

## David Taylor

### The re-awakening of psychoanalytic theories of dreams and dreaming

In 1908, Henri Poincaré (1854-1912), the French mathematician and philosopher of science, gave a celebrated series of lectures at the Société de Psychologie in Paris. One of his lectures had as its principal subject the psychology of mathematical discovery. The interest of his observations endures. They were published later that same year as chapter three of his widely read *Science et Méthode*. It was immediately translated into English and has been reprinted as recently as 2001. Poincaré's observations are based upon his own experiences. They carry weight because Poincaré, a mathematical genius, was responsible for some of the most important mathematical discoveries of his age. They made possible many significant recent advances in modern science. The importance of his theory about what are now known as automorphic functions is equal to that of the calculus (Ayoub, 2004; Weisstein, 1999; Birkhoff, 1920).<sup>1</sup>

In his lecture, Poincaré took his discovery of these automorphic functions as a case study of the process of mathematical discovery. To him, it appeared to have three components. In the first, he would work at a theoretically important aspect of his problem for some days, but typically would fail to find the solution which he had sensed to be there. This work involved hard and detailed mental reasoning of a mathematical and logical kind. In the second stage, increasingly frustrated, he would give up on his work and abandon it for an entirely different pursuit – perhaps a holiday. Then suddenly after a few hours - or it might be days, weeks, or sometimes even months - *the* solution would come to him.

Thus he recalled, “I ... began to study arithmetical questions without any great apparent result, and without suspecting that they could have the least connection with my previous researches. Disgusted at my want of success, I went away to spend a few days at the seaside and thought of entirely different things. One day, as I was walking on the cliff, the idea came to me, again with the same characteristics of conciseness, suddenness and immediate certainty, that arithmetical transformations of indefinite ternary quadratic forms are identical with those of non-Euclidian geometry.”

Although he usually experienced a sense of certainty about the correctness of his intuition, Poincaré found that there was always a third stage. In this he felt a compulsion to check that his solution was correct. Sometimes this might take just a few hours.... “ I had all the elements, and had only to assemble and arrange them. Accordingly I composed my definitive treatise at a sitting and without any difficulty.” But equally it might take days or weeks of the same hard kind of mathematical deduction and analysis as had been necessary at the beginning.

Poincaré’s immediate sense of what was happening in his mind was that all three stages were necessary. He reasoned that unconscious or subliminal mental processes were as important as those that were conscious and more familiar. In the first stage, he considered that the creative mathematician was trying out all possible connections between the mathematical objects which might be involved. Although characteristically he fails to find *the* solution, he succeeds in loosening all the connections previously thought to exist. Graphically, Poincaré compared this to the way that the atoms which go to make up the molecules of a gas may under certain conditions become unhooked. He imagined the stage when he seemed not to be thinking about the problem at all as actually involving unconscious processes consisting of repeated attempts to recombine these free atoms. Only the combination which joins the mathematical objects together in a way that brings about order, coherence, and wholeness survives. Poincaré said that his immediate sense of the correctness of the solution was rarely misleading. It usually withstood the essential proof-testing of the third, final stage. However, he noted that when he had let himself become too absorbed by the supposed elegance of his solution, he was more likely to be wrong!

Poincaré’s observations seem to me highly relevant to the subject of this chapter, namely psychoanalytic clinical research in relation to its value in our understanding of dreams and dreaming. By psychoanalytic clinical research I mean that which relies solely on the use of the psychoanalytic method in the consulting room in order to make psychoanalytic observations. It uses no instruments or forms, yet is immensely valuable for making discoveries and for evaluating whether they are true or false. To some extent, dreaming is a special, rather difficult case. Can we show what

justification there is for claiming to know anything at all about the meaning and function of dreams, since it cannot be taken for granted that dreams have meaning at all? Within dream consciousness, we have no capacity to know directly “meaning” of the kind that we ordinarily possess in waking consciousness. We then need to set out and justify the methods and principles psychoanalysis uses to interpret the meaning or significance of a given dream. We also need to have something to say in general about the possible functions of dreaming, spelling out what is involved when these sorts of questions are addressed. My hope is that I will eventually convey a certain kind of attitude to psychoanalytic clinical research: a confident questioning, possessing a balance of certainty and uncertainty, with some sense of what is not yet understood.

