Chapter 7

The adolescent brain

Wilkinson, M. (2006). Coming into Mind. London, Routledge.

A new developmental stage

The adolescent brain has been described as 'a work in progress'; adolescence marks a distinct developmental stage 'second only to the neonatal period in terms of both rapid biopsychosocial growth as well as changing environmental characteristics and demands' (Schore 2003b: 297). I became particularly interested in the challenges successful negotiation of adolescence presented for young people when I worked as a school counsellor and advisory teacher for this age group. The adolescent cases that follow are composites based on the experience that I gained through working in an educational setting with many adolescents whose difficulties manifested themselves in problems with school attendance. My interest has been sustained by the number of young and not so young adults that I have seen in whom adolescent states of mind predominate, particularly at the beginning of therapy. Astor (1988: 70–1) traces the development of analytic thought about adolescent states of mind in adult patients in the work of Meltzer (1973), Bion (1977) and Fordham (1985).

Michael Fordham, in conversation with Astor, emphasized the need to be aware of the child in the adult not merely as symbolic but also as 'the child in the adult as a body . . . a reference to the bodily relation of the child to its mother' (Astor 2005: 13). Sidoli (2000) has developed Fordham's insight concerning the bodily relation to the mother in her writing with her emphasis on the need for the therapist to consider what the patient's body might be communicating. The new understanding we have of the brain focuses attention on the unitary nature of the mind-brain-body being. The particular qualities of adolescence require us to adopt a similar

perspective in consideration of adolescent patients and adolescent states of mind in adult patients.

In adolescence there is a second wave of nerve cell production followed by neural pruning; the 'use it or lose it' principle is seen at work for the second time paralleling the process of development that occurs in the first 18 months of life. Just as the earlier stage coincides with the beginnings of an awareness of others and the development of what has been termed 'the neural substrate of shame', so this stage, when the capacity for reasoning and judgement begins to gradually mature, takes place when the young person begins to separate from their parents and to engage more with the outside world. The adolescent slowly begins to be able to be more aware of the effects of actions on others and to be able to inhibit impulsive behaviours. As in the earlier stage the limbic areas (concerned with emotional responses) mature earlier than the frontal lobes (concerned with judgement and reasoning). However, just as in the earlier stage, development is uneven with emotional development outpacing executive control; it is out of this unevenness of development that much of the difficulty experienced in adolescence arises.

Brain changes

The decade of the brain has allowed the first detailed age-related studies of the changes in the volume of grey and white matter in both childhood and adolescence. In adolescence there is a marked growth spurt in grey matter that is followed by what appears to be an extensive pruning process; however, the amount of myelinated neurons, those with axons clothed in myelin, the white matter that insulates and therefore makes them effective transmitters, increases at this stage. A gain in the amount of myelinated neurons leads to faster and more effective communication within the brain. While acknowledging recent advances in our ability 'to relate structural and functional maturation of the adolescent brain to that of the adolescent's behaviour' (Paus 2005: 60), Paus notes that while there is growing agreement that there is a continuous increase throughout adolescence in the amount of white matter, science is not yet able to distinguish definitively whether grey matter is actually lost or whether it is rather a case of those cells becoming coated (Paus 2005: 60). If it is the latter, the process probably reflects the increasing neural connectivity in the brain that results from the enriched

environmental interactions that are part of the fuller life experience of the teenager.

Much is still to be explored, for example Siegel observes that the way in which 'genetically coded information interacts with environmental and interactive elements to determine the nature of this important adolescent pruning period is open to future investigation' (Siegel 2003: 11). The nature/nurture debate continues: Paus observes that 'it is equally probable that a (pre-existing) variation in structure could affect performance or that a repeated engagement of a given circuit could change brain morphology' (Paus 2005: 63). Several studies have looked at the changes in the adolescent brain over time. Gogtay et al. (2004) used biennial MRI scans to track the changes in the grey matter development between the ages of 4 and 21 in a group of 13 healthy children and noted the pattern of the wave of brain changes, observing that the frontal lobes mature last (Gogtay et al. 2004: 8176). Paus et al. (1999), in a study of 111 children, were able to demonstrate age-related increases in white matter density in fibre tracts, providing evidence for a gradual maturation of fibre pathways thought to be involved in speech and motor function (Paus et al. 1999: 1908). Paus emphasizes that such use of structural MRI (for example to demonstrate that neuronal tracts connecting different regions of the brain thicken as they become coated with the protective sheath of myelin) has opened up 'unprecedented opportunities for studying the neural substrates [of development]' (Paus 2005: 60).

