

Understanding and Healing: Psychiatry and Psychoanalysis in the Era of Neuroscience

1. Psychiatry and the problems of mind.

Psychiatry encounters the philosophical problems of mind and body in a particularly urgent, poignant, and intractable form. For psychiatrists have characteristically sought to treat the sufferings and disabilities of *mental* disorder as disturbances of the *physical* brain. The reasons for this are unimpeachable. We have come fully to appreciate that the processes we experience as *mental* are in fact physical ones, centred in the brain. In light of this we accept, as the tradition of Hippocrates has long maintained, that we 'ought to know that from the brain and nothing else but the brain... we become mad and delirious, and fears and terrors assail us...and dreams, and untimely wanderings, and cares that are not suitable, and ignorance of present circumstances.'¹

But of course acknowledging the role of the brain has no effect at all on the way we actually think when we engage with persons and other objects in the world. Whatever their scientific orientation human beings alike experience perceiving, feeling, thinking, deciding, etc. as *mental phenomena* -- things that are registered *in their minds* -- and that they distinguish from the *physical phenomena* that they can see and touch, observe in an X-ray or brain scan, etc. This deep sense of difference persists alongside the acknowledgement of sameness because the sense of difference is rooted not in the things themselves but in the ways we think about them.²

Reality is one thing, the ways we think about it another. These are many and diverse; and we cannot readily alter or reduce them one to another. So our rightly holding that mental causes like desires can also be regarded as physiological mechanisms centred in the brain does not resolve the problems of mental vs physical, but rather restates them as limitations of scientific understanding.

2. The role of evolution.

We can understand this as part of our evolutionary heritage. Roughly, it seems that natural selection has equipped human beings (like other sexually reproducing species) with specialised neural mechanisms for relating to conspecifics. In the case of our highly social species these adaptations are particularly numerous and highly developed. They apparently include, in our expanded cerebral cortices, the representational resources required for language and, interwoven with this, for thinking of our selves as agents who perceive, feel, think, and seek to communicate and satisfy our desires in concert with others of our kind.³ This, in turn, is a main component of our ability to co-operate and co-ordinate our activities in groups of all sizes, including, of course, the episodes of ferocious group-on-group aggression and violence that have punctuated our history, and now marshal sufficient power to put a stop to it.

Engagement in this framework apparently begins with attachment -- the infantile establishing of basic emotional bonds with parents or carers -- and thus with the formation of the first and most basic of our social groups, the family. This process is sufficiently advanced by the fourth postnatal month for careful observation to yield predictions about the nature of the bonds then in formation.⁴ Stable and typical patterns of attachment, which apparently influence emotional relations throughout life, are often achieved by the end of the first year.⁵ Hence in a recent neuroscientific study of depression Douglas Watt and Jaak Panksepp (2009, p.93) describe attachment as establishing 'the massive regulatory-lynchpin system of the human brain', which exercises a 'primary influence' on the 'multiple prototype emotional regulatory systems' that we share with other mammals.⁶

Clearly this social and psychological framework ramifies deeply into our neurological being. But since its evolutionary function is to facilitate reproductive success via the communication of purpose and the co-ordination of action, we apprehend its deliverances in the language- and motive-ready categories of our everyday psychology of belief, desire, and

emotion, as opposed to the neurobiological categories we have laboured to devise during the short scientific period of our history.

3. Linguistic and psychological understanding.

In using this evolved fusion of natural language and psychological understanding we specify the (representational or intentional) contents of motives such as desire, belief, hope, fear, etc., by appending to the appropriate psychological verb a phrase or sentence specifying the object or situation desired, believed, hoped, feared, etc. Thus we may say, e.g., that someone *desires [that she gets] a drink of water from that glass in front of her*, and likewise we can say that a person believes, hopes, fears, etc. *that P*, where 'P' can be replaced by any sentence serving to specify the relevant state of mind.

This provides us with a potentially infinite, and hence endlessly flexible, set of shared descriptions for representing our mental states and the worldly (or imaginary) objects and situations that would render them true, satisfied, fulfilled, etc. The ability thus to frame the shared ideas and goals of our collaborative efforts is crucial to our attaining them. But from the point of view of neuroscience, this same flexibility appears as a descriptive variability so radically sensitive to each individual and situation as to render systematic translation into alternative scientific forms of description technically impossible.

Thus we can readily regard a desire or other mental state described in this way as realized by a behaviour-governing neurological mechanism that operates from within the subject's body and brain. But at the same time we must also acknowledge that the terms in which we naturally conceive such mechanisms – via sentences like '[that she gets] a drink of water from the glass in front of her' – have no near scientific neighbour. Such ascriptions of psychological content mark a complex representational and causal relation that connects the neural mechanisms that we describe as a person's desires and other motives with the functional targets of these mechanisms external to that person's body, such as the glass, water, and world- and self-altering act of moving and drinking that we describe in the same breath as we specify the internal mechanism itself. Evolution has evidently compacted reference to these mechanisms into our concepts of desire, belief, etc., and bridged the relation of the mechanisms to the environment, and thence to related mechanisms in other communicating brains, with the natural-language sentences we use to specify what we feel, think, and want. What evolution has here woven together, science has scarcely begun to unravel.

So we encounter an enduring gap, as between our natural understanding of the mind (that is, of the mechanisms in the brain that we conceptualize as desires, beliefs, and other content-bearing motives and mental states), and our scientific understanding of the brain and body as the kind of biological and physical entities they are. This gap, however, is particularly important for the understanding of mental disorder. For such disorder mainly consists in disruption of the paradigmatic *mentally described* phenomena – perceptions, thoughts, feelings, desires, emotions – that our natural linguistically informed mode of psychological understanding has apparently evolved to articulate, co-ordinate, and regulate.

From this it follows, as we observe, that our approaches to mental disorder are subject to constant conceptual tension. In a clinical perspective it seems we must seek to understand disorder in terms of the evolutionarily preformed mental/linguistic categories in which it arises and in which we naturally experience and communicate about it. In the perspective of research, by contrast, we seem required to seek deeper understanding via the radically disparate categories of neuroscience, psychopharmacology, and other scientific disciplines. Hence the stance continually forced on psychiatry: one foothold in natural understanding; but always stretching towards other ground, surprisingly hard to reach, in sciences related to the brain – and often across gaps of incommensurability that render categorical synthesis a hopeless task.

4. This tension and the work of Freud.

As is well known, such tension was formative for the work of Freud. He approached psychiatry as a neuroscientist who had written numerous papers based on bench research, as well as a monograph on aphasia that synthesized and extended current thinking. His neurological background enabled him to observe that hysterical neuralgias and paralyses (e.g. 'glove paralysis') occurred within boundaries set by everyday thinking, as opposed to the nervous system itself. ('Hysteria knows nothing of anatomy.') Such knowledge, however, provided no means for actually treating the patients concerned. So on learning from Joseph Breuer of a therapeutic success achieved with a patient who remembered and relived emotionally significant incidents from her past related to her symptoms – a procedure the patient called a 'talking cure' – Freud began trying to treat his patients in the same way.⁷

Breuer had enquired into this patient's symptoms, memories, and imaginings in great detail. 'Her life' as he said, 'had become known to me to an extent to which one person's life is seldom known to another' (II, 21). Freud tried to treat his patients by an even deeper and more encompassing understanding, and so met with them frequently and pressed them for memories related to their symptoms. Shortly, however, it became clear that such memories, while sometimes veridical, were also liable to be distorted or replaced by fantasy.⁸

To avoid this Freud stopped pressing his patients for memories and asked them instead to co-operate in treatment by engaging in free association – that is, by describing the rapidly changing contents of their own conscious states of mind in as much detail as possible, and without omission or censorship. Such full and collaborative self-disclosure was without precedent in previous psychological investigation, and remains without parallel even today. It proved a particularly singularly rich and valuable source of data, since over time it enabled Freud to learn as much about his patients' experiences, memories, thoughts, and feelings as they were able to put into words. In addition he was able to observe how these expressions were related to one another, to daily actions, and to dreams and symptoms. And here he was able to observe that repeatedly instantiated kinds of connections – interpretively detectable correlations⁹ – held among the contents of associative memories, significant motives and emotions, dreams and symptoms, and intentional actions.

These correlations enabled Freud to reach conclusions about the symptoms of mental disorder (as well as dreams, slips, and other phenomena) that were fundamentally different from, but also provided an explanation of, those he had previously drawn on the basis of recovered memories. He came to see that his patients' ability to put their own mental states into words – the extent of their first-person authority in respect of their own minds and motives (Gertler 2011)¹⁰ – had striking and systematic limitations, which were explicable together with the symptoms of disorder in thinking and feeling that had impelled them to seek therapy. In particular, he now saw that there was often good and repeated reason to ascribe to patients, as to human beings more generally, unconscious activations of powerful but contradictory emotions – e.g. forms of admiration, gratitude, and love on the one hand, and contempt, anger, fear, and hatred on the other – that were directed both towards themselves and towards the persons most significant in their lives.

Such present-day conflicts, in turn, could be seen as repeating similar and more powerful conflicts experienced earlier and in relation to their parents. These were rooted in disparate images of the parents -- the 'earliest parental imagos' (1933, p. 54) – who during infancy were apparently liable to be felt both as very good and nurturing, and also as very bad and moralistically cruel, even from before articulate autobiographical memory. These early representations of the parents, moreover, seemed to play a deep regulatory role in the personalities of those he analysed, particularly as regards the direction of aggression. In his analysis of the personality in terms of ego, superego, and id, he described how these imagos served to direct moralistic aggression against the self, as he had observed in (introjective) depression, and how this same aggression could also be externalized, as in paranoia.

