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Dave: Shamans will tell you that that's what they're doing.

Dawson: Okay.

Announcer: Bulletproof Radio, a state of high performance.

Dave: You're listening to Bulletproof Radio with Dave Asprey.

Today's cool fact of the day is that human meddling has manipulated dogs' brains. Dog breeders have shaped the looks and behavior of dogs for centuries, and now we've just figured out they've sculpted dogs' brains too. The brain scanning study of 62 pure bred dogs looking at 33 breeds reveals that dog brains are not all alike. Different breeds actually had different shapes of different brain regions. Distinctions that weren't just the result of head shape or the size of their brains or bodies according to the Journal of Neuroscience.

So through selective breeding, we've systematically shaped the brains of another species, according to Erin Hecht who's an evolutionary neuroscientist at Harvard. She's and her colleagues did the study. And they weren't trying to link brain shape to behavior, but they did get some hints. They found that groups of brain areas such as smell and taste regions had the biggest variability between breeds, and those groups were involved in specialized behaviors that often serve us, like hunting by smell, guarding or providing companionship like earlier studies have suggested. And they didn't study this, but there's a hypothesis that dogs that are trained extensively for things like herding sheep or detecting bombs or guiding the blind might have even more distinct brains.

So what does that mean for you? Well, it means you should buy a dachshund because they're the best dogs out there, obviously. At least if you ask my dog, he would tell you that. But he might be biased as well. And the other thing in there for you is that genetic manipulation is a slippery slope, and I'm all interested in manipulating my own genes. Not so sure that I would want to manipulate my germline going down. But once I'm confident we have enough information and enough knowledge to do that, and maybe we've tested it in our dogs, might be time to upgrade the human gene line. But we'll leave that for later times.

I am going to be interviewing today live at the Beverly Hilton, which is my favorite hotel in LA. A good friend, this guy's been on the show before named Dawson Church who's an expert in flow states, in tapping and epigenetics, and just a variety of powerful things

that he's spent his life doing. If you haven't heard the previous episode number 474 where we talked a lot about tapping, Dawson also actually lead me through an EFT session on that podcast. And if you don't know what tapping is, it's a technique of getting into emotional stuff inside the body very quickly without having to really believe anything. And it now has dozens of clinical trials behind it, including ones that Dawson himself has conducted. And he founded the National Institute for Integrative Healthcare to promote this kind of new treatment. He was also deeply studied meditation on the brain and tapping, and is looking at how do you take people and do things that are the fastest possible to reach altered states or to heal things that you didn't think were healable.

So Dawson, welcome to today's show to talk specifically about brain waves and how to get specific brain waves using techniques that don't require technology.

Dawson: I am so looking forward to sharing that, and as you were talking about the dogs, I was having a very hard time not laughing at loud and spoiling your audio because it's so hysterical. We'll find out that we actually are doing that with our own brains all the time.

Dave: That we're breeding our brains to change their sizes?

Dawson: We're breeding our brains in various ways. And in one case study I presented in one of my books called *Mind To Matter*, I talk about one particular man by way of illustration, this phenomenon. His name was Graham Phillips, and he happened to be the host of a big TV show in Australia. And he'd heard about mindfulness, meditation, these kinds of techniques, but was a bit of a skeptic and thought he'd try them out. He'd heard about the health benefits. And so before he began to do them seriously, he made an appointment at his local high tech university lab called Monash University, and they gave him a comprehensive suite of tests, including very high resolution MRIs of all different parts of his brain, measuring brain volume. He then began to meditate, be mindful, and really change his practices every day.

And within two weeks of that, he felt different. He had left road rage. He wasn't screaming, yelling at his kids, and he was a bit much more patient than before after two weeks of this. But after eight weeks, he went back into Monash. This was just two months later to the same series of tests with him under the gaze of the TV cameras, same high resolution MRI. Parts of his brain had grown by 2%, 3% or 4% in just eight weeks. But the part of brain that grew the most is called the dentate gyrus, but there was a sliver of tissue in the hippocampus that regulates emotion throughout multiple brain areas. And his dentate gyrus, the volume of neural tissue in his dentate gyrus in eight weeks grew by 22.8%. In other words, he produced about a fifth bigger dentate gyrus in just two months. So that is the power of our behavior, of our beliefs, of our practices, of our spiritual practices, of our emotional states on our brains. We are reshaping our brains with every thought we think, with every emotion we feel, with every meditation session we do.

So just like the dogs, we are breeding our own brains. They're the software of our own minds. It's literally creating the hardware of our brains.

Dave: It's pretty profound. But it also makes sense. If you look at what happens in two months of training, if you start doing curls every day, in two months, you're going to have measurably bigger and stronger biceps. How would the brain not be the same way? This outdated idea that oh, we're born with the brain we're going to die with the same number of cells, and all that stuff. It was made up. There was no data backing that up, and it's an honor that Eric Kandel, the guy who basically discovered neuroplasticity and won a Nobel Prize for it, has come on Bulletproof Radio. And I got to interview him. Talk about learning from your elders. And here we are now, you've got a study you just talked about that was on TV not that long after the Nobel Prize was actually awarded for that saying that 22% change just from a meditative practice. And this is a size change, just like building a muscle. Your brain really is a muscle, all right?

Dawson: Now extrapolate that to not just eight weeks of mindfulness but a year or two years or three years or five years of these practices. And you start to have a radically different brain, and personally, for me, it's been profound to do this, Dave, because when I was young person, we loved chaos in our family. I had PTSD early on I now realized. I was very depressed, very anxious when I was a teenager. And so my quest was to fix myself. I wanted to not be depressed, anxious human being. I was so depressed that people avoided me. One day when I was 15 years old, I was with a bunch of friends in a hotel. I walked past a full length mirror, and I looked at this person in the mirror. And there I was my very, very long hair and my bell-bottom trousers and my hippie bag around my shoulder. But I looked at this kid looking back in the mirror and I thought, my self talk was, "That's the saddest fact I've ever seen." And that was me. So I needed to fix myself.

