

WHY WE DREAM

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The definitive answer

How dreaming keeps us sane,
or can drive us mad

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PUBLISHING

CONTENTS

	Foreword	v
	Acknowledgements	vii
chapter one:	An ancient puzzle	1
chapter two:	Earlier explanations examined	5
chapter three:	An experimental adventure	21
chapter four:	Our sleeping brains	49
chapter five:	The psychology of dreaming	84
chapter six:	Two houses of cards collapse: the seminal dreams of Freud and Jung	127
chapter seven:	Solving problems: creativity and dreams	146
chapter eight:	The waking dream	160
chapter nine:	Practical applications of the expectation fulfilment theory	192
chapter ten:	Dreaming Reality	221
appendix:	Loose ends	227
	References and notes	241
	Index	255

FOREWORD

*“The effort to strive for truth has to precede
all other efforts.”*

ATTRIBUTED TO ALBERT EINSTEIN

No product of human thought and ingenuity exists in isolation. Every project is built on earlier efforts and the new findings set out in this book are no exception. Significant portions of the material content of *Why we dream: the definitive answer* originally appeared in a monograph that described Joe Griffin’s absorbing twelve-year research project, which he undertook with the aim of finding out why we dream. It was published in book form under the title *The Origin of Dreams: how and why we evolved to dream* and in *Dreaming Reality*

In it, Joe wrote up his key experiment, which he was the first dream researcher ever to think of carrying out. The experiment eventually led him to solve one of nature’s most enduring mysteries and to go on to unravel some of its implications. Reviewers who understood his achievement were effusive in their praise: “A major key to the nature of all psychic states”, “A giant leap forward” and “A watershed in our exploration of the evolution of mental processes” were typical reactions.

Although written for a scientific audience, *The Origin of Dreams* sold many thousands of copies to interested members of the general public, many of whom, as we know from numerous letters and conversations, were delighted to find that they could easily confirm Joe’s findings by studying their own emotional life and dreams. This was surprising to us because the requirements of scientific writing, and the necessary use of technically correct terms rather than plain English, made it not a particularly easy book to read.

Dreaming Reality, this book’s predecessor, was deliberately written

VI • WHY WE DREAM

in a style that was easier to follow. However, it was much more than a rewrite of the original; it was a fresh presentation, greatly extended, incorporating new research findings and more dream examples. It explored some of the practical applications, previously only hinted at, for what is now known as ‘the expectation fulfilment theory of dreams’, particularly in relation to improvements in psychotherapy and the treatment of depression and psychosis. The rewriting was done, then, not to dumb down the ideas but to take them further and, by using non-technical language as far as possible, to make them clearer and thus more accessible to a wider readership. *Why we dream: the definitive answer* has kept all these valuable changes but added yet more material to bring the content up to date, including work from other researchers that support the theory, and more dreams selected from the countless examples that people continually report to us, confirming its explanatory power.

We hope these ideas inspire you, and thereby enrich your life as much as they have ours.

Joe Griffin and Ivan Tyrrell

ACKNOWLEDGEMENTS

We have discussed the findings in this book with hundreds of individuals over the last few years and would like to thank them all for listening, thinking and commenting. We would also like to thank Val Baker, Andrew Boden, Abigail Darling, Dan Jones, Dr James Tapper, Jane Tyrrell and Juliette Young for permission to use their dreams.

Thanks are also due to our families (for their tolerance of our preoccupations) and our editors, Denise Winn and Jane Tyrrell, for their guidance and attention to detail – and, again, to Denise for all her work on this revised edition.



1

AN ANCIENT PUZZLE

“Such fantastic images give us great delight, and, since they are created by us, they undoubtedly have a symbolic relation to our lives and destinies.”

GOETHE

One bright morning, long ago in Greece, perhaps after pondering the meaning of a particularly vivid dream, the brilliant polymath Aristotle gave voice to a scientific challenge that has echoed down the ages: “We must inquire what dreams are, and from what cause sleepers sometimes dream, and sometimes not; or whether the truth is that sleepers always dream but do not always remember; and if this occurs, what its explanation is.” In the shade of sun-drenched olive trees at the Lyceum in Athens, where he and his brilliant band of thinkers used to meet, the father of natural sciences urged them to “obtain a scientific nature of dreaming and the manner in which it originates”.