Apparently psychological coherence in the individual and harmony in the family had required that images in which the parents were represented as good (or good enough for family cooperation) became dominant in the governance of behaviour, whereas those in which they were represented as malicious or bad became recessive. This was achieved via the exclusion of the 'bad' from consciousness, and so from a full role in thought and choice.

Still, as it seemed, the excluded (and hence unthinkable) feelings and images remained causally active, and so were expressed in formations that were unchosen and irrational. Their influence could be seen in dreams and bungled actions, and again in distortions of consciousness and motivation characteristic of mental disorder. Thus aggression rooted in split-off images from the past might be felt in the present, and directed towards others in a way that sabotaged projects and relationships; or again as directed towards the self, as in the ferocious self-criticism of depression and suicide.

5. A psychiatric illustration.

As just indicated, the conflicts Freud described and sought to lessen were of two related kinds. There were, first, conflicts between incompatible emotions and desires, felt towards one and the same person -- such as a parent who provided care but also aroused a high degree of anger and fear, or again a sibling with whom a deep family connection went with serious rivalry. Secondly, there were conflicts between parts or aspects of the self that had, as it were, crystallized around the early imagos of the parents, and now served in the regulation of emotion, e.g. *by turning moralistic aggression against the self*. Thus as Freud remarked, in certain kinds of depression

We see how in [the depressed person] one part of the ego [*das Ich*] sets itself over against the other, judges it critically, and, as it were, takes it as its object.

Those who are depressed often direct ferocious moralistic anger towards themselves, regarding themselves as 'worthless' and 'morally despicable.' (1917, 246-7). In this, Freud came to hold, they are identifying themselves with -- taking as part of their selves or egos -- the 'earliest parental imagos' mentioned above. They are criticising themselves with a ferocity, or from an idealized moralistic perspective, derived from early (and perhaps imaginary) experience. On Freud's account we all do this, and we will consider some normal examples below. But in those who are liable to mental disorder, these criticisms have an absoluteness and ferocity that makes them particularly difficult to knit into any kind of moral or psychological unity. Mental disorder is thus disorder in the kind of psychological functioning common to all people, but in psychological conditions so extreme that malfunction is much more likely.

Thus consider Elyn Saks' recent account of her own breakdown into depression and schizophrenia.¹¹ As she began to get depressed, Saks reports, her thoughts started to run along such intensely self-critical lines as:

I am not sick. I'm just a bad, defective, and evil person. Maybe if I would talk less I wouldn't spread my evil around' (58)

As time passed her self-reproaches became more constant, violent, and repetitive:

I am a piece of shit and I deserve to die. I am a piece of shit and I deserve to die. I am a piece of shit and I deserve to die. (61)

Saks' friends witnessed her deterioration and persuaded her to enter a psychiatric hospital, where she was diagnosed as depressed and given anti-depressant medication. As the depression temporarily lessened, she told her doctor *that she felt less angry*, and remarked on 'how much rage I had felt, directed mostly at myself...' (69). We can see this as the phenomenon that Freud described above, in which one part of the self -- the superego, or ego-ideal -- sets itself over and above the other, and takes it as object of moralistic anger and hatred. And after Saks was discharged her self-reproaches resumed, so that she had to be admitted again, hating herself more than ever.

Despite constant and helpful attention from doctors and nurses her condition worsened, and she began to lose her sense of agency in relation to her own self-condemnation. The reproaches now

crashed into my mind like a fullisade of rocks someone or something was hurling at me – fierce, jagged, and uncontrollable. (83)

At this stage Saks still felt the reproaches as her own thoughts, albeit thoughts that came into her as concrete entities hurled aggressively by another. Shortly later she lost her sense of agency in this entirely. She no longer felt that *she* was engaged in self-reproach, nor that *her own* thoughts were involved. Rather she was ‘receiving commands’ from ‘shapeless powerful beings that controlled me with thoughts (not voices) that had been placed in my head.’ Thus she was commanded:

‘Walk through the tunnels and repent. Now lie down and don’t move. You are evil.’ (84).

As was appropriate to her evil, she also received commands to injure herself, which she obeyed by burning herself with cigarette lighters, electric heaters, or boiling water. Finally she spent most of her time

...alone in the music room or in the bathroom, burning my body, or moaning and rocking, holding myself as protection from unseen forces that might harm me. (86)

Thus Saks passed from a diagnosis of depression to one of paranoid schizophrenia. This trajectory had often been traced in psychoanalytic writings, beginning with Freud’s account as to how, in schizophrenia, ‘the voices, as well as the undefined multitude [of potentially critical psychological presences embodied in the superego/ego-ideal] are brought into the foreground again by the disease’ so that the sufferer’s superego/ego-ideal ‘confronts him in a regressive form as a hostile influence from without.’¹² – For this is what we see in Saks’ reporting that ‘the commanding influence’ responsible for her own self-directed moralistic cruelty ‘came from within my own head, but was not mine. It was someone else commanding me.’ (85)

In this we also see that Saks’ diagnostic transition – and hence both the categories of depression and schizophrenia as applied in her particular case -- fit Freud’s overall description of mental disorder as rooted in emotional conflict. Her psychotic transition consisted in a kind of disintegration – together with an externalization or projection – of what had formerly been her depression-inflicting superego/ego-ideal. In this she (or her ego or brain) in effect substituted one form of emotional conflict for another: she (ego, brain) substituted *conflict with imaginary punishing others that constituted a kind of paranoia*, for the *unendurably painful conflict with an unrelentingly critical and cruel part of herself that had constituted her depression*.

As closely as this fits Freud’s description, there is nothing yet in it to suggest any connection between the figures Saks felt menaced or controlled by and her parents as she saw them in infancy. Still some of the events she reports might be understood in this way. For example she describes her first experience of schizophrenic breakdown, at age 7 or 8, as follows:

...My heart sinks at the tone of [her father’s] voice: I’ve disappointed him. And then something odd happens: My awareness (of myself, of him, of the room, of the physical reality around and beyond us) instantly grows fuzzy...I think I am dissolving...like a sand castle with all the sand sliding away in the receding surf. *This is scary, please let it be over!*...Most people know what its like to be seriously afraid...“disorganization” is a different matter altogether...One’s centre gives way...(12-13)

Of course, my dad didn’t notice what had happened, since it was all happening inside me. And frightened as I was at the moment, I intuitively knew that this was something I needed to hide from him, and from anyone else as well.

Saks first experienced terrifying schizophrenic disorganization in response to a moral reprimand from her father. This is consistent with the idea that the reprimand activated an image of her father linked with deep fear from early in her life, so evoking the disintegrating terror she then felt. Although this is only a theoretical speculation about her particular case, the hypothesis would cohere with psychoanalytic findings in other cases.

For example Freud's patient known as the Rat Man experienced his breakdown into obsessional neurosis when he was told – by the 'Cruel Captain' who was 'obviously fond of physical punishment' -- of a torture in which hungry rats ate into the anuses of their victims, causing a painful death. At that moment he felt – as in a kind of waking nightmare – that the same torture was somehow being applied both to the girl he hoped to marry, and to his father, who was long dead. Overcome with anxiety and guilt, he started to try to prevent or preclude such torture by a series of obsessional actions.

This patient knew that he had been anxiously preoccupied with his father's death since early childhood. In his analysis he imagined Freud as a punitive 'beast of prey' who would 'fall on him to search out what was evil in him' – again the kind of image that Freud was later to relate to the superego/ego-ideal, and comparable both with the punitive figures imagined by Saks, and the way she was to imagine her own analyst in the course of her therapy. At the same time he remembered how his father's punishing him as a child had made him fear for his own life.

In experiencing Freud and remembering his father in this way, he could see – and with great relief -- that both his present experience of Freud and his past experience of his father were illusory. This in turn made it possible to understand his breakdown (as well as the unconscious anger shown in his imagining his father being tortured) via the hypothesis that the cruel captain had unconsciously reminded him of his father as he had imagined him as a little child.¹³ Saks' analysis concentrated on her present experience, and she had no such memories as Freud's Rat Man. Still it is possible that a similar unconscious arousal of a past *imago* was responsible for her responding to her father's admonition with such disintegrative terror; and in the absence of some such account, her terror would remain inexplicable.

6. Theoretical description.

Above we described Saks (or her ego or brain) in terms of a kind of *alteration in her conscious experience*. In place of *consciously and moralistically condemning and hating herself*, she came to imagine herself as *enslaved by moralistic condemning others who ensured that she was punished*. That is: the alterations in which her mental disorder was expressed (and in which it changed from depression to schizophrenia) we *alterations in her experience of herself, or again of herself as in relation to others*.

This is the kind of description facilitated by Freud's tripartite analysis of the personality as consisting of ego, superego/ego-ideal, and id. Although this account is now regarded as limited in various ways, it will be useful for exegetical purposes here. The Freudian Id was the hypothetical locus of the drives, or the 'endogenous stimuli' that 'gave rise to the major needs' (1895, 297a). We can now take these to be realized by the homeostatic and 'multiple prototype emotional regulatory systems' mentioned above, which are shared across mammalian species, and whose role has recently been elucidated by the work of Panksepp, Damasio, and other affective neuroscientists.¹⁴

Likewise we can take Freudian ego (*das Ich*) as the self, but conceived as in recent cognitive science, that is, not just as the subject of person-level states such as desire and belief, but also as the coordinator of a range of sub-personal functions. In Freud's conception one of the most important of these 'executive functions' is that of regulating the basic drives and emotions, and in particular in managing conflicts among them, such as we see in Saks' and other examples of mental disorder. And as recently argued by Richard Carhart-Harris and Karl Friston, a functional conception of this kind, together with Freud's notion of primary and secondary processes, accords with a wide range of observations drawn from neuropsychology, neuroimaging, and psychopharmacology.¹⁵

The Freudian superego/ego-ideal is also conceived as a functional part of the self, but one whose work is discharged via (the ego's) representations of *persons*, or more fully, via *representations of the self, or of the self as in relation to others*. The representations we have taken this way so far include the representations of herself as morally hateful that were active in Saks' depression; those of herself as condemned and punished by others that were active in her paranoia; and the Rat Man's (paranoid) image of himself as in danger of punishment by a figure who would search out what was evil in him.