Poincaré’s exceptional thinking brings vividly to life that sense of wonder, which he himself clearly possessed, at the quite remarkable intelligence of the mental operations involved in the unconscious processing needed to see beyond old formulas and to produce new ones. In Poincaré’s case, the objects of his unconscious thinking were mathematical. Intriguing to us as psychoanalysts is the possibility that there may be some overlap between this and the kind of unconscious functions involved when, as I describe later, an otherwise uncurious analysand produces through the vehicle of a dream a complex scene or visual metaphor with the capacity to illuminate what is otherwise a totally confused set of elements. But, in addition, Poincaré had some very interesting things to say about science in general. I want to apply some of his thinking to the kind of clinical research that has been responsible for the central core of psychoanalytic knowledge about dreams and dreaming.

As far as I am aware, Poincaré did not refer explicitly to unconscious processing occurring in sleep or through dreaming, but it is strongly implied in his account. Again, as far as I can tell, his thinking about unconscious processing was quite independent of Freud’s. It was not until 1920 that any of Freud’s writings were translated into French (Quinodoz, 2010). *The Interpretation of Dreams* was published in Leipzig and Vienna in late 1899. By 1906 only 351 copies had been sold. The first French translation was not published until 1926. It was only slowly over the succeeding twenty years that *The Interpretation of Dreams (IoD)* was to assume its position as a defining part of the “spirit of its age”.

In *The Interpretation of Dreams*, we find Freud proposing that everything conscious has an unconscious preliminary stage and that, “The unconscious is the true psychical reality.” Even at that time he considered that unconscious mental functioning was vastly more extensive than waking consciousness. He wrote, “[I]n its innermost nature it is as much unknown to us as the reality of the external world, and it is as incompletely presented by the data of consciousness as is the external world by the communications of our sense perceptions.” This remarkable conclusion came towards the end of *The Interpretation of Dreams*. Freud’s italics indicate that he wanted to leave his readers in no doubt about the limitations of the view offered by our waking consciousness. He was stressing the severe limits that exist on the certainty of our knowledge of both *internal* and *external* reality. Interestingly, Poincaré also thought that reality, *the thing itself*, could not be directly or exactly known by us. For Poincaré, science could only approach nature through successive approximations.

However, Freud’s conception of unconscious mental operations was more elaborate than Poincaré’s and included more intentionality. Freud based his first conception of the unconscious almost entirely on what he thought he had understood about dreams. Displacement, condensation, mobility of cathexes, absence of negation, of doubt, of degrees of certitude, indifference to reality, and exclusive wishful subordination to the principles of pleasure and unpleasure were all held to be characteristic not only of dreams but of unconscious mental functioning in general. Freud used these features to distinguish a fundamental dichotomy between what he called primary and secondary forms of mental processing. Although dreams permit the gratification of infantile wishes, this is only their secondary function. Their primary purpose is to preserve sleep. The inhibition of the systems of voluntary movement in relation to thoughts or impulses, which would otherwise lead to action, means that the intense scenarios of dreams can be hallucinated without being put into external action.

What then is the current status of this conception of the processes involved in the formation of dreams, and, more generally, of the way that unconscious processing works? And if these were to be supplanted, what better account do we now have available to us? These are questions which run through this volume. Here, I consider the changes in these original views based upon the accumulating knowledge derived from the psychoanalytic session itself. Inevitably, my account has had to be

compressed and selective. However, I will attempt to indicate a few of the many important points of contact with other bodies of empirical work. These bear upon the wider frame of knowledge within which psychoanalysts work. Finally, I will offer some speculative hypotheses derived from clinical work which might point to how empirical and clinical approaches to research might articulate with each other.

