

Oneirology with Dr. G William Domhoff

Ologies Podcast

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Oh hey, it's your friend's fiancé who commits everything to spreadsheets, Alie Ward. We are back, it's the top of 2023. We're going to talk about hopes and dreams, but not hopes at all, just dreams, just dreams, all dreams. So, this episode is a dream, it was years in the making. This expert has been at the top of the dream research game for decades. I have waited through the pandemic until everyone was quadruple vaxxed and rapid tested, and also his new book just came out this fall. The timing was right. I went to Santa Cruz, a college town in this crunchy enclave on the California coast, where he has been a professor since 1965, and I walked around the misty, rainy, UC Santa Cruz campus until we spotted each other.

Alie: Are you in the white coat?... Ah, okay cool, I see you. I'll walk toward... *[laughs]*

And then ducked into the offices, said hello to his colleagues *[hellos and introductions]* and we posted up at his desk. And he has an affable smile, contagious warmth, and surprising humility for someone who is so celebrated in this field. He is a distinguished professor emeritus and research professor at the University of California Santa Cruz, and has written several books on dreaming including *The Scientific Study of Dreams*, and *The Emergence of Dreaming*, and his latest 2022 release, *The Neurocognitive Theory of Dreaming: The Where, How, When, What, and Why of Dreams*. This dude knows dreams; wrote the actual book on them.

And also, really quick before we ask him one million not-smart questions, thank you to everyone supporting for a dollar or more a month at Patreon.com/Ologies and submitting the questions for the show. Thanks to everyone for leaving reviews, I read them all, every week. And this week, Cam left one that said:

Do yourself a favor and listen to as many episodes as possible; even if they sound odd, like the one about flags.

Cam and everyone else, thank you.

And welcome to Oneirology. Oneirology? It's not easy to say but it's an established field stemming from the Greek word for dreams. And this man runs the research site DreamBank.net and has been privy to thousands of dream records, over decades of research. And he lets me ask him things like: What even is a dream? Why do we do it? Are dreams a wish that your heart makes? Are dreams ghosts? Are we smarter when we dream more? Why is sleep important and what does it all mean?

So, this week we'll arm you with the fundamental facts of dreaming, some brain basics and sleep trivia. And then we'll be back with him next week to answer so many Patreon questions explaining all the weird stuff that happens to us when we dream from nudity, to flying, to teeth dropping from their sockets; it's all good stuff. So, pull up the covers and open your ears for author, researcher, psychology and sociology professor, dream expert and oneirologist, Dr. G William Domhoff.

Dr. Domhoff: Bill Domhoff.

Aside: Pronouns he/him and title...

Alie: You're Dr. Domhoff, right?

Dr. Domhoff: Yeah, professor, I prefer. I tell my students Professor Domhoff, you can call me Bill or can call me Professor Domhoff.

Alie: Doc. Do people ever just call you Doc?

Dr. Domhoff: No.

Alie: No? Okay.

Dr. Domhoff: Willy, loud Willy, Geech, Billy George.

Alie: Now, I've got to ask first off, how much sleep do you get a night? Because I feel like you're more productive, and you look more well-rested than I do. [*both laugh*]

Dr. Domhoff: I probably get 8 to 9 hours of sleep a night.

Alie: Have you always been that way?

Dr. Domhoff: Yeah, I've always been a night owl that sleeps in. So, when I went to college, the first year they assign your courses and I had an 8 AM class, it was on botany. And I'd get in there and he'd start to show slides and I'd fall asleep and fall asleep. So, I never again took a class before 10 in the morning, and then when I became a professor, I never taught a class before 10 or 11; I much preferred late morning or afternoon. So, I really get rolling later at night and that was reinforced when I had young children, and so we'd get the kids to bed and then maybe 9:00, 9:30 I'd start in and go to 2:00 or 3:00. So, for some reason, that's when I think the best.

We do know from research that there are night owls and larks, and that people do... their circadian rhythm does differ. One of the things that I want to emphasize is that in every generalization I make, there are huge individual differences in people, huge individual differences. The processes are the same, but we still vary.

Aside: For more on those broad chronotypes like being an up-and-at-'em morning person versus a midnight cyber goblin, you can listen to the circadian rhythms episode, which is called Chronobiology; that's in the show notes. But wait, what is this one? Is it oneirology? I had to check.

Alie: Also, have you heard of the term oneirology?

Dr. Domhoff: Oneirology. Yes, definitely.

Alie: Yes, apparently that would be... You would be an oneirologist.

Dr. Domhoff: Yeah, that's the Greek word for it.

Alie: For dreaming.

Dr. Domhoff: Yeah. We don't use it much.

Alie: I know, I know.

Dr. Domhoff: We once used psychopompologist.

Alie: No! Really?

Dr. Domhoff: Carrier of souls to the underworld.

Alie: That's an even better ology. [*Dr. Domhoff laughs*] Am I allowed to use that?

Dr. Domhoff: That'd be an ology. You can call me a psychopompologist. They kind of took you over the river Styx.

Alie: Oh, love that.

Aside: Okay so, Professor Domhoff and his mentor were really the only ones to use the term psychopompologist, and I love it, but oneirology is the one you're going to hear more often in the literature. But, if you become an oneirologist though, and you want to spearhead an industry-wide change to psychopompology, hey, follow your dreams.

Alie: At any point during your dream research, have you ever had to watch people in the lab sleeping and dreaming? Has that ever been part of the research?

Dr. Domhoff: Just once, one or two nights, and I watched videos of it and certainly in the very early days...

Aside: And we're talking other people's studies from the late 1950s, early 1960s.

Dr. Domhoff: There were people that watched people sleep, and there's one especially great one looking at the influence of external stimuli on dreams, which is very minor in dreams, because dreams are an act of imagination and we're basically screening everything else out. But anyway, they taped these peoples' eyes open [*Alie gasps*] and they're in the bed and they fell asleep so they could watch their eye movements and they not only watch their eye movements, they wiggled a light around. [*Alie squirms*] No, it didn't faze them at all because all that kind of incoming input goes into kind of a terminal, the lower part of our brain, where the gates are down. In other words, when that is, we say, occluded, when it's excluded like do not enter, you're going no further. [*big thud of a gate closing*] So, those stimuli don't have any impact.

Alie: What about when it's waking you up? Like if you hear a cat meowing and meowing and in your dream there's a tiger after you or something, and you wake up and your cat is just hungry?