These are all examples of images in which moralistic aggression is directed towards, or turned against, the self. In light of them we can see that Freud's account of the functional role of the superego/ego-ideal contains an insight that has been lost in more recent and explicitly mechanical or computational discussions. This is, that *in our ultra-social species much of the mind's (or brain's) internal governance of its own motivation and emotion is effected by internal representations of our selves as in relation to members of our own species*. For, of course, it is natural that our brains should regulate our own emotions, as well as our relations with the individuals who are objects of these emotions, by images derived from, and representing, such individuals – and starting, as Freud held, with images of the parents, who are the first objects, as well as the first regulators, of the emotions in question.

Having seen something of the role of such imaginary images in mental disorder, it may be useful to compare an example from a normal dream. In this case the example is only illustrative, but we will come to better data later.

7. A normal comparison.

Barack Obama's *Dreams from My Father* describes, among other things, his youthful attempts to come to terms with his emotional inheritance from the distant and authoritarian father who he had seen in person only for two short periods – the second marred by his resentment at his father's forbidding him (contrary to the practice of the grandparents who actually took care of him) to waste time watching television. (This intervention seems to have made a deep impression on Obama: in the presidential debates he described the role of the father in terms of telling the children to turn off the television to get on with their homework.)

An important episode in Obama's search for identity occurred when his aunt told him about his grandfather, supposedly the only man his father feared, and with whom, as she said, 'the problems in this family all started' (370ff). As she recalled

A man came to the edge of our compound with a goat on a leash. He wanted to pass...

Obama's grandfather refused this reasonable request on the grounds that the goat might eat his plants. After pleading and assurance he agreed, but with a strict condition.

You can pass with your goat. But if even one leaf is harmed – if even one half of one leaf...then I will cut down your goat also....

And in the event he enforced this condition remorselessly:

We had walked maybe twenty steps when the goat stuck out its head and started nibbling a leaf. Then – whoosh! My dad cut one side of the goat's head clean through...The man had been warned.

After hearing this Obama had the following dream:

I was walking along a village road...I heard the growl of a leopard and started to run into the forest, tripping over roots and stumps and vines until at last I couldn't run any further...I turned around to see the day turned to night, and a giant figure looming tall as the trees, wearing only a loincloth and a ghostly mask. The lifeless eyes bored into me, and I heard a thunderous voice saying only that it was time, and my entire body began to shake violently with the

sound, as if I were breaking apart... I jerked up in a sweat...I couldn't get back to sleep again.

The figure that Obama imagined in his dream was clearly different from the 'shadowy beings' imagined by Saks, or again the bestial figure imagined by Freud's patient. But like these the figure was a fearful one, and one in which, again, what we can see as moralistic aggression is directed towards, or turned against, the self. For Obama clearly saw this figure as personifying the harsh moral exactitude of the paternal line in which he was now seeking to locate himself, as this had been shown towards the little goat in the story he had been told. Also, it seems, he recognized the dream as articulating his own uneasy sense that he might be wasting his own life-time, in travelling in Africa in search of a sense of identity and vocation that might enable him to fulfil the vague but apparently intense ambitions instilled in him by his parents (cf. his mother's waking him regularly early in the morning to go over his homework for the coming day: on the question of work for the future both parental figures were in agreement.)

So like Saks' depression and paranoia, or the Rat Man's obsessional neurosis, such a dream admits description in terms of Freud's account of the superego/ego-ideal. For as is made clear throughout his autobiography, the young Obama, like the little goat whose fate prompted his dream – and like Adam and Eve expelled from Eden – was not destined to waste time nibbling forbidden leaves.¹⁶ In this perspective the terror that disrupted Obama's sleep – 'as if I was breaking apart' – may have been similar in nature to that experienced by Saks in her schizophrenic disintegration. Both these instances of mental disturbance apparently involved the arousal of overwhelming fear, in the context of emotional conflict; and the same holds for Freud's patient's breakdown into obsessional neurosis and his terrified imaginings about Freud.

Further evidence (were we able to collect it) might well support the claim that in all of these instances the fear involved was derived from the early images of the parents that Freud took to be embodied in the superego/ego-ideal. And although we cannot collect further evidence in these cases, we can compare them with others in which more evidence is available, and in a usefully illustrative way.

8. The regulation of emotion by imaginary figures and fictive experience in dreams.

The kinds of figure we have been discussing are often described in Post-Freudian psychoanalysis as *internal objects*. The particular emotion-regulating personifications that Freud gathered under the head of the superego/ego-ideal are now seen as just the clinically first-discovered of a *range* of figures that play comparable regulatory roles. This shift of attention facilitates more detailed clinical focus on the particular constellations of imaginary figures that are to be found in each individual case. (A similar development has taken place in respect of the personified archetypal figures described by Jung.) So we can ask, How do such imaginary figures serve to regulate emotion? Here part of the answer seems both simpler and deeper than might first appear. We can start to describe it by considering the causal role of desire together with two simple dreams.

In human beings as well as other animals desire operates in accord with a regular causal pattern. Both motivation and consciousness seem to have their sources deep in subcortical systems that we have taken as the locus of the Freudian drives; for, as we are now discovering, motivation and consciousness are systematically related to one another, since motor behaviour is regulated via its sensory consequences, including immediate sensory feedback. In animals in which this regulatory neural input takes the form of *conscious experience of the causes of input*¹⁷ this is a particularly important aspect of ongoing (external and internal) sensory experience.

We are concerned with an aspect of such regulation of motor behaviour, namely the way experience regulates the motives that give rise to purposive action. To examine this in a general way we can take the paradigmatic case of thirst and drinking: for this is both a basic aspect of homeostatic regulation and one whose working is clearly marked in conscious experience. Let us refer to the subcortical mechanisms that govern the arousal of thirst, and

hence the subsequent motor behaviour of drinking, simply as desire-producing mechanisms.¹⁸ Then representing the agent by 'A' and the appropriate causal relations by '→', we can trace a sequence from the subcortical activation of motivation and consciousness through the production of conscious desire (conscious thirst, or a conscious desire to get a drink) and then through the production of desire-satisfying intentional action (the action of getting a drink) to the sensory feedback (the experience of drinking) that pacifies desire -- presumably by inhibiting both the experiential and motivational role of thirst at the subcortical level at which it originates. This gives

Desire-producing mechanisms in A → A desires that A drinks → A drinks →
A experiences, believes A drinks → A's desire that A drinks is pacified
(ceases to operate).

This pattern can readily be generalized and abbreviated to cover the arousal of desires of all kinds:

Desire-producing mechanisms in A → A desires P → P → A exps, bels P →
A des P pacified.

Here 'P' can be replaced by any suitable sentence specifying an agent's desire that he or she act in a certain way, so (if successful) bringing about the satisfaction of that desire, and then the experience of having acted successfully that terminates its operation. This indicates the pattern in accord with which desire-producing mechanisms operate to cause an action-producing conscious desire, and how the regulation of that desire in action is effected by sensory feedback from the action itself -- in particular by what Freud called the *experience of satisfaction* -- whose role we have abbreviated in the 'A exps, bels P' in the schema above. This desire-regulating experience was also a key component of Freud's clinical psychology, and of the neuroscientific hypotheses that he framed to take account of his clinical findings; and it played a central role in his understanding of dreams as well.

We can illustrate this via the role of thirst in dreams. Freud observed that when he had eaten anchovies or other salty foods, he was liable to dream *that he was drinking delicious cool water*. He would have this dream several times, until finally he awoke and got a drink. (There is, of course, a parallel dream concerning urination. In this case, having dreamt several times of having a satisfying pee, the dreamer awakes to experience sensations of a full bladder, and empties it for real.)

Dreams produce genuine, if fictitious, conscious experience; and this dream shows the same pattern of the control of motivation by an experience of satisfaction as we saw in the case of desire in action above. In the case of dreaming of drinking we have:

Desire-producing mechanisms in A → A des A drinks → A *dream-exps, bels*
A drinks → A's des A drinks pacified.

Here, and by contrast with the case of waking action, the experience of satisfaction that pacifies the nascent desire occurs as part of a dream, and so is not actually produced by the satisfaction of the desire in question. Rather *this experience is a fiction produced by the brain*, presumably (as Freud hypothesized) *to prolong sleep by pacifying the nascent desire that might interrupt it*. This is another instance of conflict, and among basic homeostatic mechanisms; for waking would perturb the homeostatic functions of sleep, which the brain at this juncture seems to be working to continue.¹⁹ So such simple examples indicate how *the brain works to regulate its own motivational functioning in situations of conflict by providing fictitious sensory input that has a comparable effect (here in the pacification of desire) to that which real experience would have*.

Freud called such use of the desire-pacifying role of the experience of satisfaction *wishfulfilment*, and his first distinctively psychoanalytic discoveries often consisted in detecting the role of wishfulfilment in various forms of motivational conflict: in slips, dreams, symptoms, and other formations where the brain apparently used this mechanism to pacify one or another desire involved in conflict. This appears to be a form of neurobiological

regulation that links Freudian psychology with psychiatry and neuroscience. For the cases involving the superego/ego-ideal that we have been considering also apparently involve the regulatory use of fictitious experience, but in more complex ways.