In 1998 Yurgelun-Todd noted the difference between responses to pictures of fearful faces between adolescents and adults. In both adults and adolescents the amygdala was responsive; in the adults, the prefrontal cortex was also activated but significantly not in the adolescents (Yurgelun-Todd 1998, cited in Schore 2003b: 174). Thus, as in childhood, the limbic area matures before the frontal cortex meaning that emotional states, including desire, may dominate and prove difficult for the young adolescent to control. Again the adolescent brain may be understood as 'a work in progress'; in this case the inhibition of emotional response by the prefrontal cortex is as yet incomplete. This is significant for the understanding that the parent and therapists must bring to interactions with this age group. It also means that analysis and therapy must as always be rooted in the relational, that the therapist must seek to work associatively, encouraging connectivity, and that left brain, interpretational interventions should be used to

underpin this rather than be the sole approach used for young people of this age group.

The effects of trauma

Relational trauma in both early years and in adolescence affects healthy brain development. Unresolved conflicts from early years challenge the adolescent who is struggling to develop an adequate sense of identity, a sense of self as separate yet in healthy relation to others. Bronstein (2004) observes that the changes experienced in adolescence and their accompanying anxieties 'evoke again the intense experiences and anxieties of early infancy. Such experiences ... now reawaken in a radically new setting that of a sexually mature body' (Bronstein 2004: 23). For children who have experienced early relational trauma and who already have as a result excessively pruned cortical subcortical circuits, this stage of life can be overwhelming. Further pruning of these already excessively pruned circuits leads to inability to develop or sustain frontal lobe regulation. The resultant inability to self-regulate reveals itself in impulsive, sometimes aggressive or fearful amygdala-driven behaviours. Father-hunger and father-thirst originating at toddler stage (see Chapter 3) may now turn to rage, despair and finally to dissociative reactions if father still remains 'absent' as the teenager struggles with the return of similar developmental pressures. In 2004 researchers showed that there was a higher risk of adolescent males going to prison if they came from homes where there was an absent father. However, the group who faced the highest risk were those from stepfamilies, including father-stepmother families (Harper and McLanahan 2004: 369).

Putnam (1997), in his discussion of dissociative responses to trauma in children and adolescents, stresses that abuse whether physical, psychological or sexual along with neglect is implicated in the kinds of difficulties that arise in adolescence. He particularly notes the high correlation with the incidence of self-harm, substance abuse and somatisation, and the lack of significant evidence for genetic contributions to pathological dissociation. He notes that 'core dissociative features are found in common across widely divergent cultures' (Putnam 1997: 197). In 2004 researchers reported that a large-scale study of 1696 young people drawn from the United States, China, Korea and the Czech Republic revealed considerable similarity in the part played by family factors in adolescent

depressive symptomatology and problem behaviours (Dmitrieva et al. 2004). In a substantial study Teicher (2000) has linked sexual abuse to disturbances of the healthy development of the limbic system (similar to that experienced by patients with temporal lobe epilepsy), and of the corpus callosum (the main information highway between the left and right hemispheres), and of the healthy functioning of the left hemisphere. Some researchers, including Teicher (2000), are pessimistic about the possibility of change for those so affected. However, many others such as Cozolino, LeDoux, Pally, Perry and van der Kolk argue that change is possible. Pally (2000) points out that 'since it is known that consciously attending to and verbalising something can enhance cortical activation . . . treatments such as analysis . . . take advantage of cortical plasticity, to modulate deeply engrained emotional responses' (Pally 2000: 15). Adolescence is generally agreed to encompass three stages that embrace early teens, mid-teens and late teens into early twenties.

