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Now We Are One

O my luve's like a red, red rose
That's newly sprung in June!
O my luve's like the melodie
That's sweetly play'd in tune!

'A Red, Red Rose'

It's the weirdest thing that will ever happen to you. Falling in love, I mean. Think about it – there you are, wending your way innocently through childhood, doing the things that children do, and then the hormones suddenly kick in. And then you fall in love. Hesitatingly in that first all-consuming crush, but then with more confidence and determination as practice and experience make perfect. And although it doesn't happen every day, from time to time throughout the rest of your life it will catch you by surprise. It's very weird. All at once, you can't think of anything else except this seemingly random person who has just stepped – probably equally innocently – into your life. Your attention is focused almost to exclusion on the object of your desire. You just cannot get enough of them. You experience heightened happiness, often associated with glazed eyes, a faraway look and a dreamy expression, and roused (though not turbulent) emotions. The word 'besotted' often comes to mind.

Think Romeo and Juliet. Here in one single story, Shakespeare has managed to encapsulate every aspect of that extraordinary phenomenon in a beautifully crafted play. Were two star-crossed lovers ever so finely drawn?

Their agony and angst distilled so deftly? Their story remains the quintessential tale of unrequited love, of the unattainable for which the protagonists ache with such all-consuming passion. In this richly complex play, Shakespeare combines all the elements of the human mate choice predicament – the accidental meeting that precipitates instantaneous love on both sides, the friends that try to arrange trysts (as Benvolio does in his attempt to facilitate Romeo's meeting with Rosaline at the Capulet ball, thus inadvertently engineering the fatal meeting between hero and heroine), parents' inevitable attempts to manipulate their offspring's marital arrangements to their best advantage (as Capulet does in agreeing to Count Paris's request for his daughter Juliette's hand), and, last but not least, the raw uncertainty as to whether we can achieve our desired outcome (instantiated here by the enmity that separates the Capulet and Montague families and forms so insidious a barrier between the lovers).

The story raises, in one seminal moment, all the questions about love and betrayal that one can imagine. Why did Romeo fall so suddenly for Juliet, when he went to the ball to sneak a meeting with Rosaline? Can we really fall in love at first sight, or is that just an urban myth? Why is the desire for a kiss so strong? Can we really love one person forever? Are we ever so distraught that we could take our own lives when our passion is thwarted – never mind if we return home to discover the love of our life awaiting burial? But even if we don't go to the lengths that Romeo did, can we actually 'die of a broken heart'? And even if we can't, why is it that we feel the pain of separation or rejection as real pain?

This book brings modern science to bear on these questions. It will oblige us to draw on scientific disciplines

that are very rarely bedfellows. The very richness of the experience makes that inevitable. But first, what is this phenomenon we refer to as falling in love? And is it really a human universal? Many have claimed that it is not, and that many traditional societies do not recognise it – that it is a phenomenon born of nineteenth-century romantic novels. So let's begin by looking more closely at what we have to study.

The kind of besottedness that we associate with romantic love can be both intense and, compared to mate attraction in most other animals, relatively long-lasting. This early intense phase of a human relationship typically lasts twelve to eighteen months, but can often extend for several years beyond that in attenuated form. In the heady intellectualised aftermath of the 1960s, it became fashionable among intellectuals, and especially among anthropologists, to assert that this sense of falling in love is a peculiarity of modern, Western, capitalist culture, driven no doubt by the market in Mills & Boon-style romantic fiction. In traditional societies, people did not marry for love, but as a matter of economic convenience or for political reasons. It is still a common view. But this is to confuse the reasons for marriage contracts with the relationships involved. People have always been hard-nosed and married for political or economic convenience. Arranged marriages have been a feature of every human culture the world over. Currently, they happen to be especially common throughout much of South Asia, from Iraq as far east as Japan, but they were the bread and meat of the noble houses of Europe ever since the Romans left us alone to get on with our lives as best we could. People still marry for convenience and economic advantage every

day all over the Western world. But that doesn't mean to say that people don't fall in love. Whether they *marry* because they fall in love is a separate issue. In actual fact, the falling in love bit can happen just as often the other way around: people get married for strategic reasons and then, lo and behold, fall in love. As Molière put it in his play *Sganarelle* (1660): 'Love is often a fruit of marriage.'

The evidence from arranged marriages tells us that the seemingly hapless couple often end up falling in love with each other after the formalities of the wedding – sometimes months, sometimes even years later. Arranged marriages are no more likely to be soulless forms of socially sanctioned prostitution than those in which the happy couple thought they had married for love. Many, if not most, of those in arranged marriages fall in love with the partner they are saddled with. We in the post-Romantic West assume we have choice over whom we fall in love with and marry. But, in reality, our choice, as I shall show in the chapters that follow, is actually somewhat random and decidedly limited – after all, we rarely search through more than a handful of potential spouses before finally choosing 'the one'. It's really just a question of when you do the falling in love bit – before or after agreeing to marry the person. Yet even in the supposedly liberated West, not all of us have this experience. Many of us make do with whatever we can get . . . and grit our teeth. But that doesn't mean that the phenomenon of falling in love is a social construction that people only experience because they've been told they ought to.

