior to past traumas, or to a turbulent family background, can help them to lessen their sense of self-blame. I believe that understanding the context of deep time and of our shared evolutionary inheritance can add to a sense of one's humanity, reducing the inclination to judge oneself or others harshly. Evolutionary thought can help to make sense of many of the narratives brought to the consulting room concerning conflict between genders and generations, as well as the internal representations of these relationships, and the powerful feelings and distress that can go with them. Evolutionary insights can be liberating. Evolutionary theory points to a sense of our unity with all creation, and to mutual recognition as the sexual beings we all are. I believe it offers a paradigm that can reunite the talking therapies with neuroscience, as Freud originally hoped.

## ACKNOWLEDGEMENTS

The views put forward in this paper are my own. However, I have benefitted greatly from exchanges with my colleagues in the evo-psychotherapy group at the Tavistock Clinic, London: Jim Hopkins, Sebastian Kraemer, Graham Music, Michael Reiss, Daniela Sieff, Annie Swanepoel, and Bernadette Wren. Many other people have been generous with comments on earlier drafts including Gillian Bentley, Linda Brakel, Jim Chisholm, Aine Murphy, Randy Nesse, Joan Raphael-Leff and Martin Miller. Earlier versions of the second section of this paper have been presented at the Scientific Meeting of the Tavistock Clinic, London, and to the Academic Faculty of the Anna Freud Clinic, London.

## REFERENCES

- Ainsworth, M. (1967), Infancy in Uganda. Baltimore, MD: Johns Hopkins Press.
- Alexander, F. & Selesnick, S.T. (1965), Freud-Bleuler correspondence. Arch. Gen. Psychiatr, 12, 1–9.
- Alexander, R. D. (1989), Evolution of the human psyche. In: Origins and Dispersal of Modern Humans, ed. P. Mellars & C. Stringer, Edinburgh: University of Edinburgh Press, pp. 455-513.
- Badcock, C. (1990), Oedipus in Evolution: A New Theory of Sex. London: Wiley-Blackwell.

\_\_\_\_\_ (2000), Evolutionary Psychology: A Critical Introduction. London: Polity Press.

Baker R. & Oram, E. (1998), Baby Wars: Parenthood and Family Strife. London: Fourth Estate.

\_\_\_\_\_ & Bellis, M. (1995), Human Sperm Competition: Masturbation, Copulation and Infidelity. London: Chapman and Hall.

Barkow, J., Cosmides L. & Tooby, J., eds. (1992), The Adapted Mind: Evolutionary Psychology and the Generation of Culture. Oxford: Oxford University Press.

Boehm, C. (2011), Moral Origins: The Evolution of Virtue, Altruism and Shame. New York, NY: Basic Books.

Bolhuis, J. J., Brown, G. R., Richardson, R. C. & Laland, K. N. (2011), Darwin in mind: New opportunities for evolutionary psychology. PLoS Biol., 9: e1001109. [<http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.1001109>. Accessed 25 November 2012]

Bowlby, J. (1969), Attachment and Loss, Volume 1. London: Hogarth.

Boyd, B. (2009), On the Origin of Stories: Evolution, Cognition and Fiction. Harvard, MA: Harvard University Press.

Britton R. (2003), Sex, Death and the Superego: Experiences in Psychoanalysis.

London: Karnac.

Burt, A. & Trivers, R. L. (2008), Genes in Conflict: The Biology of Selfish Genetic Elements. Harvard, MA: Harvard University Press.

Buss, D. (2003), The Evolution of Desire: Strategies of Human Mating. New York, NY: Basic Books.

Carotenuto, A. (1982). A Secret Symmetry: Sabina Spielrein between Jung and Freud, trans. A. Pomerans, J. Shepley & K. Winston. New York, NY: Pantheon.

Chisholm J. (1999), Death, Hope and Sex: Steps to an Evolutionary Ecology of Mind and Morality. Cambridge: Cambridge University Press.

Clark, W. R. (1996), Sex and the Origins of Death. Oxford: Oxford University Press.

Covington C. & B. Wharton, eds. (2003), Sabina Spielrein, Forgotten Pioneer of Psychoanalysis. Hove, UK: Brunner-Routledge.