Dr. Domhoff: Well, it's possible but way more rare than people want to believe. Because we have this enormous need to think that we're somehow processing external stimuli, that our dreams are influenced by recent events. But when it happens, as one of my colleagues once said, the dream has a greater influence on the stimuli than the stimuli have on the dream. So, if you ring a bell, they're hearing a symphony, or you ring a bell, and they hear something entirely different. So, there's no real connection with the external world in dreams.

And when, to the degree there is, what happens is, and one of the ways people get confused about what's in a dream is that as we awaken, we're also having imagery, in that transition kind of period, you may still have imagery or thoughts. But in terms of what is a dream, those aren't really dreams. There's a lot of experiences, mental experiences we have during the night that are not dreams.

Aside: So, that gate that goes down, metaphorically, is part of the thalamus, which is a nugget right in the center of the brain that acts as your information station and it gathers intel from your body senses and processes it so your cerebral cortex can figure out exactly what the hell is going on, thanks to pathways called the thalamo-cortical-thalamic circuits, which is a term I dare you to try and work into casual conversation; you simply can't.

But yes, the thalamus noodles around with learning and memory as well as sleep and waking. And some research suggests that external stimuli makes it into our dreams somewhere between 9 to 87% which is... how is that range even possible? Because it's tough to study how much of the waking world makes it into your dreams, because part of the research involves watching people sleep and then tickling them with a feather, or squeezing parts of their limbs, and then waking them up and being like, "What were you dreaming

about? Were you dreaming about the feather?" And results have really varied and sleep subjects, maybe they're just waking up pissed, I don't know.

But in Dr. Domhoff's new book, *The Neurocognitive Theory of Dreaming*, he lists several factors that need to happen to allow spontaneous and undirected thinking, AKA, dreaming. So, those things are an adequate level of cortical activation in the brain; there's also the blocking of external stimuli via those gating mechanisms in the thalamus. And also, a loss of conscious self-control through deactivating three networks in your brain: the frontoparietal control network, the dorsal attention network, and the salience ventral network. There will not be a quiz and it is okay if you remember none of that. But the point is, it's not just about which areas of the brain are active, but also which ones are told to chill out for now, so that we can sleep. And not all dreaming happens in REM and not all imagery is dreaming because we're not fully asleep the whole night. What?!

Dr. Domhoff: And some of them were actually awake.

Alie: Oh!

Dr. Domhoff: At other times, there's one particular experience where our mind is awake, but our body is still in this state of paralysis called atonia and so, you're awake and you're thinking, and you can't move. But that's not dreaming. The EEG record, the electroencephalogram, says you're awake but your body is not... the usual change that happens from when you're waking from this particular stage of sleep called rapid eye movement sleep, which we'll call REM sleep, that stage of sleep is unusual, and it has this sleep paralysis kind of aspect. And then we have many awakenings during the night. All of that gets confused in and mumbled into thinking it's a dream but most of them aren't.

Alie: And my biggest giant question is: What is a dream? But before I ask that, I want to ask a little bit about you because you are so prolific, and you are so well recognized in this field. When it came to, for me, researching who knows the most about dreams, it was like, all signs pointed to you. But you also have this other full career where you're a sociologist who has written textbooks. At what point in your long career did you say, "I want to go do dream research"?

Dr. Domhoff: I started out in dream research. I was a psychology undergraduate major; I did that in my junior year but I wasn't really sure because I didn't know for sure what I wanted to do. I graduated in psychology, and I'd had two or three soc courses, but I still wasn't sure I wanted to do grad school. My advisor said, "You've got to go to grad school," and he wanted to send me to the University of Iowa, which was famous for this behavioristic stuff and conditioning, learning with pigeons and rats, and I didn't like it at all. And so, I wasn't sure what I was going to do.

And then I thought, "Oh my goodness." So, I quickly went down and enrolled in Kent State University, which was near my home, raised in a suburb of Cleveland, Ohio. And I went to Kent State, and they were glad to have me because I'd been a good student at Duke where I went undergraduate. And there I really got into it and even I had these professors that my interests weren't the same as theirs, they really were exciting in terms of rigorous thought, and how to do experiments, and so on.

Then I went to the University of Miami, had a brand-new program and it was called Humanistic and Personality. In other words, they weren't doing what, traditionally, psychology had done, and that's why I said, "Wow, I'm going there." When I arrived, by coincidence, there was a visiting professor named Calvin S Hall and he was, it turns out, the

finest expert in psychology about dreams. And he was a very rigorous psychologist; he'd been trained as a behavior geneticist in psychology at the University of California Berkeley.

Aside: And Calvin S Hall was the mentor that we mentioned who co-coined the term psychopompology. But yes, he was a well-respected psychologist and studied how fast smart little rats could make it through mazes, as well as pioneered this method still known as the open field test. That is where they put a little mouse on a checkerboard table and observed it venturing around to determine heritable traits of emotionality, AKA, how freaked out they get being in an open space, based on how scared their parents were. And for more on your own heritable emotionality, now that we're all ripe from visits with our family, you can see the Personality Psychology episode, which we'll link in the show notes. But yes, Dr. Calvin Hall.

Dr. Domhoff: He bred the brave with the brave and the scared with the scared, so he bred for temperament in mice within four to five generations, so he's very rigorous. But then he got interested in dreams and he brought that rigor to dreams. And he developed what's called a coding system, which I best can describe as, you put elements in a dream in boxes. So, if I have a dream that I was sitting in my house, and a friend walked in, and he had his dog, and the dog bit me, well, the setting is my house, the character is my friend, and there's an animal character, this dog, and there was an aggression, the dog bit me.

Aside: And Bill says that a bite would be an example of physical aggression, of course. So, that goes in the physical aggression box. Wait, the *what* box? So, his mentor Calvin Hall and then this other guy, Robert Van de Castle, developed a quantitative system. It is known as the Hall/Van de Castle dream coding system, this was back in the 1960s. What the hell is a dream coding system, we're all asking. So, it's a way of taking dream reports from subjects and then indexing them to measure who is dreaming about what, how often? Some of the tags they assigned to these dream reports are characters, the people who appear, settings, objects, activities, success and failure, misfortune and good fortune, emotions, and then social interactions. Social interaction has subcategories for friendliness, sexuality, and aggressions.

