

Brain Science Podcast #43

Interview with Robert Burton MD

Transcribed by [Diane Jacobs](#)
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Dr. Campbell: This is the *Brain Science Podcast*, the podcast for everyone who has a brain, and I'm your host, Dr. Ginger Campbell. On the *Brain Science Podcast* we explore how recent discoveries in neuroscience are unraveling the mysteries of how our brains make us who we are. For more information, including show notes, links to previous episodes, and information on how to subscribe, please go to the website brainsciencepodcast.com. We also have a discussion forum at brainscienceforum.com, and you can send me email at docartemis@gmail.com

Music

"One of the really wonderful things about the mind is that it feels different - that's where this age-old body-mind thing comes from is that in the very big picture we feel the mind to be separate from the rest of what the brain does, because that's what the brain *does*."
Robert A Burton, MD

Music

Dr. Campbell: Welcome back to the *Brain Science Podcast*. This is episode #43. Today I have an interview with Dr. Robert Burton, author of *On Being Certain*. I discussed this book on [Episode 42](#), but you don't need to listen to Episode 42 to enjoy this interview. I'll be back after the interview to tell you how you can find the books Dr. Burton talks about during the interview, as well as previous episodes that relate to our subject, which is the role of the unconscious in decision-making.

Dr. Campbell: On today's episode of the *Brain Science Podcast* my guest is Dr. Robert Burton who is the author of *On Being Certain: Believing you're right even when you're not*. Dr. Burton is also retired from being a practicing neurologist for many years and now he writes full time. Bob, it's great to have you on the show today.

Dr. Burton: Thanks very much for having me.

Dr. Campbell: Would you like to just tell my listeners a little bit about yourself?

Dr. Burton: Sure - I graduated from Yale, then I went to med school at UCSF and I stayed there for a hundred years - internship, residency, and stayed on at UCSF and ran the neurology department at one of its hospitals, Mt. Zion. Then one day, I got the writing bug and started writing some novels, first novel came out in '91 - actually the book that I started, *On Being Certain*, really started as a novel but I realized I couldn't do it in the novel form because it was more about science and philosophy and so, that's what I do - I write a column for Salon and enjoy thinking about thinking.

Dr. Campbell: Great - I'll have to get you to give me a link to your Salon column so that I can put it into the show notes.

Dr. Burton: OK - it's called the Mind Reader..

Dr. Campbell: Mind Reader? http://dir.salon.com/topics/mind_reader/

Dr. Burton: It's actually neuroscience and popular culture so it covers a variety of subjects that are.. you know.. is the patient conscious? ... that type of thing.

Dr. Campbell: I haven't been reading Salon recently - do you have to pay to get to the content on Salon?

Dr. Burton: Not for the features like that, no.. I'm not sure how it works - they give me freebies so I can't tell, but I think you can get to all those columns.

Dr. Campbell: OK, great... So how did you come to write this book?

Dr. Burton: You know I started this book.. actually I was going to write a novel about brain stimulation and experiences the patients had and at the same time was also collecting some notes on a variety phenomena that I'd seen in neurology such as Cotard's Syndrome which is where patient believes he's dead - even when you show them that they have a pulse they can't believe they're not dead - in fact the patient that I wrote about was a patient who had encephalitis, believed she was dead, took her pulse, showed her she had a pulse, and she said, "Well, this only proves that people can have a pulse."

Well, I had collected a large variety of similar cases, ... Oliver Sacks and my agent said, "These are really interesting but what's the point?" So I finally spent some time thinking there must be some underlying issue here, and I couldn't decide whether it would be novel form, memoir form or whatever, and I finally realized there was an underlying question as to why all these people had the phenomenal belief that wasn't true and the evidence was overwhelming that it wasn't true, and yet they maintained it. And eventually it occurred to me that the basis of this book was "how we know what we know."

It morphed from novel to memoir to its present form.

Dr. Campbell: Did you have a particular goal in mind for what you want the book to accomplish?

Dr. Burton: No.. I did this backwards actually.. because at heart I'm a novelist. So in a novel, you start a character in motion, walk him down the street, put him in a chair, you want to see what happens to him. So in this particular case I tried to find out what these had in common. It wasn't until after I realized that the feeling of knowing was an involuntary sensation that I then went back and redid the whole thing from the point of view of how all these would all fit together. *Then* I realized the point was I wanted to tell people that certainty or feelings of conviction or rightness weren't within their conscious control. It didn't occur to me originally that that was the point. It only was after this was worked on for a long time that it finally dawned on me - one of the problems was that I never heard anybody discuss mental sensations as a separate category of human experience. We don't normally think of them that way so I didn't have any basis. It wasn't until that occurred to me that this all fell into place.

Dr. Campbell: Well that probably is why you were able to come up with an original way of looking at this, I mean the reason I wanted to devote two episodes to your book was the fact that the feeling of knowing is not under conscious control seems like a pretty important thing to become aware of.

Dr. Burton: Oh I think so and actually it's peculiar, I talked to a philosophy professor at Berkley who actually had read my book and he said, you know we don't talk about this in philosophy, and certainly in neurology nobody talks about these sort of neural phenomena because they're not something that you can prove.

I do wish to emphasize, probably more than anything else, that I think the luxury of not being tenured at the moment, not having to do this for career, getting academic point, it allows you to be wrong in thinking about something long enough that you can come up with something original, because you're not forced to prove something. But you ask me how I came about this I really didn't know what it was nor did I feel any urgency to know what it was - in writing a novel you don't have to know what it is, and I'm not applying for government grants so I think it makes it a lot easier than when you're stuck somewhere where you have write something to prove something.

