Meteorite or Gemstone?

Dreaming as one end of a continuum of functioning: implications for research and for the use of dreams in therapy and self-knowledge.

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Abstract

Is a dream a meteorite – a bit of material arriving from a distant place, that needs to be carefully analyzed and scrutinized to give us knowledge about that place (outside or inside us)? Is it a strange text which has come to us in a hard-to-decipher foreign language, that needs to be carefully translated into our own? These views, which constitute the "meteorite view," are held by some religious and spiritual persons, by orthodox psychoanalysts and other therapists, and by many researchers. They all see the dream as something alien, something totally different from our ordinary mental functioning.

I will argue for, and summarize a great deal of research favoring, an alternate view – that the dream is an earth-stone, not an alien stone. It can be very impressive and admirable, so let's call it a gemstone. But it's still of the earth, like other stones. The dream is part of our ordinary mental functioning. In fact it is one end of a continuum of mental functioning running from focused waking thought, through looser thought, fantasy, daydreaming, reverie and dreaming.

I will present this view in detail, reviewing the reasons we often consider dreams so alien or different: they are perceptual not conceptual; they are so bizarre; they are "so real;" they're so easily forgotten; they're involuntary; they occur in REM-sleep, a totally different state. For each reason I will present evidence that dreams are not so different, and there is a good deal of overlap between dreams and other forms of functioning.

I will show that the continuum view leads to new and different kinds of dream research and a different style of dreamwork. It also leads to simple solutions to questions the field has struggled with such as: Did this event/insight/discovery etc. occur in a dream or a waking reverie? Are dreams meaningful or meaningless? Do dreams "come in the service of the good" (and similar statements)? Should we study "a dream" or "dreaming?" How can we understand a dream if we can't "translate" it?

Key Words: Dream/Dreaming, Continuum of Mental Functioning, Cerebral Cortical Activity, Dream Research, Dreamwork

Meteorite or Gemstone? Introduction

I believe the question in the title is not a far-fetched analogy, but an important metaphor, which can guide our research and work with dreams. Dreams have been considered meteorites – bits of material from another world – in a large variety of different contexts, by groups of people who would be surprised by the bedfellows they find themselves with in this regard. I will argue that the evidence favors the gemstone view, and this will lead to important changes in the ways we study and make use of dreams.

The Greeks felt that dreams – or at least some dreams—were direct messages from the gods. And many religions have considered dreams to come from the gods, or from God, or from the devil. In any case they come from *somewhere else!* They are not a normal part of us. Modern dreamworkers, from various schools and backgrounds, do not speak of the gods, but frequently consider dreams to come to us from a "sacred place." The location of the place is seldom specified. Some consider it an external place, some more a sacred place within us. But in either case the dream is special. It is not treated as an ordinary part of our minds, but as something arriving from another place (usually to help us). For instance Jeremy Taylor has frequently stated, "all dreams come in the service of wholeness (1983; pg. 138)."

Freud and many orthodox Freudians have no room for a "sacred place," certainly not for an external place. For them, dreams come straight from the unconscious, but they are written in a foreign, incomprehensible language. By understanding the dream-work, and by free association, the analyst helps the patient unravel this text written in its strange language. The dream is translated into the "latent dream" or "latent dream thoughts," which are totally understandable as a

series of wishes, etc. in our usual language. One translated, the dream itself, called the "manifest dream," can be discarded.

The hard-headed empirical scientists working on the Content Analysis of dreams are very different from the dreamworkers, and from the psychoanalysts. They are simply examining the facts – the content of the dream – and examining them in great detail. However, I believe they too are considering dreams as meteorites. They are performing detailed "spectroanalysis." They are the government laboratories that examine every detail of a meteorite – the size, weight, specific gravity, light refraction, etc. -- any number of detailed analyses. This is worthwhile because the meteorite comes from an alien world, and our detailed investigations will give us a glimpse of that alien world. Likewise the Content Analysis scientists consider it worthwhile to examine every bit of a dream in detail, implying that it will reveal secrets of the place it came from. They do not expend this effort on daydreams or fantasies. I asked William Domhoff, our foremost Content Analysis scientist and a very thorough investigator, whether he had ever considered doing Content Analysis of daydreams. He said "it's so much work just studying dreams, why bother with daydreams, they're much less interesting anyway."

So the meteorite point of view is widespread, believed or at least acted on by a variety of people approaching dreams from a variety of directions (e.g., scientists, clinicians, dreamworkers). And I have to admit that in many ways the meteorite view feels intuitively right to us. Even those of us who fully believe that the dream comes from within our minds, still tend to believe that it is different – that the dream is somehow 'totally different" from the rest of our mental lives. Waking from a vivid dream, I often feel this too.

However I will argue that despite this intuitive sense of "otherness," dreaming is actually one end of a continuum of mental functioning. I will consider all the reasons we often consider a dream "totally different" (the meteorite position) and show for each argument that the differences are not absolute, that there is a lot of overlap between dreaming and other forms of mental functioning, I will conclude that

considering dreaming as one end of a continuum makes more sense than the "totally different" view. In other words, a dream may be very special and very beautiful (not just a stone, a gemstone) but it is of this earth. It is not an alien intrusion. And this viewpoint will lead to some important changes in the way we do research, and the way we work with dreams.

The Continuum

I want to make it clear that I am not saying that dreaming is like thinking, Not at all. Focused waking thought and dreaming are at opposite ends of the continuum. But there are no absolute separations. There is a continuum, not a bunch of mental activities (thought, fantasy reverie, daydreams, etc.) in one place, and dreaming in another (totally different) place

The continuum I propose, which we have studied in detail, runs roughly from focused-waking-thought at one end through looser thought or fantasy, to reverie, daydreaming, and eventually dreaming. This sort of continuum can be pictured in a number of different ways (Figures 1 & 2):

Figure 1.