So, this coding system forever changed psychopompology, and also showed that humans tended to dream about pretty similar things based on this now quantitative research. And dream scientists were kind of able to forge this new world of research just by saying, "Give me your tired, your friendly, your horny masses, yearning to dream free."

Dr. Domhoff: So, we have all these boxes for minor misfortunes, major misfortunes, types of aggression, physical and nonphysical, whether you befriended me, or I befriended you; it's very detailed. And what happened was, taking his course I also learned an amazing thing for that time period, and it's still always, always surprising to us. And that was, it had just been discovered in 1953 that our sleep, contrary to being just a simple sort of one, undifferentiated state, in fact, has these various stages, we call them.

And one of these stages, this REM sleep stage, which we go into four or five times a night, about every 90 minutes. This stage of sleep is what we call really activated. That is, your breathing rate changes, [*breathes rapidly*] and your heart rate changes, the little twinges that you'll see in your dog, it's [*small, muffled barks*] and paws are moving. And it's called rapid eye movement sleep because your eyes are moving. Even the name of it is funny because the person who originally studied it, the eye movements, they jump all around and he was going to call them jerky eye movements [*Alie laughs*] but he decided that wouldn't be right, they

would be known as JEMs, and they would be jerky eye movements. So, he called them rapid eye movements.

Aside: Who was this guy? Okay, Dr. Nathaniel Kleitman, a renowned sleep researcher, and his student Eugene Aserinsky. They hooked up willing volunteers to electrodes in 1953 and discovered the REM phase of sleep, which is called a paradoxical form of sleep because it has a lot of similarities to being awake. Your cerebral neurons are firing with the same intensity as your waking hours, and you're only in REM sleep about 20 to 25% of the night, if you're an adult. But babies, they're in that zone roughly 80% of their sleepy time, although dream scientists know that their brains aren't having the same level of dream activity that fully developed adult brains have. But what is happening when our eyes are darting around shiftily under our lids?

Dr. Domhoff: It gave people more of a sense that these eye movements maybe were tracking dreams, which was one of our early beliefs. But in fact, I think studies show that our eye movements are just jerking around randomly, and people have desperately tried to find patterns in them that would relate to dreams but that didn't happen.

But the point is very simple, and that is that if you combine the seeming finding that we only dream during these rapid eye movement periods, when our brain is basically activated again – certain parts of our brain it later turned out, but I'll get to that probably later – then if you then collect the dream during that period, which we call a verbal report because we're very rigorous psychologists, all we have... If you ask me what a dream is as you know it or I know it, [*very official tone*] a dream is a verbal report of a memory of a subjective experience that you had during the night. [*both laugh*]

Aside: From a scientist's perspective, they are data hounds, and they can't work with what they don't know.

Dr. Domhoff: So, you have this particular report, like the one I just gave. And then we sit down, and we have it on a piece of paper typed out and then we say, "Oh, there's a character, there's an animal, there's a social interaction, there's a setting." So, we combine those two and we could be scientific.

Now, you have to understand that psychologists used to have in those days what we called 'physics envy' and that is that "We want to be scientists just like you, we want you to recognize that we're scientists just like you." So, we have to be serious. And suddenly, we have a situation where we have people in a sleep lab with this big clunky... in those days, EEG was enormous. It was this big clunky, clunky machine, and that made us look pretty scientific. And we collected a dream during a REM period, which is supposedly only when we dreamt, and then we get the verbal report, and we quantify it. So, the title of my dissertation was, this is sort of like, "Please notice we are scientists," but it's said in a pretty assertive manner. So, the title of my dissertation was, [*megaphone effect*] "A quantitative study of dream content using an objective indicator of dreaming." [*Oh, stunning!*] "*Yeah.*" Like, wow, how could you get more scientific than that?

Alie: Very lab coat. [*Dr. Domhoff laughs*] You can tell you're wearing a lab coat.

Dr. Domhoff: And furthermore, we would say, this is the only known 1:1 relationship between a physiological event and a psychological event. In other words, REM sleep equals dreaming, that was called the REM dream equation. So, how could I not go into dream research as a person that was interested in human motivation, why we do the silly things we do, the things

we know we shouldn't do, that we watch absurdities unfold every day, you know, in the culture, in what we're doing in whatever realm of life that we're in.

The other hooker was, you've got to understand in the '50s and the early '60s, Freud and Jung and the neo-Freudians were the, sort of... they were in the atmosphere. And even though psychologists shied away from all three and there were very few Freudians, no Jungians, still their metaphors, their images prevailed and their ideas. And we had the expectations that we're testing some of their ideas, no question. But the point is, Freud had that right metaphor, the kind of metaphor that works and Freud's phrase was, "Dreams are the royal road to the unconscious." The *royal road*. Today we know they're a bumpy, unpaved road to the mundane, I would say, except for a few very interesting kinds of dreams that we can talk about.

Aside: And just a quick context. So, Sigmund Freud was a pioneer in psychoanalysis and Carl Jung thought that the symbols and the meanings of things that happened in dreams, really depend on the context of those events or objects to the dreamer and that dreaming can be used as kind of a creative tool to solve problems. Freud was like, "No, if you dream of corndogs, you're a secret little perv, and dreaming is just a way to keep you asleep as you plumb the depths of your repressed subconscious." So, we know dreaming happens in longer and longer cycles through the night, but what is your brain doing while you're snoozing?

Dr. Domhoff: And so, sure enough, what happens is, we dream when our brain is at a certain level of activation if there's no incoming stimuli. We dream during some parts of our non-REM sleep too, particularly at a stage that you might hear me mention later, non-REM 2. And non-REM 2 is very similar in its blood flow, and if you were trying to awaken people, they'll awaken as readily to a lighter tone, just the same as REM sleep. So, there are just slight differences in certain ways between REM sleep and non-REM sleep, and that's on the level of activation. So, my claim is that once there's adequate level of activation and there's no incoming stimuli, you're going to dream if you have a mature and intact neural substrate that supports dreaming.

Alie: I've always wondered, what does a brain in normal daily life look like in an MRI, versus a dreaming one?