Dr. Campbell: Yeah.. I had a *very, very* short career in medical research because I became quickly disillusioned by the fact that everybody was writing their grant proposals for what they actually already did.

Dr. Burton: Well, that's it. I wrote a column for Salon in which the people who I wrote about were upset - the neuroscientist shall remain nameless, but anyway, the guy said to me, "*I know* this works, we just need to prove it" and I said, well that's not the way *science* should be done.. you should think, "*I wonder* if this works.." and he said no, I know it works, so we're setting out to prove it. In fact, that's what his research ultimately represented. An effort to prove it rather than the actual proof of it. A little editorial for the people who feel they have to prove something.

Dr. Campbell: That certainly seems to influence the medical literature especially when you add in the influence of the drug companies paying for the studies..

Dr. Burton: Yes, I'm actually doing a little piece for Salon on placebo effect this next week, and one of the questions is what's the value of Prozac? Now I don't know much about psychoactive drugs but when you start to read the literature half of the studies don't show that there's anything better than placebo, and then you realize that you really have to go through each study with a fine tooth comb but even then, you can fiddle around with.. I did an NIH project where I don't even think we came to understanding what the disease we were looking at was straightforward where we could study it some.

Dr. Campbell: Yeah.. let's get back to the book for a minute - to me, I came away with the feeling that - I almost feel like I'm using a pun when I say that one of important concepts in your book was the perceptual nature of thought, looking at thought as being similar to something like the way we look at the way we do vision ...

Dr. Burton: Right...

Dr. Campbell: ... Because we understand that optical illusions trick our visual perception but we somehow think that our "thinking" should not be prone to such things.

Dr. Burton: Correct and actually the image that I've been working on since I wrote the book and I'm not quite clear I can articulate but I'll give it a try is that we all know - I think most of us accept - that the brain does everything we experience in terms of, .. ah.. thoughts and feelings and all the rest. I mean, I think that's accepted. But we don't somehow recognize that these all come out of little cells that then connect together, and they make a higher level of group, so let's say you take individual cells that see one aspect of motion, of vision, one will see lines and another borders, and they all merge together to make elemental image of something, and then another will recognize color, recognize

location of where it is, that it's in flight, then there'll be another higher level generate an image which goes somehow into consciousness as a butterfly. But I don't think we recognize that one of the things that the brain generates is the sensation of the mind looking down at the butterfly, but it comes out of the same material, so that the mind itself is generated by the same neurons that are generating the rest of the perceptions and all of these neurons, collectively in neural networks, are subject to all sorts of perceptual illusions. One of the really wonderful things about mind is it feels different - that's where this age-old mind-body thing really stems from is that in the very big picture we feel the mind to be separate from the rest of whatever the brain does because that's what the brain does.

Dr. Campbell: Yeah...

Dr. Burton: It's a perceptual illusion at the very core. So all these debates about mind-body really are just a misunderstanding about how the brain works.

Dr. Campbell: Didn't you say something about our mental limitations make it impossible for us to accept our mental limitations?

Dr. Burton: Right. And what it really part of this is, it's really what we experience in our mind are all the sensations associated like I'm thinking or I'm contemplating, whatever ... the limitation is, I'm thinking and therefore if I'm not thinking I must not be thinking. We use the sensation to determine what our brain is doing but we can't see our brain or the unconscious so the limitation we really have is that we can only see what our brain tells us we can see. And when our brains tell us *about* what we can see. It's the one that says to you, oh, I'm thinking about this. All these questions about like free will and stuff really get down to what you experience at a conscious level versus what you're actually doing.

Dr. Campbell: One of the things that relates to that is when the ideas seem to come out of nowhere cause we don't have access to where the thoughts came from before they reached our conscious awareness, and we get all kinds of distortions about when this happens. Would you like to talk a little bit about - cause I don't think I covered this well enough in my review of your book - a little bit about how our brain distorts our perception of *when* things happen?

Dr. Burton: Sure. The example I use in the book is straightforward - imagine that you go to your friend Joe Blow's house, 20 years ago, and you sit in his living room, he's there, and you make a very strong mental association that he lives on Filbert Street let's say, and you recognize the front porch and the house and so on, and that's how you learn where his house is. His house is not only a visual image, but it's now embedded with the sensation, yes, that is his house. Cause that's the only way you would learn it. So that feeling of knowing that we talked about, really is about the likelihood of correctness of the visual image you see. So you see his house 20 years ago, and now 20 years later he invites you over and you're driving down the street, the only way that you could possibly recognize his house is to already know that it's his house. But you wouldn't make sense to look out and feel "Ah, that's his house" until after you had seen it. So the way your mind experiences is, "Let's see - I'll drive down here and ... red house, white house, blue house.. oh! there's the house with the porch - that must be Joe's house." But no: the fact that you knew it was Joe's house made you recognize it in the first place so you knew, in advance, but felt the sensation occurring after the fact.