The truth is that, notwithstanding vigorous claims to the contrary, some form of romantic attachment

transcends historical and cultural boundaries, and may well be a human universal (accepting that there are degrees of expression in this trait even within the same culture).

> Tossed and bewildered, like a flickering candle,
> I roam about in the fire of love;
> Sleepless eyes, restless body,
> neither comes she, nor any message.
> In honour of the day I meet my beloved
> who has lured me so long, O Khusro.

wrote the medieval Indian poet Amir Khusrau Dehlavi (1253–1325). At around the same time – and long before the era of Mills & Boon – we find the celebrated French troubadour Guillaume de Marchaut (1300–77):

> For I love you so much, truly,
> That one could sooner dry up
> the deep sea
> and hold back its waves
> than I could contain myself
> from loving you . . .

And in another of his songs:

> Sweet noble heart, pretty lady,
> I am wounded by love
> So that I am sad and pensive,
> And have no joy or mirth,
> For to you, my sweet companion,
> I have thus given my heart.

Or from the Sanskrit of the fifth-century Indian poet Kālidāsa comes this evocative quatrain:

> Sloe-eyed, please stop for a moment
> Tying up prettily those locks of hair;
> For my eyes are entangled there,
> I have been extricating them the whole day.

Or earlier still, from around 900 BC, is the author of the Bible's 'Song of Songs' (or, as it is sometimes known, 'Song of Solomon'), who had this to say:

> O that you would kiss me
> with the kisses of your mouth!
> For your love is better than wine,
> your anointing oils are fragrant,
> your name is oil poured out.

And later in the same series of poems (for that is clearly what they actually are):

> How graceful are your feet in sandals,
> O queenly maiden!
> Your rounded thighs are like jewels,
> The work of a master hand.
> Your navel is a rounded bowl
> That never lacks mixed wine.
> Your belly is a heap of wheat,
> Encircled with lilies.
> Your two breasts are like two fawns,
> Twins of a gazelle.
> Your neck is like an ivory tower.

Your eyes are pools in Heshbon,
By the gate of Bath-rab'bim.

. . . and so it goes, on and on.

Or, even earlier, there is the Egyptian pharaoh Rameses the Great, who more than 3,200 years ago wrote this on the tomb of his favourite wife, the politically powerful Nefertari (not to be confused with the even more famous Nefertiti, who lived about a century earlier): 'The one for whom the sun shines . . .' How often has *that* been said in history, and not by folks who just happened mysteriously to know how to read Egyptian hieroglyphics deep underground in a queen's burial chamber centuries before they were eventually deciphered? And here, from around 2025 BC, translated from the cuneiform script on a modest-sized tablet discovered in 1889 during excavations at the Sumerian city of Nippur in modern-day Iraq, is what is often claimed to be the oldest love poem in the world:

Bridegroom, let me caress you,
My precious caress is more savoury than honey,
In the bedchamber, honey-filled,
Let me enjoy your goodly beauty,
Lion, let me caress you,
My precious caress is more savoury than honey.

According to Samuel Krame in his book on the Sumerians, that sense of love was by no means uncommon, despite the fact that marriages in Sumer were invariably arranged on economic grounds – literally measured in silver.

The truth is that falling in love *is* a human universal: it occurs in every culture and every time, and has done

throughout eons of human history back to that distant moment when some ancient Eve awoke one morning . . . and melted at the sight of the Adam before her. That doesn't mean that all of us experience it, or even that all of us have these experiences under circumstances that eventually lead to marriage – or whatever the appropriate social equivalent might be. But it does mean that it happens often and frequently. And it does seem to be important. Sandra Murray and her colleagues have been studying romantic relationships now for several decades, and have found that idealising one's partner is a sure recipe for marital success; moreover, the higher one's ideals are and the more one idealises one's partner, the more satisfied one is with the relationship – and the longer it is likely to last. And this isn't because people who idealise their partners more have more deserving partners: in fact, there appears to be only a modest correlation between an individual's perception of their partner and the partner's evaluation of their own traits. It seems as though there is something about the intensity of this peculiar phenomenon that *is* important to the success of the whole endeavour. And that creates a puzzle: if it's so universal a characteristic of humans, it must have a biological basis and a biological function. Yet it has been effectively ignored by most scientists. We don't really know what it is, or why we have it – or even whether it bears any resemblance at all to the kinds of things that other animals experience.