As we have seen, the provision by Saks' brain (or her ego) of an fictive experience of punitive moralistic external presences served to mitigate the internal conflict – moralistic anger directed by herself at herself – that constituted her depression. As noted, we have very little evidence bearing on Obama's dream. But it too seems an example of his own brain producing a fictive experience of a presence directing anger against the self; and we can recognize that the question of *it being time* may well have been particularly significant for the ambitious and self-controlled and so far not particularly successful young man who had it. And while we lack further data that might help us understand Obama's dream, we can find much fuller and more detailed examples in those of Freud.

The first dream Freud analysed – the 'Specimen Dream' of Irma's injection -- was prompted by his colleague Otto's mentioning to him that his former patient Irma (whose family Otto had just visited) seemed 'better, but not yet well.'²⁰ For reasons Freud's associations make clearer, he felt this as a some sort of reproof, and began writing up Irma's case history in order to justify himself. That night he dreamt that Irma had a serious organic illness, caused, as it transpired in the dream, by Otto's having thoughtlessly given her an injection that was toxic, and with a dirty syringe. Freud construed this as a wishfulfilment, on the same model as the dream of drinking above, as we can see why he did so. The dream represented Irma's distress as organic, so that his psychotherapy could not be at fault; and it represented her distress as the responsibility of Otto as opposed to himself.²¹

Freud's early account of dreaming as wishfulfilment left the matters with which we have been concerned – the superego/ego-ideal and its relations to depression, externalization in the form of paranoia, etc. – out of account. Still if we look at Freud's early associations in light of the later development of his theories, we can see how they fit with the account of the regulation of emotion by fictive experience that we have been considering. For as Freud records, his association turned to a series of his own medical failures and derelictions. These included his advocacy of cocaine ('which had brought serious reproaches down on me'), and two cases involving injection: one in which a patient he had injected had died as a result, and another in which a 'dear friend' whom he had encouraged in the use of cocaine had died from injecting it. These were clearly matters of potential self-reproach, and they were particularly transformed in the dream: for it was Otto as opposed to Freud who gave a toxic injection, and Freud who condemned him for it, by saying 'one does not give such injections so thoughtlessly; and probably the syringe was not clean.'

As he recorded his associations about his own derelictions, Freud remarked:

It seemed as if I had been collecting all the occasions I could bring up against myself as evidence of lack of medical conscientiousness.

And indeed the part or aspect of himself that was collecting and bringing such things against himself seemed also to threaten him with a primitive form of moral retribution.

[the patient who succumbed to his toxic injection] had the same name as my eldest daughter. It had never occurred to me before, but it struck me now almost like an act of retribution on the part of destiny. It was as though the replacement of one person by another [in his dream] was to be continued in another sense: this Mathilde for that Mathilde, an eye for an eye and a tooth for a tooth...

So in Freud's associations to the first dream he analysed, we find that he spontaneously recorded *how a part or aspect of his self was collecting instances of his own medical dereliction to set against him*; or, as he was to put the same idea in the context of psychotic depression many years later, how a part or aspect of his ego 'set itself over against the other, judged it critically, and as it were took it as its object'. And this part of his self seemed to the early Freud somehow to threaten him with retribution in the form of the death

of his own daughter, taking 'this Mathilde for that Mathilde, an eye for an eye and a tooth for a tooth.'

We could scarcely hope to find a more precise description of the working of the moralistic and ruthlessly self-critical part of the self that Freud was later to describe in terms of the superego/ego-ideal. Freud's associations here enable us to see him detecting the nocturnal working of his superego/ego-ideal without recognizing that he was doing so. His overall response, however, was strikingly different from that of Saks. The fictive experience provided by his brain – of Otto's having carelessly given Irma a toxic injection – *enabled him to regard Otto, as opposed to himself, as the source of such derelictions as his superego/ego-ideal had been collecting to bring against him*. So in the dream he could turn the tables on Otto, and assume the role of superego/ego-ideal himself -- as he did in ending the dream by saying 'One does not make injections of that kind so thoughtlessly...'²²

We can thus regard the various examples we have considered -- the symptoms of Saks' depression and schizophrenia, Obama's dream, the Rat Man's symptom, Freud's simple dream of drinking and the comparable dream of urination, and Freud's more complex dream of Irma's injection – as instances of the working of the same sort of neurobiological mechanism. The mechanism is *the brain's management of motivational or emotional conflict, by the presentation to the self of fictitious conscious sensory experience*. There seems little doubt that there is such a mechanism – it is too clearly in play in the simple dreams to be dismissed – and it is a very intelligible development of the deep and pervasive role of the regulation of motive by conscious experience that seems to hold for all mammals, and probably for other animals as well. So let us consider the possible explanatory scope of this mechanism in more detail.

9. Forms of conflict and forms of disorder.

We saw above how Saks could be described as having projected aspects of the superego/ego-ideal that had animated her own depressing moralistic self-hatred. Another conflict-mitigating alternative, in Freudian terms, would have been for her to *identify herself* with her superego/ego-ideal, and thereby represent all morally censurable faults as located elsewhere than in her self. This is in effect what Freud did in his dream of Irma's injection, and he later took this mode of defence to be characteristic of mania.

Freud's concept of the superego/ego-ideal thus involves a 'choice of illness' for the main mental disorders, as related to the role of the imagos the he took to be derived from the parents. The alternatives are (i) suffering the persecuting self-denigrating superego/ego-ideal in depression (ii) relieving the depressive conflict by imagining oneself to embody the superego/ego-ideal (and hence unrealistically overvaluing the self and undervaluing others), as in mania (with oscillations between these positions constituting bipolar disorder). And (iii) relieving the depressive conflict by projecting and fragmenting the superego/ego-ideal in various paranoid formations, as apparent in Saks and many comparable cases, including that of Schreber as described by Freud.²³

10. Evolution, emotion, and group conflict.

The roles that we can discern here in individuals also accord with those Freud assigned to the same psychological structures in the emotional regulation of groups. He took human groups to achieve the common moral and ideological stance required for ingroup cooperation by taking leaders and/or creeds (ideologies, norms) as constitutive of their superegos/ego-ideals. This entailed that within-group deviations from these – disloyalty to the leader, failure to adhere to patriotic or other norms – would be grounds for individual guilt and shame and social punishment. Hence also, as Freud stressed, such ingroup cohesion went with hatred and violence towards outgroups. For ingroup idealization of a group-defining creed or leader was liable to represent outgroups defined by dissociation from these as morally reprehensible, and hence as potential objects of morally mandated outgroup violence.²⁴

This illustrates how internal conflicts of the kind suffered by Saks (as well, if Freud is right, as everybody else) are externalized in groups and relations among them. The group mindset of *good us against bad them* produced by the group equivalent of anti-depressive mania – ingroup identification with the superego/ego-ideal entailing the location of depressing badness elsewhere – seems a common feature of human group conflict. It has animated countless religious conflicts and wars, and can be seen in the facilitation of the holocaust by the idealization of Hitler, the current demonization of Muslims and idealization of militarism in the United States, and so on *ad finem nostrum*. Also there is a strong case for holding that this same mindset – and hence the Freudian mechanisms that underpin it – should itself be regarded as a product of evolution.

Darwin originally sought to explain ‘the moral and social qualities of man’ – including our capacities for self-sacrifice and cooperation – by the fact that ‘at all times throughout the world tribes have supplanted other tribes.’ The key to success in this process, he thought, was ingroup cooperation for outgroup conflict. This entailed the selection of ingroup self-sacrifice, patriotism, and other distinctive human adaptations, as opposed to the ‘selfishness and treachery’ that ‘the survival of the fittest’ might otherwise be expected to yield. Such a process, we may note, might also promote the evolution of language, emotions like guilt and shame, institutions of social punishment, and that ability to understand one another in commonsense terms with which we began. Each of these seems apt to improve the ingroup cooperation and cohesion that Darwin had in mind; and evolutionary theorists have recently produced convincing accounts of the co-evolution of genes and culture in which ingroup cooperation for outgroup competition plays a central role.²⁵

Such accounts can also be taken to predict the kind of internalization of norms and punishment that suppress aggression so as to yield co-operation within ingroups while directing aggression towards outgroups that we see in the Freudian account of the superego/ego-ideal.²⁶ If so then, as Freud envisaged, we might regard the kinds of conflict that give rise to mental disorder as rooted in evolution. The kinds of mental disorder we have been considering would then be explicable in a still wider context. They would be expectable form of malfunctioning, in the complex task set the ego (or the brain) in the management of aggression in our astonishingly social but also lethally group-aggressive species.

We co-operate in multiple ingroups, in which we inhibit aggression towards others, and take it as cause for ingroup guilt, shame, and punishment; and this can at least partly be seen as controlling aggression by turning aggression against ourselves. At the same time this cooperation is characteristically in the service of competing with outgroups, and so often involves directing aggression against them. In this case the role of guilt, shame, and punishment is no longer that of inhibiting aggression: patriotism puts these emotions into the service of amplifying aggression against the outgroup, via the stance of *good us/bad them* discussed above.

The basic parameters for this remarkably complex system -- involving the constant determination and re-determination of in- and out-groups and the direction of aggression among them -- seem again to be set in early childhood, and also via the use of the early imagos Freud described in terms of the superego/ego-ideal. This in turn seems part of the reason that the paradigmatic mental disorders involve excesses of aggression-inhibiting guilt, forms of overvaluing the self as opposed to others, and paranoid fear, all of which play essential roles in ingroup cohesion for outgroup aggression that parallel their roles in individual disorder. Deeper understanding of mental disorder should clarify these links as well.²⁷

11. Emotional conflict within psychoanalytic therapy.

Engrossed in her fictive experience, Saks continued to deteriorate, until the doctors caring for her arranged for a consultation with a psychiatrist who was also a psychoanalyst. On meeting him she felt, for the first time, that despite her confusion she might be understood by another, and so might be able to understand herself. Encouraged by this she arranged to begin full-time treatment with a non-medical analyst outside her mental hospital. Although her prognosis was thought poor, she left hospital for this purpose. And as was to be

expected, in this setting her emotional conflicts began to take new and equally powerful forms.