Since those seminal times, 23 centuries have come and gone but, despite the best efforts of many of the world’s greatest minds, no satisfactory explanation was found. The answer to the question of what dreams are for, and their evolutionary cause, remained tantalisingly out of reach – a baffling mystery. In the 20th century, one of the pioneers of modern scientific dream research, Dr David Foulkes, reminded our own scientific community of why the central issue raised by Aristotle was still so important. “Dreaming,” he wrote, “needs once again to be recognised as a problem so central to the study of the mind that its resolution can help to reveal the fundamental structures of human thought.”¹

We are going to make the case that, since he wrote those words, the problem of what dreaming is, and why we evolved to dream, has at

2 • WHY WE DREAM

last been solved. And, as a result, a richer mental landscape is revealed to us, one that provides new opportunities to expand human understanding – not only for scientists, but for every curious individual. We can now view a scene quite different from what might have been expected by modern neuroscience and psychology, but one that is full of psychobiological explanatory power. This is the territory that Aristotle had the prescience to know was vital for us to explore and understand.

The breakthrough discovery of why we dream was made by Joe Griffin, one of the authors of this book, and offers a truly significant ‘organising idea’. All good scientists recognise that the devil is in the detail but that real understanding comes from the type of thinking that produces organising ideas that are big enough to make sense of that detail.² An organising idea is always needed to shape our perception and our thinking. This is because we organise what we see through what we believe we know. Thus an organising idea determines where we look and will guide our research endeavours. A new organising idea is always bigger than earlier ideas because it has to explain the anomalies that previously caused confusion. All progress comes from this type of thinking, a fact that is in tune with the recent recognition that understanding human nature requires an open-minded, holistic approach – in this case, a recognition of the interdependence of the biological and the psychological. What is now commonly referred to as ‘mind-body’ research has developed rapidly in recent decades and has produced enormous advances in our knowledge of the relationship between the brain, immunity and disease, for example, as well as in psychology and behaviour.

Joe’s breakthrough occurred because accumulated research data about dreaming and new technologies to facilitate sleep research had made it possible.³ It is truly an organising idea, in that the discovery of why we dream could only be made by integrating the findings of many disciplines, and thinking deeply through the implications until new insight occurred.

In the 20th century, the theories that arose to explain why we dream were divided into two broad categories – psychological and

biological. Psychological theories, mostly of the psychodynamic type (such as those of Sigmund Freud and Carl Jung, which we describe in the next chapter), held sway during the first half of the century until, in 1953, Eugene Aserinsky and Nathaniel Kleitman made a groundbreaking discovery. They identified a special brain arousal state, occurring periodically during sleep, that became known as ‘rapid eye movement’, or ‘REM’ sleep, because of the darting, swivelling action of the eyes during these times. REM sleep was found to have a close relationship with dreaming.⁴ (Further research soon showed that, during REM sleep, breathing became more rapid, irregular, and shallow; heart rate increased; blood pressure rose; and genital engorgement occurred in both males and females.) All this gave a great boost to the search for biological explanations for dreaming.

However, for any theory to account for the full complexity of human dreaming, there was clearly a need to integrate its biological and psychological aspects, as psychologist Dr Liam Hudson foresaw when he wrote: “This evolutionary puzzle [dreaming and REM sleep] and the question of the brain’s operating principles are tied together, as [scientists] correctly assume. What they do not entertain is the possibility of an altogether more sweeping synthesis, and at the same time more rigorous explanation, in which these biological considerations are gathered together with another more strictly psychological one: the question of the formal properties implicit in the meaning of dreams themselves. In such a synthesis ‘bottom up’ and ‘top down’ theorising about the sleeping brain and its products would knit together, and the conceptual gap within psychology between mechanistic and interpretative modes of explanation would close ... Such a synthesis is as exciting a prospect as any psychology now offers, and eminently achievable – although at present it hovers in mid-distance, still out of reach.”⁵

It was the realisation that Hudson was right that prompted Joe to set off on a research programme of his own (after reading all the available literature on the subject that he could lay his hands on). It became his passion. But it took 12 years before the full fruits of his

4 • WHY WE DREAM

work were realised. Since his theory was published as *The Origin of Dreams*,³ an academic monograph in book form, no scientist has disproved it and even more evidence has emerged to support it.

When Joe first published his answer to Aristotle's challenge, he had no idea of the wider significance of his findings. However, as a result of ongoing work over the ensuing years, remarkable new connections have emerged. For example, the relationships between dreaming and how we learn, dreaming and daydreaming, dreaming and creativity, and dreaming and problem solving, have made an important practical difference to the work of educationalists, whose attention has been drawn in increasing numbers. Many psychologists have realised that Joe's insight provides a unified theory of hypnosis and a new way to think about the nature of consciousness. Furthermore, the relationship between dreaming and emotional distress – depression, anger, addiction, anxiety and psychosis – has had such a direct bearing on psychological treatment that it has produced a new school of scientifically grounded, effective psychotherapy known as the human givens approach. This has had a powerful impact on thousands of lives in the UK, Ireland and beyond.