It's that biological story that will be the subject of this book. Part of that story will lie in understanding what it is that causes us to feel like this. But I'm not just going to be interested in the obscure aspects of physiology or genetics that underpin this curious phenomenon. There is more to biology than that. My interest will lie in trying to bridge

the gap between these more obviously biological bases of our behaviour and the psychological, social, historical and evolutionary contexts that help to mould that behaviour. Not least among these are the principles that underlie our choice of mates, and the tactics we use to ensnare them once we have spotted them. We'll take a very broad look at the business of falling in love, and ask the poets for a bit of help along the way. Mostly, but not necessarily of course, such relationships are heterosexual, but my guess is that the underlying processes that produce these relationships are not that different between the two sexualities (and all combinations between the two extremes), so I shall simply take it for granted and have no more to say about this particular issue.

Can't take my eyes off of you . . .

Everyone appreciates that when we fall in love our attention seems to become focused on one person to the exclusion of all others. But there has been an ongoing debate as to whether this is due to the fact that falling in love causes you to lose interest in other members of the opposite sex (the deflection hypothesis) or to you just becoming so wrapped up in your new love that you don't have time to attend to anyone else (the attention hypothesis). The difference may seem slight, but it belies an important contrast in the underlying psychology. Under the deflection hypothesis, you lose any motivation to be interested in someone else, whereas under the attention hypothesis some accident of circumstance might lead you to notice someone else and so switch your attention to them and abandon your previous mate. In effect, the first implies a psychological mechanism

that actively inhibits your likelihood of being attracted to someone else, whereas the second does not.

In the normal course of things, our attention is remarkably easily distracted by members of the opposite sex. We naturally check them out more often than we do members of our own sex. Some years ago, I and my students undertook a series of studies on social monitoring behaviour in the refectory of a large London university and in nearby parks and public gardens. We were interested in testing between four hypotheses that might explain why people occasionally glance around their immediate environment, even when busy eating or engaged in a conversation. The four hypotheses were: checking for predators (in this context, people who presumably might attack or rob you), checking to see whether any friends had turned up, checking for potential new mates, and checking for rivals who might steal a mate away. The third hypothesis – checking for members of the opposite sex who might offer opportunities of new romantic relationships – won hands down. The patterns of when and how people glanced around them, and whom they looked at when doing so, uncompromisingly pointed the finger at mate choice as the explanation. We found that men and women were much more likely to look up and glance at someone moving near them if that individual was of the opposite sex than if they were of the same sex. In fact, they were so sensitive to the sex of the individual concerned that they were often aware of the sex of someone coming behind them long before they came into full view. Our peripheral vision, it seems, is extraordinarily good at picking up subtle cues of gender.*

* For present purposes, I will use the terms *sex* and *gender* as meaning much the same thing, following biological practice.

When people are in love, they spend much less time looking at attractive members of the opposite sex, and they rate those whom they do see as less attractive than do people who are currently single. In a rather ingenious study, Jon Maner and his colleagues showed subjects photographs of attractive and average same- and opposite-sex individuals in one corner of a computer screen, and then asked them to perform a task that required them to switch attention to another part of the screen. Those who were in love were much faster at switching attention away from opposite-sex photos of attractive individuals than people who were single, even though there was no difference when attending to photos of averagely attractive members of the opposite sex or photos of anyone of the same sex. They concluded that when in a romantic relationship, our attention seems to be actively repelled from serious rivals. It seems that we actively downgrade people we would normally consider physically attractive to the same level of attractiveness as the jobbing average.

Johann Lundström and Marilyn Jones-Gotman used odour to gain more insights into this issue. They asked young women who had a romantic partner to complete a questionnaire about the depth of their love for that person and then asked them to try to distinguish between the odours of their boyfriend, another friend of the opposite sex and a female friend. The odours had been collected by asking the various individuals concerned to sleep (alone) in a cotton T-shirt with nursing pads under the armpits to absorb natural odour for seven nights in a row. There was no correlation between the intensity of the women's romantic involvement with their boyfriend and their ability to identify either their boyfriend's odour or the female

friend's odour, but there was a significant *negative* relationship with their ability to identify the odour of the opposite-sex friend. In other words, being romantically involved actually seems to turn you off from potential rivals rather than causing you to be *so* besotted with the object of your love that you just forget to be interested in anyone else.

Motherhood and apple pie

Romantic relationships aren't the only intense relationships we have, of course. The most obvious of these must be the incredibly strong bond that develops between a mother and her offspring. Indeed, we speak of 'mother love', using the same term that we use for romantic relationships as though it were much the same kind of thing. Here, surely, is another human universal, though one that, as with falling in love, varies a lot in its intensity from one individual to another. There is no question, for example, about the fact that men just don't have quite the same intensity of feeling that women have about small children, especially babies, even when they are their own. Women – or at least some women – are just more maternal than men, even if it is also true that some men are more maternal than other men, and perhaps even than some women. Nonetheless, these individual differences should not blind us to the fact that here is another deeply intense emotional effect that binds us irrevocably to another individual, that this is a human universal (indeed, it may even be true of most mammals) and that it is there for a reason.