Dr. Domhoff: They are different and that was the mindblower of the 1990s. Parts of our brain remain deactivated even while parts of the brain do activate during REM sleep and non-REM 2 sleep. What does that mean? More specifically, it means that the parts of our brain that are related to the external world, which means the sensory systems, visual systems, sensory-motor systems, but also what's called the executive network, which you could think of as the conductor of an orchestra. That whole executive network that lets us know what time it is, how much more time before we have to get on the bus, when our child's going to arrive home; that network is deactivated the whole night.

And we also have networks in our brain that are called attention networks and they're sort of watching; they interact a lot with the executive network. But if that executive network is kind of slacking off, so to speak... The attention networks slack off a little bit.

And what happens is, when the attention and executive networks are relatively deactivated, we call it, then what happens is the neural substrate, the set of brain areas that support a network for imagination, for selfhood, for memory, for internal thinking, that network becomes more salient, just like when you start to daydream, when you drift off, when your mind wanders. Parts of that network are what we dream with and that was the key, that

dreaming is an intensified form of mind-wandering. Dreaming is based on our imaginations. The same network that supports imaginative thought, like a really good daydream, is basically the network that supports dreaming. And that, to me, was huge because it connected dreaming and waking thought.

Aside: So, the part of your brain that daydreams and imagines is on the night shift as a dream maker. What? Okay. But what are we dreaming about? Riding on unicorns, eating chowder, redecorating the dining room, peeing our pants. What's happening?

Dr. Domhoff: To get to the core of it, dreams are most revealing, for somebody that's researching the meaning of dreams, in terms of the fact that they're about our personal concerns, 70 to 75% of the time. And of course, that's what we daydream about, "Oh my god, I hope my kids are doing okay at school." "Why did I say that to the boss yesterday?" "What am I going to wear next week to that wedding?" All of these personal concerns are what we drift to. [*Penny for your thoughts.*"]

I have to laugh because in the '60s, there was a study done where a professor was in a classroom, introductory psychology class, and he had a little starter gun that you'd shoot off for a race in a track meet. And he said, "Periodically in the quarter, I'm going to take out that gun, I'm going to go bang, and I want you to immediately write down what you were thinking."

Alie: Oh my god. [*laughs*]

Dr. Domhoff: So, the overall results were that only 25% of the people in the classroom were listening fully to the lectures [*both laugh*] at the time that the starter gun was shot. I mean, our minds are all over the place. I know that the students aren't paying attention, I know they're struggling to get back to paying attention. We all do that, especially in certain parts of the lecture, if we've heard that part before then we drift off. "Why did that guy talk about that again, will he get to anything new? Wonder why they ever made him a full professor." You know, all these things are going through your mind as you listen to this talk. And we're all the same way, we know that from research, I'm not speaking personally, it's just an example of course, based on solid research. [*laughs*]

Alie: What about people who self-identify as artists, or really creative, or people who have deficiencies in attention or executive function issues like ADHD, do they dream differently?

Dr. Domhoff: Well, first of all, there's these huge individual differences in all of us. The best example I can give you is about music. And that is that I know from different studies, but also from the studies my students did in my courses, and that is that if you are a person that's really interested in music, you'll dream about music, you will hear music in your dreams more frequently than the rest of us. So, if I see a lot of music in dreams, a lot of playing music, talking about music, then I can make the rather obvious inferences, "What's your strongest interest?" And they say, "Oh, music." [*Alie laughs*]

Aside: So, if you are creative, chances are you're creative in the dream world. But what if your attention networks and executive networks kind of go offline in your waking hours? Well, a July 2022 study called, "Dream recall and dream content in children with attention deficit/hyperactivity disorder," noted that sleep and dream studies for neurodivergent folks are a bit lacking. But this found that after studying the dreams of 103 ADHD kids and 100 kids in a control group:

Dream recall frequency and general dream characteristics, like dream length and bizarreness, didn't differ from children without ADHD. But the dreams of the children

with ADHD were more negatively toned and included more misfortunes and threats, more negative endings, and physical aggression toward the dreamer. The dreams seemed to reflect the inner world of the child with ADHD.

And the researchers noted that:

From a clinical point of view, it would be very interesting to study whether the negatively toned dreams changed during treatment, pharmacological and/or psychotherapeutic, in a way similar to how sleep quality improves.

So, if you're neurodivergent and you have bad dreams about fitting in, science backs it up.

But what if you've been medicated and you're not dreaming as much? Well, I looked it up, and in a 2020 *Frontiers in Psychology* paper titled, "Dreams, Sleep, and Psychotropic Drugs," researchers noted that you might not be dreaming less but you might be sleeping more soundly and getting up fewer times in the middle of the night, which is coherent with the arousal-retrieval model which states that nighttime awakenings help you remember your dreams, they're encoded into long-term memory and therefore you have more dream recall. So, sometimes remembering fewer dreams is a sign that you're sawing logs pretty hard. Either way, get that sleep, it's so good for your brain.

Oh, and for both Part 1 and 2 we'll be donating to a charity of Professor Domhoff's choice, and we'll tell you more about that charity next week. But both episodes are sponsored by Saatva.

[Ad Break]

Okay, back into it. So, speaking of studies, Professor Domhoff just published one with his research assistant. This is a 2020 paper titled, "From adolescence to young adulthood in two dream series: the consistency and continuity of characters and major personal interests," and it was published by the *American Psychological Association*. The study analyzed 5,000 dream reports from two subjects, and you can find them at DreamBank.net. But here's what they were about, because I know you want to know.

Dr. Domhoff: Where we had dream journals from two different young women who had kept their dreams for their own reasons, with no interest in science or anything else. One of them was blind, in fact, 12 or 13 years old, and she'd wake up and tell her dreams to her mom and her mom had said, "If you like your dreams so much, why don't you tape them?" Now, she's 30 years old and she looks on the web about dreams and, lo and behold, she finds my two research sites that were created by this research assistant, Adam Schneider, who is a great graphic designer and I'll match him against anybody as far as spreadsheets and... And so, we have two research sites, DreamResearch.net and DreamBank.net. So, they come across these, and they look at them, and then they say, "I've got these dreams from when I was 12 to 25." So, had two different people do that over the space of 5 years and now we have a dream series we can study.

So, the one woman that we named Izzy, because we give everybody anonymity, we change all the names, all the places, and we put the dreams all on the dream bank for you to look at, but there's no real names up there, it's all pseudonyms. At any rate, Izzy, she would have all these dreams about TV characters, and movie characters, and zombies, and so on. So, when you ask her about these things in her dream, she said, "I love horror." She'd been to horror conferences, where all the people who like horror films go; she goes to those things. Well, that's hardly news but it does tell us that she dreams about her concerns.