Damasio, A. (1994), Descartes' Error: Emotion, Reason and the Human Brain. New York, NY: Putnam.

Darwin, C. (1859). On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life. London: John Murray

\_\_\_\_\_ (1871), The Descent of Man, and Selection in Relation to Sex. London: John Murray

\_\_\_\_\_ (1872), The Expression of the Emotions in Man and Animals, London: John Murray.

Dawkins, R. (1976), The Selfish Gene. Oxford: Oxford University Press.

Deutsch, D. (1997), The Fabric of Reality. London: Allen Lane.

Dickins T & Rahman, Q. (2012), The extended evolutionary synthesis and the role of soft inheritance in evolution. Proc. Royal. Soc., series B, 279:2913-2921.

Flinn, M. V. (2011), Evolutionary anthropology of the human family. In: Oxford Handbook of Evolutionary Family Psychology, ed. C. Salmon & T. Shackelford. Oxford: Oxford University Press, pp. 12-32.

Fonagy, P. (2001), Attachment Theory and Psychoanalysis. London: Karnac.

\_\_\_\_\_, Gergely, G., Jurist, E. L. & Target, M. (2002), Affect Regulation, Mentalization and the Development of the Self. New York, NY: Other Press.

Freud, E., ed. (1960). Letters of Sigmund Freud, trans. T. & J. Stern. New York, NY: Basic Books..

Freud, S. (1920), Beyond the pleasure principle. Standard Edition, 18: 1-64. London: Hogarth Press, 1957.

Gilbert, P. (1997), The evolution of social attractiveness and its role in shame, humiliation, guilt and therapy. Br J Med Psychol 70:113-147.

\_\_\_\_\_ & K. Bailey, eds. (2000), Genes on the Couch: Explorations in Evolutionary Psychotherapy. Hove, UK: Brunner-Routledge.

Gould, S. J. and Lewontin, R.C. (1979), The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist programme. Proc Royal Soc, series B, 205:581-598.

Graf-Nold, A. (2003), The Zurich school of psychiatry in theory and practice. Sabina Spielrein's treatment at the B rgholzli Clinic in Zurich. In: Sabina Spielrein, Forgotten Pioneer of Psychoanalysis, ed. C. Covington & B. Wharton. Hove, UK: Brunner-Routledge, pp. 142-172.

Haeckel, E. (1899), Riddle of the Universe at the Close of the Nineteenth Century, trans. J. McCabe. Buffalo, NY: Prometheus Books, 1992.

- Hagen, E. (2005), Controversies surrounding evolutionary psychology. In: The Evolutionary Psychology Handbook, ed. D. Buss, London: Wiley, pp145-175.
- Haig, D. (1993), Genetic conflicts in human pregnancy. Quart. Rev. Biol., 68:495-532.
- \_\_\_\_\_ (2003), On interpersonal reciprocity. Evol. and Human Behavior 24: 418–425
- \_\_\_\_\_ (2007), Weismann Rules! OK? Epigenetics and the Lamarckian Temptation. Biol and Philosophy 22:415–428.
- Hamilton, W. D. (1964), The genetical evolution of social behavior. I. J. Theor. Biol., 7:1–16.
- \_\_\_\_\_ (1996), Narrow Roads of Gene Land, Vol. 1: Evolution of Social Behavior. Oxford: Oxford University Press.
- \_\_\_\_\_ (2002), Narrow Roads of Gene Land, Vol. 2: Evolution of Sex. Oxford: Oxford University Press.
- Hartmann H. (1958), Ego Psychology and the Problem of Human Adaptation, trans. D Rapaport. New York NY: American Psychoanalytic Association.
- Hopkins, J. (2003), Emotion, evolution and conflict. In: Psychoanalytic Knowledge, ed. M. Chung & C. Feltham. London: Macmillan, pp. 132-156.



\_\_\_\_\_ (in press), Understanding and healing: psychiatry and psychoanalysis in the era of neuroscience. In, Oxford Handbook of the Philosophy of Psychiatry, ed. W. Fulford. Oxford: Oxford University Press, (in press).