And so this rearrangement of time is essential for learning something then being able to recognize anything. So virtually everything that we see, like if I recognized you in the street, I would have first recognized you as, my calculation would have been, there's very high likelihood it's Ginger Campbell, and then I would say, Oh, that's Ginger. But then it would have felt like the calculation occurred after the fact. And this was what I was really afraid to - we don't know when thoughts begin. I don't even know how this book that I wrote began, but I do know one thing, that after my mom passed away, I found a paper in her collection of stuff that she'd left for me and it was a paper I'd written on the same subject forty years ago, which I had forgotten. I'd forgotten absolutely completely, it never occurred to me it was a college paper I'd written when I was 17 or something. Obviously it had been percolating along in the unconscious somehow until it emerged. You asked me when I started this book - I could

tell you the time that I experienced beginning it but I couldn't tell you when it actually began, because we really have no access to when our thoughts begin in the unconscious.

Dr. Campbell: Now I like the fact that in your book you pointed out and that since you're a novelist I think that you have the right to say this, but when you have an idea that you aren't consciously thinking about, say a problem in your novel, or whatever, and the solution comes to you that it seems common for people to attribute that to some kind of mystical source instead of the fact that it actually came from their own brain.

Dr. Burton: Correct. And you know it's interesting, I wrote one novel where I could not think of the ending, and really, it went on for like five months - nothing worked. And one night, I remember someone was telling me about a friend has had a cardiac arrest in Bangkok and then awakened and I remember thinking about it and going to bed. And in the middle of the night, I wakened, and the whole thing appeared, all at once, this chapter - I jumped up wrote it down and it stayed verbatim except for you know, the usual editing. I thought, wow, how did that happen? See you were thinking how did that happen.. well the fact of the matter is that your unconscious had all the pieces in place but because it didn't have a sense that it was right, it didn't send it into consciousness, the idea for an ending until it got the missing piece. So the missing piece provoked it but it was all primed and ready to go. It's a fascinating idea, it wasn't some muse or some extraterrestrial being sent this information to me it was just the missing piece from my unconscious but I didn't know that.

Dr. Campbell: I don't want to get into this right now but don't let me forget; at the end, we need to come back to the implications of this for approaches like of like the psychologist and psychotherapist because they seem to give the unconscious all these convoluted pseudoscientific magical abilities...

Dr. Burton: Right. Exactly.

Dr. Campbell: But before we get onto that I'd like to ask you about how all this ties into the reward systems of the brain. What do you think the key idea is about how this feeling of knowing relates to the reward system of the brain?

Dr. Burton: Well you know, it took me a long time - I sort of went through a series of thought experiments to try and figure this out. One of the questions is, why would you pursue a thought for which you had no idea it was correct? In other words, if you envision the unconscious as generating virtually an infinitude of ideas, experience, some of which will rise up into consciousness, many of which will go by the boards... the question may be why does something arise in the consciousness and then you say, I'm gonna think about this? Well, there have to be some unconscious mechanism generate some idea of the likelihood that this is something worth pursuing. Whether it's esthetic, gonna redo a scientific discovery, or it's going to make you money, whatever it is. There'd have to be some reward for your unconscious thought.

What would it be? Well, it would have to be some sense that if you pursue this something good will come out of it. So there'd have to be a good feeling, or sense of motivation - otherwise, every single thought that your unconscious mind had would appear in consciousness; I thought, well, OK, there's got to be some feeling or some quality that arises that makes some thoughts preferable to others, prior to you knowing they're any good. There's got to be something that feels good about the thought - I think probably a good example is the hunch. You wake up in the morning and go, I've got a great idea. Now what you really have is a *feeling* that you've got a great idea, along with the idea. You have no idea if it's a great idea.

What you really do need is a reward system for thinking. And it's probably as powerful as for everything else. If you don't have it, you won't do anything. When you see a kid who's stuck in highschool algebra or Latin or whatever it is and he goes, "I don't know why I have to do this," - you can't get him to do it until somehow he understands maybe he's going to get into college with it, or whatever it is, but if he doesn't understand, he won't do it.

Most thoughts, we have to feel they're worthwhile. So the reward system has to be really prime. I think now the evidence is the connections between the limbic system and the brain, you know, the meso-limbic reward systems are really quite powerful, and I think that you can't even think of a thought without a reward.

Dr. Campbell: You also brought up the idea that maybe some people might actually be addicted to feeling that they're right all the time.

Dr. Burton: Well, you know I try to strike a middle ground in genetics because I don't think genes control everything but they obviously have a significant influence how you think. I'm on the far end of the skeptical, I just don't get that feeling of knowing very often. So when I see something I think, I wonder if the other would be true, I wonder if the opposite's true, da da da da. Other people on the other hand, I suspect have a very strong sense, you know the people that are always right, they cannot be wrong, and they seem to have a great joy out of being right. And I wouldn't be surprised if it is a form of an addiction.

Dr. Campbell: Well most of us are kind of in the middle - do you think that we can learn to be more comfortable with uncertainty since the reality is that most of the time we have to make a lot of decisions without being really sure?

Dr. Burton: Well I guess that also gets down to the pleasure - this gets back to your reward thing; I actually enjoy being uncertain, and I enjoy the idea of ambiguity, in other words, it's probably one of the reasons I like writing novels - I like the idea that there can be multiple solutions - not even a solution - multiple endings, there can be multiple things a character can do, all that would be within character. I've never really enjoyed starting with the premise "I am going to prove this." I remember sitting down with one of the really famous best-selling mystery writers and he said to me, "I always write the ending first because I want to know where I'm going." And I said to him, "If I knew where I was going I wouldn't start the book."

Dr. Campbell: Exactly.