As her analysis progressed her psychotic thoughts grew more violent during her sessions. Her relationship to her analyst became suffused with three partly contradictory currents of imagination and feeling -- intense anger and fear, intense dependent affection, and intense anxiety and dread at separation. So, e.g. she associated to her analyst:

...You are an evil monster...a witch...you are trying to kill me...Don't cross me. I've killed hundreds of thousands of people with my thoughts...(97)

Or again she thought to herself

She is evil and dangerous...She is a monster. I must kill her, or threaten her, to stop her doing evil things to me. (98)

The closer she felt to her analyst the more terrified she became. So she perused shops for weapons, and for period brought a box-cutter or serrated knife to her sessions (which of course she never had occasion to use). But also

At the very same time as I was terrified of Mrs. Jones, I was equally terrified that I was going to lose her, so much so that I could barely tolerate weekends when I would not see her for two days. I would start to unravel on Thursday and be nearly inconsolable until Tuesday. In the intervening time it took everything I had to protect myself...all the while plotting ways to keep Mrs. Jones from abandoning me. *I will kidnap her and keep her tied up in my closet. I will take good care of her...She will always be there to give me psychoanalysis...*her steady and calm presence contained me, as if she were the glue that held me together. I was falling apart, flying apart, exploding -- and she gathered my pieces and held me. (97 – 8)

Violent and contradictory as her feelings and phantasies were, expressing and discussing them, and testing them against what she actually experienced in her relationship with her analyst, gradually had an effect. Although she remained liable to hallucinatory presences, she found that as she

...became accustomed [in analysis] to spooling out the strange products of my mind my paranoia began to shift...the actual daily people in my comings and goings seemed less scary and more approachable...slowly I made one friend, then two...I began to move back into the world again...Blinking and shaky (as though I'd been in a cave, and the light, as welcome as it was, was something I had to get used to) I began to move back into the world again.(93-4)

Again, Saks' phantasies provide clear examples of conflicting motives directed at one and the same person. Also they exemplify the state of mind that Melanie Klein described as the paranoid-schizoid position, in which the same person (originally, in Klein's account, the mother, or the part of her that was the most important early sensory focus, her breast) is felt either as extremely bad and threatening or as extremely helpful and good. So on their hypotheses -- as indicated by Freud's remarks on the regressive fragmentation of the superego/ego-ideal in schizophrenia -- the passage from depression to schizophrenia considered earlier would represent a reversal of the process by which the self-condemning part of herself manifest in her depression was originally formed.

On this kind of account the gathering together of her fragmenting self that Saks gratefully ascribed to her analyst would represent a partial reworking in the present of basic processes of integrating the self that take place in the interaction of an infant with its mother (and other carers) from early in life. Likewise the pain of separation that Saks found so intolerable at weekends, and the grief and phantasies of control that it evoked, would partly

repeat those of an infantile self, threatened by separation with loss of the parental presence that seemed the source life and coherence for the self.

As this indicates, Saks' analysis was felt by her to be healing and revelatory, and enabled her to resume work and to relate to people, and to start to build for herself what was to prove an intellectually distinguished and emotionally satisfying life. This does not, of course, mean that it was a cure for her schizophrenia. Remarkable as her analysis was at sustaining and helping her in the absence of medication, when she sought to terminate it she broke down. After her last session she had to be torn from a radiator to which she had attached herself, and was persuaded to leave her analyst's house only when she realized that the alternative was removal by the police. She was to rely on chemical as well as psychoanalytic help for many years to come.

Still her treatment remains an impressive example of psychiatric help that came from being deeply understood, and that was life-changing in relation to a serious psychotic condition. This accords with recent clinical and neuroscientific studies indicating that psychoanalytic therapy has demonstrable therapeutic effect; and there is some evidence that this turns on its effect on images of the parents, as these have been independently investigated in attachment-based developmental psychology.²⁸ Also it underlines a point that may prove important in psychiatry. What appears as comorbidity among distinct diagnostic categories (and at times Saks was obsessional and anorexic as well) may in a deeper psychological perspective be seen as different forms of the same underlying – and universal – human emotional conflicts, as these are mediated by a provision of fictive experience that may have evolved for this purpose.

12. Moral conflict and its emotional and genetic roots.

Why did Saks think she was so evil that she was a piece of shit who deserved to die? Her account does not fully explain this. In the case of the Rat Man we can see clearly how the guilt he suffered stemmed directly from his aggressive phantasies – for he would become anxious and guilty, and think he deserved to die, as a result of imagining his father tortured. Saks also had powerful aggressive phantasies, sometimes related to guilt. As she claimed during one of her breakdowns

There will be raging fires, and hundreds, maybe thousands of people lying dead in the streets. And it will all – all of it – be my fault.(4)

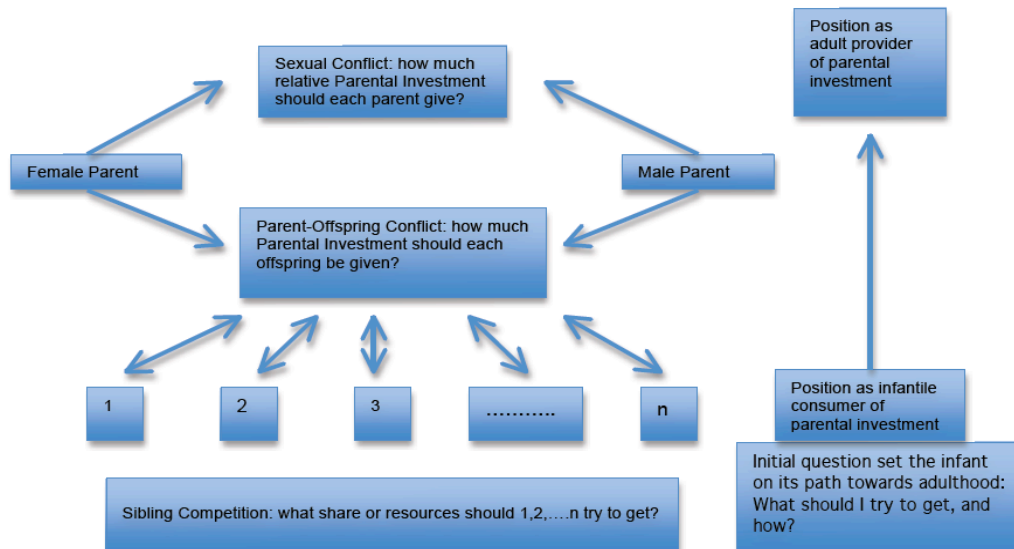
Her dialogues above show how she constantly imagined killing the analyst upon whom, at the same time, she felt utterly dependent, and even as she was feeling relief, hope, and gratitude for the treatment she was receiving. But in addition she had another and particularly striking set of imaginings, that might well have been linked with guilt. She constantly imagined killing fetuses and babies. Indeed she found her thoughts about this particularly hard to control, as she supposed that others might agree with her.

There were whole parts of myself I tried desperately to keep hidden. I knew, for instance, not to share my ongoing delusions of evil...but as hard as I tried, I'd sometimes find the wrong words coming to my lips – for example the memorable night we all sat on the roof and I casually mentioned having killed many children.

'It's a joke! I quipped...noting with alarm the expressions on their faces – uncertainty at first, and then, slowly, a hint of horror. 'A stupid joke! Oh come on, everybody wants to kill kids once in a while, don't they...(95)

In her analysis these phantasies were understood as expressions of *sibling rivalry*. From the time he wrote *The Interpretation of Dreams* Freud held that analysis indicated that everyday rivalries between brothers and sisters were underlain by deeper unconscious hostilities. This was later borne out in Melanie Klein's analyses of children, who often played out hostile phantasies towards siblings or parents in detail.²⁹ More recently biologists have come to recognize that aggression towards siblings, and even towards parents, may be

predicted by evolutionary theory. This is discussed in terms of the interrelated notions of *parental investment*, *sexual conflict*, and *parent-offspring conflict*.³⁰ Some relations among these are depicted in the diagram below, which is based on that at p. 41 of Mock and Parker (1997) *The Evolution of Sibling Rivalry*. The developmental arrow at the right has been added for discussion here.



At first pass the notions of sexual conflict and parent-offspring conflict concern only probabilities for the replications of genes. But evolutionary theorists take these to yield co-evolving patterns of adaptation and counter-adaptation that encompass both physiology and psychology.³¹ The notion of *parental investment* is intended to encompass the provision by parents of anything that contributes to the thriving of a particular offspring, where this is done at a cost to the parent in contributing to the thriving of other offspring (or at cost to the parent's fitness more generally). Such an abstract notion is difficult to apply in practice, but reasonable comparisons and judgments can still be made. Thus the physiological and emotional investment (or cost) incurred a female who conceives an offspring, carries it for months in her womb, gives birth to it, and feeds it from her breast for some months afterwards, can clearly be regarded as more significant than that incurred by a male who participates for a few minutes in its conception and looks after (and plays with it, etc.) for some hours a week after it is born. (And of course the investment of a father who opts out of post-coital participation is infinitesimal even by comparison with this).

As this suggests, among human beings (as among mammals generally) females are the greater providers of parental investment – so much so that women's capacity for child-bearing sets a limit to men's reproductive success. But where the nature of parental investment systematically differs as between reproductive partners, so too must many aspects of reproductive functioning and behaviour related to it – the parents' strategies in courting and choice of mates (and so the conditions in which the seek or avoid intercourse), their responses to conception and pregnancy, their behaviour in rearing offspring once they are born, and so on.