So we got all kinds of practices to try and do that. Spiritual practices, studying psychology, and now the wonderful thing about technology like gene trips and cortisol essays and the ability to study our hormones, our neurotransmitters, our brain waves is that we can quantify these changes. So we know that person isn't just subjectively happy but happier. But we know that they're objectively shifting their whole intercranial function, their whole brain function, their whole neurological function, and we can actually map these states and then train people on how to do them. So it's just wonderful to me that we're at this new stage where technology is serving us in that way.

Dave: It's a revolution, and a lot of people forget you go back 10 years. If you were a CEO and you said, "I meditate," there was a reasonable chance your board of directors would vote to remove you as CEO. For real. I remember, I used to put yoga and modafinil in my LinkedIn profile even going back 20 years, and people would kind of look at me weird. But it was Silicone Valley and I worked in futuristic tech. And people were a little more accepting. But every now and then someone would pull me aside after a meeting and go, "I saw you put that in there. What's modafinil?" Or, "I meditate too. I do yoga, but I don't tell anyone." So there's always been a history, especially in certain areas of art, the music industry, and in the tech industry that's been tied into these states of intuition, states of altered consciousness where good stuff happens. But it was the sort of thing

that was almost like there was a stigma associated with it. And I feel like the stigma is completely gone from meditation, and now it's like, "Oh, you don't meditate?"

So you can ask a room full of people, "How many people meditate?" And everyone raises their hand. Okay, there's a lie detector on now. A lights going to shine on you if you're lying. Now put your hand down. Half of them are going to put their hand down and just go, "I tell people I meditate but I didn't really do it." Kind of like flossing. This is a very profound shift in 10 years.

But the reason that I like your work, Dawson, the reason writing the foreword for your new book is that you're saying let's use the tools of meditation, including tapping, but let's also map it back using clinical studies. Let's look at brain waves, specifically, and see what actions generate which brain waves because if you can tell people the actions, maybe they don't have to hook themselves up to electrodes as often or maybe they just won't do it at all because they weren't accessible. So let's get into brain waves.

In your new book Bliss Brain that I'm writing the foreword for, you really are going deep into these brain wave states and what they actually do and how to turn them on. So what I want us to do today, I want you to walk listeners through the different brain states. I'm going to ask you about those. But then I want you to walk me through your fastest technique for accessing an altered state of consciousness.

Dawson: That is a great question because you need to know what the state is you're aiming for and then how to get there efficiently. And you need to know those two things. So the first one is that state of consciousness. In 1922, '23, '24, the developer of the EEG was looking for a way to measure brain waves, and he was a German doctor called Hans Berger, and he actually began looking for brain waves after a metaphysical experience. He was a young Calvary officer in the 1890s, and one day he and his unit were dragging heavy siege gun behind them in an exercise and he fell off his horse right in the path of this gun carriage that weighed many tons. As he was about to be crushed, his friends managed to stop it, stop the gun carriage crushing him. And when he got back to barracks that day, there was a telegram from his father asking if he was okay. Now his father had never sent a telegram before ever. And so he went back home that weekend and said, "What was the urgent..." And his sister said, "I had this terrible premonition at that moment. So I asked father to send a telegram."

If you had to think, "Well, how are we able to have these experiences?" He had to look for waves in the brain. And so eventually he developed the EEG in the 1920s. It was developed further in the '30s. There was a lot of skepticism that anything meaningful could be derived from brain waves, and if you read the early reports debunking brain waves and EEGS. They were fierce, and he had a very difficult time and eventually committed suicide because of the opposition to his work and other factors. But in the 1960s after World War II, several pioneering pioneers began to use the EEGs to look at states of consciousness. So not as medical technology, but as a technology looking at spiritual and emotional states.

So Maxwell Kade had worked on radar for Britain in World War II, engineer. And he began to hook up Swamis and Yogis and adapts. And he found after hooking up people from Christian traditions who were they were monks, they were nuns, people from Buddhism, from Hinduism, from the Kabbalistic School in Judaism, Sufis. He found to his amazement that they all had the same brain wave profile regardless of their spiritual beliefs through all over the map. But they all have the same brain wave profile. And he called that the awakened mind.

Then his student Anna Wise began to hook up concert pianists, elite athletes, and high performance CEOs. And sure enough, when they were in these flow states, they also showed the awakened mind. So it turns out it's not a religious state, it's actually a state the brain is able to be in and one you can measure. Now the crucial thing about the awakened mind state is that there are whole networks of brain regions that are active in it, and when most people close their eyes and meditate, and the reason that half the people in your analogy put their hands down when you say, "There's a lie detector here, and it's going to measure if you really are meditating," is because meditation is hard. And it's hard because the brain is not designed to meditate. The brain is designed to detect threats and help you survive. You say in your book Super Human, you say not die. And a huge amount of brain tissue is devoted to scanning the environment and making sure you don't die.

Now when you're nice and safe in your cave and when there's no obvious threat, you can relax and so now the brain doesn't have to do that. You're reasonably safe. Now it has spare capacity to do something. So the brain then does something. What the brain does isn't relax. The brain uses all of its capacity to do something. That's one of the big mysteries of neuroscience for decades was that the brain activity doesn't fluctuate by more than 5% up or down, day or night. When you relax, your brain doesn't relax. Your brain activity just stays at the same high level. And what turns on when you aren't doing a task and just for convenience, we call that the task positive network when you're engaged in doing something. When you're writing an email, when you're talking to your friend, when you're driving, when you're navigating your life, your task positive network is doing those tasks. When you're not doing a task, the brain sees all this unused spare capacity and it says, "Great. Let's grab this." And it grabs it to such a consistent degree that we call that the default mode network. It's just what your brain defaults to. So there's any spare capacity available, the default network grabs that capacity and uses it.