Hrdy, S. (2009), Mothers and Others: The Evolutionary Origins of Mutual Understanding. Harvard, MA: Harvard University Press.

Kerr, J. (1993), A Most Dangerous Method: The Story of Jung, Freud and Sabina Spielrein. New York, NY: Knopf.

Klein, M. (1957), Envy and Gratitude: A Study of Unconscious Sources. New York, NY: Basic Books.

Krafft-Ebing, R. von. (1886), Psychopathia Sexualis, trans. F. S. Klaf. New York, NY: Stein and Day, 1965.

Kriegman, D. (2000), Evolutionary psychoanalysis: Toward an adaptive, biological perspective on the clinical process in psychoanalytic psychotherapy. In: Genes on the Couch: Explorations in Evolutionary Psychotherapy, ed. P. Gilbert & K. Bailey. Hove, UK: Brunner-Routledge, 2000, pp. 71-92.

\_\_\_\_\_ & Slavin, M. (1992) The Adaptive Design of the Human Psyche: Psychoanalysis, Evolutionary Biology and the Therapeutic Process. New York, NY: Guilford Press.

Laland, K. & Brown, G. (2011), Sense and Nonsense: Evolutionary Perspectives on Human Behavior, 2nd edition. Oxford, Oxford University Press.

Launer, J. (2012), Sabina Spielrein: Her Life, Her Ideas, Her Genius. Raleigh, NJ: Lulu Press..

Le Doux, J. (1996). The Emotional Brain. New York, NY: Simon and Schuster.

Low, B. S. (2001),. Why Sex Matters: a Darwinian Look at Human Behavior. Princeton, NJ: Princeton University Press.

Magner, L. (1994), A History of the Life Sciences. New York, NY: Marcel Dekker.

Maynard Smith, J. (1989), Evolutionary Genetics. Oxford, Oxford: University Press.

Mayr, E. (1988), Towards a New Philosophy of Biology. Cambridge, MA: Harvard University Press.

McGuire, E, ed. (1974). The Freud/Jung Letters. London: Hogarth/Routledge and Kegan Paul.

Muehlenbein, M. & Flinn, M. V. (2011), Pattern and process of human life history evolution. In: Oxford Handbook of Life History, ed. T. Flatt & A. Heyland. Oxford: Oxford University Press, pp. 153-168.

Nesse, R. M. (1990), The evolutionary functions of repression and the ego defenses. J. Amer. Psychoanal. Assn., 18:260-285.

\_\_\_\_\_ (2004), Natural selection and the elusiveness of happiness. Proc Royal Soc. 359, 1333–1347

\_\_\_\_\_ (2005), An evolutionary framework for understanding grief. In: Spousal Bereavement in Late Life, ed. D. Carr, R. M. Nesse & C. B. Wortman. New York, NY: Springer, 2005, pp195-226.

\_\_\_\_\_ (2008), Why a lot of people with selfish genes are pretty nice - except for their hatred of 'The selfish gene'. In: Richard Dawkins: How a Scientist Changed the Way We Think, ed. A. Graffen & M. Ridley. Oxford, Oxford University Press, 2008, pp. 203-212.

\_\_\_\_\_ & Dawkins, R. (2010), Evolution: Medicine's most basic science. In: Oxford Textbook of Medicine, 5th edition , ed. D. A. Warrell, T. M. Cox, J. D. Firth & E. J. J. Benz.. Oxford: Oxford University Press, pp. 12-15.

\_\_\_\_\_ & Lloyd, A. T. (1992), The evolution of psychodynamic mechanisms. In: The Adapted Mind: Evolutionary Psychology and the Generation of Culture, ed. J. Barkow, L. Cosmides & J. Tooby. Oxford, UK: Oxford University Press, 1992, pp. 610-624.

\_\_\_\_\_ & Williams G. C. (1995), Why We Get Sick: The New Science of Darwinian Medicine. New York, NY: Times Books.

Nowak, R. (2011), Supercooperators: Evolution, Altruism and Human Behavior. London: Canongate, 2011

Ovcharenko, V. (1999), Love, psychoanalysis and destruction, trans. C. J. Wharton. J Analytical Psychol., 44: 355-373.