Early adolescence

Early adolescence is generally held to be the period in the early teen or even pre-teen years when the young person's body begins to change and to mature in ways that may seem strange to the 'child' who inhabits it. This is particularly true for the child whose experience in infancy and childhood has been less than adequate, the only memory of which may be held in the very body that begins to experience strange new sensations. These sensations may be experienced as disturbing in new and old ways. This is especially so in the case of children who have experienced physical trauma (for example illness, hospitalization and invasive procedures) or physical or sexual abuse in early childhood. An adolescent may 'experience his/her body as "bad" or "wrong", containing all the rejected unlovable aspects of him/herself' (Bronstein 2004: 27). Eating disorders, self-harming, cutting and suicidal behaviours may emerge at this stage. Dissociation as a defence may become part of the clinical picture, particularly if dissociative patterns have developed in childhood as strategies for coping with unduly stressful experience. As one's sense of self arises out of bodily experience so the young person may begin to experience uncertainty about just who he or she is. Astor (1988) describes the way in which inadequate experience in early childhood leads to difficulties with the transformation of emotional, bodily experience into symbolic form that is then available

to be thought about (Astor 1988: 71). Trauma at this stage can be particularly difficult to deal with, if underlying early trauma is reawakened as we shall see with Sharon.

Sharon

Sharon was the second child in a family where the first child, also a girl, had been seriously disabled from birth and was not expected to survive her first year of life. Sharon was just 13 months younger than her very disabled sibling, who survived but with frequent crises and hospitalizations. Sharon's mother was almost entirely preoccupied with her first-born child; she took little notice of the 'replacement child' who now seemed not to be wanted but rather to be an extra demand on a mother who already felt stretched to her limits. When her father came home from work his attention went first to his wife and sick child but then he would engage with Sharon so that he, rather than her mother, was her closest attachment figure. The terrible strain of disability wrought havoc with the parents' relationship. They stayed together until their elder daughter was moved into residential care at 13 years of age. Soon after, the father left, remarried and moved to a distant town. In a short space of time Sharon lost her sister and her father and was left with a distressed mother who still barely noticed her. At first she tried hard at school, unconsciously trying to find a way to please her parents and in particular to win her mother's interest and approval. She struggled, without being aware of them, with unconscious guilt feelings, first of being healthy and then of having her mother to herself. Her mother meanwhile remained frustratingly emotionally unavailable. When the full effects of adolescence struck Sharon was entirely unprepared for the onslaught. She began to act out her anger and despair, first having a string of boyfriends, going drinking and clubbing, using spirits and Ecstasy, then moving out as soon as she was 16 years old to live with a man closer to her father's age than her own, who was also a substance abuser. She began to stay away from school more and more frequently; she did not take her examinations, rather she became depressed and made several quite serious suicidal gestures. Her boyfriend moved to Scotland because of work and she went with him. She tried to start a college course but was struck by the first of what were to be many psychotic episodes

necessitating in-patient treatment. Her psychiatrist attributed her state to the abuse of alcohol and drugs. It would seem that the early neglect, with its inevitable effect on brain development, followed by the loss of her father at the time of her sister's disappearance, coinciding with the developmental difficulties of puberty, heightened her vulnerability to developing drug dependence and psychotic illness.

Risk or reason?

In healthy adolescents the frontal lobes that deal with processes of reasoning and judgement are still immature, thus they are unable to look into the future and to predict consequences of their actions. This ability is thought to emerge between 15 and 18 years of age but it may be that the frontal lobes do not fully mature until a young person is 21 or even 25 years old. Restak (2001), discussing the plasticity of the adolescent brain, adds the sobering comment that 'the adolescent's choices determine the quality of his brain' (Restak 2001: 77). In the clinical vignettes you will note that sometimes it is risk-taking aggravated by the stresses in current relationships or life events that the young person is experiencing and sometimes the effect of poor or traumatic experience in early years that has resulted in a turbulent adolescence.

Plasticity permits programming

The very plasticity of the brain that we value as therapists, because it holds out the possibility of change, is sometimes the downfall of the adolescent. The brain as easily becomes programmed to patterns of abuse as to care and nurture. Carter (2000) comments:

> The brain uses a carrot and stick system to ensure that we pursue and achieve the things we need in order to survive. A stimulus from outside . . . or from the body . . . is registered by the limbic system which creates an urge which registers consciously as desire. The cortex then instructs the body to act in whatever way is necessary to achieve its desire. The activity sends messages to the limbic system which releases opioid-like neurotransmitters which raise circulating dopamine levels and create a feeling of satisfaction.
>
> (Carter 2000: 95)