From the speed with which practical applications have arisen from this discovery about why we dream, it is clear that the synthesis Hudson looked forward to is no longer “hovering in mid-distance”; it has been made. And the story of how it was done, and what more it may mean for us all, you now hold in your hands.

2

EARLIER EXPLANATIONS EXAMINED

“Time is but the stream I go a-fishing in.”

THOREAU

It is a human given that we dream. Every night when we sleep we enter a magical world where the normal rules of physics, propriety and logic no longer reign: a world where, one night, we can dine with royalty, converse with famous poets or sportsmen, or walk naked down the street and, on another, we might have the ability to fly or talk with animals. Dreams inhabit a mysterious place, saturated with intense meaning, where experiences range from the prosaic to the wondrous and bizarre, from blind terror to sweet sensual delights. It is hardly surprising, then, that from the earliest times in every culture humankind has had its theories to explain the strange happenings in the land of dreams. And it is hardly surprising, either, that dreams were first thought to be inhabited by gods and devils.

The ancient civilisations of Babylon, Assyria, Egypt, Greece, India and China took dreams very seriously, believing they were messages from the gods which often foretold future events. The Ancient Greeks, however, although still believing that the gods communicated human destiny through dreams, observed that not all dreams came true. Homer, Plato and also the Roman poet Virgil subsequently made the discrimination that true dreams came from the ‘Gate of Horn’ and false dreams from the ‘Gate of Ivory’, probably building on earlier ideas from Egypt and Mesopotamia, which also had a ‘Gate of the Horns’.¹ Interestingly, as puns can often be found in dreams, the names of these gates also contain puns – the Greek for

6 • WHY WE DREAM

ivory is *elephas*, also meaning ‘to cheat’, and the Greek for horn is *karanoo*, which also means ‘to accomplish’. Temples were erected throughout Greece to encourage, under the guidance of a special priesthood, ‘healing dreams’ which would indicate which medicine or activity was appropriate for the dreamer’s ailment. Hippocrates placed great emphasis upon symbolism in dreams that he thought indicated particular ailments; for example, dreaming of overflowing rivers meant an excess of blood.

Aristotle, however, rejected notions of the divine origin of dreams. How could it be so, he reasoned, since animals could also be seen to dream? Instead, he saw dreams as residual sensory impressions left over from waking experience. Plato pointed out that, since our higher reasoning faculties were absent in dreams, this left the way open to the expression of unbridled passion. In all people, he claimed, there was a lawless wild beast whose presence is glimpsed in dreams of passion and anger. He also thought it possible to have morally superior dreams when reasoning is appropriately stimulated.

The most comprehensive work on dreams to come to us from ancient times are the five books of dream interpretation written by Artemidorus, who lived in Italy in the second century AD. He held a sophisticated view of dream interpretation, believing that the same dream could have a different meaning depending on the character and circumstances of the individual dreamer. But the idea that dreams contained divine messages persisted.

The Bible has many examples of God advising people by means of dreams, perhaps the most famous in the Old Testament being Pharaoh’s dream of seven fat cows followed by seven lean ones. This Joseph interpreted as seven years of plenty followed by seven years of famine. And the New Testament, too, is full of dream references, particularly around the story of the birth and life of Jesus.

Dreams also played a major role in Islamic cultures. The Koran was said largely to have been revealed to Mohammed in a series of dream visions, each of which appeared to him “like the break of dawn”. Ramadan, the ninth month of the Moslem year, celebrates the days leading up to the night when Mohammed received his first

revelations. Each day of Ramadan, Moslems fast from sunrise to sunset until the date of Mohammed's 'Night of Power' when, according to tradition, Gabriel first told him of his mission in a dream in which he ascended to heaven on a winged horse and met Abraham and Jesus. He was then given instructions, and he and his followers returned to Mecca before dawn. It is said that on this 'Night of Power' the gates of Paradise are open, the gates of Hell shut and the devils are in chains. (Gates were clearly a powerful metaphor in ancient times, perhaps because they were such a useful invention.)