Peterson, D. & Wrangham, R. (1996), Demonic Males: Apes and the Origins of Human Violence. New York, NY: Houghton Mifflin.

Reik, W. & Walter, J. (2001), Genetic imprinting: parental influence on the genome. Nat Rev Genetics., 2:21-32.

Richebaecher, S. (2003). In league with the devil, and yet you fear fire?' Sabina Spielrein and CG Jung: a suppressed scandal from the early days of psychoanalysis. In: Sabina Spielrein, Forgotten Pioneer of Psychoanalysis, ed. C. Covington, & B. Wharton. Hove, UK: Brunner-Routledge, pp. 227-250

Ridley, M. (1993), The Red Queen: Sex and the Evolution of Human Nature. London: Viking.

Ritvo, L. (1974), Darwin's Influence on Freud: A Tale of Two Sciences. New Haven, Yale University Press.

Seabright, P. (2012), The War of the Sexes: How Conflict and Cooperation Have Shaped Men and Women from Prehistory to the Present. Princeton, NJ: Princeton University Press.

Simpson, J. & Belsky, J. (2008), Attachment theory within a modern evolutionary framework. In: Handbook of Attachment: Theory, Research, and Clinical Applications, 2nd edition, ed. J. Cassidy & P.R. Shaver. New York, NY: Guilford Press, pp. 131-157.

Solms, M. & Panksepp, J. (2012), The 'id' knows more than the 'ego' admits: neuropsychanalytic and primal consciousness: perspectives on the interface between affective and cognitive neuroscience. Brain Sci. 2012, 2, 147-75

Solms, M. & Turnbull, O. (2002), The Brain and the Inner World: An Introduction to the Neuroscience of Subjective Experience. London: Karnac.

Sommer, V. & Vasey, P. L. (2006), Homosexuality in Animals: An Evolutionary Perspective. Cambridge: Cambridge University Press.

Spielrein, S. (1912), Destruction as the cause of coming into being, trans. B. Wharton. J Analytical Psychol., 1994, 39, 155-186.

Stearns, S. C. (1989), Trade-offs in life history evolution. Functional Ecol., 3:259-268.

\_\_\_\_\_, Allal, N., Mace, R. (2007), Life history theory and human development. In: Foundations of Evolutionary Psychology, ed. E. Crawford & D. Krebs. New York, NY: Taylor and Francis, 2008 pp. 47-69.

Stern, D. N. (1985), The Interpersonal World of the Infant. London: Karnac.

Ritvo, L. (1974), Darwin's Influence on Freud: A Tale of Two Sciences. New Haven, Yale University Press.

Sulloway, F. (1979), Freud: Biologist of the Mind. London: Burnett.

Tinbergen, N. (1963), On aims and methods of ethology. Zeitschrift für Tierpsychologie, 20:410-433.

Trivers, R. L. (1974), Parent-offspring conflict. Am. Zoologist 14: 249–264.

\_\_\_\_\_ (2002), Natural Selection and Social Theory: Selected Papers of Robert L. Trivers. Oxford University Press, Oxford.

\_\_\_\_\_ (2011), Deceit and Self-Deception: Fooling Yourself, the Better to Fool Others  
New York, NY: Allen Lane.

Williams, G. C. (1957), Pleiotropy, natural selection, and the evolution of senescence.  
Evolution, 11:398-411.

\_\_\_\_\_ (1966), Adaptation and Natural Selection. Princeton, NJ: Princeton University  
Press.

Wilson, D. S. & Sober, E. (1994). Reintroducing group selection to the human  
behavioral sciences. Behavioral and Brain Sciences 17:585–654.

Zuk, M (2003). Sexual Selections: What We Can and Can't Learn from Animals.  
Berkeley, CA: University of California Press.

**Short biography:** John Launer is a family and couple psychotherapist and an  
honorary consultant at the Tavistock Clinic, London. He is associate dean for  
postgraduate medical education at London University.

**Address for correspondence:** 7 Spring Place, Windermere Avenue,  
London N3 3QB.  
johnlauner@aol.com