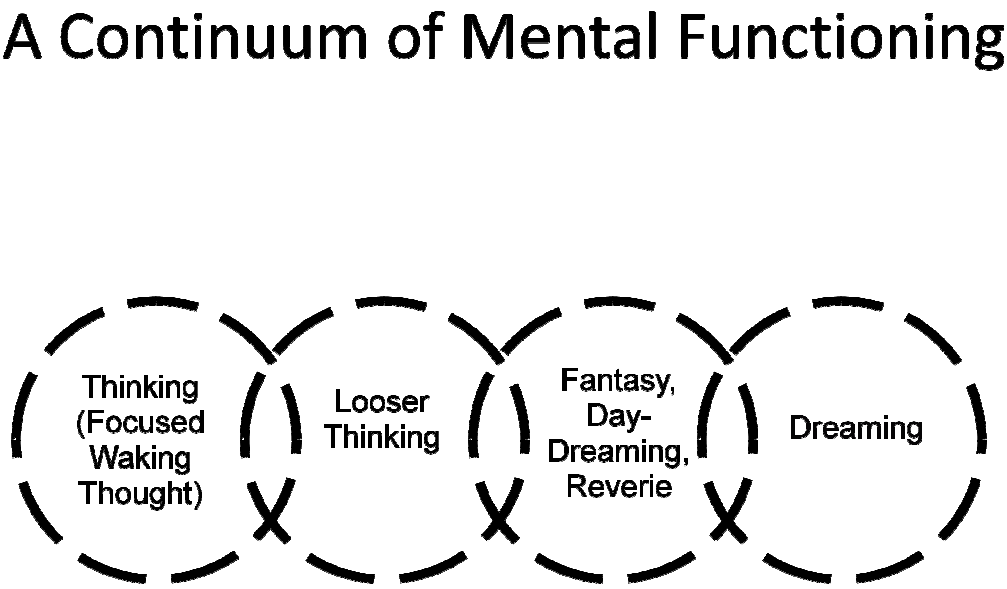
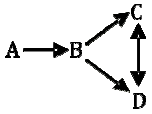
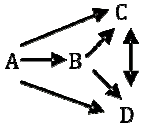
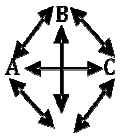

A Continuum of Mental Functioning
Thinking (Focused Waking Thought)
Looser Thinking
Fantasy, Day-Dreaming, Reverie
Dreaming

Figure 2. A continuum of mental functioning: Details

	Thinking (Focused waking thought)	Looser Thinking	Fantasy, day-dreaming, reverie	Dreaming
What dealt with?	Percepts, Math symbols, signs, words	Fewer words, signs, more visual-spatial imagery		Imagery built from memory: almost no words
How?	Logical relationship If A then B	Less logic, more noting or picturing of similarities,		Almost pure picture metaphor
Self-reflection:	Highly self-reflective — "I know I am sitting here reading."	Less self-reflective, more "caught up" in the process, the imagery		In typical dreams: total "thereness", no self-reflection
Boundaries:	Solid divisions, categorizations, thick boundaries	Less rigid categorization, thinner boundaries loosening of categories		Merging, condensation, thin boundaries
Sequence of ideas or images:	A→B→C→D			
Processing:	Relatively serial; net functions chiefly as a feed-forward net		Net functions more as an auto-associative net	
Subsystems:	Activity chiefly within structured subsystems		Activity less within, more across or outside of structured subsystems	

Of course the four overlapping circles in Figure 1 are an oversimplification. Many other mental states or forms of functioning are not listed -- for instance hypnagogic imagery, drug-induced states, "waking dreams," hallucinations, etc., but these can readily be fitted into the continuum. The evidence favoring the continuum view will become clear as we discuss the reasons why dreams are so often thought of as "totally different."

Reasons why a dream is often considered "totally different"

Here are the major reasons, which I will discuss in turn. 1) The dream is perceptual, not conceptual – in other words we picture rather than think. 2) Dreams are " bizarre." 3) Dreaming is "so real;" we're "right there." 4) Dreaming, unlike waking thought, is so fleeting, so easily forgotten. 5) Dreaming is involuntary – we have no control over our dreams. And finally 6) Dreaming has to be "totally different" because we're in a totally different state: sleep; or, more specifically, the unique state of REM-sleep.

1) First of all, there seems to be little formal thought in dreams. Our dreams seem to be pure imagery rather than thought. We appear to cogitate, plan, and plot very little in our dreams. The dreams seem to be made up almost entirely of imagery -- especially, for most of us -- visual imagery. This has been summarized in the view that dreams are perceptual rather than conceptual.

It is certainly true that in dreams we are far from our focused waking thought mode, but there is no sudden break or discontinuity between fantasies/daydreams and dreams. Consider our typical daydreams. For most of us, daydreams are perceptual, especially visual. They involve much more picturing and feeling than thinking. We may have a daydream about a wonderful vacation on the beach, eating a perfect banquet, having sex with a movie star, etc. We picture something we'd like, or at times, some scenario we don't like – a boss getting mad and firing us or a man threatening us with a gun. These are usually pictures and they are obviously guided

by emotion. They are more like dreams on this dimension than what we are doing when we work on a mathematical problem. And in fact we have data showing that daydreams at times cannot be distinguished from dreams (Kunzendorf, Hartmann, Cohen, & Cutler, 1997).

Furthermore, although thought is not usually prominent, it is definitely present in many dreams.). Kozmová and Wolman (2006) and Purcell, Mullington, Moffitt, Hoffmann, and Pigeau (1986) have studied thought processes in many series of dreams and have found that thinking is by no means absent in dreaming. It may be less prominent and sometimes overwhelmed by the ongoing action and feeling, but it can still be detected and studied. It's a matter of degree, rather than all or nothing. In laboratory studies, Foulkes and his collaborators found many very thought-like reports from REM-sleep awakenings (Foulkes, 1966).