And her dreams are all so excellent for another thing to understand about dreams that relate to your point Alie, and that is that she had these dreams of people she had crushes on. The first time she had a couple dreams when she was 12, she had a crush on some TV or movie man, and then she got a crush on another TV or movie star, and she wrote them down, and then she started to write her dreams down, that's actually how she started to write her dreams down. [Alie laughs] Well, we can figure out the percentage of her dreams where she's dreaming about these celebrities, as we call them, they're known people but they're celebrities, she doesn't know them personally. Anyway, she has dreams about these crushes, and then it turns out she's pretty soon having dreams about high school crushes. There's this one guy that appears throughout most of her high school years. So, if you ask her, "Do you have romantic interest toward certain guys?" She would say, "Oh yes, I get crushes and they really last a long time."

Here's the interesting thing: it's all imagination. We finally asked her, "Do you ever get involved with these people?" This is via email, and she knows it's anonymous and she said, "I've never even touched anyone." She was the most shy person but her fantasy life was very rich. [Alie laughs] So, whether you do the things you dream, that's another story and that's why I call it imagination.

Now, the other woman, the blind young woman that we codenamed Jasmine, Jasmine has a kind of blindness where she can see vague outlines. If you magnify things enough, she can read on a screen. At any rate, she's always messing with her equipment, always with her computers, always with her sound equipment, and she was very, very interested also in music. But when she dreamed about famous characters, we'll call, it was like Snow White [both laugh] or something like that, harmless little video cartoon kind of characters, or nice characters like Mary Poppins, not some horror movie or some crush, or something that involved sexuality. So, she had a very different set of interests, and I could know all those through her dreams. So, dreams present a portrait of your personal concerns, and they portray how you view the world.

Alie: I'm curious too, in Jasmine's case, are you using the part of your brain that can see things visually? If you don't have sight, would you have sighted dreams?

Dr. Domhoff: It depends. That's an ideal question, thank you. First of all, visual imagery is something we gradually develop out of seeing but it is located in what are called secondary visual cortices.

Aside: Where in the brain is this? Well, the primary visual cortex is located in the occipital lobe, which is the very back of the brain, it's like your brain's butt, it's just above the nape of your neck. And the secondary visual cortices are just above that, just a wee smidge closer to the top of your head.

Dr. Domhoff: What that means is that one of the parts of the brain that never activates in a whole sleep period is what's called your primary visual cortex, which is a significant part of your brain. So, what you're seeing is the mental imagery that you can see if I asked all of you, right now, imagine you're sitting in your living room. What's your living room look like? How many windows are in there? What does the furniture look like? Now, have your mom walk into that room. You can call up that visual imagery.

Aside: And just a quick aside, there's a slim fraction of folks who don't have visual imaginations and they have what's called aphantasia, or imagery weakness. And a 2020 study found that about 0.8% of sighted folks are unable to form visual mental images. But a 2022 *Consciousness and Cognition* paper revealed that the majority of aphantasics, though

they can't conjure mental imagery while awake, nevertheless retain the capacity to experience rich, visual dreams. So, not so much when awake but then it's a visual bonanza in their sleep. So, people's ability to imagine can vary.

Dr. Domhoff: Now, that visual imagery is not automatic and it's not there at the start. How do we know? We know two ways. One is developmental psychology studies, people who are awake, there are ways of doing studies that I don't dare get into detail on, on how we can see how good you are at visualizing, say, in your mind.

But the other way is precisely blind people. If you are born blind, or become blind before about age 4, you do not have visual mental imagery. But, if you become blind after age 7, you will have visual imagery in your dreams at least for many years. In one case, a woman gradually had less and less. She was older but she'd lost her sight at 7, so she didn't have much visual imagery.

In other words, we've done studies of visual imagery in the dreams of the blind and other imagery, and this was done with a person who is doing a doctorate degree in which he brilliantly gave people cassettes – this was older, in the '90s, [*Alie laughs*] gave them cassettes. He didn't know quite how to study them well and that's where we came in, because of this crazy little content system I've told you about, it's obsessively detailed, one might say. And we were able to create a taste, touch, smell percent, hearing percent, visual percent. So, we could go through, we now have it all fancy on the computer, so we can create word strength for taste, touch, smell for various words, all words for taste, touch, smell, and so on, and then find all the dreams, from these blind people that have those in them. Then we check them for false positives, things like, "Oh, I see what you mean." Well there, that's just a metaphor.

In any case, we can determine that the people that did not have any visual mental imagery because they were blind at birth or before, they dream of... One guy I really remember, he could smell, he was holding onto his coffee cup and he can feel how warm it is, and he smells the coffee. We do that a little bit, we who are sighted, but it's 2-3% of the sensory images in our dream. But hearing occurs in a fair amount of dreams too. So, we have this mental imagery, it doesn't depend on the primary visual cortex.

Alie: I'm so confused about dreams because I could sit in front of a laptop and say okay, write a movie, and I'd be like, "I don't know what to write about, I don't know how to describe it." And then I fall asleep in my pants on the couch, and I have this like, fantastic odyssey with whatever, like, pirates and hot air balloons. How does our imagination do that?

Dr. Domhoff: I call it, imagination roaming freely. See, when we're awake, you're constrained by these other networks, these networks that are oriented toward the waking world, these executive and attention networks. So, you're constrained. At night, you're roaming freely and incidentally, the same thing in the morning. When you wake up in the morning, whether you wake up from a dream or not, and if it's a relaxed waking, which it is for most human beings, even in hunting and gathering societies, people are all around the fire, they feel safe, so you wake up gradually. And the parts of the brain that are activating the most are not immediately the executive network or the attention network; you're foggy and you have a lot of drifting waking thoughts.

In my case, I'll wake up in the morning, not from a dream and I'll say, "That's where that paragraph should go. I've got to move that paragraph, that didn't fit right." And then I'll

quickly note something down, make changes to the manuscript, revealing what I do with most of my time, of course. *[both laugh]*

Aside: Seriously, this dude has written over 20 books and they're not zombie fanfic. He's written 20 legit sociology and neurobiology textbooks in his waking hours, and then he dreams about paragraphs when he rests.