It seems fair to say that, almost from the very beginning, Freud and his collaborators realised that the founding theory provided an inadequate model for the range of the phenomena connected with dreams and the unconscious as these are encountered in the more ecological setting provided by the psychoanalytic session. We are familiar with the notion that in the analytic session the way that the patient uses the telling of the dream is often more important than its content. Again, almost from the beginning, it was clear that the method of free association was of limited value as an instrument of investigation in the clinical setting. But equally immediate to our theme is the non-trivial way that aggressive impulses, excessive arousal, anxiety, fear, and evidences of attempted problem solving form such large and meaningful parts of the manifest dream. Empirical research findings (see Palombo, 1978, 1984; Shredl, 2006; Kramer, 2007) are in line with these clinical observations. There are interesting issues here about the ways in which clinical thinking and empirical research develop. Do they do so interdependently or do they follow rather separate trajectories?

The status of Freud's original theory of dreams in relation to that of modern psychoanalysis is similar to that of Newtonian mechanics in relation to modern physics and astronomy. Newton's theory still works for aspects of celestial motion but not for the relativity of time and space, the origin of the universe, or at the quantum level generally. Freud's original theory of the formation of dreams and, by extension, of the nature of unconscious process, continues to offer a good fit for that limited part of the spectrum of psychoanalytic phenomena concerned with self-deception, hypocrisy, and to some extent the satisfaction of libidinal wishes, but not, I think, for others including Bion's influential idea that dreams have a role in the processing of different levels of thought and feeling.

Recently a number of authors, most notably Welsh (1994) and Blass (2001), have drawn our attention to the long period in which Freud's methods of justifying his

conclusions about dreaming were exempted from major critique from within psychoanalysis itself. In essence, Freud had argued that the meaning - the latent dream thoughts he hypothesised - could be indirectly, but nevertheless validly, reconstructed through the vehicle of free association. But these associations arise in waking consciousness. It could be counter-argued that we may be finding in dreams only what we already know or suspect. According to this view, the putative latent thought may be present in the waking consciousness of the dreamer, but may not necessarily be crucial to the formation of the dream. In general, Freud's argumentation in support of his free association method was sometimes *ad hoc* or tendentious. Blass in particular demonstrates that Freud's method does not really convincingly support his conclusions.

Perhaps it was an uneasy awareness of the existence of these problems which led to a dormancy, or at least to a partial suspension of a collective psychoanalytic critical faculty. This phenomenon might indicate the operation of some factors in common with those which possibly underlie the latency or dormant period which some of Poincaré's mathematical discoveries seemed to require. Perhaps, much as is the case with individuals, science also needs a latency period before a deferred rethink finally becomes possible, or the full significance of existing observations can be realised.

Before moving on from *The Interpretation of Dreams* we should note how many crucial ideas it contained in addition to the headline theory that dreams derive from wish fulfilment. In this respect, Blass also showed how many of the theses in *The Interpretation of Dreams* can be justified by a method of proof which takes into account the whole set of the data which bear upon them. These include the overarching notion that dreams *are* meaningful, as well as the work's observations about the distinctive contents of the mind that we specifically associate with a psychoanalytic view of the human psyche. They include Freud's hypothesis that the infantile level continues to be a highly active motive force within the mind throughout life, operating throughout our entire thinking as well as our dreaming; and that in naked, as well as in disguised ways, we continue to desire the exclusive possession of one parent or of their substitute, and wish to kill or displace the rival, or *their* substitute. These theorems about our most private thoughts and motives possess characteristics which are necessary if a truth is to be a distinctively psychoanalytic

truth. They must have the potential to upset the orthodoxy of the waking self. They must be able to stand outside taboos, including the incest taboo, and whatever other social or cultural norms that happen to be current at the time. This is partly why it would be mistaken to discard the classical theory of dreams and its method of free association.