2) Dreams are sometimes considered "totally different" because they are so "bizarre." Strange things happen in dreams that never happen to us in reality. We are able to fly. We occasionally see strange impossible creatures. Indeed bizarreness does occur in dreams and there are scales to measure it (Wingert & Kramer, 1979). But several points are worth noting. First of all, the great majority of dreams turn out to be very ordinary – the bizarreness ratings are very low (Domhoff, 2007; Dorus, Dorus, & Rechtschaffen, 1971; Snyder, 1970). We only occasionally have a truly bizarre or weird dream, though it is true that for some of us such a dream may be so striking that it remains in our memories for a long time. As I have discussed elsewhere (Hartmann 2008), the powerful central image, whether bizarre or not, is what makes a dream memorable, makes it stay in our minds.

Conversely, bizarreness is by no means restricted to dreams. Reinsel, Antrobus, and Wollman (1992) conducted a very methodical study of persons under conditions of sensory isolation. The subjects' waking fantasies, in this situation, were scored just as bizarre as their night dreams.

Even under ordinary conditions, many people have daydreams or fantasies that are surprisingly bizarre. In one study, we found that when dreams and

daydreams were scored on a blind basis, dreams overall were indeed scored as significantly more "bizarre" and more "dream-like" (using well-established scales) than daydreams. However, the daydreams of one group of students – those characterized by thin boundaries – were scored just as bizarre and just as dream-like as the night dreams of another group of students - those with thicker boundaries. Here is one example from our study (Kunzendorf et al., 1997).

> *I am seeing outlines of things. Then I see what appears to be an eye. The eye blinks and the surroundings jumble around and turn to mist. There seems to be a pit with levels of ledges. That is the only way to go but I don't go down there. I stay my ground and wait and wait but nothing happens till I look up and try to reach a light and then turn around and get comforted by the warm darkness that surrounds this place.*

This was a daydream reported by one of the students with "thin boundaries." So although bizarreness does sometimes occur in dreams, it is not restricted to dreams. For instance, if we try to catch what's going through our minds as we shave or brush our teeth, we find pretty bizarre material. Likewise, Foulkes and Vogel (1965) have found that very bizarre material can occur as we are falling asleep (hypnagogic or sleep onset imagery). Overall it appears that bizarreness is not restricted to dreams but appears increasingly as we examine material along the continuum towards fantasy, daydreaming, and dreaming.

3) Another reason dreams are considered "totally different" is that they often seem to have a powerful feeling of reality – a feeling that we are "right there"- which our thoughts and daydreams lack. Nightmares especially are felt as very real: we wake up with hearts pounding, etc. I agree that this is definitely a sensation found in most (though not all) dreams. We are totally involved in whatever scene we are experiencing and we are not aware that we are in bed sleeping (though this is not true in lucid dreams – to be discussed below under "voluntary control"). The sense of reality occurs especially in dreams from REM sleep, and may be related to the

biology of REM sleep.). But even this sense of reality is by no means unique to dreams. In one study, people described daydreams that they considered just as "real" as their night dreams. A number of the participants, who had many nightmares at night, also described having "daymares" -- daydreams that became totally real and very frightening (Hartmann, 1984).

Here is an example of a daydream that felt very real and very frightening, from the study of dreams and daydreams mentioned above (Kunzendorf et al., 1997):

> *Me and two of my friends were going to a Halloween party. We were almost there when we looked back and noticed that someone had been following us. It was a tall, dark, hairy, rounded figure with wings. It ate us!*

Likewise hypnagogic imagery as we are falling asleep often feels totally real Foulkes and Vogel, 1965). And of course there are special states that feel totally real, such as hallucinations related to drugs, unusual medical conditions, or mental illness.

4) For some, our poor memory of our dreams appears very striking, apparently making dreaming totally different from our other mental processes. Indeed it is very common for us to have a long, detailed dream, and then to totally forget it within a few minutes of waking, unless we write it down or take some other step to make sure we remember. Again there is a brain biology that underlies the difficulty in remembering, most likely related to different regions of cortical activation, and the lack of neurotransmitters, especially norepinephrine at the cortex. However, this forgetting is not true of all dreams. A powerful "big" dream may be remember3ed for many years. We have found in recent studies that almost all college students remember at least one dream from childhood, usually from age 6 to 8 (Hartmann & Kunzendorf, 2005-06).

And again, this ease of forgetting does not distinguish dreams from much of our other mental activity. We are actually quite good at forgetting! There is no question that our memory is good when we are dealing with a focused waking activity which we have labeled as important — a meeting with a significant person, a detailed

plan of action, a solution to a serious problem, etc. But what of our memory of bits of daydreams and fantasies? Do we remember much of the images that were going through our minds while brushing our teeth this morning? Or fleeting daydreams while lying in bed awake last night? The data suggest that memory for such waking imagery, which has not been labeled as important, is just as poor as it is for dreams (Klinger, 1990; Singer, 1993). Again, my conclusion is that dreams are certainly forgotten more easily than focused waking thoughts, but there's a lot of overlap between dreaming and daydreaming/fantasy/reverie.

5) Then there is the lack of voluntary control in dreams, which for many is the main reason for calling dreams "totally different." Things just seem to happen, completely out of our control. A typical dream is one of the times when we appear to have no free will, as I discussed in detail in a paper long ago (Hartmann, 1966). But again this lack of control is not unique to dreams and it is not always found in dreams. As we noted above, many people with frequent nightmares also reported frightening daydreams and several of them spontaneously called these experiences "daymares." They would say something like, "I was having an ordinary nice daydream, but them it gradually became scarier and it ran away with me. I couldn't stop it" (Hartmann, 1984). These daymares obviously have the scary and out-of-control characteristics of the dreams we know as nightmares.