Mother-and-baby relationships share many of the features of romantic relationships: the completely focused attention; the sense of wonderment, elation and contentedness;

the wanting just to be with the object of desire, to touch and stroke the person concerned; the willingness to do anything for them. This might lead us to suppose that the processes involved in romantic relationships had their origins in mother–infant bonds. The same chemistry has just been generalised from one context to another. This is not an implausible suggestion. After all, you might suppose, the business of making babies and the romantic feelings that underpin this are just the prelude for the bigger job of getting that baby through to independence, so why not just use the same psychological machinery and adapt it to the first part of the process?

The maternal instinct is fundamental for mammals, whose key evolutionary adaptation was the two-stage process of internal gestation and then lactation. Internal gestation is not entirely unknown elsewhere in the animal kingdom. Famously, male sea horses bear and give birth to live young; cichlid fish suck in their eggs and allow their young to develop within their mouths, while midwife toads insert their eggs under their skin and allow the tadpoles to develop there in little blisters. Nonetheless, internal gestation is relatively rare and rather patchy in its distribution across the animal kingdom. It is only in mammals that all species are obligate internal breeders.* One of the benefits of this rather challenging option is the ability to produce large-brained offspring who are then capable, as adults, of fine-tuning their behaviour more effectively to the particular circumstances in which they later find themselves. This early nurturing is critical because

* The only exceptions, of course, are the monotremes, the group of rather primitive egg-laying mammals that includes the platypus and the echidna.

it allows the parent to invest in brain and body growth over a much longer period of time. Since brain tissue can only be laid down at a constant rate, the key to evolving a big brain lies in extending the period of parental investment for long enough to get the brain you ultimately want.

This whole business is very taxing and demanding for the parents who have to keep up this effort rather longer than they would really like to. This isn't, perhaps, so much of a problem during gestation, when the baby is small and inside one's body. But once it has been born, its energy demands rise exponentially as it grows rapidly to the size where it can safely fend for itself. However, in some species like monkeys and apes there is a whole additional phase of socialisation that kicks in after the end of the lactation period. Shepherding one's young through the business of acquiring the requisite social skills and placing them as judiciously as possible in the adult social world only begins when the baby is weaned and it can carry on for many, many years thereafter. That all adds up to what has to become a labour of love – especially during the early months when babies don't themselves provide that reinforcement. This is a particular problem for humans because our babies are born so prematurely that it takes them about a year to reach the same stage of development and independence as other monkeys and apes at birth. Monkey and ape babies can get up and stagger about within days, if not hours of birth, but our babies are so neurally immature that most cannot do this much before their first birthday.

This is a curious evolutionary side effect of the fact that our ancestors first adopted an upright stance. This caused a remodelling of our pelvis to provide a stable platform to support the trunk, and a consequent narrowing of the

birth canal. Then, several million years later, our brains began to undergo a dramatic increase in size. The result was a square-peg-in-a-round-hole kind of problem: any significant increase in the baby's brain size at birth meant the head was much too big to get through the now rather modest-sized birth canal. This mightn't have been such a problem, but an accident of history hundreds of millions of years earlier when our fishy and reptilian ancestors were first evolving had resulted in the reproductive tract passing through what became the bones of the pelvis rather than over them. A more sensible arrangement would have been to have the urethra and reproductive tract coming out just below our belly button. That would have saved no end of problems later. But evolution is not that good on foresight, and later generations are often stuck with the unfortunate consequences of past evolutionary events.

Our solution was to give birth to as premature an infant as we could get away with. By monkey and ape standards, our infants are desperately, even dangerously, premature when they are born and they can survive that crucial first year outside the womb only by dint of some very devoted parenting – and, in particular, by a mother who is, in the normal state of nature, willing to carry on lactating with seemingly enthusiastic abandon until the baby is old enough to start feeding for itself. Something pretty powerful is needed to get us over that hump and persuade us to keep pumping milk and food into the ever-open maw.

In fact, mother–infant relationships aren't the only kind of interaction we have that seems to share something with romantic attachments. Though the meaning of the word has been rather debased of late by Facebook, friendships are a third category of close relationship that we have.

Intimate friendships, in particular, share many of the deeper and more meaningful features of romantic relationships, so much so that occasionally they can even spill over into full-blown sexual relations. We tend to distinguish different kinds of friends – intimates, good friends, down to the 'he's just a friend' type – and for the good reason that this is in fact a graded series of relationships. There is good evidence that we find it difficult to maintain more than one genuinely committed romantic relationship at a time. But we can have many kinds of friendships, which grade imperceptibly into each other.