Dr. Burton: Yeah well so these are different, but I do believe there are actually different ways of thinking about the world that come out of your biology. I just like the idea that this could be wrong. When you say to me, can you teach people, I don't know that you can teach people who love to be right, not to be right, because I think in part you have to start really young where they're trained to understand that this isn't necessarily true. Now this might be an illusion, the idea that you're correct, but once the circuitry's really in there it's like having a bad backhand in tennis or something, it's really hard to get rid of.

Dr. Campbell: I know, in medicine it seems like people in different specialties have different personalities; I'm an emergency room doctor and we're always having to act with incomplete information, and then the radiologists drive us bonkers, you know, cause they're always sending us reports that say, "Well, it might be this or it might be that - order another test," which does us *no* good...

Dr. Burton: I started in neurology, in part because they didn't have any tests. When I started my residency they didn't have CT scans and MRIs ..

Dr. Campbell: It was all physical exam..

Dr. Burton: And history. It was fun to speculate, it was also fun.. there was lots of leeway for error. You knew you were gonna be wrong a fair percentage of the time because you had no way to confirm your ideas. So you attracted the people who were sort of like gentlemen philosopher doctors. Now with the genetic code, etc., all of the molecular biology, you're attracting a different breed of person. So I really do think you select out not only your fields you go into, you know, what branch of medicine in part dictated by how you feel about, enjoy being wrong, not having to be correct. You're right about the radiologists. No comment.

(Musical interlude)

Dr. Campbell: Do you want to say anything else about where genetics comes in? I agree with you that we can't ever really explain something as complex as behavior purely with genetics, but when it comes to this feeling of knowing, do you think there's anything else we need to say about that?

Dr. Burton: Well, I think there's one thing.. it is that when you start a thought, you feel as though it starts from its origination. For example I think George Bush said last week - he was going to want to do more oil drilling, OK? So, "I think we think I'm going to sit down and think about oil drilling, the pros and cons." It feels on a conscious basis that our thought's going to be rational exploration of exploration of oil, OK? but, try a simple experiment. If I say to you, "Exxon Valdez" what's the first image you get?

Dr. Campbell: Oil spill.

Dr. Burton: Right. Now: someone else might get, "long gas lines."

Dr. Campbell: Um-hm.

Dr. Burton: Really the question is, that image that you got, you see when you ask people you divide them up right away. I have a family member who said, "long gas lines" because he doesn't have the same starting point for thoughts that then generate his thinking about oil drilling. And I think in part it depends a lot upon how your memory's stored. So you mentioned on the podcast that's there's evidence now that whether or not you store fearful memories is in part related to a single gene, in mice at least - in mice you've not got that gene they don't have that fearful memory. Well, they're not gonna be afraid of an oil spill if they were a politician let's say... so they're gonna start with a different additional reference point that you don't have, which is, "Ah, there is no such thing as fear about this. We can fix it up. Technology comes up with all these ideas."

So I think the genes don't influence the behavior, they influence your thoughts that lead to your behavior in ways that we can't really understand. So if somebody was fearful about an oil spill talking to someone who wasn't, it's not a level playing field. They can't talk to each other where their ideas will start at the beginning so what involves their end reasoning are different. And I think genes have an enormous amount to do with that, I mean all these identical twin studies and so on suggest that our preferences in large part are dictated by genetic biases.

Dr. Campbell: I want to talk some more about the whole... what did you call it? The myth of the autonomous logical mind?

Dr. Burton: Rational mind. Yeah, rational mind.

Dr. Campbell: Rational mind... ? I want to talk about that in a minute but we talked about thought as being a perceptual thing, and you also talk quite a bit in the book about thought as a sensation. Those seem to be like overlapping ideas, but what does it mean to look at thought as a sensation?

Dr. Burton: I don't know if thought is a sensation, but the feeling about a thought has to be, and then .. I use the example in the book which sounded intentional - it was intentional - when I was finishing up the book I was in bed with my wife and I said to her, "What was the name of that cartoon figure that was the possum that was all philosophical," and she says, "I can't remember." And I said, "Watch this. I am going to do an experiment on my mind, in which I'm going to intentionally ask my unconscious who wrote that comic strip and what was the name of the comic strip." And I went to bed. And when I woke up in the morning, sure enough it was Walt Kelly and Pogo. It came right up and I said, "Oh, see it did work, just like that."

Now, the thing about it is, I could not feel my mind thinking. But it obviously was thinking, it had to come up with the name. The only way I was aware of the answer was I was aware that suddenly the answer appeared in my mind but I was never aware of thinking of it. So now you say, well what's the difference between that kind of thought and the thought that you're doing consciously. Well, one aspect which is certain is that you feel like you're thinking. And I've never heard it described, but the only way you know you're thinking consciously versus unconsciously is the sensation of the thought. So, when I say the thought is a sensation, at least in part conscious thought has to be a sensory awareness of what the brain is doing as opposed to just what the brain is doing. If it was just what the brain was doing, you'd be aware of all the information for Pogo. I never got all the names of the various cartoon characters I went through to find that name. So, it has to have a sensation for us to know we're doing it. I think this is another thing that's been sorely overlooked is the brain has ways to notify itself of what it's doing, so it's up to the unconscious to tell you when you're thinking.

Dr. Campbell: Just like we're not aware of all the stuff that goes on before what we consciously see reaches our awareness, all that processing, we don't see that either.