Furthermore, control is not totally lacking in dreams. A great many people -- over 25 percent by some estimates -- experience lucid dreams -- dreams in which they know they are dreaming. Sometimes people wake up quickly after such realization, but some are able to continue dreaming. Good lucid dreamers are proud of their ability to remain in a dream and to control the dream to a great extent without waking up. Thus if they are having a nightmare, they will realize they are dreaming and then be able to run away from the monster if a monster is chasing them, or simply destroy the monster, or tame the monster and have a dialogue with it. They tell themselves that since they are dreaming they can fly, and then proceed to fly off to visit far-off places or people, or visit dead relatives and have conversations with them (Gackenbach, 1991; LaBerge, 1985). In these situations, even though the dream is

continuing, and REM sleep is continuing (LaBerge, Levitan, & Dement, 1986), the lack of control is no longer present. (This may be related to the admixture of waking brain activity with the REM activity (Voss, Holzmann, Tuin, & Hobson, 2009). The person is able to control the activity and does have a certain measure of free will. This control in dreams varies a great deal and there is a whole paper called "How lucid are lucid dreams" (Barrett, 1992) which finds a wide range of ability to control the dream. Overall, I'd say that a lack of control in dreams certainly characterizes most dreams, but it is not invariable, nor is lack of control restricted to dreams.

It is also relevant to our discussion to note that a lucid dream – especially one in which the dreamer is in control – may begin to resemble a daydream, in which one is usually more in control. I have spoken with some frequent lucid dreamers who dislike this analogy, claiming that their lucid dreams feel very different, subjectively, from their daydreams. However, my impression is that these were people whose daydreams were not very vivid or powerful. Others disagree with them. I spoke to one very well-known lucid dreamer, Peter Worsley in England, who has written about his many years of experiencing lucid dreaming (1988). He apparently experiences vivid daydreams too and he told me that he sometimes lies in bed awake and purposely goes into a vivid daydream, which then sometimes becomes a lucid dream. For him the distance between lucid dreams and vivid daydreams is small, and the distinction not always clear.

6) Finally the fact of sleep makes some people certain that dreams are "totally different." After all, Aristotle's original definition of dreaming was simply "mental activity during sleep." Usually they are talking about the contrast between the world of a vivid dream and the world they awaken into. It's a whole different setting, different characters, etc, etc. But again I have to point out that this sense is extremely clear only when we've had a dream that's very vivid, perceptual, "real." It's much less clear when we awaken from a more thought-like or fantasy-like dream, or a dreamlike state in which we're not sure we were really dreaming. And again, those who have very vivid, "real" daydreams, such as those with "daymares," describe a sense of

coming out of it or jerking themselves back into reality that sounds not so different from waking up from a dream.

In recent years, based on biological research on REM and non-REM sleep (NREM) some have considered dreaming "totally different" because most dreaming occurs in a separate biological state (REM sleep). This is not persuasive. Our most typical dreams do indeed arise from REM sleep, but this does not mean that the dream itself need be "totally different." I have spent years studying sleep and I certainly agree that REM sleep is an entire organismic state, with clear biological differences from NREM sleep, and from waking, throughout the body (Hartmann, 1965; Jouvet, 1962a; Snyder, 1965). REM-sleep and waking are relatively active states, throughout the body, whereas NREM-sleep is relatively inactive. REM sleep activation at the cortex produces the cortical activity patterns that underlie typical dreaming. However, it is gradually becoming clear that the same or similar patterns of cortical activity can occur at times without REM-sleep. Some very dreamlike and bizarre material can arise from awakenings at sleep onset (Foulkes & Vogel, 1965) or in NREM sleep (Foulkes, 1966; Suzuki et al., 2004), and conversely, some REM awakenings result in quite thought-like reports (Foulkes, 1966).

Also, work by Solms (1997) and by Yu (2006) demonstrates that in patients who have experienced various types of brain damage, those with damage to certain cortical areas report that they have completely stopped dreaming since their stroke or other brain event. Yet they continue to have REM-sleep as before. It is the cortical activity pattern, not the fact of REM-sleep that underlies dreaming. So I believe that the usual occurrence of dreams in REM-sleep cannot convince us that the dream itself is totally separable from other forms of mental activity.

Brain imaging studies are beginning to reveal a continuum of cortical activation patterns which underlie the continuum of mental functioning we have suggested. Concentrating on the frontal lobes, for instance, focused waking thought involves strong activation especially of the Dorsolateral Prefrontal Cortex (DLPFC). Different areas in the DLPFC are activated for different focused waking tasks. Fantasy

or daydreaming involves reduced activation of DLPFC and more activation elsewhere, including the ventro-mesial portions of the frontal lobes [the "default pattern" (Buckner, Andrews-Hanna, & Schacter, 2008)], while REM-sleep involves almost total deactivation of DLPFC and even more ventro-mesial activation. (In addition to these changes in regions of activation, I believe new techniques such as magnetoencephalography (MEG) will soon reveal a continuum in spread of activation involving cortex and subcortical areas. Most likely, tightly channeled activation underlies focused waking thought, while greater spread of activation in various patterns underlies fantasy, daydreaming, reverie, and dreaming.)

Thus none of the reasons for considering dreams "totally different" (the meteorite view) are persuasive. I believe it is more useful to consider dreaming as part of a continuum (figs 1 and 2). Certainly, dreams are different from waking thought in many ways, but there is a great deal of overlap between adjacent forms of mental functioning. Dreams are not totally different from reverie or daydreams, which in turn are not so different from fantasy or loose waking thought. This should not prevent us, and it does not prevent me, from being awed and impressed by an occasional amazing dream. There is no question that we sometimes have striking images, important insights and occasionally make new discoveries in dreams. However, we know that such things can also occur in reveries and daydreams.

Bodies of Research supporting the continuum of mental functioning

I have reviewed above the reasons that we sometimes consider dreams "totally different" and for each reason we have noted that there is considerable overlap between the parts of the continuum. I have mentioned under each "reason" the relevant research studies, which clearly favors the continuum view. In addition, there are several large bodies of research supporting the continuum and the finding of overlap between dreaming and states such as daydreaming and reverie.

Domhoff and his collaborators, in numerous studies (reviewed in Domhoff 1996, 2003), provide evidence that dreaming is in many ways continuous with waking fantasy and daydreams. They find, in long dream series, that a person's dreaming concerns and interests are identical or very similar to the same persons' waking concerns and interests. They also find that there is more continuity between dreaming and waking fantasy than between dreaming and waking behavior (Domhoff, 2007). Similarly, Schredl has shown in several studies that a person's dreaming concerns are very similar to the same person's waking concerns (2007).