What the default mode network does is two things. One is think about the tiger that almost ate you yesterday and how you escaped from it. And the tiger that might eat you tomorrow. Today, there are no tigers. So we close our eyes, we sit back and relax, and we start thinking about... Well, for me, the most scary thing I can think about the most tiger-ish thing is my email inbox or the deadline that's looming or the insult someone made at me 10, 20, 40 years ago and how that might happen in the next while. So now the default mode network defaults to the disasters of our past and the possible disasters of our future. And so we close our eyes to meditate, and the default mode network says, "Oh, here's all the spare capacity. Let's catastrophize about what might happen in the future and the bad stuff of the past." So people close their eyes.

When I was trying to think about my new book Bliss Brain about how to... A story to tell about this, as I was trying to find an analogy for this, one of my team members came in to work that particular day. And he was a little bit out of sorts, and he said, "Oh, I really messed up this morning in my relationship. My girlfriend's a meditator and she meditates every morning. I tiptoed around the apartment. I didn't want to disturb her, and I try not to get in her way. But today I just closed the cabinet door too loudly, and she opened her eyes and she said to me, 'Don't fuck with my serenity.'"

Dave: Nice.

Dawson: So she's meditating, and yet her default mode network is totally turned on. So that's why people can't meditate. So you have to find a way meditating that overcomes the tendency of the brain when not faced with a challenge to default to thinking about the past and the future.

Dave: When I first started writing for the Bulletproof Blog, I came across some research that for the first time researchers at Oxford figured out that the default mode network is always on. We used to think it was either on or off. And that now we understand it's more like a sliding switch. So what percentage of the brain is using the default mode, and I also realized that we oftentimes aren't aware of what's happening. It's the default mode when we're not paying attention. And with meditation, you kind of go in there and pay attention to it. I even developed some software a few years ago that would allow me to train my memory while I was in default mode so you can remember what's going on because you forget your dreams, you forget your daydreams. But it seems like there's a lot of goodness going on in there, at least when you can train it not to think about tigers. Because if you go in and you're able to spy on your default mode and all that's in there is fear, what good is that? But if what's in there is something useful... Do you have techniques that tell us how to make our default mode, which we normally don't see? How to make it do good stuff?

Dawson: There is a sort of techniques that I developed many years ago, which I bundle. And what I was thinking about at a conference once, I was keynoting a conference, and Roland McCrady from Heart Math was there. And there was a neurofeedback expert there. And we were just talking about all the different techniques we all have and how great they are and how they all work. And I thought of them as a buffet, and there's the smoked salmon. And there's the tuna and there's the prime rib. And there's the wonderful macaroni and cheese. There's green salad. There's all these things on the buffet. So I thought what would happen if I put them all together. So I developed this little routine that combined Heart Math and tapping and neurofeedback and hypnosis but in mechanical ways. So you just relax certain muscles in your body. You breathe in a certain rhythm. And essentially you're mimicking the physiological state of a master meditator when you do this.

So I did this as kind of just as a joke putting all these things together. And then I was at a conference. So I got about 200 people in a room. I had them all do this, and low and behold, they all went into this demeditative state. Not only that, they went into heart coherence, and then they went into heart coherence together, all 200 of them. And so it

was exciting. I've now been teaching this. I've now been studying this. We've now done EEG studies. The first time I did this with a group with two neuroscientists in the room with people hooked up to EEGs in the back of the room. So I didn't know what would happen.

But during the lunch break the first day, I had lunch with these two neuroscientists. And I was asking them, "What did you see on your screens?" And they could hardly contain themselves. The one said, "Dawson, these people were making so much delta that I had to literally change the aspect ratio of my screen and zoom out fourfold to capture it. I had never seen that much delta before." And then of course when you make lots of delta, you make lots of gamma. They were making lots of gamma. And they eventually said, "After I zoomed out fourfold, I still couldn't capture enough delta. I had to zoom out fourfold again, 16-fold. And then finally I was able to see all the delta and all the gamma they were producing." And then one of our colleagues subsequently wrote a paper about this, and what amazed them was that not only were people not meditators or fail meditators entering these states mechanically doing these seven simple steps, but they were doing it in about four minutes. And then the critical thing she wrote afterwards in the report that was published on her work was that she said, "What we found was that when they finished the meditation and opened their eyes, they maintained that awakened mind state with eyes open." And that's a crucial thing.

You want to be able to get to these elevated emotional states when you're in meditation. What we really want to be able to do though is carry them forward into your work day, into your parenting, into your friendships, into your workouts, into all the other parts of your life. So maintaining those states with eyes open is the critical thing. We've now found the really simple physical steps, they trigger this in most people, even those who fail meditation, and the steps keep your task positive network turned on a little bit. I keep reminding you during the meditation, now breathe, and the instruction is six seconds in, six seconds out. That puts you into heart coherence. And then I'll remind you to relax certain muscles. So that just gives the task positive network enough stuff to keep it busy to where the default mode network doesn't crank up and take over the meditation.

Dave: That's fascinating. So four minutes to get into a really deep meditative state. That would be faster than almost any other technique that I know about, and this is basically the subject matter of Bliss Brain. You're teaching people in your book how to do that.

Now you mentioned delta. What is delta good for? Let's walk through the brain states. So even walk me and everyone listening through the technique that we understand what the states are. So start with delta. Let's work our way up from there. What does delta do?

Dawson: So delta is one to four cycles per second or hertz. When we talk about hertz or cycles per second, it is a rhythm that neurons use to fire to communicate with each other. And the analogy I use in my book Mind To Matter is I went to a concert my a Beatles tribute band called Rain with my wife. Now my wife, one of my favorite photographs from her teenage years is standing on the roof of her house in Connecticut waving a huge banner

that says, "We love you John Lennon," as the Beatles plane flew over for their first concern tour in 1964. She's been a Beatles fan for a long, long time. And even at that concert with the Beatles tribute band, she was jumping up and down and screaming and yelling.