To test the undiminished nature of the power of the classical theory, the reader is invited to follow for a few moments the haphazard line of any of his or her private thoughts, or to do the same with a recollected dream, and then to imagine how it would feel to be required to speak out loud these thoughts in a public gathering, even one of trusted friends. In this, as in so many things, we can still lean on Freud's valour. He risked revealing his dreams and private associations in order to communicate what he had understood about the universality of the devices of the unconscious part of the mind. One example came from what he called a relatively simple dream. In it there was a:

... company at table or table d'hôte ... spinach was being eaten ... Frau E. L. was sitting beside me; she was turning her whole attention to me and laid her hand on my knee in an intimate manner".... Freud continued, "I was struck by the contrast between my wife's behaviour at table and that of Frau E. L. ... my wife and me at the time at which I was secretly courting her.... The caress which she gave me under the table-cloth was her reply to a pressing love letter. In the dream, however, my wife was replaced by a comparative stranger —E. L. ... I was aware of intense and well-founded affective impulses [*as I associated*]... the thoughts themselves fell at once into logical chains ... I might draw closer together the threads in the material revealed by the analysis ... they converge upon a single nodal point, but considerations of a personal and not of a scientific nature prevent my doing so in public. I should be obliged to betray many things which had better remain my secret, for on my way to discovering the solution of the dream all kinds of things were revealed which I was unwilling to admit even to myself. (Freud, 1901)

Perhaps this has reminded the reader of his or her own version of the uncomfortable state of mind to which Freud's description refers. I want to speculate further that the uneasiness, identified above in relation to the tendentious quality of some of Freud's reasoning about dreams, may have also played some part in a more general tendency to inhibit the critical faculties which are needed for there to be rigour in psychoanalytic clinical research. It is dangerous to be thought to be casting the first stone.

Poincaré thought that to be a step towards a scientific theory a given description must enable the subject to go beyond *brute facts* to what he called *the soul of the fact*. By this he meant our understanding of the way that the thing in question works. Scientific or mathematical truth, while always an approximation, always aims to be as close an approximation as possible. In psychoanalysis, versions of Poincaré's three stages of discovery are also necessary. The first is hard disciplined clinical work, and here, as we know, there is often a sense of failure. However, it is only on the basis of this that, like the mathematician, the creative psychoanalytic clinician can proceed to the second phase – often after a break (such as that between sessions) in which he or she engages in unrelated activities - of valid intuitions about the phenomena with which he is dealing. We do not go very far without these. But such intuitive understanding then has to be tested by the production of an assessable and contestable line of observation and reasoning, in other words by a kind of proof with a form and content appropriate to the discipline of psychoanalysis. Finally, there is the testing of the predictions and the extrapolations which a scientific theory should make possible.

In this context, it is interesting to find, in a favourable review of Eissler's 1965 book *Medical Orthodoxy and the Future of Psycho-Analysis*, great frustration with the lack of encouragement given to these sorts of critical procedures in the course of psychoanalytic training. The reviewer, Wilfred Bion (1966), writes:

Eissler quotes a procedure adopted by Aichhorn, whose clinical acumen he praises highly, for watching strangers whom he is close to for a period with a view to forming a conjecture about their next act. As he describes it Aichhorn was playing a game not unlike that of a boy imitating Sherlock Holmes. He speaks of it with approval,



attributing to it some of Aichhorn's flair for understanding instantly and accurately the personality of the delinquents with whom he dealt. But he deprecates the possibility of making any parallel procedure part of a formal training course. But why not? I welcome the introduction into training of Baby Observation; I think it would be all the better for an injection of the good humour of the "Holmesian" technique. The baby should be observed with all the enthusiasm of Holmes on the track of a desperate criminal. Eissler pessimistically doubts the success of any approach, even Aichhorn's, to the delinquent. I suggest that the lack of success will continue so long as the investigation is carried out with a predisposition to see the object of the investigation as a "delinquent" no matter what his life may have been, and to do so with the humourless attitude which seems to be inseparable from having suffered a psycho-analytic training course.