My collaborators and I demonstrated that under the influence of emotion, daydreams can become extremely dreamlike (Kunzendorf, Hartmann, Thomas, & Berensen, 1999-2000). A group of students was asked to write down a recent dream, a recent daydream, a daydream that developed over five minutes, sitting in class, awake, and also a daydream that developed (in class) while they experienced a strong emotion. On a blind basis, Judges scored the last condition (daydreams under emotion) to be just as dreamlike and just as bizarre as the students' recent dreams. Other studies showed similar effects (Hartmann et al 2002-03), consistent with the increasing effects of emotion as we move towards dreaming on the continuum (Hartmann 2000, 2010a).

These same conclusions about overlap between daydreams and dreams come from studies that start with daydreams rather than dreams. Eric Klinger, who spent much of his professional life studying daydreams and fantasy, has written an entire book on daydreaming. His conclusions, after reviewing many detailed studies of daydreams, are very similar to what I have suggested above.

> *The style in which we daydream, which reflects our individuality as daydreamers, extends to the style in which we dream at night. True, dreams are on average looser, wilder, and more vivid. And during most dreams— excepting only the occasional "lucid" dream when we know we are dreaming –we become totally immersed, and the dream feels like reality. Yet daydreams sometimes take on*

> *some of that feeling of reality as well. This makes the conclusion that dreams are on a continuum with night dreams, rather than sharply different phenomena, hard to dodge (Klinger 1990, p. 64).*

Jerome Singer (1988, 1993) has for many yeas studied ongoing conscious activity in normal individuals engaged in dull monitoring tasks. He summarizes his results:

> *I have found that samples of ongoing conscious thought of normal individuals include many of the metaphors or symbols that are also reported by them in recounting subsequent night dreams, i.e. the ongoing consciousness is already laying the groundwork for what seem to be the strange or creative settings of the night dream" (Singer, 1993, p. 107).*

Our investigations of personality and dreaming are also relevant. A number of studies have demonstrate that people characterized by "thin boundaries" not only remember more dreams, but have more emotional, vivid, complex dreams (Hartmann, Elkin, & Garg 1991; Hartmann & Kunzendorf, 2006-07; Hartmann, Rosen, & Rand, 1998; Schredl, Kleinferchner, & Gell, 1996). As has we have noted above, people with thin boundaries appear to be functioning further to the right on the continuum (Fig 1), and they are more comfortable towards the right end of the continuum. Their thoughts are looser, their daydreams are more dream-like and their dreams are even more vivid, emotional, complex, and "dream-like" compared to those with thicker boundaries. These results fit well with the continuum ("gemstone") view. The pure "meteorite" view would suggest that these alien stones or messages would fall equally on the heads of the thick and the thin.

Further evidence comes from studies of the development of dreaming. Foulkes and his collaborators have shown that the ability to dream develops in childhood at age 4 – 10 concomitantly with the ability for waking visuo-spatial thinking (Foulkes, 1982; Foulkes 1999; Foulkes, Hollifield, Bradley, Terry, & Sullivan, 1991). Strikingly, the children, who have better developed visuo-spatial abilities, also have better developed dreaming. Daydreaming involves the same or similar visuo-spatial abilities

and Foulkes believes that the development of daydreaming shows the same pattern as the development of dreaming, though he has not studied daydreaming as thoroughly (Foulkes, 2009, personal communication). Again, this is very consistent with the view that dreaming, and daydreaming, are part of a continuum of mental functioning.

Finally there is evidence from studies of brain lesions showing that roughly the same regions and pathways are involved in visual dreaming and in visual waking processes such as fantasy and daydreaming. Mark Solms, reviewing the world's literature on the rare cases in which a brain lesion resulted in cessation of visual dreaming, says: "The most robust finding was the observation that cessation or restriction of visual dream imagery is invariably associated with a precisely analogous deficit in waking imagery" (Solms, 1997, p. 131).

In my opinion, even the therapists and dreamworkers who often speak in "meteorite" terms about dreams coming from a "sacred place" implicitly accept that there is some overlap between dreaming and other forms of mental functioning. In their clinical work with dreams, they are almost invariably willing to work with a fragment of fantasy or daydream in someone who does not readily remember dreams. This usually leads to important underlying emotional material similar to what happens to when a dream is used. The implication clearly is that there is no all-or-none difference: the dream may be the "royal road to the unconscious," but there are many highways and byways that reach the same place.

For all these reasons I think it is useful to consider dreaming to be one form of mental functioning (and cerebral cortical functioning): one end of a continuum with thought, reverie, fantasy, daydreaming. I am not in the least claiming that dreaming is similar to waking thought -- they are opposite ends of the continuum. However, I am noting that there is a lot of overlap between the various forms of mental functioning.

We can certainly consider dreaming to be an important and very special part of the continuum. In fact, I have discussed elsewhere ways in which dreaming may be considered the most creative or artistic part of our mental functioning (Hartmann, 2007, 2010a) but it is not something that can be separated entirely from the rest of

our mental activity. I do not mean to insist that there is must be one continuum using precisely the terms appearing in Figure 1. We could say that there are several related continua rather than one continuum and I have no objection to this. In fact Figure 2 shows several continua which run more or less together as we move from focused-waking thought to dreaming.

My main point is that dreaming cannot be neatly separated from the rest of our mental activity. It is a stone of the earth, rather than a meteorite from a far-off world. Looking at dreams in this way can solve or simplify a number of controversies about dreaming, and lead to new forms of research and practice.

Thinking In Terms of the Continuum (Gemstone Viewpoint) Can Solve or simplify a Number of Controversies:

Was it a dream or a daydream? As we know, dreaming has played a role in any number of new ideas in the arts and sciences (for a review see Barrett, 2001). In some of the most famous cases, such as Kekule's discoverey of the structure of the benzene molecule, there is a great deal of debate as to whether the crucial insight occurred in a dream, during sleep, or rather in a waking fantasy or daydream (Strunz, 1993). Kekule claimed it was a dream that just "came to him," while others suggested that he made the discovery while awake in a reverie or loose-thinking mode, and thus, may have been more aware of related work by other scientists, etc. This is an important distinction if one thinks of dreams as meteorites from an alien world, but if we think in terms of a continuum (gemstone view) it makes little difference.