Dr. Burton: That's exactly correct. You know there was a study that just came out a few weeks ago which I'm still trying to sort through - they did these fMRI studies and they asked people to press buttons with either their left hand or their right hand while they were in a scanner, you know, just make an arbitrary choice, and it turned out that at least 5 seconds before they made any conscious choice, the appropriate area of the brain lit up on the MRI scan and this is the whole argument - who chose what? In other words from a conscious perspective it was chosen unconsciously and ... looking at research, unconsciously and then came into consciousness, but from a conscious perspective you feel like you chose it, sometime later. This gets back to that same thing perception of time. If you look at it that way these are sensory phenomena within the brain that dictate how we feel about our thoughts and actually guide them. That make sense?

Dr. Campbell: Yeah. One of those subjects that's been going on on my discussion forum has been how this relates to the idea of free will, and one person wrote, "Well, if it was in my unconscious it was still me."

Dr. Burton: That's right, and that's one of the major questions is most of us only think of our conscious as being our "self" so to speak, and then this whole diminished capacity argument about well, he couldn't help himself because his unconscious told him to do it. I think the idea of what is "you" is an outdated term, based upon the idea that we are conscious, rational human beings. Once you realize that a lot of what we do is unconscious, then free will or decision-making - if you step back from free will, just change the word to "choice" - the unconscious has all kinds of choices because it's making them all the time. Free will implies that it's free of material influence which is probably a non sequitur, probably it's meaningless...

Dr. Campbell: Yeah.

Dr. Burton: Your brain is materialistic at some level and yet you do have choices. I had a choice not to do this interview or to do this interview. So yes, we do have free will but it's of a different sort - it's more of a choice. [Ben Libet](#) - I don't know if you are familiar with him...

Dr. Campbell: Yes.

Dr. Burton: He and I shared an office right next door to the Neuroscience Institute at Mt. Zion, and he said, "You know, your unconscious makes all the decisions but your conscious still retains the veto power."

Dr. Campbell: Right.

Dr. Burton: And I think that's a profound comment because really what he's saying is, "Yes, maybe your idea will appear to you from out of the unconscious but you can then contemplate it and then you can input back into your unconscious your thoughts about it and change the way you think about things. A feedback loop from the conscious to the unconscious.

Dr. Campbell: Which I think means that in the end we have responsibility for the choices that we do make.

Dr. Burton: Correct. I totally agree and it's not an all or nothing, there's intermediate ground, we have choices within the limits of our biology.

Dr. Campbell: Right. Now, one of the ideas that you talked about in your book that I think, although it wasn't a theme is an important one to remind people about - would you talk a little bit about the idea of cognitive dissonance?

Dr. Burton: Right. Cognitive dissonance; obviously everybody understands it in the psychological terms of, "Oh, how could he believe that? - all the evidence is to the contrary." If you take somebody, for example... - I don't mean to be religious but somebody who believes physically in the resurrection - he has to know at some level that this isn't physiologically possible as we understand biology. And yet it has great meaning for him in terms of his iconography for religion. Well, under these circumstances it would seem a good up until recently to make some sort of psychological discussion of why he might feel that way... maybe he wants to be religious, maybe he's got deep-seated needs da da da... but the fact of the matter is, it seems to be manifest by a belief system, mainly the feeling of knowing is *so strong*, that even when you know the physiology doesn't make sense, that feeling that 'the physiology doesn't make sense' is not as strong as the feeling that 'yes this occurred'. You know there are lots of people who just simply cannot accept life without flying saucers or UFOs or alien abductions.. there's lots of so-called cognitive dissonance that actually I think emanates from an over-powering feeling of knowing on a physiological basis. As to why that occurs, maybe in part it is psychological, maybe in part it's because of peoples' predisposition to the ease with which they can experience this feeling. I actually don't know why some people are more prone to it than others, but it ends up being a physiological phenomenon at the root of cognitive dissonance, namely an inappropriate feeling of knowing making a wrong idea seem more correct than evidence to the contrary.

Dr. Campbell: One of the questions that one of my listeners submitted was, one of the things you said several times in the book was that, in general, the feeling of knowing tends to overrule the logical or the evidence for most people, even when they're confronted with the facts. And one of my listeners wanted me to ask you, "Why does the feeling win out?"

Dr. Burton: Because I think at the heart of it all we are emotional beings. Just take falling in love. You've never heard of anybody who's dissuaded from attaching themselves to somebody where from an outside observer's point you see a horrible match, because of any kind of logic. They even agree, but the emotion of love is too.. it overpowers whatever comes second. I guess it has strong evolutionary roots, I mean I'm not sure whether it's got to do with procreation whatever.. but love has clearly outdistanced anything that comes second such as reason. Right? By the same token, if you didn't have

a feeling of knowing, there'd be no reason to do *anything* - you'd be totally lost. The feeling of knowing is a very powerful - without it you would have no learning. In other words the only way you can really learn is by, "2 plus 2 is 4 - isn't that right?" And the teacher says "yes, that's right Johnny, you did fine", and eventually you feel really good about $2+2=4$, and you learn that. Well, if you didn't have that feeling, you learned nothing. So I think that this feeling of knowing must be enormously powerful - it must subvert reason when the two come into conflict. One is more biologically necessary. I think reason came much later and is much less of an evolutionary necessity than this feeling of correctness which is at the heart of learning, at the heart of what causes reasoning in the first place. The reasoning is dependent on the feeling - the feeling isn't dependent on the reason.