But what about a relaxed awakening? Let's talk about that for a second. So, according to the 2019 book, *Dreams: Understanding Biology, Psychology, and Culture*, the circumstances around an awakening also play a really big role in how often you can remember your dreams. So, for example, if a person in a dream study has to complete a task as soon as they wake up, that distraction interferes and messes up dream recall compared to participants who are allowed to enjoy the languor of bed, and fart around, and think about their dreams the night before. But there's a ton of individual factors that influence that wildly. And remembering the details of your dreams may or may not be helpful to you, it depends on who you ask.

Dr. Domhoff: In other words, your waking reflections and thoughts that are triggered by your dreams are used by a few writers, not a lot, and not a lot by poets. And there's books and articles on that where you ask a lot of poets, artists, this and that, do they use their dreams? A few do, and most don't. So, in your case I would suggest then that you tape record your dreams and see if you see... and then your reflections on your dreams become useful. There are some people who believe we solve problems in dreams, but if you talk about cognition and complex thinking, the fact is that sometimes people do solve problems *reflecting* on their dreams.

There's one study done for instance where a professor asked the students to try to dream about something that's been bothering them, so they collected these dreams. The students said, like two of the 50, say, related to anything at all to a problem in the students' minds and judges, independent judges, that means some other psychologists that you're working with, they go through, and they see, "Yeah that dream seems to relate to that particular problem." But the one I like best in that study was this woman had a dream where she woke up and she was wolfing down pills, "I forgot to take my pills" gulp, and gulp, and gulp down pills. And she woke up and she said, "I think I'd better write down a schedule to remind me to take my pills." But the dream, she didn't solve a problem in that dream, *[Alie laughs]* but reflecting on that dream changed.

Another woman had a dream where she'd been having trouble with her menstrual cycle, and she'd been to the doctor about it and so on, and she has a dream about running. Anyway, when she wakes up and she reflects on the dream she said, "I think I forgot to tell the doctor that I have been doing a lot of running," and of course, we know that women that run miles, and miles, and miles, it can affect their menstrual cycle. So, it's a reflection on the dreams but I don't believe, contrary to many, that dreams solve problems. Dreaming is not a problem-solving mechanism. I disagree with that kind of view because, first, we forget 98% of our dreams, 95 to 99 we'll say.

Alie: That's got to kill you as a researcher to think of how much data is just not recollected upon waking! Does that kill you?!

Dr. Domhoff: Yeah, well it's fascinating and the trouble is, we can't figure out why. *[Alie laughs]* It's the easiest kind of study there is to take people that are, what we call, high recallers and low recallers, and they've been compared on every personality test and every cognitive test, and we don't get high correlations. So, I can't say, "You dream because of this, you don't dream

because of that.” Now, people are trying that with neuroimaging studies of people that say they dream frequently, and people that say they rarely dream, and there are differences in the activation levels of some parts of that neural network. So, that’s just in its infancy but it could then turn out to be useful.

So, we end up with things like this: one of the best predictors of whether you recall dreams is whether you’re interested in dreams. Now, “Why might you be interested in dreams?” then becomes the question. [*“She wants to know about your dreams.”*] Well, one of my students did a study of that and she asked people how interested they were in their dreams, and she got the highs and the lows. With the highs, the interesting thing was, several of them thought they’d had a dream that was psychic, so they had a dream that their sister was ill, or their grandfather was very sick, and those dreams were very upsetting to them, and they called the people to check, which people often do.

So, what happens is if a thousand people, a million people tonight dream that their grandfather’s become gravely ill, one of those grandfathers is going to die that night, by chance, so that person is going to think they’re psychic. The other people, they often do call, I know that because we’ve done studies where we ask people about types of dreams and we ask basically, “You ever had a dream that led you to take any action?” And they’ll say, “Well, I dreamed my grandfather died and I called home, and he hadn’t and I was relieved.” The other was in that study... this is where dreams are fun. A lot of times, even though we have more negative, dreams have more misfortune than good fortune, they have more aggression than friendliness, and so on. They have negativity bias, as does much of our waking thought.

Aside: For more on this startling and bummer info, see the paper, “A wandering mind is an unhappy mind” by two Harvard professors who used a mood tracking app to learn that about 47% of the time, we’re thinking about things that make us anxious or sad rather than just enjoying being alive on the planet. The researchers wrote, “A human mind is a wandering mind, and a wandering mind is an unhappy mind. The ability to think about what is not happening is a cognitive achievement that comes at an emotional cost.” And that’s partly why some experts say that mindfulness can help shift your mental habits away from the dark recesses of, “Why did I do that? Why did I do that? Why did I do that?” Or “What if a disaster happens?” Thoughts that are all too familiar for some of us.

Dr. Domhoff: At any rate, in this particular study, where we asked if it led to action, there were two women in about 45 who had had a dream that their boyfriend was cheating on them. Now, it’s on a questionnaire, it’s anonymous. This one woman who dreamed that her boyfriend cheated on her, they were actually sleeping in the same bed. She said, “I was so angry, I socked him in the arm.” [*both laugh*] The other woman was not in the same bed with her boyfriend when this dream happened, but she said, “I didn’t speak to him for two days.” [*both laugh*] Can you imagine?

Alie: Yeah, it feels so real. You feel so hurt by it.

Aside: And no matter how real it feels, you’re not allowed to physically or emotionally abuse anyone when you wake up. We got that? We good there? Go have a nap, and in it you can take a Louisville slugger to both headlights, you can slash a hole in all four tires, and then you can wake up and be nice.

Dr. Domhoff: Well, that gets to the other thing about dreams, it’s one of the reasons why they’re so fascinating to us. We have a term, fancy term; it’s called embodied simulation. Now, that’s what a dream is, it’s an embodied simulation. What does that mean? First of all, simulation is

when you're putting yourself in some hypothetical scenario. You're driving along and you're thinking, "What if I pulled over here and went into that gas station? And what if I then played the jukebox and started listening to music? And what if I really started to really do what I want to do which is to sing and show people I can really sing?" So, I've just simulated a scenario. I'm driving along, I'm going to pull into this gas station and into its little store, and I'm going to go in there and sing. That's a simulation.

But an embodied simulation, what that means is when we really get intensely into dreaming, part of the brain areas that are activated are not only our imagination, but also the secondary visual, auditory, and motor cortices. And you can sometimes call this up in your mind. Imagine yourself running, you're really running and you're really afraid. You can work yourself up and get a sense of that. Imagine you're being chased by that dog that you're scared of down the street.