Are dreams meaningful or meaningless? A number of scientists over the years have taken the position that basically dreams are meaningless – and that those who insist on finding meaning in dreams are projecting their own meanings onto the dream, just as we do when looking at an inkblot on the Rorschach test. This position implies the meteorite view, which allows one to make an absolute separation between dreaming and the rest of mental functioning. One can then call dreams meaningless

while maintaining the obvious meaningfulness of thinking, looser thinking, and, fantasy. However, if we accept the continuum viewpoint, dreams are definitely meaningful. If we wish to consider fantasy, daydreaming and reverie meaningful, then we must consider dreaming meaningful too. Of course we need not consider dreams meaningful in exactly the same way as we consider focused thoughts meaningful. Dreams may be meaningful more in the way a creative reverie or a work of art is meaningful.

Along these lines, I want to emphasize that "meaningful" is not simply an abstract term. Dreams can be meaningful and useful to us in practical ways. Some hardheaded types claim that dreams are just too illogical or bizarre to be worth our attention. Personally, I find such a view bizarre! It may make some sense if one takes the meteorite position: dreams are bizarre and crazy, but the rest of mental life is normal and studiable. Thinking in terms of a continuum, this position is untenable. The hardheaded view, within the continuum, would imply that we should attend only to our most logical, straightforward linear thoughts and discard the right side of the continuum entirely. This would mean paying no attention to creative reverie or to the arts. Art is seldom linear and logical, it has no immediate use, and new art is often called "illogical," "far-out," or "bizarre." This view would deprive us of some of the most intriguing, creative portions of ourselves. I also believe that such a view belittles art, considering it as purely decoration or entertainment, rather than an integral part of our world.

Why not let our minds help us in whatever part of the continuum they happen to be functioning? Why neglect the entire daydreaming/dreaming end of the continuum? Never examining one's dreams is depriving us of a potentially important aspect of ourselves. I am certainly not arguing that we should use only our dreaming minds or that we should substitute our dream ideas for our waking ideas. (That would truly be bizarre!) I believe we can obtain new insights or ideas in dreams as well as in daydreams and reveries, but we must of course check out these ideas in our very different focused waking mode of functioning. Why not make use of everything we have?

Do all dreams come in the service of the good? Or of wholeness? (and similar statements)(For instance Taylor, 1983, p.138) Statements such as these are frequently made by dream therapists and dream workers. Since there is so much overlap between the states of mental functioning -- then if the statement is true of dreams, it must be true of reveries, fantasies, loose thoughts etc. too. In that case everything comes in the service of the good, or of wholeness, which is simply stating that we all have a potential for wholeness, or that we are all basically good. This statement, and similar ones, cannot be taken seriously as statements about the origin or provenance of dreams. However, I would agree that such beliefs or sentiments can often be useful in therapy or dreamwork. They provide a sense of hopefulness: we can start with any dream, no matter how sad or frightening, and find something to work on which will lead to wholeness (or good).

Implications for research

I will not discuss details of research studies here, but indicate some general guidelines. Overall, the continuum view suggests that research should focus less on the detailed analysis of "a dream," and rather examine psychological and biological functioning across the processes we have discussed -- dreaming, daydreaming, reverie et In fact I have cited in previous sections some psychological studies that have initiated such work.

Biological studies can fit well into this framework too. I hope it is clear that when we speak of the various states of mental functioning, we are speaking basically of activated states of the cortex (though always including subcortical connections). We can begin to study the various patterns of cortical activation that underlie the various states of mental functioning such as focused thought, looser thought, reverie, dreaming. We would expect to find a continuum of cortical activation patterns underlying the continuum of mental states, rather than a "totally different" cortical pattern underlying dreaming. In fact brain imaging studies are beginning to support such a continuum, as discussed a few pages back when we examined REM sleep.

Shall we study a dream, or study dreaming? Our discussion is relevant to a very important research question: shall we study "the dream" or study the process of dreaming? The meteorite position leads directly to the study of "a dream." A meteorite is a well-demarcated entity, separable from its surroundings, from an alien place, and examining it in great detail will give us hints about that place. However, the continuum (or gemstone) view casts doubt on this. As we have seen, a dream is not totally different from a reverie or a daydream. Furthermore, dreaming often does not arrive in clearly demarcated chunks. Many of us, including myself, often wake up with a lot of dream material, but are quite unsure whether we had three dreams or one dream in three parts. And a dream often does not have a clear-cut beginning and end. Some dramatic dreams such as nightmares do have a clear-cut ending point when the dreamer wakes up, but the beginning of the dream is often foggy or unclear.

Thus, the continuum view suggests that we study the process of dreaming, perhaps relating it to processes of reverie, daydreaming, etc. It suggests that we not be overly concerned with data such as the number of words in a dream or the number of characters in a dream. Note that we seldom spend time worrying about how many words there are in a reverie or a fantasy or an interesting thought.

Continuity or Compensation? Some dream researchers have tried to organize work on dreams in terms of two competing theories: one called "continuity" -- suggesting that dreams are basically continuous with waking life, involving the same people and concerns as waking life -- and the other called "compensation" suggesting that our dreams "compensate", by bringing up what was omitted or avoided in waking.

The idea of compensation derives from the work of C. J. Jung. Based on his clinical work, he suggested that portions of the personality which are kept out of consciousness during waking emerge during dreams. This suggestion by Jung is actually not very different from Freud's writing on repression, and his view that material repressed during waking emerges in dreams.

The continuum view ("gemstone") certainly appears to favor the continuity view. And there is a great deal of research supporting continuity in many senses. Content Analysis studies provide strong evidence for continuity between waking and dreaming life (Domhoff, 1996). Over a period of time, the characters that occur in dreams are closely related to the characters in the dreamer's life, as are the settings, the successes, and the failures that occur.