So what happened though was people were applauding. And when they're applauding, they're applauding and it's just like the usual applause you hear, which is out of phase. Everyone's clapping out of phase. But after the end of the Rain concert, everyone began to clap rhythmically, clap, clap, clap, clap, clap, cap. That's roughly twice a second. That's delta that one to four, zero to four cycles per second. So your neurons fire that way, and that rhythmic clap, clap, clap, clap was heard by the band off stage. It was a signal to them to come out and do an encore. Where the non-coherent clapping beforehand had not been. Same thing with our brain waves, our neurons. They fire at those rates, and that communicates something to distant neurons. So the band behind the curtain could hear that clapping. So that's what hertz or frequency means.

Then the next one of course is theta, four to eight cycles per second. But delta, in delta, our brains in meditation make lots of delta in those deep states. And delta is associated with all kinds of amazing effects in our cells. Things like the proliferation of stem cells. You need stem cells, and you need them to do three things. They need to proliferate, they need to multiply, they need to travel. They need to migrate. So stem cell migration is important, and stem cell adhesion is important. And there are frequencies in delta that literally trigger the proliferation of stem cells. There are different frequencies in theta that trigger the migration of stem cells, and there's a third sort of frequency that our brain's make during meditation that causes adhesion of stem cells.

So it's remarkable. We're literally triggering these things with these frequencies ourselves during meditation. But the slowest wave is delta. It's the wave of people in deep meditation have lots of delta. Psychics tend to have lots of delta. Clairvoyants have lots of delta. Mystics have lots of delta. People in very, very deep revelry have delta. It's our main restorative way when we're asleep. You need to have lots of delta. Delta's the foundation of your sleep patterns. So it's a phenomenally important way and you have more of it in these states.

Dave: It's one of the reasons that in Super Human, I'm writing, you really have to get your deep sleep. And if you're sleeping but you're not getting deep sleep, you're doing a bad job of it. And certainly I see that at 40 Years of Zen, your delta's a powerful state, but there's different types of delta. There's different locations of delta, and some of them are very powerful. And some of them probably not places you want to go without doing a lot of work ahead of time because very deep delta states can also be ungrounding or even just kind of put your ego in charge.

Dawson: Yeah. For example, PTSD survivors, child abuse survivors often have lots of delta because they're scanning the environment for threats all the time. Delta's also important pruning wave when you're asleep. So you do a lot of pruning in delta.

Dave: Now you mentioned theta a little bit. Theta is about stem cell migration, making it move around. What else happens in a theta state in the brain?

Dawson: When I was writing Mind To Matter, I looked at a review of all the research on the effects of frequencies on our cells. It covered 175 papers. It was from 1950 to the present time. And I thought how do I make sense of 175 papers? How do I tell a story about this? How do I make this meaningful to readers? And applicable and relevant to their own lives? So what I did was I then said I'm going to focus only on the frequencies that our brains make indigenously during meditation. So I'm going to limit this big mass of information to those frequencies that are helpful to us in our lives, in our health, and the ones we make ourselves because those are the ones we have control over.

So I began to look at what delta, theta, alpha, and the other frequencies do. And it's amazing what these frequencies produce in our lives. I list the studies, and I list the effects in the book.

Dave: This is in Mind To Matter.

Dawson: This is in Mind To Matter.

Dave: By the way, people who were subscribers to the curated box... Every quarter I send out a box full of the latest biohacking goodies to people. And if you go to biohacked.com, you can sign up for that. But I actually sent them all the first couple chapters of Mind To Matter when this book first came out. This was going back a couple years.

Dawson: Yeah. Again, the idea is to inspire people to use-

Dave: It's a good book.

Dawson: ... use these techniques. So enhancing molecular bonding is one of the effects of theta. Another is regenerating human cartilage. Another is increasing the activity of antioxidants, which post-neutralize pre radicals and also increasing the production of serotonin. And also repairing DNA. Also, theta is the fundamental wave of the planet, the earth. 7.8 hertz is the Shaman frequency of the earth, and so one of the interesting studies of healers found that their brand waves, again, were all over the place in ordinary states of consciousness. But in the healing moment when they were actually doing laying out of hands, healing touch, Shamanic healing, Qigong healing, they all came into pronounced theta and that magical frequency of 7.8 hertz, the Shaman frequency. And what I think might be happening is they might be recruiting the frequency of the earth to produce the healing effect. I can't prove that in and of for sure, but-

Dave: Shamans will tell you that that's what they're doing.

Dawson: Okay. So we evolve the planet, that's the Darwin frequency.

Dave: When you and I both talk with Shamans, they're connecting to the Gaia Mother Earth and whatever other stuff they do. But generally, no matter which Shaman you talk to, there's some sort of language that sounds pretty similar to what you just described.

Dawson: Yeah.

Dave: It's a hypothesis though. It's hard to prove.

Dawson: It is.

Dave: Okay.

Dawson: But what isn't is that their brains are tapping in at 7.8 during the healing moment, regardless of the healing tradition they're part of.

Dave: Correct. So there's something around that resonance, and then that resonance happens because when there's lightning, there's a resonance between the atmosphere and the surface of the earth. And basically because of the size of that spacing, it generates a 7.8 hertz EMF signal that's probably our predominant timing signal for our biology, other than the light/dark cycle.

When I look at theta, theta's also a state where a lot of interesting creativity and intuition comes out. So I was in a really deep theta state. In fact, I snapped out of it. This is one induced by neuro feedback. I snapped out of it and kind of shook my head and wrote the entire outline for my first book, *The Better Baby Book*. Just straight from my own conscious. It was pretty amazing, and that's actually the first book, Wiley published it. And that launched me as an author because of a theta state. And so this is a profound thing. And the things that you're teaching in *Bliss Brain* actually are, "Okay, here's how you get into delta. Here's how you get into theta." What about alpha and beta and gamma? Talk to me about alpha.