A third important category is kinship. And I don't just mean the feelings of love for one's parents that eventually allow us to reciprocate for those devoted years of parental solicitude. Kinship is weird stuff. For most of us, something genuinely visceral kicks in when we discover that someone is related to us, however distantly that might be. It suddenly puts a perfectly ordinary stranger in a completely different class. They are no longer just 'people', but kin, those with whom you share blood. Just on the strength of that single ephemeral three-letter word you would have them round to dinner, take them in, or even lend them your car. And I don't mean just rediscovering your birth parents decades after being adopted. I mean distant kin like third cousins, people with whom you share just a great-great-grandparent. What is even weirder about this is that the relationship is a purely linguistic one, something we can only specify in language. There is nothing really tangible about it, because neither you nor they knew your common great-great-grandparents – they are folk you've simply heard about by word of mouth. Almost none of us have ever had the chance to meet a great-great-grandparent, to be dandled

on their knee, or spend time with them. Yet when the magic word trips off the tongue, suddenly you are blood brothers, bound by a common bond.

We are much more embedded in kinship circles than we often realise. Our research suggests that around half the people we consider dear to us are in fact members of the family, by blood or marriage. And by this, I don't mean just your mum and dad and siblings, but those in your extended family right out to second cousins and beyond. For the average person, that amounts to around fifty to seventy people in all. We give them priority above all others, are willing to lay our lives down for them if push comes to shove in a way we simply wouldn't even consider for people who were not related to us. The Inuit (or Eskimo) of the Alaska coast still go whaling in small open boats, Moby Dick style, as they have done for centuries. It is an exceptionally dangerous business, since the boats often get upended by whales as the whalers get in close enough to be able to harpoon the leviathans by hand. Because the risks of being thrown into the water are so high, the crews always consist of close kin – because, say the Inuit, no one but a close relative is willing to dive into icy Arctic waters to rescue you if you get thrown out of the boat. Blood *is* thicker than water.

Just how does a romantic relationship differ from a friendship, or a friendship from kinship? And how are close friends different from friends-of-friends, or close kin different from distant kin? I have spent the last decade exploring the structure of our social world, and this book will draw heavily on my work to tease out a framework for understanding the similarities and differences between our various kinds of relationships. At its core will lie the role

of trust in allowing two individuals to form a bond that provides mutual support as well as pleasure. But, first, there is one more issue to put on the table.

What is love?

Freud, inevitably, had a great deal to say about love, and there has been a long (and, on the whole I think, largely unhelpful) tradition of clinical interest in the topic. In this broad approach there has been a general distinction between *eros* and *agape*, terms borrowed from classical Greek to refer to erotic, sensual love and something closer to friendship with its connotations of altruism and unstinting generosity (and from this adapted in the Christian tradition to refer to religiously motivated love, usually towards the Redeemer or one of his saints). Most of this psychoanalytical literature is pretty dull, and has in any case tended to focus on the negative aspects of inadequate or poor-quality relationships, so I will ignore it in favour of the other group of people who have been interested in romantic relationships – and to a lesser extent, friendships – namely, social psychologists.

There have probably been two main approaches among social psychologists. One, attachment theory, has a developmental focus and argues that our adult romantic and other intimate relationships develop out of, or are scaffolded by, our early experience of mother–infant relationships. Attachment theory largely derives from the influential British psychiatrist John Bowlby, who tried to combine psychiatric theories, including Freudian psychoanalysis, with ethological observation. He was responsible after the Second World War for persuading maternity hospitals to abandon the practice of placing newborn babies in nurseries away from their mothers

from the moment they were born. He argued passionately that mother and baby needed to develop a close bond during the first few hours after birth and that it was absolutely essential for the future development and wellbeing of the baby that this was allowed to take place naturally, by leaving the baby with the mother. That's one reason why babies are now put straight to the mother's breast as soon as they are born, even before they have been cleaned up. Bowlby's ideas were extremely influential, and almost all of you reading this now have been the beneficiaries of his reforming crusade. But are your adult romantic relationships at root just your relationship with your mother writ large? The answer is, for perhaps obvious reasons, largely no – though, as I shall show later, your relationship with your parents does have unexpected implications for your choice of romantic partner later in life. But the bottom line is that neuroimaging suggests that maternal love and romantic love are actually two different things: they involve some of the same bits of the brain, but, importantly, they also involve some very different bits of the brain.

That said, however, it is a robust finding that the quality of a romantic relationship has considerable repercussions for one's emotional and psychological wellbeing, both in the teenage years and through adulthood. A common finding is that being in a relationship, and especially a congenial relationship, has a positive impact on self-esteem and psychological wellbeing, and that in turn almost certainly has a very significant impact on physical health and the body's ability to resist disease. Poor relationships and relationship breakdown, on the other hand, are both risk factors for depression. Similarly, the experience of relationships, both parent–child and sibling–sibling, within the home environment during childhood