In these senses the presence of "continuity" has certainly been confirmed. However, in my view the "continuity vs. compensation" debate is not a useful way to look at things. The presence of continuity does not rule out compensation. I believe that, "compensation" in Jung's sense, certainly can occur as well, though this is not as easy to study.

In one sense, the broader thinking and making of connections that characterize the dreaming end of the continuum can be thought of as compensating for the limited directed functioning of waking thought in which material is kept in separate compartments. For instance I have heard from six different women by now a dream of "Jim" (a boyfriend) turning into Father. I did not try to "analyze" but simply listened. In each case the woman went on to say " And when I woke up, I realized that Jim was indeed like my father (and each woman gave numerous details of the similarity) but, you know something amazing: I never noticed this obvious similarity until I had the dream." It seems that in our focused waking mode, "Jim" and Father are kept in separate compartments or channels, but are bought together in dreaming.

Furthermore, I would certainly agree with Jung and Freud – in fact I think we would all agree – that we sometimes avoid (suppress or repress) certain things while we are awake and "in control." It is not surprising that in dreaming, when our connections are broader or looser, these ideas may be touched on more easily, so that material, hidden or repressed in waking, may emerge. This is certainly a form of "compensation." It does not necessarily involve deep-seated problems from childhood. As a simple example, I several times was supposed to give a lecture about which I was not very enthusiastic. I managed to avoid thinking about it, and did not

prepare for it until almost too late. A dream then showed me the scene and the people involved and thus reminded me not to push it away any longer. Obviously the thoughts about the lecture were there in my mind, and not very deeply repressed. Dreaming compensated for my waking avoidance.

In these simple senses compensation is obviously present, in addition to continuity. And clinical experience suggests the presence of some deeper form of "compensation" as well -- the emergence of repressed sexual and aggressive material (Freud) or the emergence of a suppressed part of the entire personality (Jung) – though it's hard to prove this. My conclusion is that continuity is clearly present, in many senses, but compensation occurs as well.

Since we have established that there is a great deal of overlap between daydreams and dreams, we can consider continuity vs. compensation in daydreams. Again I do not find the dichotomy useful. Both are obviously present. In the very simplest case, for instance when we are extremely hungry, we know that our daydreams will involve finding food, eating a meal, perhaps a banquet. The concern pictured (hunger) is obviously continuous with our waking concern, yet we can also say that we are compensating for our waking hungry state by our daydreaming of eating. Daydreams of sex when we are sexually deprived can be considered in the same way. So in daydreaming, as well as dreaming, continuity and compensation are both present.

Functions of dreaming, and functions of the continuum

Considering dreaming as one end of the focused-waking-to-dreaming continuum can also clarify the question of function. There are a lot of hypotheses, but little agreement on possible functions of dreaming. I believe that dreaming has a specific function in integrating new material with existing memory stores (Hartmann, 1998/ 2001, 2007, 2010a), but I will not discuss this in detail here. Others have argues that dreaming probably has no specific function (Flanagan, 2000; Domhoff,

2003). But in either case -- whether or not dreaming itself has a specific function -- it seems obvious that the entire continuum has an adaptive function. It is useful for us to be able to think in a focused manner at times, and at other times to daydream or to dream. The broad, loose connections of dreaming, and of reverie, can provide a different perspective and can help us make important decisions and discoveries.

This seems difficult to prove or even to approach experimentally, but it appears to me to need no proof. It seems self-evident. As we think of human beings engaged in their usual activities (now or in ancestral times), focused-waking-thought is obviously adaptive. It is important and functional for us to be able to think directly and clearly, to accomplish a task, to make and to carry out plans for the future. When we are hunting, tracking an animal, we need to focus narrowly on the task. When we are in the outfield, trying to catch a fly ball, we turn our minds/brains insofar as possible into navigational machines to observe and calculate the ball's trajectory, and move in exactly the right way to meet it. We try not to let our emotional concerns or our daydreams influence us while we are engaged in this pursuit. There may be stunningly beautiful cloud formations above us, or a distant storm approaching. A close friend may be in the hospital. But, it is important, and functional, for us to maintain our narrow focus and not be distracted. We do not want to think broadly or loosely. Similarly when we are balancing a checkbook or doing some kind of math problem, we want to focus directly and totally on the task for a time, with as little distraction as possible.

However, focused waking thought is not what we need all the time. It sometimes gets us into a channel or a rut. ("Jim" is in one channel, Father in another.) Our thinking is stuck and can't make the connections and broad leaps sometimes required. This is where daydreaming, reverie and dreaming are useful. A large number of creative thinkers, in science as well as art, have emphasized the importance of daydreaming and fantasy in their creative work, and some have claimed that their discoveries came directly from their dreams. The broad views and imaginative leaps occurring in reverie and dreams must have been useful to our

ancestors too in developing new tools, new hunting and agricultural techniques, and new forms of social and interaction and organization.

Implications for working with dreams

I believe that accepting dreams as part of a continuum of mental functioning (the gemstone view) leads to a number of important changes in the way we work with dreams in therapy, in dreamwork, and in understanding our own dreams. The dominant version of the meteorite position, as developed by Freud and accepted by most psychoanalysts and many therapists, is that the dream is written in a foreign language, which needs to be translated. We all love the image of the Rosetta Stone (I'm sorry, dear reader, to be introducing still another stone.) which provided the same text in hieroglyphics and in two known languages, and allowed scholars finally to understand the language of hieroglyphics). The techniques of psychoanalysis, including the use of free association, and knowledge of the "dream-work" is considered the Rosetta Stone which allows the analyst to translate the dream (called the "manifest dream"), written in its strange dream language, into the underlying thoughts (called the "latent dream" or "latent dream thoughts") written in our everyday language. Once one has made this translation, one understands the dream, and the original manifest dream can more or less be discarded.