Records show that Mohammed frequently interpreted the dreams of his disciples. Following his example, dream interpretation became a widespread feature of Islamic culture. An Arabian dream book of the eleventh century makes mention of several thousand dream interpreters operating at that time.²

The great Arab historian, traveller, statesman and Sufi, Ibn Khaldûn, in his 1377 introduction to his monumental history of the world, *The Muqaddimah*, described three types of dream. There are 'clean' dream visions that come from God, 'allegorical' dream visions that are inspired by 'angels' (higher human faculties of perception according to Sufis) and 'confused' dreams which are inspired by 'Satan' (the material world). He noted that, "When the spirit withdraws from the external senses during sleep, it can activate forms from memory which can then become clothed by the imagination in the form of sensory images". He also described a technique for inducing spiritual dreams which involved focusing a clear desire to have such dreams and the repetition of certain phrases, indicative of the "perfection of human nature", before falling asleep. He pointed out that this technique could only create a state of preparedness for such dream visions, it provided no guarantee of receiving them.³

Whilst Khaldûn was writing within the accepted religious orthodoxy of his day, this approach does hint at a sophisticated use of the potential of the dream state. From the research evidence explored later in this book in regard to creativity and dreams, it will become clear that the technique which Khaldûn describes would certainly facilitate the expression of a solution to – or knowledge of – a

problem, arrived at unconsciously.

Whilst dreams remained important in the Islamic world up to modern times, in Europe during the Middle Ages studying them fell into disrepute and was progressively identified with 'the devil', sin and sources of temptation. This only started to change during the Renaissance, when artists like Giotto used dreaming as a metaphor for prophetic inspiration. To indicate this, he painted the saints asleep within pictures that portrayed the subject matter of the visions inspired by their dreams.

It was not until the nineteenth century, when writers such as Alfred Maury⁴ and Ludwig Strumpell⁵ emphasised the role played by waking experiences and emotions that were insufficiently inhibited during sleep in instigating dreams, that a more scientific approach to the topic began in the West. Ideas about the role of unconscious processes were also widely circulating by this time and it was Freud who famously pulled some of these ideas together, combined them with his theory of neurosis, and produced the first attempt at a systematic theory of dreaming.

Freud's censor

Sigmund Freud's theory of dreams grew out of his theory of neurosis. He saw a neurotic symptom as being a solution to conflict between a conscious wish and an unconscious repressed wish.⁶ Each neurotic symptom was, he believed, an attempt at simultaneously satisfying both wishes.

Freud noticed that patients often talked about dreams during therapy sessions. He saw dreams as the product of a conflict between the wish to sleep and unconscious repressed wishes from early childhood. He believed that, while we are awake, these repressed wishes are active in the unconscious but are held in check or restrained from entering consciousness by what he termed a 'censor'. He posited that, during sleep, however, this censor was not as alert as during our waking hours, and that repressed wishes, if sufficiently disguised, could sometimes get past it and be expressed in a dream. Freud believed dreams to be very similar to neurotic symptoms and that

they acted as the guardian of sleep, performing a protective role by allowing the expression of unconscious wishes that would otherwise disturb sleep.

He believed that the fact that we sometimes wake up from a nightmare was the result of the failure of a particular dream to sufficiently disguise the unconscious wishes being expressed. As a consequence, the censor was suddenly aroused to full waking alertness. Freud saw the disguise taken in the dream by the unconscious wish as the product of 'dream work'. (This is where Freud's theory becomes incredibly complicated. We contend that, if even our very brief outline generates a degree of cognitive indigestion, this is intrinsic to Freud's theory rather than our explanation of it!) Dream work was deemed to involve the condensing of material, so that a particular element of the obvious content represented several dream thoughts. It might also involve displacement, where a dream element's clear and obvious significance was far less than the disguised, concealed significance. It also involved representation – primarily the translation of a thought into visual images. The final process involved the replacing of a particular character or action with symbols. This happened, Freud thought, because of the need to disguise the salacious, largely sexual, nature of the hidden content.

Freud described the day's residue of problems, worries, unsatisfied wishes or purely indifferent material, as acting as, in his words, the 'entrepreneur' for a dream, and stated that the 'psychical capital' which made the dream possible was invariably a repressed infantile wish contained in the subconscious to which the daytime residue became linked. The images from waking experiences that were usually contained in the clear content of dreams came from a repressed infantile wish that saw an affinity with the waking experience and which used these images, and others from memory, as a sort of disguise to slip past the half-asleep censor and thereby gain a degree of expression for itself.