Dawson: Well, alpha is the big one that biofeedback and neuro feedback try to get you into. And Max Kade, that early pioneer called it the bridge. He felt as though the two slow waves of delta and theta were the subconscious and unconscious mind. And then of course beta is the conscious mind, higher frequency wave. But he felt that alpha was a bridge. And if you look at people, for example, doing therapy, we've had a number of conferences. I had one person on stage, they're maybe 1000 people in the audience. We'll have their brain waves projected on the screen behind them. We'll then do EFT tapping or have them go to a deep meditative state, and one woman, for example, had been sexually abused at an early age. We use this work a lot with PTSD. We just did our annual count of the number of veterans we treated over the last 10-12 years through our Veterans Stress Project, which offers free EFT to people. And it's now over 21,000 veterans we've treated free of charge over the last decade and a bit with these methods.

It's amazing, Dave, to watch people who've been sexually abused, have been hurt, and what happens to their brain waves. And what happened to hers was that when she was

thinking about the abuse, her theta and delta shrank to almost nothing. Both of her left and right hemisphere and her beta, which is the wave of anxiety and stress, fill the entire screen.

Dave: Classic PTSD brain.

Dawson: Classic PTSD brain. Hyper vigilant, alert, full of intrusive thoughts, full of all the anxiety that comes from that state. But as the therapist who was working with her treated her, you saw her whole brain wave state change radically. Now it's not the frequencies that are the crucial thing so much as the ratios between them. And so we saw the amount of beta shrink and the amount of alpha expand, and Maxwell Kade said that alpha is the bridge between the conscious frequencies of beta. So what you find, for example, in Tibetan monks who have done over 40,000 hours of meditation, they're not brain dead. Their beta just hasn't got away. They have some beta activity there too. They're still thinking. But they have this huge alpha bridge. So now that bridge is the creativity bridge between that unconscious stuff, which you're talking about writing your book, that theta. You have access to it because alpha's there. You can have all the theta and delta in the world, but if you don't have the alpha bridge to get you there, you're cut off from it consciously. When you have that big alpha, that's when you then have those ideas rise over the consciousness.

So what we saw with her after treatment was all that high beta went away. It was just beautiful. She felt a sense of inner peace. She felt a sense of love. She felt a sense of calm in her life. She had huge alpha, an enormous amount of delta, and then what rides on big delta is gamma. She began to have flashes of gamma because before, when she was all anxious, no gamma either. So you literally see these changes happening in people in real time during this treatment.

Dave: It's amazing. One of the reasons that I started 40 Years of Zen is I realized I wanted my alpha to be bigger, a better alpha bridge, and any time a brain doctor looks at my brain, they say, "Wow. That's a big alpha." And it is absolutely trainable. And I'm exceptionally fortunate to have neuroscientists working for one of my companies, so I get to have all the gear at home to do that. But I don't think I could do the array of creative stuff that I do. Super Human just hit the *New York Times* list, which I'm super grateful for. It was my third time, and I'm a dad and a husband and a venture backed CEO and a podcaster and all this stuff that requires creativity. I don't think I could have done those things. In fact, I'm sure I couldn't have in my 20s where you're younger. But I didn't have the brain waves for it. So they are absolutely trainable.

And I'm really intrigued by the technique that you're going to share with me that might be able to get me there very quickly, which would be a great gift. But you haven't talk about gamma yet, which is something that we didn't know about back when they were discovering the alpha bridge. No one could measure gamma because it's harder to measure because it's a tiny little frequency. What's your latest research on gamma brain waves?

Dawson: Yeah. Just an aside too that time of meditation, there is little unanimity in the EEG community as to what meditation even is. So I'll talk a little bit about what I define it as in Bliss Brain. But what Andrew Newburg found and it reports in his book *How Enlightenment Changes Your Brain* is that when he hooks people up, it takes them 20 to 40 minutes to hit that awakened mind state. Even experienced meditators takes them 20 minutes to get there. Novices can take them a whole hour to get there. So if you have say, for example, 45 minutes to meditate, and it takes you 20 minutes to get there, you only have 25 minutes there. If it takes you 40 minutes to get there, you only have five minutes there. So you really want to shorten that window.

Dave: You're saying in one hour or why's it limited to an hour? Once you get there, can't you hang out there?

Dawson: You can hang out there, but let's say, for example, you are a dad and you have your kids. You've set your alarm clock early because I did that when I first decided to meditate. I had to get my kids to school by eight. So I had to leave the house at 7:30. I had to get them up and everything like that. So I get up at 6:30. And then the day I decided to meditate every day, and that's a whole other story, I realized I'd have to get up at 5:30. It's like is there any such hour? Does 5:30 exist? I was just terrified. But I did it. I began to do it the next day. I got into the rhythm of it after a while, and I do it automatically every day.

So doing it every day. So I only had 45 minutes, and most of my 45 minutes was wasted. You want to make it as efficient as possible and get there fast.

Dave: Did you just say hurry and meditate faster? I mean, that's what it really comes down. We don't have time to waste getting into these states. Even the Dalai Lama offered I think \$100,000 prize a while ago to anyone who could help me get into this state faster. It takes me four hours. I don't have four hours. So it's on one hand almost offensive to meditators, "Oh, you're supposed to be slow, and you're supposed to just relax." You're like no, there's only so much time. There's all kinds of meditative states you go into. And there's other stuff that you want to do as a functioning human being. So thank you for saying it that, look, you only have five minutes there because you had to take your kids to school because that's the way most of us are living our lives, including me.

Dawson: Well, these studies are people say, for example, the Richard Davidson studies are people who have 40,000 lifetime hours of meditation. But they went into a monastery when they were six, and their needs are taken care of. They're meditating many hours a day, but they don't have to raise a family or raise venture capital or manage businesses or any of these things. So we read about their meditative states, and we say, "Oh, these are great gurus, great adapts." Well, yeah, but they don't have to deal with all the stuff. So that's not a realistic model for Westerners. So we need that meditation that gets us into that state quickly.