Such differences generate *sexual conflict*, for they entail that radically different motives or conflicting patterns of behaviour will result in successful replication of a mother's as opposed to a father's genes.³² Thus if female fecundity limits male reproductive success we should expect males to compete for access to females, and to work hard to gain it, as is observed for many species. And if females must incur much larger costs than males in investing in an offspring, they have far more to lose by fast and indiscriminate mating, and correspondingly more to gain by exercising careful choice (e.g. in the genes or capacity for investment of those they mate with). So as in many other species, human females copulate

more selectively than males. This pits female selectivity against male opportunism, in the forms of sexual conflict that are still referred to as the battle of the sexes.

Part of this battle stems from the fact that there are many circumstances in which it is in the genetic interests of either parent to shift the burden of investment to the other, or again to reproduce elsewhere. Men regularly abandon partners, leaving them to bring up children on their own, sometimes to start another family elsewhere; and women occasionally do the same. A woman can sometimes secure investment by establishing or feigning paternity, as a man can avoid it by denial or simply refusing to participate. These are familiar sources of infidelity, deceit, betrayal, and other sources of domestic discord. As they indicate, both men and women can also shift investment from present to future offspring, where the future can include alternative reproductive partners. The means for this include abortion, infanticide, adoption, orphanage, and many forms of selective neglect.

These are sometimes employed with offspring that seem bad or costly bets: burdensome, unviable, unrewarding, socially inconvenient, or just less likely than others to carry on the line. But in hard times abandoning one or more children may be the only means of securing the survival of others. So the notions of parental investment and sexual conflict carry that of parent-offspring conflict – conflict between the interests of the genes of parents as opposed to those of their offspring -- in their wake. This in turn sets the stage for sibling rivalry, as we see even in domestic pets. Puppies or kittens often die because they cannot get access to milk; and this is not simple misfortune, but the effect of sibling competition as mediated by parental investment.

So in other circumstances some pigs are born with tusks to slash their sibs, young birds regularly peck weaker sibs to death, bird parents intervene to kill superfluous nestlings, and so on and on.³³ Sharks are particularly striking in this respect. The female sand tiger has two uteruses, and the fetuses in each devour one another until only a separated pair remains. This compression of development and learning enables her selected brood to enter the sea as well-nourished, natural-born, and practiced killers.³⁴ The corresponding psychoanalytic claim – that human infants have hostile impulses towards parents and siblings that are repressed within the family, in such a way as to be channeled into outgroup competition – seems mild and sociable by comparison.

The links between parental investment and sexual and parent-offspring conflict have led evolutionary theorists to argue that the genetic interests of offspring would best be served by what they describe as ‘true monogamy’³⁵, which corresponds to the human moral ideal of lifelong faithful marriage to a centered on the rearing of children. It is remarkable that biological and moral concepts should coincide in this way, and suggests that we should see the imagos produced by the superego/ego-ideal as regulating sexual and parent-offspring conflict. For, which emotions work to limit infidelity, deception, and betrayal of partners, or again against neglect, infanticide, or abandonment of children? Of course there are forms of love, attachment, and empathic concern. But also, and crucially, there is guilt, shame, and fear of punishment or censure – the so-called moral emotions -- and the internalization of these in the superego/ego ideal. As our addition to Mock and Parker’s diagram is meant to illustrate, the infant’s brain and mind first come to address the basic practical/moral question of life – what shall I try to get, and how? – as powerless dependent consumers of parental investment. A significant part of maturation apparently consists in moving from this initial position to that of a competent provider of such investment, and one who is perforce in potential sexual conflict with his or her partner or partners. From the perspective of evolution, this seems one of the most significant of human psychological developments.

Unlike sharks human infants are born neurologically premature and physically uncoordinated. Their individual shortcomings, however, are more than offset by their social connections. The subcortical homeostatic and ‘multiple prototype emotional regulatory systems’ are operative at birth, and wired for expression in their faces, voices, and movements. Their automatic engagement enables infants to begin life-sustaining emotional relationships with others even before they start the related task of using their experience of these relationships to build the *representations* of their selves in relation to others that will later subject the same emotions to cortical and cognitive regulation. For since the basic sub-

cortical mechanisms of motivation also produce the conscious experience of the consequences of movement that regulates the working of motive, the scope of infantile consciousness and infantile action develop together, and towards the setting of the 'regulatory lynch-pin' of attachment that is achieved by the end of the first year.

Infants are also born into parent-offspring conflict. For while we should expect evolution to prepare offspring to secure a maximum of parental investment for themselves, it should prepare parents to apportion investment over more than one offspring -- so fating offspring to seek more than parents are prepared to give, and at the expense of siblings, whether actual or potential. (Parents themselves, moreover, are liable to conflict over provision, even from relatively soon after birth: a father's genes might be best served by rapid re-impregnation of the mother, but hers by waiting to ensure that infant she has laboured to bring to term is well established, and her body recovered, before starting again.) In such conflicts human babies can exercise few powers apart from their expressions of emotion.

Speaking very roughly, babies can express emotion in their own genetic interests in two main ways. They can use the circuits that Panksepp describes in terms RAGE, FEAR, and separation distress/PANIC/GRIEF. These tend to operate together, as they seem to do in babies' uniquely penetrating, guilt-inducing, and compelling cries. In this they serve as babies' main means of coercing what they most urgently need. (And in light of parent-offspring conflict we can see that an infant's expressions of rage at shortcomings in maternal care are continuous with the evolutionary function of anger in conflict over resources more generally.) Alternately, however, babies can exercise the systems that Panksepp describes in terms of SEEKING, LUST, and PLAY. These are ingredients of co-operative and affectionate attachment, and the 'good' early imagos of the parents, as Freud stressed (and as research in attachment seems to be bearing out) apparently serve as life-long prototypes for relationships of affection and love.

Sara Blaffer Hrdy has long stressed the evolutionary importance for babies of being able to evoke love and care.³⁶ It seems a direct consequence of the concepts we have been considering that babies stand to increase their share of parental investment by using their abilities to evoke love and care -- as well as their anger, distress, etc. -- in a particular way: that is, *in any emotional or other manipulation that impedes their parents in conceiving another child*. And this obstruction of alternative lives is not some remote theoretical possibility: rather it is what babies naturally and affectionately do in feeding at the breast. Infants often show every sign of regarding this as a particularly significant, valuable, and pleasurable relationship; and something similar may hold for mothers as well. But since the infant's activity at the breast is contraceptive, it can also be seen as part of an alliance between mother and infant -- saving the former from the wear and tear of fast-repeated pregnancy, and enabling the latter better to thrive -- as against the genetic interests (and in some cases the overt jealousy) of the father.

The infant's first sensual and affectionate relationship at the breast is also its first engagement in parent-offspring and sexual conflict. This may be the neurobiological inception of the developments that Freud described in terms of the Oedipus Complex -- and it also involves the regulation of aggression by the development of guilt, concern, and other moral emotions that (as I have sketched elsewhere) we can partly trace over the course of the first year.³⁷ In this we see evolutionary and emotional conflict at work together, for human infants are bound in the network of conflict we have been considering *to feel and express powerful but conflicting emotions towards one and the same person -- particularly the mother -- from shortly after birth*. This seems to constitute a natural liability in our species to the kind of emotional conflict that in some appears as disorder of the mind.

As long as infants do not recognize that their mothers or other carers are single and unique individuals the direction of radically conflicting emotions towards them need present no psychological difficulties. The conflicts become important for infants themselves only as they start to apply the concept of numerical identity, and so to regard themselves and others as individuals who are enduring and unique in space and time. This development coincides with what Melanie Klein regarded as the transition from the paranoid-schizoid to the depressive position, and there is some reason to suppose, as she held, that it starts to take

hold during the fourth month of life³⁸. This might well also be the time at which imaginary attacks on the mother, or again on siblings, would start to be felt by infants themselves as potential causes of grief and distress at separation, and so would engage with aggression-punishing images produced via the superego/ego-ideal. Hence we might finally speculate that this development took place in Saks' individual case in a way that was incomplete³⁹, and so left her with a disposition to imaginary aggression (particularly as regards the killing of babies) that remained a source of guilt in later life.

In any cases we can see that human infants steadily learn to regulate their anger over the course of the first year, and in accord with the images of themselves as in relation to others that experience builds in their cortices. At four months, for example, infants angered by an experimenter's impeding hand direct their anger at the hand itself. They apparently still conceive even the persons around them (and hence the mother and her breast) as part-objects, as psychoanalysis has held. By seven months, however, they direct their anger at an offender's face, and their history of experience with an offender determines the kind of anger they feel. Infants of this age are especially angry if their mothers annoy them after a stranger has already done so, for by now they apparently expect her comfort in such a situation and regard her joining the stranger in annoying them as a betrayal. Overall it appears that infants' recognition of their carers and themselves as unique individuals leads to an increase in separation distress and also to a fear of strangers, as if the consolidation of mother and infant as a first *good us* led also to a first *bad them* in the form of fearful strangers.

This would bring our evolutionary speculations about infancy into line with those about group competition and the role of the superego/ego-ideal considered above. The overall structure is registered in a familiar proverb.

Myself against my brother
My brother and I against the family
My family against the clan
All of us against the foreigner.

This represents sibling rivalry and parent-offspring conflict as part of a larger pattern of cooperating to compete that channels aggression via successively larger groups. Even such a schematic account brings to the fore a consequence that we seem actually to face. Insofar as we cooperate in groups to compete in groups we cannot manage to cooperate as a single group even when important common interests require it. Rather we are liable to regress to competition against the foreigner instead.

13. Psychiatry, Psychoanalysis, and Neuroscience.

At the outset we observed that psychiatry is liable to tension between a clinical approach that concentrates on the lived experience of mental disorder and a neurobiological one that focuses on the brain in which such experience is realized. This tension caused Freud to abandon neuroscience⁴⁰, and in recent times – as registered in the history of the DSM – it has caused psychiatry to abandon Freud.