By now you are probably thinking that it must be well nigh impossible to discover the meaning of a dream with all this convoluted distortion ... yet more is to come. The waking mind, according to

Freud, gave a secondary revision to the obvious content of the dream story in order to give it a more logical façade. Freud declared that the real meaning of a dream could be uncovered by getting a patient to 'free associate' to each element in the dream that they had described. This free association process, he believed, unravelled the dream work and revealed the hidden wish or wishes that caused the dream. This random, open-ended interpretive technique adopted by Freud, where any dream symbol could be given a meaning associated with sexual desires or repressions of any kind, was what enabled the hermetic world of psychoanalysis to grow into the massive cult that it did.

Nowhere in Freud's self-declared masterpiece, *The Interpretation of Dreams*, did he actually give an example of an analysed dream showing an infantile wish as its source, although he did elsewhere. For the most part, he seemed to have been satisfied with his own confident interpretation of a repressed wish of recent origin, usually sexual in nature, being the source of any dream he 'analysed'. Many people have commented on the singular oddness of Freud's ideas and how they crumble when faced with empirical evidence (that is to say, facts). Ludwig Wittgenstein, for example, pointed out that, "Freud very commonly gives what we might call a sexual interpretation. But it is interesting that among all the reports of dreams that he gives, there is not a single example of a straightforward sexual dream. Yet these are as common as rain."

Jung's myths and legends

Carl Jung was a colleague of Freud who became increasingly disaffected with what he felt to be Freud's doctrinaire approach to the investigation of dreams and neurotic symptoms. He came to believe that, while Freud's free association method of dream interpretation might lead to the identification of the dreamer's psychological complexes, it nonetheless led away from the real meaning of the dream. He could not accept that the meaning was hidden or disguised to get past a censor so that it could enter consciousness. For him, the symbols in a dream were the natural form in which the unconscious expressed itself. He saw dreams as the unconscious mind's way of

correcting distortions and imbalances in the conscious mind. He also saw the unconscious mind as the repository of the 'collective unconscious', which he described as the archaic consciousness of primitive man, from which the consciousness of modern man developed – just as our body still conforms to a basic pattern that was typical of primitive mammals. He believed these archaic elements of the unconscious were sometimes expressed in dreams, and called them 'archetypes'. To identify these archetypes, according to Jung, a wide knowledge of ancient myths and legends was necessary.⁷

Jung developed, and encouraged, a cult around himself and his ideas, and many of his followers came to believe that dreams provided evidence of life after death. This meant that implicit in Jungian analysis was the idea that it was an initiatory preparation for the afterlife.⁸

Although few of Jung's ideas achieved the same degree of popular acceptance that was conferred on Freud's sex-obsessed theories, the increasingly widespread view among dream theorists – that dreams in some way help us come to a more balanced view of our emotional problems – owes more to Jung than Freud.

The multiplicity of modern theories

From the 1950s onwards, scientists generated a host of theories to explain dreaming. 'Dreams as problem solving' was one such, strongly put forward by a researcher called Thomas French.^{9,10} He suggested that recent interpersonal conflict was the focus of problem solving in dreams but that dreams substituted analogous problems to 'solve' which were more suited to the nonverbal-thinking characteristic of sleep. He thought that, when making interpretations, it was more meaningful to work with a series of dreams rather than just one.

In 1953 a dream researcher called Calvin Hall proposed a cognitive theory in which dreaming was an extension of 'ego psychology'.¹¹ Dreams, according to this theory, are a continuation of normal thinking processes carried on through the medium of pictures or visual images. His research showed that the subjects of dreams were the personal concerns of the dreamer rather than the great political issues

of the day. For instance, in the numerous dreams he collected from his students during the last days of the Second World War, when the first atomic bomb was dropped on Hiroshima in Japan, he noted that this catastrophic event did not feature in a single one. Therefore, he deduced, dreams were primarily to do with reflecting the dreamer's self-image, and he likened them to a work of art. An artist expresses his or her ideas through some medium, be it writing, pictures, sculpture, music or dance. The essence of the endeavour is that the artist succeeds in communicating inner conceptions by translating them into a medium perceptible to others. In the same way, according to Hall, the dreamer translated his conceptions about his own personal concerns into pictures and thus made them perceptible to himself. When a thought was made perceptible, Hall said, it was communicated. Unlike the communications of waking life, which, he noted, might have an audience of millions, the dream was a private communication with an audience of one, rather like the ancient Talmudic idea of a dream being 'a letter to oneself'. Dreams could thus reveal an honest and undistorted view of the dreamer's self-conceptions. Hall suggested that this report to oneself was unlikely to be as superficial or distorted as reports of dreams collected during waking.