Dr. Campbell: Kind of brings us way back to what David Hume wrote - I think that's what he argued, was that the mind was really the stepchild of our emotions.

Dr. Burton: Correct. That is correct. I mean really the thing about this - you wouldn't really *have* reason without that feeling cause you know you'd never be able to go, "Oh I think that's right."

Dr. Campbell: Yeah.

Dr. Burton: But on the other hand, you could certainly have the feeling without the reason. That's what the 'aha' is - that sort of aha where life is wonderful. You don't need the reason for that.

(music interlude)

Dr. Campbell: I really appreciated the fact that you on several occasions in your book you argued for more tolerance, from both ends - from believers and nonbelievers toward each others' stances on these things, since we really don't have a conscious control over when we have that feeling, or just like you said you're on the skeptical end - that's not something that you can will.

Dr. Burton: No.. it really isn't and it's just the way I am. You know I got an email the other day from a prominent trial attorney in America who said he's writing a book for lawyers and after reading the book he's writing a chapter on how in looking out at the opposing lawyer and at the jury and the judge, you should say, well each of these people has independent lines of reasoning arising out of dissimilar unconscious mechanisms such as the hidden layer we talked about, then I have to look upon them with more respect and that they aren't just dodos that disagree with me. And I thought this was really interesting because all of a sudden he saw a jury box as twelve different hidden layers as opposed to a group of people that you had to convince you were right.

Dr. Campbell: That's a great example. You had a chapter where you talked about gut feelings and intuition and you particularly talked about the book *Blink* which I bring it up because it's a book I have talked about in the past. Do you want to say anything about that before I comment?

Dr. Burton: Well you know I don't mean to do character assassination because Gladwell's a great writer - I mean he is really a sensationally good New Yorker-style writer and I admire him greatly. But I think in this particular case he's made not only a faulty assumption but one which is really dangerous. If you have a second, what basically he did was said he wrote his book based in part upon reading this book by Timothy Wilson, *Strangers To Ourselves* about the unacceptability of unconscious thought. But Gladwell thought, well maybe there are ways that you can train this in some way. So he uses examples of where unconscious thought turns out to be as "right" as he calls it as more deliberate thought. But the fact of the matter is, *all* thought originates in the unconscious. It is then modified, scrutinized, examined then tested in the conscious. So the idea that the unconscious is suddenly a spring or a marvelous fountain of ideas is a truism - it's of no meaning cause that's where the question is, can you know if these thoughts are correct? And he uses an example at the start of his book - if you remember the Greek statue -

Dr. Campbell: Yeah...

Dr. Burton: .. And the Greek Koros which is a 500 BC statue was bought for 10 million dollars and the people at the museum thought it was great, and so people came along and said that they were revulsed by the sight of it, it was a forgery, a phony... so Gladwell says, it turned out, that these people - and he uses the word absolutely right, that's a quote - that by their revulsion these people were able to tell

that this was a forgery. No... these people were experts in the museum. They were experts who had expertise as part of the unconscious - you learn something, you do it over and over again, then it becomes part of your unconscious. On an *expert* level they made an unconscious decision *they* thought was right. Well the answer is, they made an expert decision, and it *could* have been right. But it's up to the conscious mind to test it out, to use some sort of empirical method to see whether this really was a forgery. So the fact is that they went out and did all these studies and they still don't know. I looked this up a few weeks ago in the catalogue from the Getty museum and they list it as either a 550 BC statue or a forgery - they said it's perhaps because we don't understand the methods of Greek burial statues, so when Gladwell says they were "absolutely right," he's absolutely wrong. In doing it he's glorifying or deifying the unconscious as having the ability to know when it's correct. And this is why I divided my book up into two things - those things which you should be opinions - the unconscious came up with an *opinion* but it didn't come up with scientific evidence, and it's up to the conscious person to test the statue or whatever, any way you can, you know, carbon dating whatever, to see if they can justify the opinion. So he can't "know" that this was absolutely right and that for him to say that is the same reason that doctors say, "I have a gut feeling that you got this or that or the other thing..." No no, that's not the correct way of thinking. So I take great exception with his book on that basis.

Dr. Campbell: The question that came to my mind as I read what you were writing was he doesn't seem to really make a distinction between the expert knowledge that say a physician has acquired and has kind of become part of our unconscious circuitry in some ways so that we don't have to think about it every time we see a patient, and stuff that comes out of your unconscious that's really not based on anything like that.

Dr. Burton. Yeah, that's correct. Take a surgeon for example, or take yourself in an emergency room situation. So you've had that feeling, oh, this is nothing.. or, this is a person who may have appendicitis. And you make some qualitative judgment. OK, so your experience is that you have over a bunch of years goes and becomes part of the unconscious mental processing - it becomes additional information, it feels as though it's better. And so for some medical experience it clearly is better. Obviously the real criteria with you - OK let's do a study on ER docs and see whether or not they're better than chance alone at diagnosing appendicitis based on their clinical experience. And if they are then you've shown statistically that your expertise is of value. In this case you can find out because you can see with a lot of people with appendicitis, do CT scans or whatever, right? so you can know... you can judge where expertise works. But in other cases you can't know where the expertise works - there's no - if they don't know whether or not this statue's a forgery then you're still left with the expertise being untested. You're absolutely right - expertise goes to inform your unconscious so obviously it's a major portion of what you think is expertise. And then you just test it, if you can. If you can't you just say, "in my opinion" - you've got appendicitis - that's fine.. But there are differences between just any old random idea and expertise.