So in a big study I did of Joe Dispenza's meditation retreats, I defined it as time in meditation. And we define it as sustaining alpha for 15 seconds or more. When you can

sustain alpha for 15 seconds or more, regardless of being in meditation. So we actually did have a definition of meditation we created for that research project. But then-

Dave: Was his eyes closed alpha?

Dawson: Eyes closed alpha.

Dave: Okay. That's important. If you're listening to this, you're saying, "Okay. I think I know what alpha is. It's that relaxed bridge state." When you close your eyes, especially if you look up towards your forehead, your third eye between your eyes, you'll pretty much experience alpha, a brief flash of alpha. So it's harder to have eyes open alpha. That's why a lot of meditative states are eyes are closed. I just realized that's common for you and me. We know that. But listeners may not. Okay, keep going.

Dawson: Okay. So gamma is what starts to happen when people are sustaining these states. So for example, in those 40,000 hour meditator studies, those meditatives were able to both have gamma and sustain gamma, and the degree of gamma was 700-fold the amount that they were seeing in ordinary people. So enormous amounts of gamma. Gamma is found in highly creative states, highly creative people. Whether, again, it's an extreme athlete, whether it's a concert pianist, whether it is a scientist having a flash of insight, that's gamma. So when you solve a problem, when you have a really satisfying intellectual exercise, you'll have a burst of gamma. But these monks can sustain gamma for a very, very long period of time, and it's found in creative people. It's found in high achievers. It's the mark of the flow state. So that big alpha bridge and then that'll tend to produce gamma.

Dave: It's probably the most unknown of the brain states. A lot of people still believe it can't be trained, and I see routinely when we're training people to do gamma, that their gamma goes up into the right the more they're doing the training exercises with neuro feedback as a part of it. This is 40 Years of Zen stuff, but it rides as a carrier. It rides on delta. It rides on alpha. And if you want to visualize this, so there's a big, slow wave. A giant wave. Imagine your surfing these big waves, but on top of that big wave, there's little waves at the top. The gammas are the little waves at the top that are crashing, but the big wave is the carrier wave. And your brain waves do something similar to that. You like that analogy? That's how I walk people through it.

Dawson: Yes. Yeah.

Dave: And it's very hard unless you're an engineer, which I am. I even looked at oscilloscopes to remember what waves are and how they look. But you can think of it as the little wave that sits on the big wave. But if the big wave isn't there, you're not going to get much of the little wave. So it's hard to train the little wave, which is why most neuroscientists say, "Oh, either gamma doesn't matter or it's not trainable." It's because you have to create the big wave to have the little wave.

Dawson: Right. And I want to say one thing about gamma. You mentioned the study in Super Human as well. But in Super Human, you mentioned it very briefly. I give a lot of

attention in Mind To Matter, and it's the MIT study of gamma shown into the brains of lab animals. And what the researchers found was that mice when they're running a maze and they hit a black wall and they can't get any further, they get frustrated. So normal mice have a burst of gamma. Alzheimer's mice, mice bred for Alzheimer's research have rapid formation of beta-amyloid plaques in their brains don't have that burst of gamma. So this team at MIT said, "What would happen if we induced gamma in the brains of those mice?" And so in the first study they did, they did it by shining light in through the noses of the mice. And they found... Now this is an example of what a frequency can do for your physiology. They found that in one hour of gamma, 50% of the beta-amyloid plaques in the brains of those mice disappeared. 50% reduction in the beta-amyloid plaques in the visual cortexes of those mice in one hour of gamma.

And I just list that as one of the many things in Mind To Matter because we can make gamma. We can make alpha. We can do all these things, and we can have huge effects with energy on our physiology.

Dave: It's really interesting in one of the researchers from I want to say Harvard, a neuroscientist figured out that a light blinking 40 times a second, 40 hertz, the beginning of gamma. I'd put that in gamma. Gamma's normally around 60, but it's higher than typical beta. She found that it reliably reduced amyloid plaque. Ended up starting a company about that, and I remember this really well because I first talked to her about it when I was wearing Hugh Hefner pajamas at a costume party.

Dawson: Let me see, I can picture it in my mind's eye.

Dave: It was fantastic. It was at the Near Future Summit, and it was right next to the Salk Institute in San Diego. And it was a costume party. I didn't have a costume, so I asked my assistant, "Hey, send me something," and she sends me these red stain pajamas. I'm like, "Really? Thanks." And everyone else shows up in unicorn onesies because they were all venture capitalists. They all like unicorns. And then there's this Harvard neuroscientist dressed like a neuroscientist, completely like, "Why are all these people dressed weird?" It was exceptionally memorable because it was so random. But we spent the whole night just talking about this research and the study there. And what it comes down to in Super Human, amyloid plaque, including beta-amyloid in the brain, it's essentially cellular level scar tissue, and it's a consequence of aging. But when you can induce a signal that reduces trauma, the body realizes it needs less scars to protect itself.

So there's an explanation, and can I prove everything I just said? No. But does it make sense given the results we're seeing when people go into these states that are a socio trauma release? It kind does make sense. So talk to me about trauma and gamma.

Dawson: Trauma is where I really first began doing research. I founded the Veterans Stress Project to get this to veterans. I twice testified before House committees on PTSD, veterans and trauma. I written two books on trauma. And I only later kind of began to think more about excited states. Initially I was focused on just healing the trauma of these people who were suffering so terribly. And so again trauma has its own profile.

PTSD also is one of those conditions that gets worse over time. According to the World Health Organization, if you have depression, your episode will last about on average eight months unless you get medication, in which case could last forever. But untreated medication depression last about eight months. PTSD often gets worse and worse and worse over time. In fact, one study of 5300 first responders to 9/11 found that half of the cases of PTSD were delayed onset PTSD. These people looked fine after six months to a year. They didn't look so good two or three years down the line.