Hall developed his theory of dreaming by collecting a large number of wide-ranging dreams and meticulously analysing their content.¹² On reading the dream accounts he collected, and comparing the dreams with the known concerns of each dreamer, it is difficult not to be impressed with his theory. Yet the theory did not receive the attention it deserved. Most recent books about dreaming do not even mention Hall's name.

One reason for this neglect might be that the theory seems incomplete. The idea that dreamers send themselves communications in pictures several times a night, which for the most part are forgotten on waking, seems rather wasteful. And the idea that nature evolved and preserved intricate biological mechanisms for the purpose of creating works of art to be seen only by one person who then, on most occasions, instantly forgets them, makes little intuitive sense. Yet one

cannot deny the strength of Hall's empirical findings.

In fact, the strength of his empirical approach was also its weakness. The missing vital part of the dream process that could, potentially, have completed Hall's theory only becomes available initially through inspection of one's own dreams and one's own waking concerns, in the manner Hall used so brilliantly for other people's dreams. We will come back to this shortly. We need to look at some representative examples of other dream theories first.

In 1977, the 'activation synthesis theory' was put forward by J. Allan Hobson and Robert McCarley.¹³ Hobson developed it further in work published in 1988.¹⁴ They suggested that dreaming was the result of the attempt by the neocortex – *the higher brain* – to make sense of the random barrage of signals sent from the lower brain, and that the synthesis of material in the dreams we create may reveal something of how one's personality habitually operates. They thought that running out these random dream patterns might also serve a maintenance and developmental function. However, it quickly became clear, from the research of Hobson, McCarley and others, that the REM state is controlled by mechanisms in *the lower brain* and that dreaming in the REM state is more intense during bursts of activity such as rapid eye movements, fine muscle twitching, and breathing and heart rate changes.

According to Hobson and McCarley's original theory, a barrage of random stimulation was coming up periodically from the brainstem and being synthesised by the frontal cortex into dreams. But, once PET scanning of the brain was developed, scans of the brain in the REM state showed that the cortex was very selectively activated. The emotional brain (the limbic system) and the visual brain were highly activated but the pre-frontal cortex was excluded from this stimulation (the very part supposed to be doing the synthesising).¹⁵ Hobson now concedes that, instead of global forebrain activation being responsible for dream synthesis, it is the emotional brain that is responsible for dream plot formation.¹⁶

Hobson and McCarley also theorised that REM sleep served to 'rest' the cells in the brainstem which produce serotonin and nora-

drenalin, because in REM sleep these particular neurotransmitters are not used by the brain. Their idea was that these neuronal pathways were being rested so that we would wake up the next day, refreshed by REM sleep. Consequently, then, the more REM sleep people had, the more refreshed they should be. But researchers looking at the sleep patterns of depressed patients found that they had massive amounts of REM sleep in proportion to slow-wave sleep and yet, far from waking up refreshed, they were waking up exhausted!¹⁷ How did Hobson account for this? He just said, “It is a paradox.” (The amount of REM sleep experienced by depressed patients is very important for our understanding of the role of dreaming and we shall come back to it later.)

Yet another problem with their theory, which Hobson admits, is that it can't explain why certain dreams have positive aspects and some have negative aspects.¹⁸ But the final nail in the activation synthesis theory's coffin is the finding that deep brainstem lesions do not generally stop dreaming, whereas certain lesions in the cortex do, despite the existence of brainstem-initiated REM sleep.¹⁹

Another possibility, the ‘we dream in order to forget’ theory, was put forward by Francis Crick and Graeme Mitchison in 1983.²⁰ Their idea came from studying work done on computer programs that simulated neural intelligence. An overload of incoming information could trigger “parasitical connections” between unrelated bits of information – leading to the association of purely tangential or weak connections to the original learning (for instance, something one just happened to be thinking about at the time, when learning how to change a flat tyre). To stop the brain from getting overburdened by storing such remote connections to new material, it would make sense, Crick claimed, if there were a way to knock out such unhelpful associations. He saw REM sleep as providing this service, by delivering a series of bangs to the neocortex that would break the weaker links in the neural network. The clear implication of this idea is that dream material is essentially meaningless and without coherent structure. As, at that time, most dreams were thought to be bizarre in content, this was taken as evidence for the existence of

these parasitical connections. Crick and Mitchison theorised that, if we didn't have dreaming, we would go on making more and more bizarre connections, which would imply that, if we block REM sleep, our memories should become more confused. If this theory is correct, then depressed people on antidepressants that block REM sleep should suffer memory impairment – they don't and, if anything, report memory improvement. As psychologist Liam Hudson has also pointed out that, if Crick's and Mitchison's theory were right, people who frequently recall dreams should be more "addled in their wits" than non-recallers, a finding unsupported by research.²¹