Dr. Campbell: So I think that one of the key things you were trying to bring out in that chapter was that we can't know when the feeling of knowing is right - we can't stop there.

Dr. Burton: Right. It's really I think pretty simple to say, "OK, is this an idea that that I can test or is this an idea that I have to carry with me as feeling right but I can't yet know that it's right?" And that really does sort of sort out the scientific questions from the metaphysical or political or practical. I mean you can't know whether it's better to go to the beach or to the mountains for a vacation. One feels better than another but that's not really the kind of opinion that you can test. You'd have to know that. But when people say we should be in Iraq or we should be out of Iraq or we should do oil drilling I mean they act as though these are things that can be tested - those aren't testable ideas.

Dr. Campbell: Right... Another thing you said in the book was that the feeling afterwards that you're happy with the choice you made is not a - that's not a valid criteria for deciding it was the right choice.

Dr. Burton: That study I mentioned in the book about .. the interesting thing is since I wrote it it has become even more popular - because there are even more books on gut feeling - is the idea that if you ask people to make a decision where they want to live and they'll tell you that if they use their unconscious split second or distracted opinion rather than when they're concentrating on it they'll make a better choice - the choice that they're happier with. But if your choice is to buy a home in Malibu and it feels great, and then it slides into the ocean, it wasn't a good choice. And so the real question would have been, in that case, this guy I'm studying, good choices versus bad choices, what would have been a reasonable criterion? I don't know what it would have been. It's certainly not the fact that it feels like

a good choice. Saying a choice is good because it feels like a good choice is a circular argument.

Dr. Campbell: And it brings us back to the whole idea of tolerance, since, as you pointed out, there's an awful lot of things that we can never really know.

Dr. Burton: Yes.

Dr. Campbell: Stuff that people really care a lot about.

Dr. Burton: One of the things that writing this book that took so long to write was that I now don't know that I'm tolerant, more tolerant, but I do recognize that their opinion's arising out of a separate process than mine and I can't know which one's correct. It should make me more tolerant - I hope it does. I'm aware of the fact that they're not starting from the same position. Just that alone is helpful.

Dr. Campbell: And I'd like to return to "the myth of the autonomous rational mind" because the whole fact that this is not really under our conscious control has some big implications, doesn't it?

Dr. Burton: Absolutely. Just being aware of the fact that we are a complex organism which developed an additional faculty, which is awareness of what the unconscious is doing - this doesn't make you rational, and it does mean that you have to have empathy for our biology.

In other words you take Richard Dawkins; he says something about faith as a cop out. Now, I am a hundred percent in favor of Dawkins' ideas on evolution and all the rest of it, but he has to also understand that our biology, it's more.. it's sort of like telling someone who's in love, "Don't be in love." Well that doesn't make sense. Don't have faith.. a lot of this is sort of us all pursuing our biology to greater or lesser degrees as best we can - we have to sort of develop a society that's more consistent with our biologic principles rather than having some enlightenment sense that there's a rational mind and that should govern the way we are - it reminds me of Nancy Reagan saying, "Just say no to drugs." You know, whatever.. I mean, that may be true.. I mean you know it sounds great - I have no objection to that, except it just doesn't work. I mean it's foolish to draw up a policy like that because it goes against your biology.

(Music interlude)

Dr. Campbell: I've just about gone through the questions that I had written down, .. and, is there anything that you think I .. I know you said in your email that I hadn't left anything out, but surely there is something that you would like to.. well, what about your new ideas - you said you had some -

Dr. Burton: Well I'm actually working on it, is one of the questions - I don't know if I can articulate this because it's still sort of seeping around in there is that most of us feel that we are what our conscious mind tells us we are. That question you asked about the free will and about someone said what your unconscious is doing is not part of 'you' - I think that we sense only what we sense. We sense ourselves as darting an idea, having a thought, making plans, etc etc. and we really don't see that that facility arises out of the same cognitive stew that causes all these perceptual illusions in general. And somehow, if you were to take a look at sort of western thought, it really is all about the mind-body thing. All the major questions arise out of the conception that the mind is somehow a separate entity. I mean there's a book by [John Searle](#) the philosopher - he has a whole book called The Mind, and he covers all the various kinds of theories, but none of them make any sense if you think about it. Because way down deep the mind is simply a higher level function that we can't conceptualize, just the same way as you said it's more than the sum of its parts I think you said.. this whole idea of emergence is

really impossible to visually see - in other words you realize that if you take a chocolate chip and you take a piece of flour and take water, there is no embedded cake in there.. there's nothing - there's just chocolate and flour but we know you can make a cake. Well the cake is material. You can still see it. But in this case the problem is, the problem is what the brain generates is *immaterial*, that we *can't* see, yet does exist. I mean exists in the same way that pain exists. Pain isn't anywhere. The brain doesn't experience pain in the neurons I'm suffering. When you stub your toe there's no neuron that goes ouch. It occurs at a higher level. The problem I haven't figured out yet which I think might be the next project is, there needs to be a metaphor for understanding higher level function when seen from a lower level that will allow people to get rid of this distinction and argument about the mind and free will and causation. I think these are all problems of language that arise out of misconceptions what the mind is. Which is sort of what I think might be the next project.

Dr. Campbell: You pointed out in your book that we don't think pain is something mystical or magical just because it can't be localized - it's emergent - yet somehow it seems natural to look at our mind and feel that it has to be somehow different.