I had a wonderful man called Harrison Jack who helped us get EFT into the VA. And after Vietnam, he served as a Marine pilot there. He didn't believe in PTSD, thought it was a character weakness. Said, "I'm fine." And then in the mid-1990s, 30 years after Vietnam, he woke up one night in the middle of the night and he was straggling his wife in his sleep. He then admitted he had a problem. Went to the VA hospital, got therapy, learned Heart Math, learned tapping. So that's because you're using neuroplasticity to signal those trauma pathways over and over and over again. So they get bigger and bigger and better with signaling.

So now whereas before you may have had a certain profile of brain function. After traumatization, you develop a different profile of brain function. You're probably going to have a lot less gamma. You're going to have more delta or potential delta. You'll probably have less theta and less alpha as well. And a lot of high beta. So all of that signaling, again, is changing the structure of your brain and the function of your brain over time. So that's why people tend to get worse and worse and worse unless they get an effective treatment like EMDR, EFT, yoga, any one of those therapies.

Dave: Okay. You've though really made a practice of figuring out what is the best I can get from each of these practices and how do I cram it into the smallest amount of time. That's basically what Bliss Brain is about, your new book. But you talk about something called eco meditation and EFT, which we've interviewed about, this tapping thing and how it's in a study with someone named Judy Pennington out of Pennsylvania. How you were able to create these states that were ridiculous. Like a very short period of time. I'm just looking through the notes I have on this study. Combining those two methods produced a statistical gains in what they call the EO awakened mind.

Dawson: Eyes open.

Dave: Yeah. Eyes open awakened mind, that's one of the things that people vast in caves for decades working to achieve. So how long does it take to do eco meditation plus EFT?

Dawson: I teach at Esalen Institute, and I've been teaching EFT there for years. And so I proposed to them that I teach eco meditation there. And I said we can bring people into these elevated states in 90 seconds on the third day, four minutes the first day. I got a very irritated rejection back from them saying, "Dr. Church, Esalen has been teaching various forms of meditation for 40 years, and we know that people cannot attain these states that quickly or easily." So they rejected my-

Dave: That can't be, therefore it isn't. Classical science.

Dawson: Well, eventually they relented and let me teach eco meditation there, do a retreat there. And the results were wonderful. People's levels of happiness went up, their immunoglobulins went up substantially. Their cortisol levels dropped. I also did a week there people doing a combination of EFT and eco meditation. And the results of that study were absolutely mind blowing. Their levels of their baseline cortisol, and you have to measure the cortisol the same time of day because it fluctuates during the day. So we had the measure them basically at 10:00 a.m. the first morning, 10:00 a.m. the last morning. So we measured all of these physical markers of health and their baseline levels of cortisol in just a week went down 37% with a high degree of statistical significance. When the bad stuff goes down, when your stress hormones go down, it liberates all kinds of precursors for good stuff. Their immunoglobulins rose by 113% in the course of that week. Their happiness went up by 31%. Their pain went down by 41%. Their anxiety and depression went down dramatically. Their resting heart rate dropped substantially. Their heart rate variability improved in just one week of these practices.

So, Dave, that's why I'm so excited about this, and I love your books because I read your books. I comb through your books. I make lists of the things I'll do, and I may change myself on it. So I might change an exercise routine I use. I'll use these external exogenous behavioral interventions because they're useful. We need to get them right. But what we can do by changing our minds and our heart centeredness... Are we in our hearts or in our heads when we relate to other people, when we live our lives? Are we approaching our business meetings up here in our heads or down here in our hearts? In our spiritual practices, are we able to move into those elevated states and build that brain tissue?

I've been so intrigued by people coming up to me now at my retreats and at my workshops and saying, "I'm feeling a pressure in my head when I meditate now. What does this mean?" And invariably they point to either the mid-prefrontal cortex or the temporal parietal junction in their brains. And I think what's happening is they're stimulating neural growth in those areas, and they're feeling it. They're literally feeling their brains as they change. So I'm just wildly excited that science is now giving us the ability to study these ancient practices where we don't have to go to a monastery and spend 40,000 hours to get there.

In Bliss Brain, I also look at some pretty obscure research, and it's MRI studies comparing people who have done 40,000 lifetime hours, which is a crazy amount of meditation, with a mere 20,000 lifetime hours. And the answer is there's no end point to brain change. The answer is even after 20,000 hours, the difference between the 20,000 hours and the 40,000 hour people was substantial. In fact, the amygdala in the 40,000 hour people began to atrophy. This is your brain's alarm center. This is the fire alarm of your brains. We go into fight or flight. It literally was withering away through disuse. I mean, you want your brain like that where the happiness centers, the emotion regulation centers are big and bulky and effective, and the stress centers are just withering through lack of use.

Now if you have to get away from danger, if someone swerves in front of you in traffic, your fight or flight system is perfectly capable still of snapping on and taking care of you.

But you don't live your life that way. Most people I test, their levels of cortisol are far too high. The amount of beta they have is like they're in the jungle. That is not what you want. You want a happy brain. You want a loving brain, a compassionate brain. You want to wake up in the morning so inspired, so full of just wisdom and connection with what I call non-local mind in my books that you're ready to just to have that pour through you and inspiration and joy to affect everyone in your world. So that's the kind of brain, the kind of life you want, and the thing about science is it's showing us how we can literally catalyze that without needing to be that monk doing the 40,000 hours. We can learn these techniques, practice them, and then become that... have the brain we want in just a few hours of practice.

Dave: Can you walk me through association, everyone listening through the four minute version of that right now?

Dawson: Sure. Absolutely. Love to.

Dave: All right. Let's do it.

Dawson: So if you're driving, pull over. If you're operating a forklift truck or a crane, put it on pause.