Yet another problem with the theory is that technical advances in the recording of what actually happens during dreaming have now shown that the overwhelming majority of dreams are, in fact, quite routine, everyday experiences.²² It is the tiny percentage of dreams that we recall that seem bizarre: dreams recorded in the sleep laboratory, when sleepers are woken as soon as they go into REM sleep, are mostly not bizarre at all. As a result of this discovery, Crick revised his theory to suggest that it might still, at least, explain those few dreams that do have a bizarre component to them. In other words, his theory has been so drastically modified that very little of it remains at all.

Finally, since Crick and Mitchison formulated this theory, not a shred of evidence has arisen to show that the human brain makes parasitical connections. That is something known only to occur with computer networks. The new research presented in this book disproves the 'we dream to forget' theory.

It is not surprising, however, that with the dawn of the information technology age in the 1960s, the new metaphor of the computer was seized upon to explain many processes, including dreaming^{23,24} and one line of thinking became very fruitful indeed. Because, during REM sleep, the brain is disconnected from sensory input from the outside world by the inhibition of major muscles scientifically termed the anti-gravity muscles (we are all temporarily paralysed during REM sleep), it could be compared to an off-line computer. Perhaps the myriad of 'programs' contained by the brain could be being updated

during the off-line time of REM sleep, and dreaming was somehow related to this. In other words, REM sleep might be about programming the brain. This proposal had the advantage of seeing the REM state as an active one with specific purposes. The computer metaphor prompted scientists to consider REM sleep in the fetus and newborn as a time when the 'software' of the brain is programmed, an idea crucially picked up and developed by the French scientist Michel Jouvet.

It was Jouvet who made the discovery of the inhibition of anti-gravity muscles (our major muscles) during REM sleep. He suggested that REM sleep, which he calls paradoxical sleep, might have the role of programming the central nervous system to maintain or organise instinctive behaviour.²⁵ He argued that the programming of instinctive behaviour on a continuous basis, rather than a once and for all basis during early development, would enable a more efficient expression of instinctive behaviour. Since the original programming must interact with the animal's experience in the real world, then REM sleep might allow either the original programming to be reasserted (nature over environment) or the effects of the experience to modify the programming (environment over nature).

When we look at the biology of dreaming later we will explore Jouvet's research in greater depth and see how his work put in place some of the essential building blocks for understanding the function of the REM state. However, as we shall see, it does not offer an explanation as to why dreams take the form they do.

Some researchers have recognised that emotion has a central role in dreaming. In the 1970s, sleep researcher Rosalind Cartwright proposed that dreams enable us to problem solve creatively in an unrestrictive setting, without being inhibited by circumstances or our emotions. Still active in this field, she holds that dreaming is a means of incorporating memories and regulating negative emotion, thus keeping us emotionally healthy.²⁶ We make the case, however, in Chapter 7, that problem solving is not a direct function of dreaming.

Sleep researcher Ernest Hartmann has argued that dreams are

guided by the emotions of the dreamer and are a form of psychotherapy, enabling the dreamer to make connections, in a safe place, between different experiences, thoughts and emotions. When the emotional state is clear-cut, the dream is simple but when emotions are mixed, it becomes more complicated. He suggests that traumatic or difficult emotions are gradually woven in with other less extreme experiences the dreamer has had in the past, enabling the emotional disturbance to be reduced and the dreamer to cope better with similar trauma or stress in the future.²⁷ However, this doesn't account for the fact that not all dreams are about traumatic or difficult emotions and that, while 80 per cent of dreams may involve negative elements, 53 per cent of dreams also involve positive elements.²⁸

Antti Revonsuo, a Finnish cognitive neuroscientist also focused on trauma and proposed that dreaming evolved as a means of rehearsing threat perception and threat avoidance in a simulated threatening situation (i.e. practising our survival techniques). He and colleague Katja Valli analysed nearly 600 dreams from dream diaries kept for four weeks by 52 participants, categorising possible threats (escapes and pursuits, accidents and misfortunes, failures, catastrophes, disease and aggression) and the strength and frequency of them. They found that the main threats came in the form of accidents, misfortunes and aggression, of which the dreamers were mainly the victims. Threat situations in dreams were stronger (eg involving stabbings, shootings or being pursued by animals) and more frequent than in real life but were broadly realistic and mainly threatened the dreamer or people close to the dreamer.²⁹ Interesting though the theory is, again it doesn't take account of the fact that over half of dreams have positive elements.