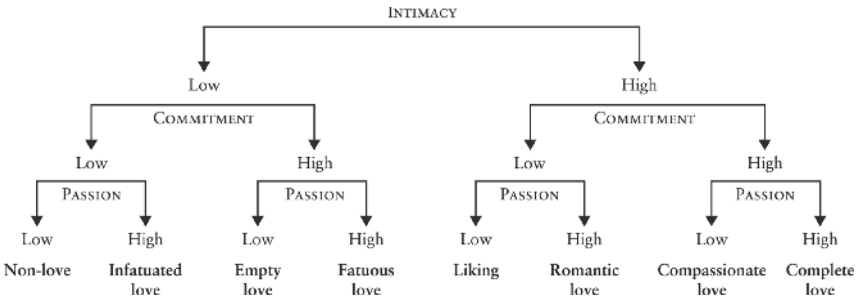
provides a framework that establishes the general pattern of our relationships as adults. A series of short-lived, unstable relationships in the teenage years is predictive of poor relationship quality in adulthood. It seems that failure to practise the skills needed for mature relationships is important: one of the best, and most robust, predictors of marital dissatisfaction and divorce is a teenage relationship that resulted in early marriage. That's not to say that all such relationships end in failure, but rather that statistically speaking it's not a good start.

The other approach within social psychology has focused almost entirely on how we see ourselves in relationships, with a particular interest in the emotional and cognitive components of a relationship and whether these predict relationship satisfaction, stability and longevity. Building on the very successful paradigm used to study, first, intelligence and, later, personality, the standard approach has been to ask people to agree or disagree with statements of the kind: 'I feel an emotional uplift when I see [person X]', or 'I experience great happiness when I am with [X]' or 'I can't imagine ever ending my relationship with [X]'. Answers to several hundreds of these kinds of questions by many thousands of people are then subjected to some heavy statistical analysis to look for consistencies and patterns. This identifies common themes in the answers that are interpreted as factors or dimensions. In personality theory, these constitute the familiar 'extraversion/introversion', 'neuroticism', 'openness', 'conscientiousness' and 'agreeableness' personality dimensions, commonly known as the 'Big Five'. While personality theory works reasonably well and personality profiles measured in this way are generally fairly consistent across time and space,

social psychologists' attempts to disentangle the nature of love, romantic or otherwise, have been much less successful. As many of them have commented, few psychological constructs have been more elusive than the construct of love. Somehow, it has proved exceptionally difficult to put a finger on exactly what we mean by it, and so it has been all but impossible to describe it.

Perhaps the best and most successful of the attempts to define romantic relationships in this way is Robert Sternberg's 'Triangular Theory of Love'. He argued that romantic relationships can be categorised along three independent dimensions: intimacy, passion and commitment. Passion reflects those aspects of a romantic relationship commonly associated with what we think of as 'falling in love' (an intense focus on the object of one's desire and a sense of exhilaration, with or without a sexual component). Intimacy reflects feelings of closeness, connectedness and bondedness, while commitment reflects a desire to support, and remain in the physical presence of, another individual. The latter two have sometimes been referred to by the slightly more evocative terms 'feeling close' and 'being close'.

Sternberg's categorisation has the merit of allowing us to see how different relationships might vary on his three dimensions (see diagram on next page). Infatuated love, for example, is when passion is high, but intimacy and commitment are low, whereas romantic love derives from a combination of high intimacy and high passion in the absence of commitment. Companionate love is the combination of high intimacy and high commitment in the absence of passion, whereas fatuous love is the combination of passion and commitment in the absence of



Sternberg's 'Triangular Theory of Love'. An extensive analysis of people's answers to a battery of questions about their relationships led Sternberg to conclude that relationships have three dimensions: intimacy, commitment and passion. Since each can be low or high, this gives rise to eight distinct types of relationship (shown in bold at the bottom of the diagram). These vary in quality from 'non-love' (disinterest or the absence of love), through 'liking' to various forms of 'infatuated', 'empty' and 'fatuous' love to 'compassionate' love, and finally to what he considered to be true, 'complete' (or consummated) love, where all three dimensions are high.

intimacy. When all three dimensions are high we get consummate or complete love. These make intuitive sense, though one might argue about the terms he uses for the different kinds of love. Nonetheless, they serve to remind us that relationships can come in many and varied forms and aren't necessarily all of a kind. Or at least, the motivations and emotional drivers that underpin them can vary considerably and give rise to relationships of different strengths and value.

This categorisation, imperfect as it is, is also a useful reminder that reciprocity is an important feature of all intimate relationships. Unrequited love is what bothers the poets most, it seems, if only because it arouses the most intense emotions – emotions of loss and unfulfilled desire. And some relationships can be quite one-dimensional, as in those based solely on lust (or, as Sternberg would have it in more polite vein, passion). But some of these may simply

represent stages in the development of a relationship, from the initial unrequited love through consummated passion to friendship in more mature romantic relationships. However, useful as it is, it doesn't really get us beneath the surface of what a relationship actually is – what it is that produces all that turmoil of emotions, the abreaction when our tentative advances are spurned or rejected or a lover betrays us. Nor does it get us beyond the immediacy of our 'raw feels' to ask how we choose our lovers or our friends. And it certainly doesn't ask why these things exist in the first place. Like most of psychology, it takes the world as we find it as given, almost as though it were the Panglossian best of all possible worlds, and never asks about how or why it came to be this way. Asking the evolutionary questions about history and the biological functions that phenomena are designed to serve can often uncover unexpected oddities in the world that don't make a great deal of sense. Very often, these are – like our helplessly premature babies – evolutionary compromises that only make sense when seen in terms of the bigger picture.