For Bion's "baby" or "delinquent" we could equally well substitute "dream" or "clinical theory". Perhaps it is no coincidence that this more challenging, intellectually vigorous position is found in someone who was, by general consent, one of the most eminent of the small number of clinical researchers who have substantially advanced psychoanalytic thinking since Freud's day. A reading of Bion will find him developing a notion of prediction specific to the nature of psychoanalytic data. Thus the analyst's intuition should be based upon early, barely noticeable signs of feeling in the patient, which nevertheless are observable in principle. This analytic form of clinical intuition is employed in a *predictive* way, to anticipate what is about to happen. Such an analytic hunch – which might well be based upon an element in a patient's dream - might suggest that the patient is on the verge of feeling something mentally painful. But should the analyst describe only what is already fully formed, he/she will be simply stating the obvious - or in Poincaré's terms, stating only *brute facts*.

In the 111 years since Freud's first account, the accumulation of our knowledge of the transference/countertransference relationship, and the discovery of the power and function of projective identification, mean that clinically we now have sources of information which were not available when Freud began. These developments,

including a number of Freud's own, have meant that our ideas about the nature of dreams have changed. To illustrate something of this change, I use a clinical vignette to show the theory of dreaming that I find myself using, and of my approach to intuition in the clinical setting and to its proper evidencing. The clinical material is disguised while preserving the essentials. The patient is one who rarely brought dreams.

When about fourteen years ago E began his analysis, he was a 22-year-old student of mathematics finding it very difficult to work. This was getting him into trouble. He happened to belong to one of the wealthiest families in the UK. Generally, his beautiful mother seems to have sustained little interest in her children. She would dip in and out of any engagement with E in a seductive way. When he was 14-months-old she went away for six months leaving him to be looked after by a succession of nannies. Some of them were disciplinarians and tended to use punishment. As E grew up his early promise was not realised. His intelligence disappeared from view. Perhaps it was consumed in his near-perfect capacities to disappoint, and waste time. He persisted with solutions connected with a central project of finding a girl, but their inevitable failure aroused no curiosity in him. In a sense, E was also a delinquent because he subverted the rules of academic or personal procedures, and provoked hostility and criticism while erasing from his mind any record of his subversiveness.

The following exchange occurred towards the end of a period of lassitude lasting many months.

**A:** It affects you as a lack of energy, but it is meant to create a deadly, and I think, violent fight between us.

**E:** I agree that what you say seems to fit. But I don't know it. All I know is that I just feel defeated every time I leave here ...

**A:** I think that just now you gave in to the temptation to defeat me. And of course it deals with other things ... [By this I meant the way that his inhabiting a world provoked by his complaints enabled him to

avoid more direct contact with many of his more subtle feelings of vulnerability.]

**E:** I get embarrassed at the thought that I might respond .... It's very strange, because I actually had a violent dream last night ... I don't feel violent ... Anyway ... *It was on a bus and people were getting off at the front. In fact that doesn't happen, people get off in the middle. There was this black woman with a round face trying to get off at the front and I found myself oppositional. I kept obstructing her. Every time she tried one way I would stop her [implying with increasing physicality]. Anyway some way or another she got off. I then noticed that it was my stop too and I thought that when I got off she might be there waiting for me and would attack me ...'*

**A:** I think you could remember this dream because you felt I wasn't getting caught up in feeling blocked by you and then attacking you. Your dream matches what has been going on here. In your dream you were wanting to block and trap the woman, but at least there *was* a woman in your dream. We don't know why she was black. But this is taking place at the front of the bus, presumably by the driver, a bit like your opposition to me earlier was intended to distract me as someone like a driver who might be trying to go somewhere.

**E:** (as if puzzled by a nonsensical remark) I don't understand what you mean. [It was now within a minute or two of the end of the session.]