In recent years, another theory has tried to climb the slippery pole of scientific acceptance: dreaming as a means of consolidating memories.³⁰ The evidence presented seemed to show that REM sleep was connected in some way with the learning of routine procedures. The theory still has enthusiastic adherents but Jouvett and others elegantly demolished it.³¹ If it were true, depressed people, who dream

proportionately more and more intently than non-depressed people, would have much better memories than everyone else. They don't. (We explore the dreams consolidating learning idea more fully in Chapter 7.)

It has even been suggested that dreams are the result of our brains trying to make sense of external stimuli registered during sleep. For example, the sound of a radio or phone may be incorporated into the content of a dream.³² But this, of course, leaves a great deal of dream content unaccounted for.

By the end of the 1990s, most cognitive neuropsychologists had given up on the idea of there being any biological function for dreaming, settling instead upon the notion, along with Hobson, Crick and Mitchison and others, that dreaming is merely the result of low-level neurological processes going on during REM sleep, a biological epiphenomenon with no meaning and not selected for by evolution. Even G. William Domhoff, a leading sleep researcher who studied under Calvin Hall and who has recognised the role of emotion and metaphor in dream content, has finally concluded “reluctantly” along with the majority of cognitive neuroscientists that dreams have no important function.³³

His outline for a new neurocognitive theory of dreaming, “sees dreams as psychologically meaningful in that they are coherent, relate to other psychological variables, and are continuous with waking conceptions and concerns, [but] it does not claim any purpose or function for dreams. Based on current evidence, it is most likely that dreams are the accidental by-product of two great evolutionary adaptations, sleep and consciousness. However, their frequent dramatisation of emotional preoccupations and their parallels with the figurative dimensions of waking thought may explain why many societies have invented cultural uses for dreams, usually in conjunction with religious ceremonies and medicinal practices.”³⁴ He then triumphantly rams his point home: there can't possibly be a meaningful function for dreams, he insists, when most of the time we completely forget them. But he was incorrect in these assumptions, as we shall show.

Over half a century since the start of modern sleep research, despite dozens of theories, only a few of which we have outlined here, ignorance about sleep and dreaming is something of an embarrassment to scientists. In mid-2003, in a *New Scientist* report on a conference on sleep research in Chicago, a pertinent comment was made about dreaming: “Try to think of another fundamental biological phenomenon to which we can’t assign a role. You’ll draw a blank.” Craig Heller, a sleep scientist at Stanford University, was quoted as saying, “It’s the biggest unanswered question in neuroscience.”³⁵

But Heller was wrong. The question *has* been answered, but by a psychologist, not a neuroscientist. Scientists get so wrapped up in their own particular approach to a problem they rarely step back far enough to see what other people in different fields have done. (Joe first published his findings in 1993.³⁶)

The dream theories so far described all fall short of meeting the criteria for a holistic theory that combines the developmental (why dreaming evolved), the phylogenetic (dreaming occurs across different species) and the psychological (the richness of the feeling of meaning our own dreams have) aspects of dreaming, or why we almost always forget them. The various reductionist biological theories of dreaming put forward over the last few decades see dreaming either as essentially a meaningless epiphenomenon, an insignificant by-product of a biological process, or as somehow connected to learning or programming. There is no consensus. Even those that recognise the central role of emotion have not put all the pieces together. All the various lines of research have created a scientific logjam. Indeed, when reading reports of scientific conferences on this subject, we are reminded of the parable immortalised by Rumi in his *Mathnavi* over 700 years ago and projected again, for its contemporary relevance, in the West, in the 1960s and 1970s by Idries Shah.³⁷ In this now familiar tale, a team of men from a city where all the inhabitants were blind were sent off to examine an elephant. Each became convinced that they understood what an elephant was like, depending on which bit they managed to touch. One felt a leg

and described the elephant as a kind of moving tree. Another passed his hands over an ear and declared it to be like a living carpet. A third grabbed its tail and said it was a rope. A fourth explored the trunk and was convinced an elephant was a hose or snake ... and so on. When they reported back to the city, it was clear that each had felt only one part out of many. Each had perceived it wrongly. And each went on to attract bands of supporters convinced that one or other description was the true one.

Any new theory of dreaming, if it is to conform to the highest scientific tradition, should mesh with the major biological findings of recent decades and also reconcile a much wider-ranging set of findings and variables than existing theories. It should generate novel predictions that are capable of validation. In other words, it must describe 'the whole elephant'.