Plasticity means that development of the reward pathway that is activated in drug abuse can mean that the brain very quickly becomes wired to the overwhelming pleasure that is achieved through the use of street drugs. In adolescents who use these drugs, the brain is literally being shaped by increasing dependence on the pleasure response that comes from the 'drug associated electrochemical firing of the reward pathways of the brain' (Restak 2001: 85). Restak explains the detail of the reward pathway:

> The cascade begins when neurons in the hypothalamus release serotonin. This triggers the release of other neurotransmitters that in turn allow cells in the ventral tegmental area to release dopamine. The dopamine travels to the amygdala, the nucleus accumbens, and certain parts of the hippocampus. Along with the prefrontal cortex, these centres are involved in memory formation, explaining why visual and other cues associated with drug use can trigger intense cravings in people addicted to such substances.
>
> (Restak 2001: 84)

Thus, in the abuse of Ecstasy or cocaine, the young person's desire system is easily stimulated by the sight (outside) of the exchange of drugs or the memory (inside) of what it's like to feel high; the developed limbic system sends the message 'go for it' without inhibition from the frontal cortex which is as yet too immature to reason 'this could damage me'. The young person will go to any lengths to satisfy the desire system that has been activated. Again the frontal cortex's immaturity makes it more difficult for the adolescent to reason 'I should not be doing this', for example as he or she steals in order to support the craving. The drugs bring an overwhelming sense of satisfaction produced by the artificial introduction of serotonin in the case of Ecstasy and dopamine in the case of cocaine.

Plasticity, the power of the reward system and the as yet incomplete development of the capacity of the frontal lobes for inhibiting impulsive action means that vulnerable teenagers, who have had a poor start emotionally, are particularly at risk.

The effects of Ecstasy

MDMA, the synthetic product methylenedioxymethamphetamine, known as Ecstasy, stimulates the release of serotonin producing an

euphoric high within 45 minutes, as the effects begin to wear off quite quickly the user often takes more in order to prolong the pleasurable experience. There is considerable controversy surrounding the long-term effects of Ecstasy. Research on non-humans indicates that Ecstasy acts as

> [a] selective neurotoxin, destroying the axon terminals that arise from serotonin cell bodies in the brain stem. Repeated doses of MDMA cause cumulative loss of serotonergic axon terminals in the cerebral cortex . . . studies . . . have demonstrated reduced serotonin activity in abstinent recreational Ecstasy users.
> (Parrott 2002: 472)

Such research would indicate that those who use Ecstasy regularly or in large quantities on a given occasion are at risk of damaging their own system for producing serotonin, resulting in long-term depression. Writing in the same issue of *The Psychologist* (September 2002) three researchers (Cole, Sumnall and Grob) argued against long-term damage; however, their views were hotly contested by Morgan (2002), Croft (2002) and Parrott (2002) in three separate responses.

Damage to brain means damage to mind

Morgan (2002: 468) suggested that his study presented 'overwhelming evidence that regular ecstasy users suffer from impulsive behaviour and deficits in verbal memory performance, and that these deficits are specifically associated with past use of ecstasy' rather than any other street drug. Croft et al. (2001) reported serotonin impairment in Ecstasy users, relative to both controls and cannabis users, and argued that this, alongside the research demonstrating decreased serotonin function in rats (Commins et al. 1987) and non-human primates (Ricaurte et al. 1988), means that the use of Ecstasy must be considered a serious threat. Parrott (2002) cites research that indicates memory deficits resulting from the use of Ecstasy (Zakanis and Young 2001) and notes that further research has shown these deficits to be greater in those who are heavy rather than light users of the substance (Fox et al. 2001a, 2001b) and notes that Ecstasy users report significantly higher depression and less sociability than non-users. He concludes that the notion that these deficits are imaginary as hypothesized by Cole et al. (2002) is 'negated by the brain scan literature, the consistency of human functional deficits, and the extensive animal data' (Parrott 2002: 473).

Middle adolescence

Brafman (2004: 46) describes the mid-teen period as the years when 'youngsters have to fumble their way through disentangling the values of their earlier life that they wish to continue to adopt from those they wish to discard'. He notes the 'unconscious (and sometimes conscious) ambivalence about the disengagement' (Brafman 2004: 46). As young people struggle with ambivalent feelings about parents and experience a fluctuating need to be close and to separate, experience which is challenging in this area can be particularly difficult to manage. Traumatic experience can impact adversely on the young person's attempts to negotiate this stage of development.