**A:** If what I say doesn't make sense it offers the prospect of a disagreement. And as we are near the end of the session I think that you try to detain us with a disagreement.

Later, I thought that E's ability to have this dream seemed similar to a slight shift towards a more cooperative attitude he had shown a few days earlier. There was some insight into the captivity in which he and I, and indeed all his objects, were kept. This insight was matched by the dream's imagery. I used it to signify the way E had been acting in the session because I had had months of first-hand experience of the pull and push of his oppositional way of proceeding. This provided me with sure ground for my comments. I felt much more uncertain about the significance of the other elements in E's dream, most particularly the black woman with the round face. But the fact that

there was a woman in E's dream seemed in itself new. A couple of months later E began by saying:

**E:** Last night I went to my gym class .... I tried to stop getting angry with this woman who goes there. She insists on standing in front and blocking my view of myself in the mirror. She always does it.

**A:** I think you are trying to make me think that you are tempted to pick an argument because of your self-absorption [he has recently emphasised how often he becomes absorbed in looking at himself in the mirror] but I don't think this would be quite right. I think you are seeing if I will take this unsympathetic view of you. Then you could argue that I was blocking a proper view of you. I think that this is how when someone whom you might think is good and important to you isn't "in the way", you sidestep any need to know that you might have thought them good.

E seemed interested and although the session was nearing its end he could go on to say:

I have noticed that some people are more lively than me. For the last couple of months there's been this black woman who sometimes sits opposite me in the library. She's married and has got a child but although she's got troubles she just gets on with things.

### **Concluding comments**

How is this final sequence to be understood? When E mentioned the woman blocking his view of himself in the mirror I was put in mind of the dream of the blocking encounter with the black woman. Unresolved, this had stayed with me. I had the same immediate feeling of recognition when at the end of the session he spoke of "the black woman in the library". Such things may be attributed either to a long-extended kind of free association, or to an analyst's over-valued idea. However, neither of these explanations quite does justice to the reverberative qualities of what had passed backwards and forwards between the dream and the dreamer, between the analysand and the analyst, and between analysis and E's life over these days, months, and years.

My line of thought concerning my patient's dream was that it represented an exceptional moment in terms of his relationship with insight. My speculation is that

E's encounter with the "woman in the library" had led to two types of reaction: the first, a diffuse and unsymbolised arousal (the physiological reaction of fight/flight rather than sexual arousal); the second, an interest tinged with hope. This latter provided enough of a good internal object to allow him to sleep to a depth where he could dream. At this point, when there was just enough of an experience of a good object within E, it allowed him a wish that was effective internally, in that he could hallucinate and/or remember the "woman" who was the cause of his divided reaction. It even extended as far as an image of roundness.

How do these things happen? I will close with a wider, bolder speculation. A process such as this may take advantage of the fact that man's dominant sense is vision. The processing of visual experience is developmentally earlier, and is less subject to the kind of emotional difficulties that have to be managed in the developmental task of linking infantile affects with language and verbal thought. The visual images and scenarios that are generated through dreaming may offer the kind of relief associated with something's *having happened*, compared to the kind of anxiety which accompanies something which has *not happened*. As a consequence, and other things being equal, the primitive physiological reactions of fight/flight are dissipated or relieved on the one hand, and some symbolic thought generated on the other. These processes at the neuropsychological level may play a part in the developmentally crucial integration of visual and auditory forms of experience.