Aside: I have a feeling that Dr. Domhoff had a bad experience with a dog, which saddens me, and I didn't ask about it. But anyway...

Dr. Domhoff: So, at that point, it becomes not just sort of abstract thought, but we are maybe shaking a little bit or really feeling a sense of running. All of that is what I mean by intensified form of mind wandering because we know that the secondary visual cortices and motor cortices are activated during dreaming, and what that means is it *does* feel real. We experience dreams as real while they are happening, and we wake up and it's usually gone in a flash. We say, "My god, I can't believe that, I was actually arguing with that guy that I never would argue with in my life. I was actually talking to that person I've never talked to, or I was giving Jimmy Carter advice." [*Alie laughs*] And so, they feel so real and so, for most of us, we shake that feeling. But some dreams can feel more than real.

Aside: Bill says that one type of embodied simulation is a little more profound.

Dr. Domhoff: And that is, occasionally, this is a rare dream now, but people sometimes have dreams of deceased loved ones. Not just that you're walking around with your dad and mom who are deceased, but you recognize that they're alive and you can't believe it.

Alie: Yeah. This happened to me, literally like, two nights ago. I was like, "Dad, you're back!"

Dr. Domhoff: Yes, back-to-life dreams. Those dreams are so powerful for people. And here's the striking thing. One of the founders of modern anthropology, an English guy named Edward Tyler, he said, dreams and the spiritual world, dreams and religion are very closely tied because these occasional dreams of somebody being alive are really so real to people, they tell other people. [*"You'll never guess who I ran into."*] And in that sense, some myths... this is another phrase I really like. Many myths are dreams that have been told and retold. If I tell you a dream in which this amazing thing happened where so-and-so was back to life and that dream kind of grabs you or resonates like it did for you, you might tell my dream. But it would be just slightly altered by you with every time a story is told, it gets altered slightly. We call it leveled and sharpened; the minor stuff falls out and the stuff that's interesting gets sharpened and embroidered. The big guy in the dream becomes a giant, and so on. So, that kind of embroidering of dreams that have been told and retold, may well relate to some of our mythology.

Now, I want to tell a little story related to that about when you ask people for dreams. When I first read research on these back-to-life dreams, I was very interested and I wanted to see if very many students had that kind of dream. And I used to teach these very large classes, whether it was introductory psych, or personality, or a course on dreams, and I'd give them

these anonymous questionnaires. This particular questionnaire, I just asked this very general question: Have you ever had a dream of a deceased loved one in which they seemed to be alive? And to my surprise... These are all 18- to 20-year-olds, they probably hadn't experienced even the deaths of their grandparents yet in a lot of the cases. But four or five students had dreams in which their dog was alive, their cat was alive. And they loved it. And I was so taken aback. And one of my daughters had a dog she really loved, and I told her about these dreams I'd collected, and she said, "Dad, I dream about him being..." about her dog being alive. "I'm so joyful when I see him and he's alive!"

So, if you've had that experience, now I'll turn to one of our studies and he's up on the web, on the DreamBank. His name is Ed, pseudoname is Ed, pseudonym, whatever the right word is.

Aside: This 2015 paper titled, "Dreaming as Embodied Simulation" was published via the *American Psychological Association* and it deals with dream journals that this anonymous subject, Ed, recorded on his own for decades, never intending them to be public, but later passed them onto researchers in case they could help other people going through difficult emotional times.

Dr. Domhoff: We call him the widower. This is a man that never had an interest in dreams in his life. And then his wife got seriously ill, cancer returned a third time when the first two times they thought it was beat, so it was really— she was going to live on. So, it was a disastrous year or so and she went through a horrifying, gradual death through stomach cancer, so you can imagine how dramatic it was. But any rate, shortly after she died, within a month, he had a dream in which she was there, and she was alive, and she looked alive, and he couldn't believe it. He was kind of frightened. And she reassured him that she was okay, we call these reassurance dreams, "I'm okay, it's okay."

And then he was a really discombobulated guy after this, and several months later he met another woman and he was thinking about getting married to her, and he had a dream in which his — we'll say this one might be highly motivated — but he had a dream in which his deceased wife said, "You should get married again." So, he had these moving dreams. But at any rate, in his diaries, which made the dreams so valuable, he wrote, "I'm not a religious guy, I'm scientifically oriented," although he wasn't a scientist, but he said, "I swear she visited me a couple of those times. I *swear* she visited me a couple of those times." That is the connection dreams have with the spirit worlds.

And here's another thing about this, we have people that interpret our dreams. The people that interpret our dreams are the first professionals in human history; they're called shaman. You are sick, you are confused, you go to a shaman, who I call the first psychoanalyst. [*Alie laughs*] And you go to the shaman, and you say "I'm feeling ill," and the shaman dives into the world of spirits, often through a dream, and finds out which evil spirit, which malevolent thing, which spirit is mad at you for whatever reason. And often it's random, you just had back luck that this spirit was annoyed and picked you. He tells me it's okay or what the spirit said and then I can go work that day. And I think that's what a lot of people in our society do, they have the function of making it so the rest of us are able to go out and work. Their job is to keep us working in terms of... so we don't collapse into all of our neuroses and anxieties, angers, and fears, and resentments and the rest that go with human beings being injustice collectors.

Alie: They're like mood mechanics, kind of.

Dr. Domhoff: Yes, that's a good word for it. Yeah, they got to do it, or you can't work. And if they do it right, if they inspire us as some tend to do, then we really feel good about ourselves.

Alie: What about when you see a big book on the shelf at a bookstore and it's like, *The Dream Encyclopedia*, and it's like, "You had a dream about owls? It means you might be pregnant," or whatever? [Dr. Domhoff laughs] Do you find any correlation between the symbolism of dreams and any of your research?

Dr. Domhoff: No. [laughs]

Alie: Okay, that's what I thought the answer was going to be. [laughs]

Dr. Domhoff: I mean that's a short answer based on a long, painful set of... a long journey. First of all, when I said in the '50s, clinical lore is all around you and the dreams are the railroad to the unconscious. Freudian symbols, hats, hats and phallic symbols. But we did other studies. I've studied dreams of- I have 4,000 dreams from this one woman, and we look through, and we did word searches and found the unusual dreams, big sample, went through trying to make sense out of them. One example, she had 10 dreams about bananas. But in the one dream, the banana was clearly a phallic symbol. In other words, the banana turned into a penis, ["Ooh, hello."] But in all the other dreams, the bananas were just sitting there with other things and so on. So, there's a famous statement that's made about Freudians that probably Freud didn't make, but the famous statement is, "There are some days when a cigar is just a cigar."