In this essay I have tried to argue that this tension, large as it now looms, may be liable to at least a partial intellectual dissolution. The ideas that we have considered suggest that the accounts of mental disorder provided by Freud and his successors should not be taken as alternatives to a more adequate neurobiology of mental disorder, but rather as indicating paths we might take towards attaining one. Our circumstances of life entail that our basic emotional systems are liable to conflict; and important forms of disorder seem rooted in conflict of this kind, and the fictive experiences by which the brain seems to regulate it. These emotional conflicts, in turn, seem rooted in evolution, together with the 'moral' emotions that go awry in mental disorder as well.

These claims are speculative, but increasingly sustained by evidence. Insofar as they prove to be correct, psychoanalysis and our future accounts of the neurobiology of mental disorder should converge, at least within the limits set by the differences in their categories. It is a further question whether such convergence would help us to regulate our use of group-

on-group violence, or to co-operate in the absence of human enemies whom we can demonize to our own satisfaction. But understanding mental disorder in this way is of a piece with understanding the irrationalities that are part of human nature; and we may hope to progress in both together.

¹ Hippocrates, 'On the Sacred Disease' tr. Francis Adams, <http://classics.mit.edu/Hippocrates/sacred.html>

² My own account of these modes is related to the problem of consciousness in Hopkins, J., 'The Problem of Consciousness and the Innerness of the Mind' in M.M. McCabe and M. Textor, ed, *Perspectives on Perception*, Frankfurt: Lancaster Publishers, 2007; and to the representational role of conceptual metaphor and psychoanalytic symbolism in Hopkins, J., 2000 'Psychoanalysis, Metaphor, and the Concept of Mind', M. Levine, ed, *The Analytic Freud*, London: Routledge.

³ The evolution of this framework is discussed in Hopkins, J., 2000 'Evolution, Consciousness, and the Internality of Mind', in P. Carruthers and A. Chamberlin, eds, *Evolution and the Human Mind*, Cambridge: Cambridge University Press. Both it and psychoanalysis more generally are related to neuroscience in Hopkins, J., 2012 'Psychoanalysis Representation and Neuroscience: the Freudian unconscious and the Bayesian brain' in Fotopolu, Pfaff, and Conway, eds *From the Couch to the Lab: Psychoanalysis, Neuroscience and Cognitive Psychology in Dialogue*. Oxford: Oxford University Press.

⁴ On this see Beebe, B., Jaffe, J., Markese, S., Buck, K., Chen, H., Cohen, P., Bahrack, L., Andrews, H., and Feldstein, S. (2010). The origins of 12-month attachment: A microanalysis of 4-month mother-infant interaction. *Attachment and Human Development*, 12 (1), 3 – 141.

⁵ On this see Cassidy, J. and Shaver, P. (2008). *Handbook of Attachment*. London: Guildford Press

⁶ Watt, D. and Panksepp, J. (2009). Depression: an evolutionarily conserved mechanism? *Neuropsychanalysis*, 2 (1).

⁷ Breuer's treatment of the patient described as Anna O has itself become a locus of historical imagining, much of it, as usual, aimed at discrediting Freud. This has recently been subjected to a careful and clarifying discussion in Skues, R., (2006) *Sigmund Freud and the History of Anna O: Reopening a Closed Case*. Palgrave, Macmillan. This allows Breuer's modest but apparently genuine therapeutic success to be discerned.

⁸ This lesson had to be relearned nearly a hundred years later, when thousands of women in the United States began to report recovered memories of childhood sexual abuse of the kind that Freud had elicited from his early patients. As the *Guardian* reported on December 3 1993:

Across the United States, thousands of adults are recovering memories of having been sexually abused in childhood, memories they never knew they had. Sometimes they appear in a flashback, triggered by an event in their adult lives. But often the memories begin to emerge in therapy -- even though the person may have sought therapy with little hint that his or her emotional problems stemmed from childhood abuse...Psychiatrists, psychologists, and other mental-health professionals have split into warring camps over whether the sudden surge in recovered memories stems from better therapeutic techniques or a horrible abuse of therapeutic power...What no one can say is how many of these memories are true, an uncertainty that has plunged the psychological-psychiatric community into a crisis.

As this indicates, a first response was to accept the claims of abuse, and criticize Freud or Freudians for claiming that some people were prone to imagine abuse that had not occurred. A second was to hold that the claims were often false, but to criticize Freud or Freudians for having elicited them by suggestion. Few reflected that the whole episode -- the excited proliferation of the claims, as well as the intensity and tenacity with which they were maintained -- was in accord with Freud's view that on this score memory was particularly liable to be distorted by fantasy and could not be trusted.

⁹ This topic is discussed more fully in Hopkins 1999, 'Patterns of Interpretation: Speech, Action, and Dream' in L. Marcus, ed, *Cultural Documents: The Interpretation of Dreams*, Manchester: Manchester University Press.

¹⁰ Gertler, B. (2011). Self-knowledge. In E.N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy*, Spring 2011 edn. Online: <http://plato.stanford.edu/archives/spr2011/entries/self-knowledge/>.

¹¹ Saks, E. (2008). *The Center Cannot Hold: My Journey Through Madness*. New York, NY: Hyperion.

¹² Freud, S. (1914/1957) 'On Narcissism' In J. Strachey (ed.) *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, Volume X . London : Hogarth Press, p. 96. For some recent discussion of partly similar examples see for example Maltzberger, 'Self break-up and the descent into suicide' and Bell 'Who is killing what or whom?' in Briggs, S., Lemma, A. and Crouch, W., eds, *Relating to Self Harm and Suicide: Psychoanalytic Perspectives on Practice, Theory and Prevention*, London: Routledge 2008.

¹³ Freud , S. (1909/1957). 'Notes upon a case of obsessional neurosis' and 'Addendum: original record of the case.' In J. Strachey (ed.) *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, Volume X . London : Hogarth Press. This episode is discussed in the context of an account of the superego, ego, and id in terms of Bayesian neuroscience in Hopkins, J. (2012) 'Psychoanalysis Representation and Neuroscience: the Freudian unconscious and the Bayesian brain' in Fotopolu, Pfaff, and Conway, eds *From the Couch to the Lab: Psychoanalysis, Neuroscience and Cognitive Psychology in Dialogue*. Oxford: Oxford University Press.

¹⁴ For recent discussion -- and for the important and closely related idea that both motivated behaviour and the conscious experience that accompanies and regulates it originate in the same subcortical regions and via the same or closely co-ordinated mechanisms -- see Damasio, A., Damasio, H. and and Tranel, D., (2012) Persistence of Feelings and Sentience after Bilateral Damage of the Insula, *Cerebral Cortex Advance Access*, *Cerebral Cortex* doi:10.1093/cercor/bhs077, and Solms, M. and Panksepp, J., *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, 147-175; doi:10.3390/brainsci2020147. The consequences of this for psychoanalysis are considered in detail in Solms, M., (2012) The conscious Id, to appear in *Neuropsychanalysis* together with commentaries including Hopkins, J., (2012) Conflict creates an unconscious id.

¹⁵ See Carhart-Harris, R. and Friston, K (2010, 2012). The default-mode, ego-functions and free-energy: a neurobiological account of Freudian ideas. *Brain* 133, 1265–1283, revised and reprinted in Fotopolu, A., Pfaff, D., and Conway, M., eds *From the Couch to the Lab: Psychoanalysis, Neuroscience and Cognitive Psychology in Dialogue*. Oxford: Oxford University Press. While these authors discuss ego-functions they lay no emphasis on emotional conflict.

¹⁶ At 377-8 Obama describes what seems a linked incident, in which his grandfather recues a little goat, abducted by a terrifying night runner, which seems the kind of figure depicted in the dream. So I am inclined to guess that this story may also have entered into the formation of this dream, although Obama describes hearing it afterwards.

¹⁷ Hence the significance, in this context, of the Bayesian slogan that (in conscious animals) *the brain represents neural input as conscious experience of the causes of the input*. This is the point at which the conception of the Bayesian brain, as described in 'Psychoanalysis, Representation, and Neuroscience...' dovetails with the claim by Damasio, Panksepp, and others that the mechanisms that produce motives also produce the conscious experience that regulates motivation. On this see also 'Conflict creates an unconscious id' cited above.

¹⁸ This is meant to integrate the present discussion with Ruth Garret Millikan's descriptions of the role of representation-producing mechanisms (including desire- and belief-producing mechanisms) in her account of intentionality. This is briefly discussed in connection with neuroscience in 'Psychoanalysis Representation and Neuroscience...' cited above.

¹⁹ This again is discussed in 'Psychoanalysis, Representation, and Neuroscience...' cited above. Since that article Hobson and Friston have produced a comprehensive Bayesian account of dreaming that indicates a role for neural homeostasis consistent with that discussion, and also with the present account of the role of imaginary experience in regulating emotion. See Hobson, J., and Friston, K. (2012) Waking and dreaming consciousness: Neurobiological and functional considerations, *Progress in Neurobiology* 98 (2012) 82–98

²⁰ The quotations in the following paragraphs are from Freud, S (1900/1957). Analysis of a specimen dream. In J. Strachey (ed.) *The Interpretation of Dreams*, in Strachey, J , ed., *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, Volume V, pp. 96–121. London: Hogarth Press.

²¹ For an account that spells this out in detail see Hopkins, J. (1999) 'Patterns of Interpretation: Speech, Action, and Dream' in L Marcus, ed, *Cultural Documents: The Interpretation of Dreams*, Manchester: Manchester University Press.