When language is so inadequate

At the end of his book *The Symbolic Species*, the neuroanatomist Terry Deacon observed that humans have very unusual living arrangements. They live in monogamous pairbonds that are set within a large social community in which many males and females live together. This would be fine, but for what has become known among anthropologists as the 'division of labour': from time to time, men and women go their separate ways, especially in traditional societies where males go hunting and females gather

vegetable foods. The problem, as Deacon saw it, is that whenever a mated pair are apart, they are at risk of rivals who might either steal the mate or effect extra-pair copulations. This is a particular problem for males. Males are always vulnerable to paternity uncertainty: among mammals, a female always knows that the offspring she gives birth to are hers, but a male can never be 100 per cent certain. Deacon argued that humans face this problem in a particularly intrusive way. We are always surrounded by many rivals for the attentions of our romantic partner, and they have open season when the division of labour obliges one or other sex to leave their mates for long periods of time (e.g. while away hunting).

The solution, Deacon suggested, was overt social statements of ownership such as marriage ceremonies and symbolic badges. To signal marital status, we use a whole raft of purely symbolic markers, not least among which is the wearing of wedding rings. In many cultures, women also adopt a whole host of additional practices such as using titles like 'Mrs', adopting the husband's surname, and changes in style of dress or coiffure. In traditional Polynesia, a couple marked their marriage by placing *leis* (traditional flower necklaces) around each other's necks, and women switched from wearing a flower behind the right ear (meaning *Still available*) to wearing it behind the left (meaning *Spoken for*). Deacon argued that, being symbolic, these all require language, and he thus saw symbolic contracts of this kind as being the key selection pressure behind the evolution of language – hence the title of his book. If monogamy evolved early (and he assumed that it must have evolved very early), then language necessarily evolved early too – and by early, he meant with

the appearance of *Homo erectus*, the first member of our genus, around two million years ago.

Deacon is surely right to identify the formation of monogamous pairbonds in humans as a major anomaly that requires explanation. But the real issue, and the one that lies at the focus of our enquiry, is why on earth pairbonds evolved at all, not how we keep them together in the face of the risks that threaten to engulf them. The conventional explanation has always been that it requires two to raise human offspring, and the assumption always was that two meant mum and dad. It is not entirely obvious to me that the costs of rearing inevitably require that it be mum and dad, though the frequency of pairbonded monogamy among the birds for precisely this reason might predispose us to thinking this is the obvious first call. An equally plausible possibility in the case of humans, at least, is mum and granny. After all, why do human females give up all possibility of reproducing just when they are at their peak of maternal experience and skill at around forty-five years of age? The menopause is all but unique to humans. There have been claims that chimpanzees and elephants – two other long-lived species – also undergo menopause, but to be honest this is more like a slowing down of reproduction in very old age.

Humans are clearly in a different league: no one else so completely gives up the possibility of reproduction so early in the lifespan. And the conventional explanation for that has always rested on the observation that the timing coincides with the point at which daughters start to reproduce. Mum gives up reproducing herself so as to be able to help her daughters – the so-called grandmother hypothesis. As the same time, it provides a neat explanation for why

mother–daughter bonds should be so important and should persist into adulthood – and why grannies should be so obsessed with their grandchildren.

But, while this may explain one aspect of human behaviour, it leaves us with two puzzles. One is why pairbonds should form between a man and a woman, given that they appear to be unnecessary. The other is whether language and symbolic cognition are really necessary to create a system in which pairbonds exist within large communities that contain many individuals of both sexes. Is a relationship really a conscious, cognitive phenomenon that we can think deeply about and need language to regulate, or is it buried so deeply in emotion that it is almost opaque to our conscious mind?

The second issue is much the easiest to answer, because it turns out that the kinds of mating/social systems that Deacon worried about are not as rare as he imagined. In hamadryas baboons, for example, males form harems of up to four females, whose loyalty they enforce by punishment: females that stray too close to other males are given severe bites on the back of the neck that have them cowering close to their male for hours afterwards. Nonetheless, the integrity of the pairbonds between a female and her male are not just dependent on the harem male's proactive reprimands: much also depends on other males' willingness to test the strength of these bonds. Males normally 'respect' the pairbonds of other males and will assiduously avoid trying to mess with another male's female. A male placed in a cage with another male and female that he has watched interacting will sit at the edge of the cage showing intense interest in whatever might be going on outside the cage, or fiddling with the grass at his feet – *anything* but look at the other male's girl, since that would constitute

an explicit threat and instantly precipitate a fight. This phenomenon (known as triadic differentiation) seems to be designed to protect the pairbond.