Aside: PS, I tried to figure out if, like, Liza Minnelli or something, said this. And all I found was that Freud.org says that it wasn't Freud who said it, but if he did say it, he said it ironically. Meaning that a cigar is *never* just a cigar. A cigar is also a dick, according to Sigmund.

Dr. Domhoff: But here's the interesting thing about these neuroimaging studies that I emphasize so heavily in the last 10 or 15 years. That is that when you study the network in the waking brain that is activated when you say something metaphoric to somebody, in other words, they're going to decode this metaphoric statement I made, "Cross that river when you come to it." "Don't count your chickens before they hatch." Part of the brain that activates during an interpretation of a metaphor, or generating a metaphor, if you ask me to make up a metaphor, those particular areas are not active during dreaming.

Alie: Oh, weird!

Dr. Domhoff: Or only partially active, I should say. It's a more complex story. In other words, the networks that make it possible to experience emotions, to make symbolic statements, to understand symbolism, *and* the networks that allow you to recall specific memories, those networks are not functional during dreaming. Dreaming has far less emotion in it than the stereotypes say. It has, as far as I can tell, virtually no symbolism, and furthermore, if we study your dreams, there are no specific memories in them, there are no episodic memories, we call them, where "Oh yes, I was with my sister at the zoo two weeks ago," kind of memory. Instead, the memory bank we draw on in dreams are what are called semantic memories. That is, my general view, my general conception of my friend Joe, or your general conception of your younger sister. That, we draw on.

Aside: So, we tend to drum up general vibes from life, but not replay exact scenarios as we remember them. So, dreams aren't a time machine made of your own jiggly memories.

Dr. Domhoff: So, we have cognitive insufficiencies during dreams. That is, there are certain things we can't do well during dreams. We don't have as much emotion, as I've already said. I don't

think there's much symbolism in dreams. There's not episodic memories. And of course the most obvious is, we don't know where we are. In rare cases, for some people, they will think they are aware they are dreaming. In other words, it starts to use a little part of the executive network. Even though they think they're dreaming, they don't say, "Yeah and I'm in bed, I'm in my house," et cetera, et cetera. They still don't really have what we have during waking life.

So, that network we're dreaming with is partial. It's a network that's very important in human beings; it's only in human beings. It's a network that's probably 75,000 to 250,000 years old. Of course, that's been studied like crazy by evolutionary anthropologists. Cognitively modern human beings could be as recent as 100,000 years ago and that's a lot more recent than we thought 10 years ago or 20 years ago.

Aside: For more on this, you can see papers like, "The Role of Dreams in the Evolution of the Human Mind," which says that dreams aren't just a rehearsal for shit hitting the fan real bad, they're more of a general, virtual practice for life and they could have played a big part in human cognitive capabilities. So, our ancestors twitched and dreamed so that we could walk around one day wearing underpants, and eating cereal, and building rockets... sometimes all at once.

Dr. Domhoff: So, if you look at the brains of chimpanzees, or monkeys and so on, they have some of the structures that are part of our imagination network. Incidentally, the technical term, which is just an accidental technical term, the guy happened to name it first, it's called the default network. It means when we're not doing something, when we're not on a task, we just go into this state which is the state of mind-wandering and daydreaming. So, we mind wander and daydream with a default network, but that default network is only one small part of things. So therefore dreams are not the same as waking and they're not the same as consciousness. They're not a form of consciousness, they have parallels with consciousness.

So much more on this in Part 2. We get to the really juicy stuff via your questions, everything from sex dreams to teeth falling out, and how to control your dreams. More of that will be out next week. here's a tiny preview.

Alie: Can I ask a few questions from listeners? Is that okay?

Okay, that's all you get for a preview from next week, you need to come back because we will have a marathon Q&A with your dream questions, and they are all so good. Like: Is there an intersection between dreaming and hallucinating? Does sleep quality affect your dreams? Why don't babies dream? Lucid dreaming, flying in dreams, the imagination in dreams, reducing nightmares, and why rest is so critical.

Meanwhile, ask specialists your sleepy questions because why else would they study this for decades if they didn't want you to know? And links to DreamBank.net and his new book are in the show notes and so are our social handles. We're @Ologies on Twitter and Instagram. I'm @AlieWard on both. I'm on TikTok @Alie_Ologies, please say hello. And to submit questions for future episodes you can join Patreon at [Patreon.com/Ologies](https://www.patreon.com/Ologies) for about \$0.25 an episode. And *Ologies* merch is available at [OlogiesMerch.com](https://www.OlogiesMerch.com), thank you Susan Hale for managing that and so much more. Thank you, Noel Dilworth, for all the scheduling. Erin Talbert admin's the *Ologies* Podcast Facebook group with assists from Boni Dutch and Shannon Feltus. Emily White of The Wordary makes our professional transcripts and Caleb Patton bleeps them. Kelly R. Dwyer works on our website and can make you one. The incredible Mercedes Maitland of Maitland Audio is our

new editor with some assists from the ever-helpful Jarrett Sleeper. The theme music is by Nick Thorburn of the band Islands.

And if you stick around until the end of the show I am going to tell you a secret and this week, it's that I live on a steep hill and things roll down the hill and then I think they stay there for decades because I've had to go to the bottom of the hill after I've dropped things off of the hill such as a rechargeable battery for a power drill. And at the very, very bottom of the hill, aside from a bunch of old Pepsi bottles from the '80s, the coolest thing I found was a glass skull, completely intact. I don't know how it fell hundreds of feet down this rock-covered hill, or what it was doing down there, but I'm pretty sure it's not cursed, it seems friendly. But now I've got a glass skull on my bookshelf, and it was free. Okay, we'll see you next week for more dreams. Berbye.

Transcribed by Aveline Malek at TheWordary.com

Links to things we discussed:

Dr. G. William Domhoff's book: [The Neurocognitive Theory of Dreaming](#)

His website: [Dreamresearch.net](#)

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