²² As this indicates, the dream Freud first analyzed as an instance of wishfulfilment is better seen as an instance of projection, in which Freud represents himself as better and Otto as worse by locating in Otto

the characteristics he would condemn in himself, the better to condemn them in Otto. This can be seen as wishfulfilling, because it represented things as Freud would have wished them to be; but in general projection should be distinguished from wishfulfillment: as in Saks, Schreber, and countless other examples, the projection of badness into other persons or groups can lead directly to forms of paranoia.

²³ See Freud, S., (1911/1957) Autobiographical Notes on a Case of Paranoia, in J. Strachey (ed.) *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, Volume XII, London: Hogarth Press.

²⁴ For a recent and more up-to-date treatment of this topic see Kernberg, O. (2003) Sanctioned social violence: A psychoanalytic view. Pt I Int. J. Psycho-Anal, 84. 683-698; Pt II 953-968.

²⁵ See for example Richerson, P., and Boyd, R., (2006) *Not by Genes Alone: How Culture Transformed Human Evolution*, Chicago: University of Chicago Press.

²⁶ The relation between Freudian and Darwinian theories touched on here is discussed further in Hopkins, J. (2003) 'Evolution, emotion, and conflict' In M. Chung (ed.) *Psychoanalytic Knowledge* London: Macmillan/Palgrave Press, and (2004) 'Conscience and conflict: Darwin, Freud, and the origins of human aggression' in D. Evans and P. Cruse (eds) *Emotion, Evolution, and Rationality* Oxford: Oxford University Press.

²⁷ The discussion of ego, superego and id in 'Psychoanalysis, Representation, and Neuroscience...' is supplemented by consideration of recent advancements in affective neuroscience in Hopkins, J. (2012) 'Conflict Creates an Unconscious Id'. This is due to appear in *Neuropsychanalysis* together with other commentaries on Solms, M (2012) 'The Conscious Id'.

²⁸ On this see Schedler, J. (2010) 'The efficacy of Psychodynamic Psychotherapy' *American Psychologist*, and Buchheim A, Viviani R, Kessler H, Kachele H, Cierpka M, et al. (2012) Changes in Prefrontal-Limbic Function in Major Depression after 15 Months of Long- Term Psychotherapy. *PLoS ONE* 7(3): e33745. doi:10.1371/journal.pone.0033745

²⁹ For a recent discussion see Mitchell, J., (2003) *Siblings*. Cambridge: Polity Press.

³⁰ Robert Trivers' pioneering essays on these topics are in Trivers, R., (2002) *Natural Selection and Social Theory*, Oxford: OUP 2001: see particularly 'Parental Investment and Reproductive Success' and 'Parent-Offspring Conflict'. The latter is linked in detail with sexual conflict in Mock, D. and Parker, A. (1997) *The Evolution of Sibling Rivalry*, Oxford: OUP, and both are illuminatingly discussed in Hrdy, S. (2000) *Mother Nature*, London: Vintage. The linked topics of parental investment and parent-offspring conflict related briefly to psychoanalysis in Hopkins, J. (2003) 'Evolution, emotion, and conflict' and (2004) 'Conscience and conflict: Darwin, Freud, and the origins of human aggression' cited above, as well as to neuroscience and attachment in 'Psychoanalysis, Representation and Neuroscience...'

³¹ Thus the working of these conflicts can apparently be observed from conception, in the invasion of the mother's body by the placenta. This organ is constructed via the activity of the father's genome, to extract maternal investment on behalf of the fetus, and discounting, in accord with the father's ability to invest elsewhere, other children the mother might have. Accordingly the placenta develops as 'a ruthless parasitic organ existing solely for the maintenance and protection of the fetus, perhaps too often to the disregard of the maternal organism.' (Quoted in Hrdy, S. (2000) *Mother Nature*, London: Vintage, p 433). In this it bores into the mother's blood vessels, secreting hormones that raise her blood pressure and sugars in ways that may injure her but benefit the fetus. The mother's body responds by producing hormones that counteract these; and so on. Here we can see how sexual conflict between the genes of the parents, as carried forward in countervailing physiological adaptations over countless generations, is also physiological conflict between a pregnant mother and her unborn child. (And the sexual conflict embodied in the placenta may be involved in sibling rivalry more directly, as when one of a potentially multiple birth aborts others.) For further discussion see Haig, D., 'Genetic Conflicts in Human Pregnancy', *Quarterly Review of Biology* 68 (1993), pp 495 - 532.

³² Thus see Gegestand, S., (2007) Chapter 23: Reproductive Strategies and Tactics in Dunbar, R., and Barrett, L., eds. *Oxford Handbook of Evolutionary Psychology*, Oxford: Oxford University Press.

³³ For examples and discussion see Mock, D and Parker, A. (1997) cited above, and Mock, D., (2005) *More than Kind and Less than Kind*, Cambridge, Mass: Harvard University Press.

³⁴ See Eilperin, J. (2012) *Demon Fish: Travels through the Hidden World of Sharks* London: Duckworth.

³⁵ See Mock, D and Parker, A. (1997) cited above, esp. p. 222.

³⁶ See Hrdy, S. (2000) *Mother Nature*, London: Vintage, and (2009) *Mothers and Others* Cambridge: Harvard Press.

³⁷ The regulation of anger in infancy is discussed in terms of Bayesian neuroscience and attachment in Hopkins, J. (2012) 'Psychoanalysis, Representation, and Neuroscience...', and also in Hopkins, J. (2012) 'Conflict Creates an Unconscious Id, both cited above. Emotional development and conflict are also discussed in relation to the infant's recognition of the mother as a single enduring object in Hopkins, J. (1987): 'Synthesis in the Imagination: Psychoanalysis, Infantile Experience, and the Concept of an Object', in J. Russell, ed, *Philosophical Perspectives on Developmental Psychology*, Oxford: Basil Blackwell.

³⁸ On this developments see the readings cited in the previous note, particularly the last. As discussed there and also briefly in Hopkins, J. (2003) 'Evolution, emotion, and conflict' In M. Chung (ed.) *Psychoanalytic Knowledge* London: Macmillan/Palgrave Press, and (2004) 'Conscience and conflict: Darwin, Freud, and the origins of human aggression' in D. Evans and P. Cruse (eds) *Emotion, Evolution, and Rationality* Oxford: Oxford University Press, One experiment seems particularly relevant. Bower, T. (1977) *Development in Infancy*, San Francisco, CA : W.H. Freeman , p. 217) describes

A simple optical arrangement that allows one to present infants with multiple images of a single object . . . If one presents the infant with multiple images of its mother — say three 'mothers' — the infant of less than five months is not disturbed at all but will in fact interact with all three 'mothers' in turn. If the setup provides one mother and two strangers, the infant will preferentially interact with its mother and still show no signs of disturbance. However, past the age of 5 months (after the co-ordination of place and movement) the sight of three 'mothers' becomes very disturbing to the infant. At this same age a setup of one mother and two strangers has no effect. I would contend that this in fact shows that the young infant (less than five months old) thinks it has a multiplicity of mothers, whereas the older infant knows it has only one.

This experiment does seem to admit interpretation as evidence that while at four months the infant takes its mother as a psychological other to whom it relates, it does not yet regard her as a single enduring person, as opposed to a potential multiplicity of presences whose spatiotemporal dimensions are as yet indeterminate. By five months, however, the baby apparently opposes uniqueness to episodic multiplicity, and starts to represent the mother (and by implication/identification its own self) as individual, continuous, and lasting. If this is correct, then the four- to five-month consolidation of the mother' s image via the concept of spatiotemporal numerical identity represents a synthesis in the imagination by which the baby integrates the major parameters of its internal and external worlds. We should regard this as a momentous event, particularly in light of the considerations about motivational conflict advanced here. As such it deserves fuller experimental investigation.

³⁹ Contemporary neurobiological accounts of schizophrenia, such as the 'Dysconnection' hypothesis advanced by Friston and others, are consistent with the idea that that the disorder should involve biologically based failures in the resolution and management of conflict. See, e.g. Stephan, K., Friston, K., Frith, C., *Dysconnection in Schizophrenia: From Abnormal Synaptic Plasticity to Failures of Self-monitoring* *Schizophrenia Bulletin* 2009; doi: 10.1093/schbul/sbn176

⁴⁰ As his clinical work progressed Freud at first sought to combine it with neuroscience. Following Fechner, he hypothesized that the nervous system worked to minimize a kind of energy, and so to regulate 'free energy' produced by external perception and inner instinctual demands. In this he represented learning as modifying connections ('facilitations') between neural cells correlated in their activations, and 'psychic acquisition' as embodied in such connections – two ideas which have remained central to computational neuroscience. He conceived lack of satisfaction of instinctual needs as activating motor expressions of frustration, which became associated with memories of satisfaction provided by carers, which could be activated in a kind of primary process in response to need. Sensory and motor learning produced a neural organization – an 'ego' – which could inhibit this primary process so as to integrate motor activity along lines which had proven successful in achieving satisfaction.

In all this Freud was prescient. In a contemporary Bayesian 'free energy' approach to neuroscience, as indicated in Carhart-Harris, R. and Friston, K (2010, 2012). The default-mode, ego-functions and free-energy: a neurobiological account of Freudian ideas. *Brain* 133, 1265–1283, revised and reprinted in Fotopolu, A., Pfaff, D., and Conway, M., eds *From the Couch to the Lab: Psychoanalysis, Neuroscience and Cognitive Psychology in Dialogue*. Oxford: Oxford University Press, the processes he described would appear as he described them, that is, as basic processes in the minimizing of free energy, which is seen as the fundamental task of the brain. But as the burden of recasting his psychological discoveries in neurobiological terms became too great he abandoned this attempt, and

contented himself with structuring his later psychological accounts to fit around the skeleton of the sketch he had begun.