Charlie

The experience of Charlie demonstrates the added risk to which a young person is exposed if they have to deal with repeated trauma at this vulnerable stage in the attainment of maturity and independence. Charlie was the victim of a road traffic accident when he was almost 15 years old. Charlie and two friends had left his parents, who were at a party at their neighbours' house, to walk the short distance home so that they could go and listen to some music. As they walked along a motor-bike careered off the road, mounted the pavement and hit Charlie. According to the driver, who stopped and called an ambulance, Charlie did not lose consciousness and he was conscious when the paramedics arrived. However, Charlie remembered nothing of the incident from beginning the walk home to coming round in hospital in severe pain with his mother at his bedside.

Initially it seemed that Charlie was the victim of this single horrifying event. Gradually it became clear that the young Charlie had experienced not one but three frightening events that emphasized to him his helplessness and lack of ability to keep safe. A year or so before his own accident, the whole family had been involved in a motorway crash, all were unhurt but it compounded his later fright. As a young child he had had emergency in-patient treatment for a

severe infection. Thus when he found himself in hospital with a badly broken pelvis, the result of the accident with the motor-bike, earlier layers of distress were reactivated.

When Charlie emerged from hospital and returned to school he had built a protective wall of denial around his experiences. He avoided speaking about any aspect of the accident to anyone, but he suffered from frightening dreams at night and intrusive thoughts by day. He began to seek ways of putting the trauma out of mind, of keeping the terror at bay. Over the next eighteen months he began to 'bunk off' single lessons, then half days. When he found that he 'got away with it', the absence escalated until he began to miss whole days of school. He found smoking cannabis gave some relief and an escape from unbearable thoughts. He drank and partied, sometimes using Ecstasy. He felt himself to be at risk but could not control it. His parents were concerned, hoped it was 'just a phase' and found 'No' only exacerbated the situation. They wisely sought other ways to help their son. His father thought that maybe some therapy would help and he persuaded Charlie to come to see me.

Time had become skewed for Charlie as the trauma of his accident threw shadows both backward and forward. Charlie felt that he was closest to his father and his younger brother was closest to his mother. Sometimes he was able to be aware of his parents' closeness to him, at other times he spoke of feeling always alone and close to no one. I became aware of his fears that there was no one to keep him safe, that sometimes he felt as if it had been that way forever. Gradually he came to understand that this second layer of feeling about his parents was part of the shadow cast by the accident, and the earlier difficult experience he had had in hospital as a very small child. Indeed Charlie, like so many trauma victims (Terr 1991: 13–14), was unable to imagine a safe future. It felt that the next accident or disaster was lurking just around the corner. In therapy he struggled with the experience of hospital and what he felt was his mother's failure to tell the nurses of his need for better pain control. This perception lasted over many therapy sessions until suddenly he became able to realize that the accident, not his mother, was responsible for his pain. However, once again he had to confront knowledge of utter helplessness and frightening feelings concerning the random

element of chance in life, a difficult experience for a boy just entering adolescence with his fears and longings concerning separateness, autonomy and the ability to function independently.

After we had been meeting for about six months, Charlie and his family went abroad on a skiing holiday. It was rare for the family to be able to spend time together and it helped to 'settle' Charlie. He began to attend school more regularly. He studied hard and did quite well in spite of the amount of school he had missed over the years. He decided to stay on in the sixth form for an extra year to get results that would enable him to enter college, whereas previously he had not felt able to do so. While he gradually became free of his daily playbacks of the trauma his underlying anxieties about a certain future remained. However, his parents reported that the lively boy with a teasing sense of humour that everyone knew before the accident was gradually beginning to re-emerge from time to time. With his experience of catastrophe he could not always sustain this; a sense of going safely and strongly into the world had somehow become elusive. He felt the need to sleep a lot; study seemed overwhelming at times, and the thought of the future that he was told he should study for, intangible. Further progress came with the advent of a steady girlfriend, a relationship that seemed overall to be supportive. About this time I became unwell and a two-week school holiday break became four. This was very hard for Charlie. He could not tolerate the thought of weakness or helplessness in me, it felt far too scary. He returned with difficulty after the break, often it seemed he 'accidentally' arranged to be at extra Maths lessons or to be committed to school sports events at times that coincided with the therapy. He chose to end his therapy at the end of the school year as he was mostly symptom free and his parents began to feel he was his old self again. He continued to drink quite freely at weekends but no longer smoked cannabis or used Ecstasy. His difficulty with work and need for sleep may well have been at least in part the aftermath of the substance abuse to which he had turned in an effort to keep the trauma at bay, in the period before he came into therapy. His ability to gain control over his impulsive behaviour had much to do with the quality of parenting he received at the time and the use he was able to make of me in the therapy.