Overall, the continuum (gemstone) position is that the dream is not written in a foreign language that needs to be translated. Rather it is one end of a continuum, not entirely separable from daydreaming and reverie, though usually more connective, more "far-out," more creative. In working with a dream, one can sometimes see meaningful new connections, and one can discover underlying emotions, but one cannot completely translate or completely understand a dream. The dream is a creative product, somewhat like a work of art. One can no more substitute the underlying thoughts and concerns (the "latent" dream) for the dream, than one can substitute a critic's explanation of a work of art for the work itself.

The continuum view leads to a number of specific recommendations for work with dreams, which I will discuss briefly here.

For therapists: feel free to work on a dream, as you work on other material. Don't be scared that dream interpretation is a whole separate difficult field. Many therapists, of various orientations, generally psychodynamic, have told me that they don't work at all with their patients' or clients' dreams. They say something like: "I just don't know where to start. I've never had training in dream interpretation. It's a whole separate discipline, isn't it?"

I'd say no, working on dreams does not have to be considered a separate discipline. Certainly it's useful to know something about Freudian dream interpretation using free association, and Jungian work using amplification and active imagination, and other techniques as well. However, you don't have be an expert dream interpreter of any school, and you don't have to treat dreams as totally separate from other material the patient brings up. In fact competent therapists, whether trained as Freudians, Jungians, or in other schools, generally deal with a reverie or fantasy, or a bit of a daydream the same way they deal with dreams. Even those who love working with dreams and consider it a "specialty" will usually be very happy to start with a daydeam or fantasy if the patient does not remember a dream. So if you feel comfortable in your therapeutic work generally, and have no trouble helping a patient or client understand and work with free associations, reveries, daydreams, flashes of memory, etc., I believe you should have no trouble working with dreams.

Where to start, when time is limited. (Start, usually with the Central Image.) Another reason many therapists don't work with dreams is that there's just not enough time. When time is limited, where do you begin? Strict Freudian analysis bypasses this question, since every element of a dream is analyzed -- free associations are sought to every single element of a dream. This of course is time-consuming. An analyst may spend several hours examining a single dream. Unfortunately, time does not usually allow for complete Freudian free association. In current practice, where a

patient is seen once per week or less, it seems impossible to even try to understand a dream. No matter how psychodynamic the therapist or how interested in dreams, there is just no time, since there's so much other important stuff going on in the patient's life. Besides, they tell me, "I just don't know where to start."

My suggestion is: when time is limited, start with the Central Image. This suggestion is based, not purely on the continuum view of dreaming, but on a great deal of work on the Central Image of the dream (Hartmann, 1998/2001; Hartmann, 1999; Hartmann, Rosen, Gazells, & Moulton, 1997; Hartmann, Rosen, & Grace 1998; Hartmann & Stickgold, 2000; Hartmann, & Zborowski, 2001). Emotion plays an increasingly important role in guiding our mental functioning as we move from focused thought to daydreaming, reverie, and dreaming; and the Central Image of the dream often pictures the underlying emotion.

Starting with the Central Image usually leads quickly to important underlying emotions. This is a good starting point but of course not an ending point. Becoming aware of important underlying emotions is often only the beginning of understanding, but it is important and can quickly lead into significant new material, even when time is limited. And in fact two Jungian analysts, who heard me lecture on the Central Image, told me later that when they are choosing a part of a patient's dream to work on -- to "amplify" -- they almost always choose what I call the Central Image, though they had not previously used that term.

Of course this is only a general suggestion: every clinical situation is different and there are times when it might be dangerous to start with the Central Image and get to important emotional material too quickly. In such a situation the therapist might choose to start with more peripheral parts of the dream.

Where to stop. With most dreams, one can stop after getting the Gist of the dream. Much of the time, it's enough to get what I call the Gist of the dream. This means first of all looking for new connections or discoveries made in the dream ("Hmm, Jim really is very much like my father," or " Yes, that new skating step might work; I'll try it out," or "That's it. A hole in the tip of the needle is just what the

sewing machine needs.") And then examining the Central Image to get at the underlying emotions or emotional concerns. This is sometimes easy, and leads to new material. Sometimes not. Sometimes all you can do is remember the dream (write it down!) and wait for further dreams, which may make the emotions and concerns clearer. Don't feel that you have to completely understand (translate) every dream. In my opinion, it can't be done. You don't have to stop there, of course. Some dreams, especially your own dreams, may seem important enough to keep working on for the rest of your life.

With a "big" dream, by all means go on. Just don't expect to ever be completely finished. Many of us have had dreams that seem especially important, memorable, significant, impactful -- in other words "big" dreams. This includes Freud, Jung, and most workers seriously interested in dreams including myself. I have shown that such "big" dreams are almost always characterized by a powerful Central Image (Hartmann 2008). Such a dream almost insists on being worked on, played with, examined. You can work on it in any number of ways, with or without a therapist. Sometimes the same "big" dream will speak to you in very different ways at different times of your life. But, following the continuum view, remember that this dream is not a meteorite, and not written in a foreign language that needs a complete translation. It is a part of you, and it comes from the most connective and creative part of your continuum. You cannot completely understand it, but you can admire it, and perhaps learn from it.

In summary, the continuum view leads to new avenues of research and to new approaches to working with dreams -- your own, or a patient's. Overall, since a dream is not an alien intrusion, and not written in a foreign language, it cannot be translated, and in my view cannot be completely understood. And, though a dream cannot be completely understood, it may remain with us, and be valuable in a number of ways. A dream comes from the most creative part of our continuum of functioning. As I have discussed in detail elsewhere (Hartmann 2010b), a dream is always a creation, never simply a replay (even in "repetitive dreams and post-traumatic dreams, where we sometimes believe the dream is simply replaying something.). A "big" dream is a

creation, not unlike a work of art. I remember several "big" dreams from many years ago that have helped me explore myself, helped me write some papers, and helped me in other ways. But I have never completely understood them. A gemstone cannot be dissected. It cannot be translated. It cannot be totally understood. But it gleams! It has facets that reflect the world around it, sometimes in new and unexpected ways.

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