Today, there are several contenders to account for the function of dreaming. These include wish-fulfilment/sleep preservation, problem solving/information processing, selective mood regulation, memory, and some notion of "debugging". To proceed any further it is necessary to specify more precisely what we mean by these terms. Under the impact of new knowledge, and perhaps after a period of relative dormancy, our understanding of dreams and their function may be about to enter a new and productive period of unresolvedness. Much new knowledge will derive from neuroscience, semiotics, and cognitive science. It is also important we acknowledge the important work of researchers such as Ellman & Weinstein (1991), Holt (2009), Kramer (2007), Palombo (1978, 1984), Shredl (2006), Solms (1997), and Weisstein (1999), plus several others, whose empirical investigations have shown that the psychoanalytic view that dreaming has both intrinsic meaning and its own functional

importance is highly likely to be a correct one. In this chapter, I have argued that contestable psychoanalytic research in the clinical setting is equally vital if we are to peel back the layers to reveal the intimate connections that exist between dreams and our deeper selves and motives.

## References

- Ayoub, R. G. (2004). *Musings of the Masters: An Anthology of Mathematical Reflections*. Washington, DC: Mathematical Association of America, p. 88.
- Bion, W. R. (1966). Review of *Medical Orthodoxy and the Future of Psycho-Analysis*, by K. R. Eissler. *International Journal of Psychoanalysis*, 47: 575-579.
- Birkhoff, G. B. (1920). The work of Poincaré on automorphic functions. *American Mathematical Society*, 26(4): 164-172. Available at <http://projecteuclid.org/euclid.bams/1183425178>.
- Blass, R. (2001). The limitations of critical studies of the epistemology of Freud's dream theory and clinical implications: A response to Spence and Grünbaum. *Psychoanalysis and Contemporary Thought*, 24: 115-151.
- Ellman, S. J., & Weinstein, L. (1991). REM sleep and dream formation: A theoretical integration. In: S. J. Ellman & J. S. Antrobus (Eds.), *The Mind in Sleep: Psychology and Psychophysiology*. New York: Wiley.
- Freud, S. (1901). On Dreams. *S. E.*, 5. London: Hogarth, pp. 629-686.
- Holt, R. R. (2009). *Primary Process Thinking: Theory, Measurement & Research*. Lanham, MD: Jason Aronson, p. 153.
- Kramer, M. (2007). *The Dream Experience: A Systematic Exploration*. New York: Routledge.
- Palombo, S. R. (1978). The adaptive function of dreams. *Psychoanalysis and Contemporary Thought*, 1: 443-476.
- Palombo, S. R. (1984). Deconstructing the manifest dream. *Journal of the American Psychoanalytic Association*, 32: 405-420.

Poincaré, H. (1908). *Science et Méthode*. In: S. J. Gould (Ed.), *The Value of Science: Essential Writings of Henri Poincaré* (pp. 357-558). New York: Random House.

Quinodoz, J. M. (2010). How translations of Freud's writings have influenced French psychoanalytic thinking. *International Journal of Psychoanalysis*, 91: 695-716.

Shredl, M. (2006). Factors affecting the continuity between waking and dreaming: Emotional intensity and emotional tone of the waking-life event. *Sleep & Hypnosis*, 8: 1-5.

Solms, M. (1997). *The Neuropsychology of Dreams: A Clinical-anatomic Study*. Mahwah, NJ: Erlbaum.

Welsh, A. (1994). *Freud's Wishful Dream Book*. Princeton, NJ: Princeton University Press.

Weisstein, E. W. (1999). *The Poincaré-Fuchs-Klein Automorphic Function*. From MathWorld-Wolfram Web Resource, <http://mathworld.wolfram.com/Poincare-Fuchs-KleinAutomorphicFunction.html>.

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<sup>1</sup> In respect of automorphic functions, formerly known as Fuchsian functions, Poincaré used non-Euclidean geometry to develop the theory of the general transcendental automorphic function. Those

with mathematical knowledge might wish to consider 
$$f(z) = \frac{k}{(cz+d)^r} f\left(\frac{az+b}{cz+d}\right) \text{ where } I[z] > 0.$$
 See Weisstein, E.W. (1999) at <http://mathworld.wolfram.com/Poincare-Fuchs-KleinAutomorphicFunction.html> or Birkhoff, G. (1920) at <http://projecteuclid.org/euclid.bams/1183425178>