Traditionally analysts have linked the capacity to relate to the outside world to the relation with the father. While Stern (1985) has noted the unconscious technique of purposeful misattunement used first by the mother and then by other close care-givers in the second year of life, analysts have also emphasized the father's role as the bridge to the outside world at this time. In adolescence the need for a bridge to the outside world becomes even more apparent and the problems for teenagers who have maintained too close a tie to the mother are well documented. Charlie and another teenager, each of whom I saw once a week for over a year, caused me to think carefully about the links between the maturing brain and the maturing mind and to consider very carefully the importance of the relation to the father in the susceptibility towards substance abuse. I surmise that as the frontal cortex, responsible for reasoning and judgement, lags behind the limbic system in development, the availability and internalization of a good enough parent's knowledge of when and how to say 'No' may be of crucial importance in protecting the young person from over-exposure to uncontrolled, impulsive behaviours.

Late adolescence

This is the time when the adolescent may really begin to separate from parents, to venture forth into the world of university or of work, of digs or a shared flat. Those who remain at home may establish a degree of independence that symbolizes a new ability to separate internally, and in so doing to value the other in a new way.

Peter

Peter was referred to me by the head of his year at school. One of the brightest students in the year, Peter had been expected to do exceptionally well in the examinations that would admit him to higher education; he had been offered a provisional place at a prestigious university to read the subject of his choice. When he was 16 years old his parents had split up. He was an only child and as a young child he had felt close to both parents and very attached to his mother. At the time of the break-up it was she who had moved away with a new partner to start a new life in another city. He and his father had moved in with his paternal grandmother. At the time of the break-up, his paternal grandmother reported, he had been a sociable, sensible young man who worked very hard during the week and enjoyed going clubbing on Saturdays. Soon after his mother left he began to go out the three nights of the weekend but continued to study in the week. His father worked long hours in a low-paid job and left home early in the morning each weekday. As the examinations that would allow him entry to university drew near, his father found out that his son had ceased to attend school. It became clear that he was lying in bed all day with the curtains drawn; he'd persuaded his grandmother to say nothing about this. When asked he said that he did not feel up to getting up and going to school. After the usual gamut of hospital tests had been run and drawn a blank, he came to see me.

By the time we first met, Peter had failed to take his examinations, he was very depressed and convinced that as he felt so awful something very serious physically must be wrong with him that the doctors had missed. He agreed it might be helpful to have someone to talk to about how he felt; he spoke about how much he missed the woman French teacher who had left the school a year earlier, he felt she had understood his aspirations. I felt that she had stood in for his mother and the loss; bringing with it the failure of the illusion of mothering, meant he could no longer manage. Inevitably the transference to me was complex. He hoped that I might make the doctor understand how ill he was feeling, he was sure something was very wrong physically. Occasionally I was able to catch glimpses of the able, gutsy, independent teenager he had once been, who had loved his academic subjects, who held strong views intellectually and politically, but also a young man who had enjoyed clubbing, drinking beer and using Ecstasy. More often I met the exhausted, deeply depressed young person who just wanted to remain in bed in the dark, with the curtains drawn. Significantly he had conceived a deep dislike of his father; he felt it was his father's fault that his mother had left. In blaming his father he avoided his underlying conviction that it was his own fault that his mother had left. Although the school was some considerable distance away from his home, mostly he began to make what was for him the huge effort to attend at least on the days he had an appointment with me.