However, the extent to which rival males behave in this way depends on their assessment of the female's attachment to her male, something they pick up on by noticing how attentive the female is to her bonded male. If she shows limited interest in monitoring where he is, and doesn't seem to be paying him all that much attention, a rival male introduced into the cage will sometimes have a go at separating her from her male, if necessary by openly fighting for her with him. If the female is not that attentive to her male, then she may be willing to switch her interest to him – and that may be just enough to tip the balance against her previous male even if he is more dominant than the rival. In contrast, a male who senses that the female is constantly glancing at her male, and following him every time he moves, won't bother even to try. If she is strongly committed to her male, there will be no chance of wresting her from him even if the rival is physically stronger than her male. It is under these circumstances that males suddenly become so interested in events going on outside the cage or in the minutiae of their toes.

In a more explicitly monogamous species like the South American titi monkey, both sexes actively preserve the pairbond by discouraging rivals of the same sex from coming too close. Similar behaviour is seen in antelope like the klipspringer. This small African antelope, not a lot bigger than a weaned lamb, is intensely monogamous, perhaps one of the most intensely monogamous of all mammal species. Each pair lives in a tiny territory barely twice the size of a football pitch on a rocky outcrop in the savannah grasslands

of eastern and southern Africa. Again, each sex is profoundly jealous of its partner, chasing off any stranger of the same sex that happens to drift onto its territory.

But there is one species that seems to have an almost identical social arrangement to humans, and this is the little bee eater, a tiny member of the bee eater bird family that builds nesting burrows in sandy banks along river courses in the savannah plains of East Africa. Because suitable nesting areas are few and far between, bee eaters are forced to congregate at the handful of places where they can successfully burrow into the earth. This usually means many hundreds, even thousands, of birds sharing the same bank. Even though each breeding pair has its own burrow, the burrows are densely packed and the female, in particular, has to run the gauntlet of unattached males hanging around the edge of the colony whenever she goes out to the foraging grounds to feed. To reduce the risk of harassment, the bee eaters have very close pairbonds so that the male accompanies his female wherever she goes. In effect, he acts as her bodyguard. And all this is done without a shred of language to manage it.

In so far as the purpose of these kinds of behaviour is to protect the pairbond (at least for a limited period of time), it should give us pause to ask why humans would need anything as complex as social contracts or language to do the same job. Instead, the fact that monkeys and birds can solve the same problem by purely behavioural means suggests that symbolic markers and language may not in themselves be essential for protecting pairbonds in social environments. What it might suggest, instead, is that pairbonds (and the processes that underpin them) evolved well before language, and that language was later co-opted

to the business of reinforcing whatever natural mechanisms already existed to protect pairbonds.

I mention language because it brings me back to my starting point, and the poets whose evocative words we so admire. Most of us seem to have great difficulty in expressing our emotions in language. Words literally fail us just at the moment when we really need them. How often do we use the phrase 'You know what I mean?' in exasperation at our own inability to turn feelings and vague thoughts into words? Yet some people have the gift of being able to say just what we wanted to say, to put into words what we instantly recognise as the very feelings with which we struggled so inarticulately.

There are two important lessons here that are germane to our enquiry. One is that the emotions that well up and create our inner feelings are not well connected to the conscious, language-accessible brain. They belong to the emotional right side of the brain, the side that seems to handle our more supposedly irrational, animalistic reactions. Conventional neurobiological wisdom has it that our language capacity is, by and large, lodged in the left side of our brain, and it seems that its connections to those emotional centres in the right half aren't as good as they might be. This ought, I think, to alert us to the fact that all this falling in love stuff might arise from a bit of deeply buried emotional machinery that we don't acquire just by reading Mills & Boon novels. Rather, it is something that is very ancient, something we inherited from our remote ancestors long before they acquired language. The other lesson is that it offers us an explanation as to why we should revere poets. These rare individuals – and I think we can all accept that the ability to write good

poetry *is* rare – seem to have the knack of accessing their emotional brain with their conscious mind and turning what they find there into language.

It is a rare and exceptional skill, and we rightly do them homage. But it reinforces the fact that we are just not very good at explaining what's going on inside us. We *feel* our emotions, but we do not always understand them. The problem for our present enquiry is that this makes it very difficult for us to dig beneath the surface and find out what is actually going on. It's a problem that has bedevilled all attempts to study romantic relationships – and, indeed, all other kinds of relationships – scientifically. Nonetheless, let's see what we can do.

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This book sets out to explore just what it is that makes romantic relationships what they are. In the chapters that follow, I will explore the neurobiology and psychology of relationships, ask how romantic attachments differ from the other kinds of relationships we have (in particular between mothers and infants, friends and kin), and try to unpack something of their evolutionary origins. So let's begin with trying to understand the neurobiology that creates all the turmoil and intensity of falling in love.