Dr. Burton: Right. And I haven't been able to think of it because maybe I'm too dense, but there must be some analogy or metaphoric analogy where you can say, well just as pain exists but is undetectable, the mind exists, but it exists arising out of stuff that we cannot control so even though it feels like it's separate and also feels like it's in control in some sense it also feels like it's you, and feels like a self - these are all phenomena that are undetectable but necessary - I don't want to use the word illusion because illusion implies it doesn't exist - but on the other hand it is an illusion if you mean by illusion you can't see or taste or smell or touch it. It's an illusion without being an illusion.

Dr. Campbell: It's an illusion in the sense that it's not exactly what we think it is.

Dr. Burton: Right. And I think the problem is that most of us feel very very strongly that we exist as people - you know, as individual persons, and if you didn't have that feeling you wouldn't do anything there would be no motivation - without a sense of self there'd be nothing we could refer to as life - yet we must recognize that this exists somehow in a different realm and I don't know what the word 'realm' is - I use the word 'hierarchy' in the book to go up to the level of consciousness but I never actually discuss the mind because I don't quite figure but I don't believe the philosophy we've used has gotten us anywhere, where also these questions of free will and responsibility and diminished capacity - for example if you are Robert Alton Harris - he's the guy that was the murderer I think and after he killed these people he ate their hamburgers and you know, he was sent to the electric chair, or whatever, and the argument was diminished capacity because he had childhood abuse and this and that and the other thing, which was true, he had brain damage, and the question is, who is Robert Alton Harris? Is he just a conscious person? Or does he represent all of the biology and abuse? Of course he represents all of the above so the question is we need a new way of thinking about what is a person in order to attribute responsibility - if somebody has got disinterest in let's say, reading, because they read slowly, we don't punish them if we say they have dyslexia. On the other hand, is it right to say 'don't try'? What we need to know who the whole person is .. I suppose as we go along we need to know a whole new conception of what the mind is. So that's my new meta project.

Dr. Campbell: I heard [Michael Gazzaniga](#) interviewed [on All in the Mind](#) in relationship to this and he made a good point that when it comes to these kinds of social things it's also about the interrelationship with the person and his society, in other words the person also knows that in the society he lives in it's not OK to eat other people - he thinks that should be part of the equation when we're deciding about peoples' responsibility for the things that they choose to do.

Dr. Burton: For this actually there's a - [David Bohm](#) - I had the good fortune of meeting him- when I was young I spent a weekend with him he was a physicist who used to work with Einstein, and he wrote a book called [Thought as a System](#). And I remember spending a weekend with him. He was trying to explain what he thought the mind was - he had the idea that it was a different order or different level or

emergent level and he was trying a metaphor which I couldn't quite grasp but he made the point that even our thoughts aren't just ours. In other words, if you watch a bunch of skinny little models and you believe that's the norm, you will inject into your unconscious hidden layer an idea of what the norm for seeing your own body is - so when you look in the mirror, and you see that you're overweight, say in the case of anorexia, you will actually see a skinny person - I mean a fat person when you are in fact skinny. Your perception actually came out of a social idea which became your thought.

So David Bohm actually believes that you don't own your thoughts apart from a larger community, which I think is also a fascinating idea.

Dr. Campbell: That was somewhat similar to what Gazzaniga said. Well, I think we're just about out of time - is there anything else you'd like to share before we close?

Dr. Burton: No, I very much enjoyed chatting with you. I think this, I really was also thrilled that you took the time to read my book and the way you did, it was actually fun to listen to. I was listening to it and I thought, gee that sounds like an interesting book.

Dr. Campbell: Well you know the thing about editing is that by the time I get done I can't tell anymore because I'm - you probably experience it when you're editing your book - it's like ..

Dr. Burton: Oh sure..

Dr. Campbell: .. You can't tell if it's good anymore because you're so sick of it..

Dr. Burton: Right. But I thought.. I was very impressed and I actually, you know the funny thing is because it's hard to keep this all in mind at once - even though I've written this book and spent a lot of time on it it always strikes me every time I hear it. It's counter-intuitive at some level it makes you go, *that's* interesting.. It's hard to avoid the fact that your mind reverts back to the default position that this isn't true.

(Music)

Dr. Campbell: I want to thank Dr. Burton for being on the ***Brain Science Podcast*** and I really want to encourage everyone to go ahead and read his book [*On Being Certain: Believing You're Right Even When You're Not*](#). I think that between Episode 42 and Episode 43 I have covered some of the key ideas but I think that this is a very important topic which is why I think that if you can you should read the book for yourself.

One subject that I mentioned early on that we forgot to come back to was, what are the implications for psychology and psychiatry to the fact that the unconscious really isn't totally accessible, controllable, or necessarily reliable, because obviously there are schools of psychoanalysis that depend on the belief that our unconscious contains truths that are not in our conscious mind. Dr. Burton really doesn't talk about this in his book. He is very conscientious about staying in his own areas of expertise, and he never claims to have any expertise in psychiatry - after all he was a neurologist. But, I think if you're familiar with some of the ideas of psychology you will see the implications of this information.

The key idea, I think, is that Dr. Burton points out that our feeling of certainty about anything that comes out of our unconscious mind is not the most reliable indicator. And then there's the fact that research in memory is showing that memory is highly dynamic and that it's really easy to create false memories. That too has big implications for approaches in psychology that are based on recovering a