Dave: Or performing surgery, anything like that.

Dawson: Yeah. Put it on pause and do this later. And again, all of these instructions are free online, and we'll show you. Dave will give you links as to how to get those later on. But first of all, begin by stimulating one set of acupuncture points by simply tapping with your fingertips on the area of your other hand right below where your little finger is joined to your palm. So tap there on the side of your hand with your fingertips of the other hand.

Dave: Like where you're doing karate chop.

Dawson: Yeah, the karate chop point. Just imagine all of the tension and stress leaving your body.

Dave: You're tapping about one time a second.

Dawson: About one time a second. Just visualizing all the stress flowing out of your body. And imagine your breath flowing in and out through your heart. So imagine breathing in through your heart, breathing out through your heart. And then tap right below the pupil of your eye on your skull with two fingers. Again feeling all the tension leaving your body. Breathing in through your heart, out through your heart. And tap onto your nose. Tap onto your lower lip. Then relax your hands, and if you haven't closed your eyes already, close them now. Breathing in through your heart, breathing out through your heart. And relax your tongue on the floor of your mouth. And picture a big empty space between your eyes. Tongue relaxed on the floor of your mouth. Breathing through your heart. And now slow your breathing down to six seconds per in breath and six seconds per out breath.

Big empty space between your eyes. Tongue relaxed on the floor of your mouth. Breathing through your heart. Six seconds in. Six seconds out. Feeling the energy of love and compassion in your heart. And then send a beam of that love and compassion to a person or place that makes you feel absolutely wonderful. And fold that person or place and that beam of love and compassion flowing from your heart's center. Tongue relaxed on the floor of your mouth. Big empty space between your eyes. Six second in breath through your heart. Six second out breaths through your heart. Visualizing that beam of love, compassion flowing from your heart to that person or place that makes you feel wonderful.

And now expand that beam of love and compassion to touch every single atom in the universe. Imagine your heart beam touching and loving every single atom in the entire universe. Breathing in through your heart six seconds, breathing out through your heart six seconds. Tongue relaxed on the floor of your mouth. Big empty space between your eyes. Your heart beam filling every single atom in the universe with compassion.

Now tighten your heart beam again to focus only on that one person that makes you feel wonderful and fold them with your compassion, and then gently detach that beam of energy and bring it all the way back into your own heart. Feeling your energy completely inside your own body. And then send energy to a part of your body that needs help. It could be a part of your body that's in pain. It could be a part of your body that is sick. It could be a part of your body that is weak or you don't like. And fold that part of your body in your own compassion. Tongue relaxed on the floor of your mouth. Big empty space between your eyes. Breathing in and out through your heart. And with the next three breathes, prepare to turn your attention back to your environment, back to the area around you, and on the third breathe, open your eyes, look around, and notice the largest round object in your environment. Notice the smallest pink object in your environment. Notice how good your body feels and what time of day it is. And just give thanks to be in a body and to be here.

So, Dave, that was a total of 10 minutes.

Dave: That felt like more than four minutes.

Dawson: Yeah. I cheated.

Dave: Well, that was-

Dawson: I took you in, I took you out.

Dave: That was pretty deep. I'm hoping that if you actually participated in that, hopefully not while driving as we warned you not to. That definitely takes you to really deep meditative places, and this is powerful stuff and no technology other than the ability to listen to it required. And you can learn to do that without any voice guidance whatsoever. So these are tools that are there, but there really isn't a manual that tells you how to do this that you're born with. We have to figure it out as scientists and researchers and meditators. That's why I think Bliss Brain is a worthy book. That's why

I'm writing the foreword for it. So I'm pretty excited for when this is available on the shelf because I think access to this for everyone where if you're going to do 10 minutes in the morning, maybe this is a 10 minutes' worth doing. But maybe for someone else, pranayama where they alternate breathing through their nostrils is really the thing. But if you don't try them, you're not going to know. And if meditation is like a vitamin for your mind, it's a nutrient thing that you pay attention to what you put in your coffee for breakfast, you might want to pay attention to what you put in your mind before or after that. It's an important part of being a high performance human being.

So thanks for sharing this with our guests. This episode was with Dawson Church. His new book is Bliss Brain. His last book he talked about on the show is Mind To Matter, and he's one of the leaders in the movement around EFT and tapping. And just a guy who's spent decades researching these things as you can tell from this interview.

Dawson, thank you.

Dawson: Dave, I'm so grateful to be here and so grateful for your work and the passion you bring in sharing all of these wonderful biohacking tips to people. And also your love and your care that you show other people. And the humor and the wisdom you bring to it. So I love the information. I love the energy behind it. I'm so grateful that you're sharing this with your community. Thank you.

Dave: You're welcome, Dawson. Intentionally did not wear my Hugh Hefner pajamas today.

Dawson: Next time.

Dave: If you liked today's episode, you can actually play it again. Try it tomorrow morning. Take that last 10 minutes of the show and use that as your meditation and see what happens. Or go to Dawson's webpage dawsonchurch.com I'm guessing.

Dawson: The best one for mediation is just mindtomatter.com. Mindtomatter.com.

Dave: Go to mindtomatter.com, get the meditation, give it a shot, and if you like it, do the simplest gratitude thing you can possibly do, which is go to Amazon and go to the book Mind To Matter and leave a review. While you're at it, leave a review for one of my books or for the podcast itself. Bottom line is by letting people like Dawson know that you've used their work, that it was valuable, and letting other people know it's valuable. It's one of the easiest things you can do to help other people, and we all know at least if you listen to more than two episodes that gratitude is one of the cheapest drugs you can use to be a better person and perform better. So what the heck, there you go. Free gratitude, and it's like tipping your Uber driver but just what you do for authors.

So on that note, have a wonderful day hopefully upgraded as a result of that extra 10 minutes of meditation. And I'll see you on the next episode.