After I had seen him for six months and he was to leave school, he agreed to the family doctor's recommendation that he have a psychiatric assessment. On the recommendation of the psychiatrist, he began a course of a selective serotonin re-uptake inhibitor. Gradually his depression improved and eventually he took a job in the local supermarket. He hoped that later he might feel well enough to do a college course, hope of a first-class degree from a prestigious university had disappeared, but nevertheless he was considerably better. I have often wondered whether it was the counselling, the selective serotonin re-uptake inhibitor, or the cessation of exposure to alcohol and Ecstasy, or possibly the mixture of all three, that led to his improvement, albeit limited. I have also wondered whether, when his mother left, it was the blame that he attributed to his father, who had previously 'laid down the law' in the house, that meant that impulse driven behaviour came to dominate the life of this previously disciplined young man.

Woodhead (2005) has examined the importance of the relation to father in infancy, understanding the father as the creator of boundaries, structures and moralities, the one who separates mother and infant and who stimulates development, much as we saw with Jacques in Chapter 1. I find myself wondering about the importance of the 'good enough' father in adolescence in establishing the dominance of reason and control over impulsivity and risk. I wonder about the 'neuronal mirroring' of father that would assist in enabling the maturation of the frontal cortex to take place, without the hijacking of the reward system to the seeming delights of addiction. Delights that always prove all too transitory as the system adjusts to the abuse.

Conclusion

The plasticity and rapid change of the adolescent brain coupled with the developmental task of achieving greater separation from parents and a clear sense of self and identity make this a challenging and exciting stage of life. For the therapist there is the opportunity to capitalize on the plasticity and openness to change of the adolescent patient. The mirroring aspects of the transference are crucial at this stage as the adolescent has another developmental chance

to internalize the mind of another. Schore's comment, concerning the transference in general, is therefore particularly applicable to adolescence.

> Because the transference is a reciprocal process, facially communicated 'expressions of affect' that reflect changes in the internal state are rapidly communicated and perceptually processed within the affectively synchronised therapeutic dialogue.
> (Schore 2003b: 51)

Schore emphasizes that resonance is one of the more significant factors determining synchronization of processes within the whole brain and goes on to argue that it is affective resonance of right brain states in the analytic dyad as well as in the nursing couple that will enable change. I think the intensity of the encounter with the adolescents or those adults in whom adolescent states of mind predominate, who are engaged in finding themselves through their relation to others, enables the therapist to make very effective use of the underlying brain processes of resonance and synchronization to establish the right brain-based affective empathy that will carry the adolescent through the more difficult moments in the therapy. However, this can be effective only if the analyst also adequately recognizes and acknowledges existence of these states alongside the adolescent's search for separateness and identity.

This can be particularly difficult with adolescents who may use the defences aptly described by Sidoli (2000), writing of her work with one suicidal young man that 'he wore the conversational persona as a mask and wanted to make me and everyone else believe that, indeed, he was all right' (Sidoli 2000: 47). In her account of this work she emphasizes the importance of the bodily countertransference in the analyst's ability to understand 'the untransformed early infantile experiences which have not been made sense of, primarily by the mother, in the dyadic relationship', in order to assist the young person in the process of 'naming the nameless' (Sidoli 2000: 47). Bovensiepen (2002) emphasizes the importance of the process of developing a symbolic space in work with children and adolescents. He believes this arises from 'the matrix of the transference/countertransference . . . which, like the early mother–child relationship, can lead to a transformation of emotional experience in a dyadic relationship' (Bovensiepen 2002: 252). Thus while the importance of adolescence is often emphasized in terms of

the revisiting of oedipal experience, for many troubled adolescents, or adults troubled by predominantly adolescent states of mind, therapy will mean revisiting much earlier developmental experience that was not successfully negotiated in the earliest relation to the primary care-giver. Culbert-Koehn (1997), writing about regressive states in adult patients, identifies the feelings of 'smallness, helplessness and shame, when dependency on the analyst is exposed' (Culbert-Koehn 1997: 102). These kinds of feelings are particularly difficult for the adolescent state of mind to bear and need careful management. Feldman (2004) emphasizes the severe and early damage to the symbolic function that was revealed in his analytic work with a bulimic patient in late adolescence; he stresses the critical need 'to create a safe space where the emotional reactions to the early infant/mother relationship could be experienced and worked through in the analytical interaction' (Feldman 2004: 309). Sensitive work is clearly required, with an ability to work at the earliest levels while respecting and supporting the emergent adult self, whether in the adolescent, or out of the adolescent state of mind that may predominate in an adult patient. I suggest that right brained to right brained affective synchrony is the key to successful negotiation of these challenges.